

An Interim Management Plan for Oregon's
Nearshore Commercial Fisheries

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INTRODUCTION

The groundfish crisis continues to deepen. Since 1997, the nearshore commercial fishery has continued to grow due to the development of live-fish markets. More recreational and commercial fishing effort will likely move into nearshore areas in 2003 due to anticipated restrictions and area closures on the continental shelf. Little is known about the status of nearshore fishery resources. Washington has virtually eliminated commercial fishing for groundfish inside of 3 miles – expressing a strong sport preference. California continues to develop a complex set of restrictions on its nearshore fishery – including effort limitation. Oregon has a unique set of circumstances in that most of the commercial effort is concentrated in southern Oregon while recreational effort tends to be concentrated in central and northern coastal waters. The Fish and Wildlife Commission has directed staff to come up with a plan to limit growth and protect nearshore resource, and to balance overall ocean-wide marine resource use among recreational and commercial interests. This staff report and management proposal has been developed based on the initiative of Oregon commercial fishermen, particularly those on the South Coast, who are seeing increasing effort in the commercial nearshore fishery. Staff requests the Commission to take action to bring the commercial nearshore fishery into the Developmental Fisheries Program.

GOALS AND OBJECTIVES

Staff proposes the following goals and objectives for managing Oregon's nearshore fisheries:

- Sustain biological resources at optimal levels.
- Minimize the number of commercial nearshore vessels fishing off central and northern coastal waters in areas of high recreational use;
- Allow continuation of black rockfish open access fishery;
- Avoid additional effort shifting from open access fishery to nearshore fishery.
- Reduce effort by at least 50%.
- Gather information needed for management – using mandatory logbooks and sampling.
- Develop a cap on harvest levels of nearshore species.

BACKGROUND

Stock Status

Most nearshore species have not had formal stock assessments to determine abundance and appropriate harvest levels. Lingcod and black rockfish are notable exceptions in this respect. In the Pacific Fishery Management Council (PFMC) scheme, most nearshore species are managed as aggregates (either 'minor rockfish', or 'other fish'), or are not included under the Council's groundfish fishery management plan at all. As such, they do not have separate commercial harvest guidelines or trip limits, or separate recreational bag limits. Many of these species are long-lived, and show very little movement over the

course of their lives. Increased fishing pressure may lead to local depletion of rocky reefs and user conflicts. **Appendix A** provides synopses on the biology, life history and ecology of the species that would fall under this interim management plan.

Fisheries

Harvest of some nearshore rockfishes, kelp greenling and cabezon has increased substantially since the mid-1990s. This increase is due to development of a live-fish fishery in which desired species are landed and marketed live to specialty markets. The increase catch is also a consequence of the West Coast groundfish crisis that has reduced fishing opportunities on other species. The live-fish fishery originated in California, and developed significant landings in Oregon beginning in 1997. The high value (for example, China rockfish can bring over \$6.00 per pound) for live fish has created incentives for open access and limited entry fishers to pursue the nearshore complex of marine finfish species even though commercial landing limits and recreational bag limits for many rockfishes and lingcod have been reduced significantly in recent years. The expansion in this fishery is primarily along Oregon's south coast.

Characteristics and recent history of the Oregon's nearshore fishery are described in **Appendix B**. Several of the nearshore species caught by commercial live-fish fishers are groundfish managed under a federal Fishery Management Plan (FMP). A few, like surfperch and some sculpins, are under state jurisdiction. Like other commercial fisheries, the nearshore fishery is a component of a diverse portfolio of other fisheries and species harvested, and must be viewed in this context. Participants in this fishery are diverse in terms of their reliance on nearshore species, and in terms of their participation in other fisheries. Recreational anglers use the same reefs as commercial vessels. Recreational divers also use these reefs to view and hunt these species.

The expansion in the Oregon nearshore live-fish fishery is well illustrated by commercial landings of cabezon, a large member of the sculpin family. Slightly over 46,000 pounds (round weight) were landed in Oregon in 1997, of which just over half was landed as live fish. In 2001, over 102,000 pounds were landed, and nearly 95% of this was as live fish. (**Appendix Table B-1, and Appendix Figures B-1 and B-2**). In 1997, 44 vessels landed live fish in Oregon and delivered to 27 buyers. In 2000, 102 vessels delivered live groundfish to 45 buyers in Oregon. Overall, 185 separate vessels have landed live fish in Oregon one or more times from 1997 through 1 July 2001, but no more than 102 vessels in any one year (**Appendix Tables B-4 and B-7, and Appendix Figure B-5**).

Participants in this fishery are diverse in terms of their reliance on nearshore species, and in terms of their participation in other fisheries. Only half of the vessels that delivered live fish in 2000 delivered more than 500 pounds, and harvest volume was only 5% of their total landings. However, the average value of the live-fish catch of vessels delivering any live fish was 34% of the vessels total income in 2000. Thirty-five of the 102 vessels earned more than 50% of their income from the live-fish fishery. The live-fish revenue is obviously very important to the viability of the participants.

In 2000, a total of 1,937 landings were made with fish species delivered live. Eighty-nine percent of these landings targeted species to be delivered live (note: we classified a targeted trip as one with revenue greater than or equal to 50% of total trip revenue). July is the month with the highest number of live-fish deliveries, with over 350 landings a month delivering to Oregon's southern ports.

Several hook-and-line gears, and pot gear are fished by both open access and limited entry participants. Increased effort has been directed toward nearshore species due to increased restrictions on the continental shelf needed to conserve and rebuild depleted canary rockfish and lingcod stocks. In addition, long-term fishery participants and new open access fishers are directing more effort toward highly lucrative nearshore species to satisfy the live-fish market.

Public Meeting and Plan Scoping Process

The increase in harvest of nearshore species, particularly on Oregon's south coast, led a number of fishermen to suggest that management measures be devised to constrain further growth of the fishery. The lack of information on the abundance, population dynamics and ecology of these species currently precludes more biologically based management and conservation measures. Several ideas for management were discussed before, during, and subsequent to a fisheries forum in Bandon on 26 April 2001. Subsequent public meetings to discuss nearshore management were held in Port Orford and Garibaldi on 26 and 28 June 2001, and in Newport and Port Orford on 11 and 12 October 2001. It was also discussed at meetings of the Developmental Fisheries Board in 2 October 2001 and 6 November 2001.

The concept of restricting entry for the open access component of the groundfish fishery has been a topic of discussion within the PFMC. The Council has recognized that reducing harvesting capacity in West Coast groundfish fisheries is one of the most important measures to bring the financial demand for groundfish into balance with the productive capacity of the resource. The Council's groundfish strategic plan sets out a goal of reducing fleet capacity by approximately 50% in each of the groundfish fishery sectors (limited entry trawl, limited entry fixed gear, and open access). The Council has established a control date of 5 November 1999 and notified the fleet that participation after that date may not qualify vessels for future participation should the open access component of the fishery be limited. Most recently, the Council's Open Access Permitting Subcommittee of the Ad Hoc Groundfish Strategic Plan Oversight Committee discussed possible limitations to the open access groundfish fishery in Portland on 30 – 31 January 2002. The subcommittee adopted preliminary goals and objectives and requested harvest summaries by gear, species, area, and catch condition (live versus dead) of landings by the open access fleet. The subcommittee will continue to meet and develop recommendations for restricting future participation in the open access fishery. Should the Council adopt any restrictions, it is unlikely that they could be imposed before 2004.

Based on background information and meetings and discussions with constituents, the Oregon Fish and Wildlife Commission addressed the nearshore plan issue at its 19 October 2001 meeting. The Commission considered three options; no action, to adopt the PFMC control date of 5 November 1999, and to adopt a less restrictive control date of 1 July 2001. The Commission acted to establish a control date of 1 July 2001 for possible use in future programs that may be developed for limiting commercial participation in fisheries for nearshore species.

At meetings held in Garibaldi, Port Orford, and Newport in June and July of 2002, revised options were considered, using live-fish landing histories for a window period of 1 January 1997 through 1 July 2001. After review of issues brought forth by public and staff, a final set of options were drafted and presented to the Developmental Fisheries Board on August 26, 2002. The balance of this document presents a potential interim management program to bring several species into the Developmental Fisheries Program. It would establish a permit system to access these species, and would constrain further growth in participation in this fishery.

The issues being directly addressed under this potential management approach are:

- the number of participants who would be permitted to target and land selected nearshore species,
- the qualification criteria for permits,
- areas of operation,
- legal gears, and
- reporting requirements.

ODFW staff is well aware that prudent management of a fishery requires total removals from the ocean to be balanced with the productive capacity of the resource. Some of the needed information will be developed through the proposed program. A separate proposal to be introduced at the September 2002 Council meeting will impose direct limits on total removals capping harvest at 2002 levels. Additional reductions in catch may be required. The proposed actions presented here are an interim management approach. Additional biological and fishery information will be collected and used to develop a longer-term plan.

STAFF ANALYSIS OF ISSUES AND OPTIONS

Issue 1. Add 21 Nearshore Finfish Species to Category A of the Developmental Fishery Program's Species List.

In order for species to qualify for the Developmental Fisheries category A list, they must be underutilized, not "actively managed" under another state or federal management plan using a limited entry system, and have the potential to be economically viable (OAR 635-006-810 and OAR 635-006-820). The stock status of the 21 species proposed for inclusion under category A is unknown and may be underutilized. A new high value fishery directed toward these species emerged in 1997. Currently, most of the proposed species are under a federal management plan for groundfish, but most harvesters participate as open access fishers who do not have federal limited entry permits, thus are not actively managed. Therefore, the 21 species proposed qualify for the category A species list.

The staff preferred option focuses on species that live predominantly in the Oregon territorial sea, and do not have separate optimum yields determined by the PFMC under its groundfish fishery management plan. Black and blue rockfish are not included on the list for two reasons: 1) black rockfish are managed under a separate OY under the PFMC groundfish FMP; 2) blue rockfish are also caught incidentally with black rockfish and are often taken outside the territorial sea. Lingcod and canary rockfish are also excluded from this proposal because each species is closely managed by the PFMC and each has a separate OY.

Reinstating black rockfish management areas and providing a smaller bycatch allowance will allow the black rockfish fishery to continue without impacting those who developed nearshore fisheries principally for live-fish markets. If black rockfish were allowed on the list, too many boats would qualify for a permit and have access to the other nearshore species. Many of the boats landing black rockfish during the window period have not made significant landings of non-black rockfish in the nearshore fishery. Staff will track landings to determine if there is a need for a Developmental Fishery Permit for black rockfish.

Species associated with soft-bottom nearshore habitats such as flatfish and skates are also excluded. As a precautionary measure, the list of proposed species includes some rockfish whose range is limited to California. Recent Oregon landings have included several species, such as black-and-yellow and gopher rockfish that were previously thought to have more southerly distributions. Growing understanding of changing ocean conditions and associated changes in fish distribution suggest that including species such as kelp rockfish, calico rockfish, olive rockfish, and treefish in this proposed list is prudent.

Staff analysis of qualification based on landing history showed very few fishers who have participated in the surfperch fishery would qualify for a permit. The nearshore surfperch

fishery is characterized by shore side hook-and-line landings of surfperch, taken from Oregon's beaches in small quantities. If there is an increase in effort or change in gear used for surfperch, staff will propose adding surfperch to the Developmental Fisheries Program under a separate permit.

Option A(*preferred*):

Staff recommends the species listed in **Table 1** be added to category A under the Developmental Fisheries Program, and a new harvest program developed for these species. The list effectively moves cabezon, kelp greenling, and sculpins from category C to category A, and adds several other new species to category A.

Option B:

Same as Option A but add black and blue rockfish and surfperches. (Issue separate permits for black and blue rockfish, and surfperches based on different qualification criteria).

Table 1: Focal species for Oregon nearshore fishery management. Common name, Latin binomial and PFMC management category is listed below each family name. ‘n/a’ (not applicable) means the species is not part of the PFMC groundfish management plan.

Family Cottidae

Buffalo sculpin <i>Enophrys bison</i>	n/a
Red Irish Lord, <i>Hemilepidotus hemilepidotus</i>	n/a
Brown Irish lord <i>Hemilepidotus spinosus</i>	n/a
Cabezon, <i>Scorpaenichthys marmoratus</i>	Other fish

Family Hexagrammidae

Kelp greenling <i>Hexagrammos decagrammus</i>	Other fish
Rock greenling <i>Hexagrammos lagocephalus</i>	n/a
Whitespotted greenling <i>Hexagrammos stelleri</i>	n/a
Painted greenling <i>Oxylebius pictus</i>	n/a

Family Scorpaenidae

Kelp rockfish <i>Sebastes atrovirens</i>	Minor nearshore rockfish
Brown rockfish <i>Sebastes auriculatus</i>	Minor nearshore rockfish
Gopher rockfish <i>Sebastes carnatus</i>	Minor nearshore rockfish
Copper rockfish <i>Sebastes caurinus</i>	Minor nearshore rockfish
Black & Yellow rockfish <i>Sebastes chrysomelas</i>	Minor nearshore rockfish
Calico rockfish <i>Sebastes dalli</i>	Minor nearshore rockfish
Quillback rockfish <i>Sebastes maliger</i>	Minor nearshore rockfish
Vermilion rockfish <i>Sebastes miniatus</i>	Minor shelf rockfish
China rockfish <i>Sebastes nebulosis</i>	Minor nearshore rockfish
Tiger rockfish <i>Sebastes nigrocinctus</i>	Minor shelf rockfish
Grass rockfish <i>Sebastes rastrelliger</i>	Minor nearshore rockfish
Olive rockfish <i>Sebastes serranoides</i>	Minor nearshore rockfish
Treefish <i>Sebastes serriceps</i>	Minor nearshore rockfish

Issue 2. Harvest Program for Nearshore Species

If the proposed nearshore species list is adopted by the Commission a harvest and monitoring program would need to be developed for the new category A species (OAR 635-006-0880). This plan is outlined below under **Issues 2a-2h**. The harvest and monitoring program may be later modified by the Director under authority provided in OAR 635-006-0880 (3).

Issue 2a. Qualification Criteria for Initial Permit Issuance.

Staff recommends creating a Developmental Fisheries permit system with qualification criteria based on landings of nearshore species (principally cabezon, greenling, and nearshore rockfish (after 1999) but not black rockfish. The qualifying landings must be made in at least one calendar year during the window period January 1, 1997-July 1, 2001 inclusive.

The nearshore fishery north of Heceta Head is less developed than compared to the south. Thus, a two tiered set of criteria were used to identify qualifying vessels. A minimum landing threshold of 500 lbs. of nearshore species landed within one calendar year within the window period was used north of Heceta Head. A higher threshold of 750 lbs. of nearshore species landed within one calendar year within the window period was used south of Heceta Head.

Under the preferred alternative, a total of 71 (65 from the south coast and 6 from the north coast) vessels would qualify for a Developmental Nearshore Fisheries permit (**Table 2**). Current active fleet size is between 90-110 boats. This option would result in less than a 50% reduction in fleet size and would be further reduced to 50% through attrition of permits not meeting the annual renewal requirements.

The permit would be required to land any of the 21 species listed above under Issue 1 unless otherwise provided for in an incidental allowance. The permit applies to the 21 species without regard to their condition, live or dead.

Option A(*preferred*):

Applicants for a nearshore Developmental Fisheries permit must own a vessel that has landed at least 500 pounds of nearshore species in any one calendar year during the window period 1 January 1997 through 1 July 2001 to qualify for a permit north of Heceta Head. The majority of qualifying landings must have been made into Oregon ports north of Heceta Head.

Applicants for a nearshore Developmental Fisheries permit must own a vessel that has landed at least 750 pounds of nearshore species in any one calendar year during the window period 1 January 1997 through 1 July 2001 to qualify for a

permit south of Heceta Head. The majority of qualifying landings must have been made into Oregon ports south of Heceta Head.

Option B: No alternative given – see **Table 2** for other possible alternatives.

Table 2. Vessels qualifying using different landing criteria during the January 1, 1997-July 1, 2001 window period. Totals in bold north and south of Heceta Head corrected for double-counting between ports.

Non-trawl Vessels with Non-Black Rockfish Nearshore Fish as the qualifier

PORT	AREA	POUNDS	VESSELS	AREA	THRESHOLD	VESSELS	AREA	POUNDS	VESSELS	AREA	POUNDS	VESSELS	AREA	POUNDS	VESSELS	AREA	POUNDS	VESSELS
Astoria	North	100		North	150		North	200		North	300		North	400		North	400	
Garibaldi	North	100	19	6 North	150	13	5 North	200	10	3 North	300	7	3 North	400	6	3 North	400	2
P. City	North	100		9 North	150		5 North	200		4 North	300		2 North	400		1 North	400	2
Depoe Bay	North	100		1 North	150		1 North	200		1 North	300		1 North	400		1 North	400	1
Newport	North	100		4 North	150		3 North	200		3 North	300		2 North	400		2 North	400	1
Coos Bay	South	100		17 South	150		13 South	200		12 South	300		6 South	400		6 South	400	5
Bandon	South	100		1 South	150		1 South	200		1 South	300		1 South	400		1 South	400	1
Port Orford	South	100	122	66 South	150	114	65 South	200	103	62 South	300	86	51 South	400	80	51 South	400	47
Gold Beach	South	100		44 South	150		39 South	200		35 South	300		31 South	400		31 South	400	29
Brookings	South	100		26 South	150		21 South	200		16 South	300		14 South	400		14 South	400	13

PORT	AREA	POUNDS	VESSELS	AREA	POUNDS	VESSELS	AREA	POUNDS	VESSELS	AREA	POUNDS	VESSELS	AREA	POUNDS	VESSELS	AREA	POUNDS	VESSELS
Astoria	North	500		North	600		North	700		North	750		North	1000		North	1000	
Garibaldi	North	500	6	2 North	600	5	2 North	700	4	1 North	750	4	1 North	1000	3	1 North	1000	1
P. City	North	500		2 North	600		1 North	700		1 North	750		1 North	1000		1 North	1000	1
Depoe Bay	North	500		1 North	600		1 North	700		1 North	750		1 North	1000		1 North	1000	1
Newport	North	500		1 North	600		1 North	700		1 North	750		1 North	1000		1 North	1000	1
Coos Bay	South	500		5 South	600		5 South	700		4 South	750		4 South	1000		4 South	1000	4
Bandon	South	500		South	600		South	700		South	750		South	1000		South	1000	1
Port Orford	South	500	77	46 South	600	74	46 South	700	67	43 South	750	65	43 South	1000	55	43 South	1000	35
Gold Beach	South	500		25 South	600		23 South	700		20 South	750		19 South	1000		19 South	1000	16
Brookings	South	500		13 South	600		12 South	700		11 South	750		10 South	1000		10 South	1000	7

Note: Vessel Numbers reflect nonrepeated total numbers of vessels - accounts for vessels repeated in more than one port
 Fresh & Live Fish not differentiated in the threshold qualifier.
 Qualifier generated from Oregon landings dated Jan 1, 1997 - Jul 1, 2001.
 Qualifier excludes Bottom, Midwater and Shrimp Trawl gears.

Issue 2b. Permit Allocation by Area

Allocation of permits by area would be based on where the majority of qualifying landings into Oregon ports were made. Sixty-five vessels south of Heceta Head qualify for permits while 6 qualify north of Heceta Head. The ratio of permits between the north and south coasts is consistent with the goal of minimizing nearshore commercial effort north of Heceta Head in areas of high recreational use. Allowing some effort preserves the opportunity to support a nearshore commercial fishery while minimizing user conflicts.

The preferred option is also consistent with our goal of keeping effort from increasing in areas with more limited nearshore reef habitat north of Heceta Head.

There was a strong preference expressed for **Option B** by public attending the Port Orford meeting. Others, largely from central and north coast areas expressed the concern that effort might shift to the north and create additional pressure on limited resources.

Option A (preferred):

Under this option, Developmental Fisheries permits would be issued on an area basis differentially north and south of Heceta Head located approximately midway between Astoria and Brookings.

Option B:

Adopt no area management option for permit issuance.

Issue 2c. Renewal Requirements

Developmental Fisheries permits are non-transferable, except to another vessel owned or controlled by the permit holder. Renewal requirements are designed to encourage use of Developmental Fisheries permits and to discourage speculation on future permit value without using the permit. Renewal requirements in other limited entry programs can also reduce the number of permits through time by eliminating unused permits until a target number of permits is reached. Currently, nearshore fisheries have a large number of participants for a small amount of resource. Setting a large landing requirement for renewing a permit might stimulate effort and lead to increases in catch.

The staff preferred option requires a smaller landing limit but at least 5 landings to qualify a permit for renewal. There were 40 boats out of 105 that made fewer than 5 landings of live groundfish in 2000.

Option A (*preferred*):

Permit holders receiving permits for 2003 must land at least **100** pounds of Developmental Fisheries nearshore species and make **5** or more landings, to qualify the permit for renewal for the subsequent year.

Option B:

Permit holders receiving permits for 2003 must land the amount used to initially qualify for a permit of Developmental Fisheries nearshore species to qualify the permit for renewal for the subsequent year. The annual renewal amount would be [500/750] pounds of nearshore species for [north/south] permits.

Issue 2d. Numbers of permits

Current fleet participation is around 100 boats annually. An initial target level of 50 boats is consistent with the goal of reducing fleet size by at least 50%. Staff recommends setting a goal of implementing limited entry in 3-5 years so permits can be transferable. The target goal of 50 boats would be evaluated prior to developing a limited entry program. Depending on the initial qualification criteria, there may initially be more than 50 permitted boats. It may take 3-5 years for enough permits to be retired to achieve the target.

Option A (preferred):

Staff recommends no lottery for permits until the number of participants falls below 50, or until stock assessments and harvest levels are determined for the majority of species on the nearshore Developmental Fisheries list.

Option B

Set the number of permits equal to the number of permit holders renewing permits in 2004. (Under the Developmental Fisheries Program, a lottery is held if the number of applications for permits exceeds the number of permits available after renewal of the previous years permits has taken place).

Issue 2e. Gear Restrictions

Legal gears for foodfish include trawl, dredge, seines, a variety of hook and line gears, pots, and traps. Seines may not be used for groundfish in the ocean. One concern is with gears that effectively would increase exploitation or would lead to higher harvest rates. The Developmental Fisheries Program can allow experimentation with new gear types under a more controlled manner, allowing sufficient time to evaluate their impact on the resource and habitats.

Public has expressed some concern over the use of fixed gears (longline and pot or trap gears). **Staff recommends a 50 pot limit for trap lines**, based on concerns expressed at the public meetings. Other gear restrictions may be necessary. Staff has not had sufficient time to evaluate additional restrictions on gear types. The Developmental Fisheries Program allows the flexibility to add or delete gear types if needed. Permits would be issued based on the predominant gear type used to make the qualifying landings. A permit issued for hook and line gear would include those vessels qualifying with longline gear.

Groundfish limited entry permit holders using longline gear and possessing a nearshore permit would continue to be able to land Council trip limits unless otherwise restricted by state landing laws.

Trawlers would not use their catch history to qualify for a nearshore fishery permit but would be able to continue to take incidental catches of nearshore species under Council

rules. In practice, very few cabezon and greenling are taken by trawl gear. Nearshore rockfish are currently limited to no more than 300 lbs per month cumulative period.

Option A (preferred):

Based on qualifying landings by gear type, permits would be issued for either hook-and-line gear (including longline gear) or traps (pots) for directed harvest of Developmental Fisheries nearshore species.

Option B:

Status quo. All current legal gears would continue to be legal to harvest nearshore species.

Issue 2f. Information Requirements

Logbooks have been a controversial part of our minor fisheries. In the past, users have cited difficulties using logbooks in fisheries where minor gears are used or when vessels are operated by one person. Others have been reluctant to share information on catch location. Collecting catch, effort, and fishing area information is, however, a key component in gathering data needed for stock assessments. If the 21 species are added to the Category A Developmental Fisheries species list, logbooks would be required to be kept by permit holders (OAR 635-006-0890).

Issue 2g. Incidental Catch Allowance

Several fisheries occur close to or within the territorial seas. The salmon troll fishery in particular catches many of the proposed nearshore species as incidental catch. Hook-and-line and pot fishers targeting groundfish on the continental shelf also catch some of the nearshore species. An incidental catch allowance would provide for an incidental take of nearshore species by fishers without a Developmental Fisheries permit who make their living targeting other species.

Staff recommends dropping the incidental catch allowance further than the fifty pound allowance previously proposed. Public concern was expressed that a ‘mini’ nearshore fishery would be created by remaining open access fishers fishing for black rockfish or other species. Most of the directed black rockfish trips take very few of the proposed 21 nearshore species (**Table 3**).

Option A (preferred):

Vessels without a Developmental Fisheries permit for nearshore species may land up to twenty-five pounds of nearshore species as incidental catch, provided that the non-nearshore species comprise more than **75%** of the landed catch and are caught with legal gear.

Option B:

Vessels without a Developmental Fisheries permit for nearshore species would be prohibited from landing nearshore species as incidental catch.

Table 3. Incidental catch in pounds of nearshore fish on targeted black and blue rockfish trips with and without live fish in landings for the year 2000.

Pounds	Cumulative no. boat-trips (without live landings)	Cumulative %	Cumulative no. boat-trips (with live landings)	Cumulative %
0	280	71	10	9
0-5	352	89	43	38
0-10	384	97	67	59
0-15	391	99	88	78
0-20	391	99	93	82
0-25	393	99	100	88
0-70	396	100	113	100
Total	396	100	113	100

Issue 2h. Size Limit Change on Cabezon

Oregon currently has a 14 inch minimum size limit for cabezon caught in commercial fisheries. California Department of Fish and Game recently evaluated size limits for nearshore species including cabezon, and made a recommendation for increasing the minimum size limit to 15 inches based on life history, maturity, and the need to reduce overall exploitation rate. The size limit proposed for Oregon would also be consistent with California's and would facilitate enforcement of size regulations for cabezon. The larger of the two proposed size limits will also reduce harvest.

Option A (preferred):

Adopt Council recommended minimum size limit for commercially caught cabezon. The range of options being considered is 15 to 16 inches. Absent Council action, the staff recommend 15 inches.

Option B:

Status quo. Retain current minimum size limit of 14 inches.

Issue 3. Area Restrictions

Special black rockfish management areas were established in 1994, restricting commercial harvest within areas of high recreational use. This management approach minimizes user conflicts and recognizes differences in needs of the fishing communities up and down the coast. Black rockfish management areas have been specified in the Oregon Commercial Fishing Synopsis but not in recent OARs. Rule language was inadvertently dropped when the Commission adopted groundfish rules by reference to the Federal Register in 1997.

At the Bandon Forum in April 2001, recreational users supported limiting commercial access in nearshore reef areas adjacent to Bandon. It was suggested that this could be done either by rule or by gentleman's agreement. **Figures 1 and 2** show the distribution of catch by port for selected nearshore species from the proposed list that are common to both commercial and recreational fisheries. There is currently a separation of areas of intense commercial activity from areas of higher recreational activity. Capping commercial harvest within areas of high recreational use will minimize impacts on existing recreational use, and reduce the potential for future user conflicts.

Option A reinstates four black rockfish management areas and expands the restricted area off of Coos Bay to include reefs near Bandon, Oregon. Option B reinstates black rockfish area management OARs, retaining the original management areas (Figure 3).

Staff recommends reinstating black rockfish management areas and extending one area off Bandon, Oregon – based on public testimony during the Bandon Forum held April of

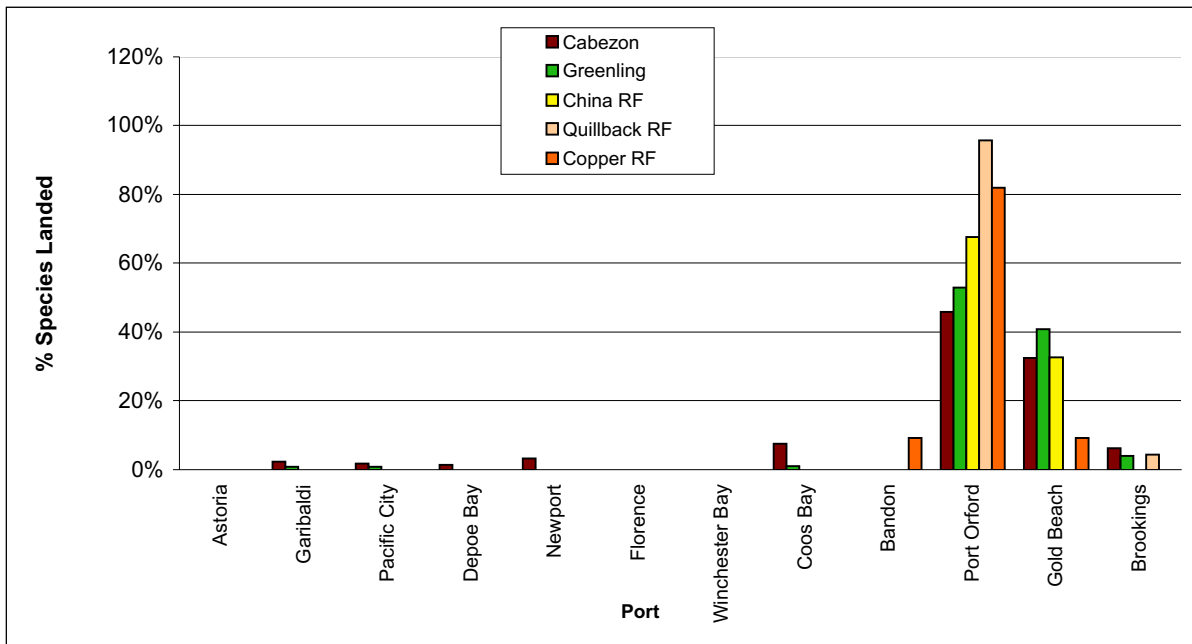


Figure 1. Percentage of pounds of selected fish species landed in Oregon ports by commercial vessels during the year 2000. PacFIN data.

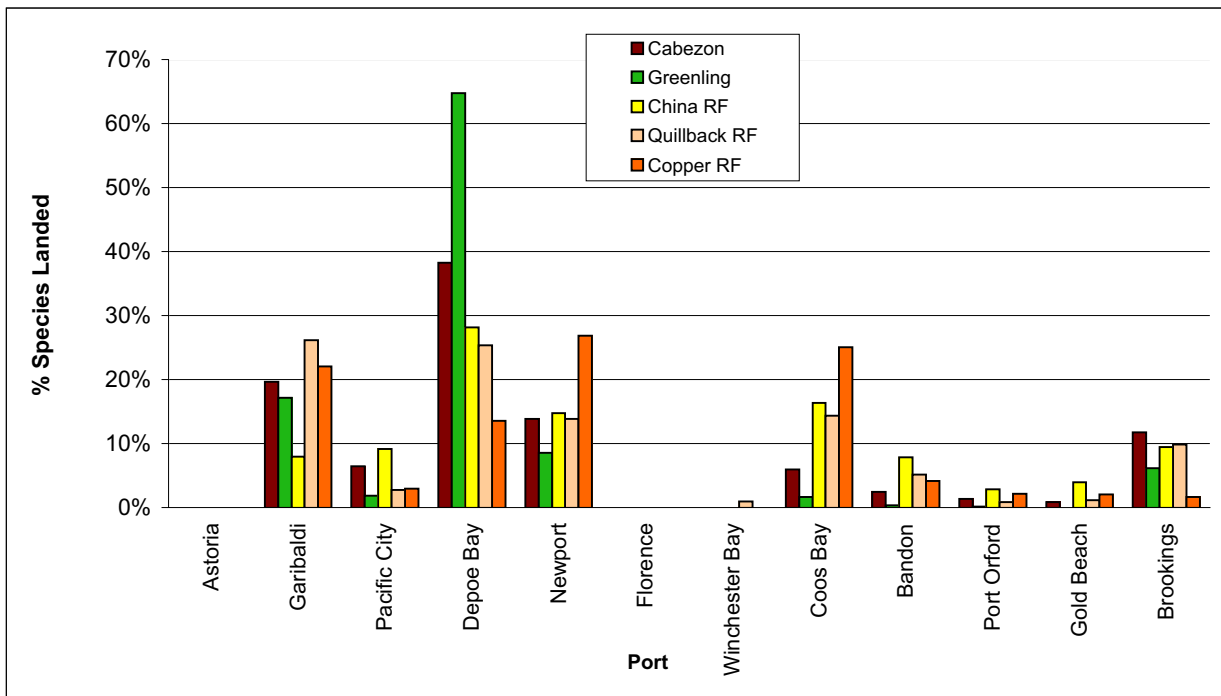


Figure 2. Percentage of pounds of selected fish species landed in Oregon ports by recreational users.

2001. Tighter bycatch restrictions on open access fishers and the reduced fleet size in the northern area should be sufficient to protect nearshore species within black rockfish management areas.

Option A (preferred):

Reinstate black rockfish management areas and expand the restricted area off Coos Bay to include reefs near Bandon:

(1) It is unlawful to take or retain more than 200 pounds of black rockfish, or 65 fish, whichever is greater, per vessel from a single fishing trip within one of the following areas:

- (a) Tillamook Head (45° 56' 45" N. latitude) to Cape Lookout (45° 20' 15" N latitude),
- (b) Cascade Head (45° 03' 50" N latitude) to Cape Perpetua (44° 18' N latitude),
- (c) from a point (43° 30' N latitude) approximately 8.5 nautical miles north of the Coos Bay north jetty to a point (43° 03' N latitude) adjacent to the mouth of Four-mile Creek,
- (d) Mack Arch (42° 13' 40" N latitude) to the Oregon-California border (42° N latitude).

(2) No vessel shall take, retain, possess, or land more than the allowed trip limit when fishing occurs for any species of fish within one of these restricted areas.

Option B:

The following trip limit applies to black rockfish taken with all commercial gear except trawl gear:

(1) It is unlawful to take or retain more than 200 pounds of black , or 65 fish, whichever is greater, per vessel from a single fishing trip within one of the following areas:

- (a) Tillamook Head (45° 56' 45" N. latitude) to Cape Lookout (45° 20' 15" N. latitude),
- (b) Cascade Head (45° 03' 50" N latitude) to Cape Perpetua (44° 18' N. latitude),
- (c) from a point (43° 30' N latitude) approximately 8.5 nautical miles north of the Coos Bay north jetty to a point (43° 10' N. latitude) about 11-1/2 nautical miles south of the Coos Bay north jetty;
- (d) Mack Arch (42° 13' 40" N. latitude) to the Oregon-California border (42° N. latitude).

(2) No vessel shall take, retain, possess, or land more than the allowed trip limit when fishing occurs for any species of fish within one of these restricted areas.

This option reinstates the previous black rockfish management areas without the extending the area to include reefs near Bandon, Oregon.

Issue 4. Future Management Measures (No Action)

Sustainability of the nearshore fishery is dependent on sustaining the underlying resources. As previously noted, too little is known about the abundance and population dynamics of this suite of species. A mandatory logbook program will be an important piece of developing the necessary information. Additional management measures to conserve nearshore stocks of fish will be needed. A proposal to cap harvest of several nearshore species will be heard at the September 2002 Pacific Fishery Management Council meeting in Portland. Additional reductions in harvest may be necessary to protect the resource.

The measures could potentially include season restrictions to protect spawning and egg or larvae-bearing females, and additional size restrictions and harvest limits.

Staff recommends pursuing additional funding to develop details of a long-term fishery management plan for Oregon's nearshore fisheries.

Options: See **Appendix A – Potential Future Management Options.**

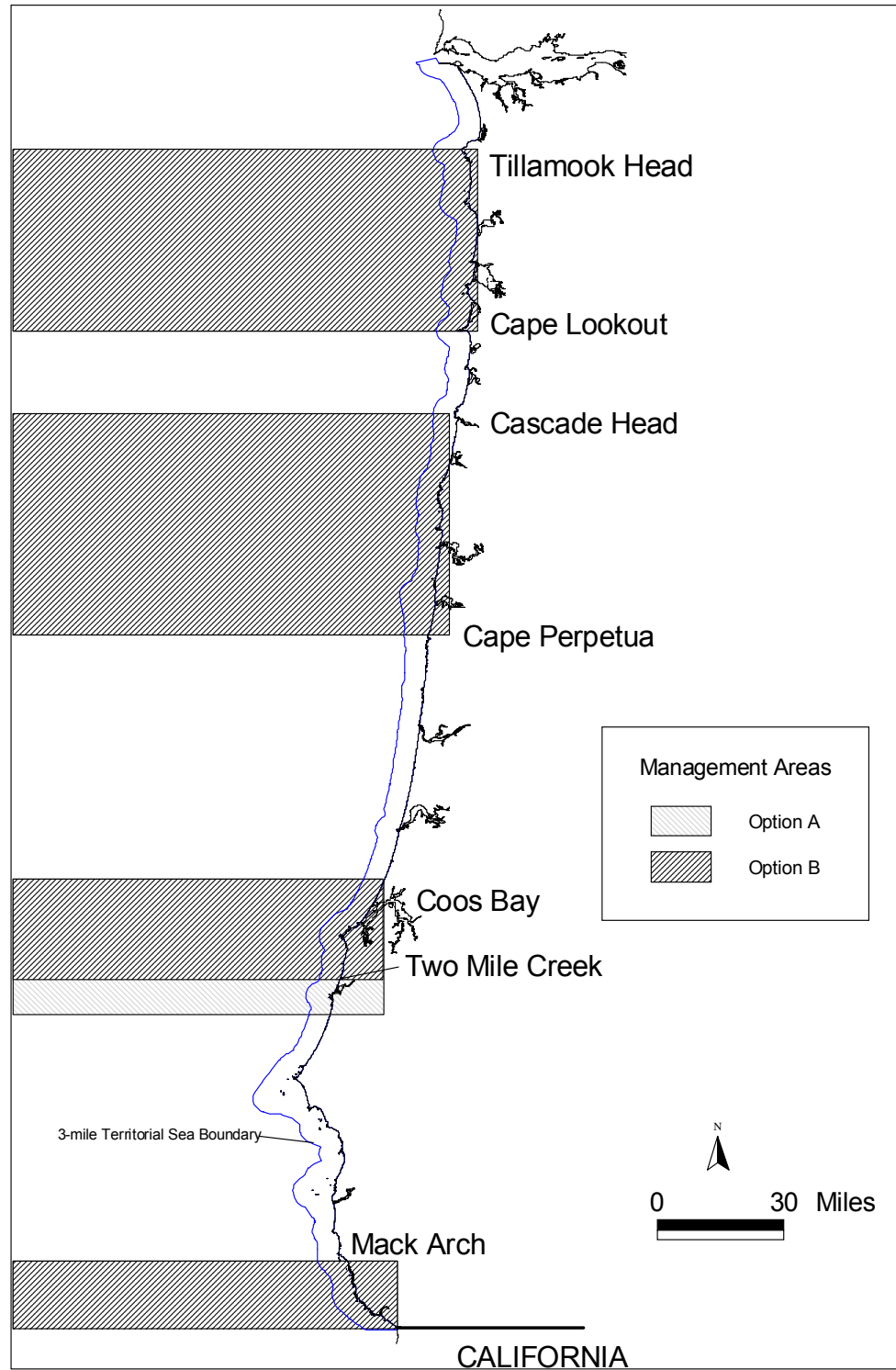


Figure 3. Proposals for nearshore management areas. Option A includes and extends former black rockfish management areas (darker shading).

SUMMARY OF RECOMMENDATIONS

Below is a list of staff-preferred options for nearshore management. Preferences are based on staff consensus and views from users presented at several public meetings. The Developmental Fisheries Board was given two opportunities to provide recommendations, but was unable to vote on options without a quorum at meetings held regarding nearshore issues.

Issue 1. Add 21 Nearshore Finfish Species to Category A of the Developmental Fishery Program's Species List

Option A (*preferred*):

Staff recommends the species listed in **Table 1** be added to category A under the Developmental Fisheries Program, and a new harvest program developed for these species. The list effectively moves cabezon, kelp greenling, and sculpins from category C to category A, and adds several other new species to category A.

Issue 2. Harvest Program for Nearshore Species

Issue 2a. Qualification Criteria for Initial Permit Issuance

Option A (*preferred*):

Applicants for a nearshore Developmental Fisheries permit must own a vessel that has landed at least 500 lbs of nearshore species in any one calendar year during the window period January 1, 1997 through July 1, 2001 to qualify for a permit north of Heceta Head. The majority of qualifying landings must have been made into Oregon ports north of Heceta Head.

Applicants for a nearshore Developmental Fisheries permit must own a vessel that has landed at least 750 lbs of nearshore species in any one calendar year during the window period January 1, 1997 through July 1, 2001 to qualify for a permit south of Heceta Head. The majority of qualifying landings must have been made into Oregon ports south of Heceta Head.

Issue 2b. Permit Allocation by Area

Option A (*preferred*):

Under this option, Developmental Fisheries permits would be issued on an area basis differentially north and south of Heceta Head located approximately midway between Astoria and Brookings, based on where the majority of qualifying landings took place.

Issue 2c. Renewal Requirements

Option A (*preferred*):

Permit holders receiving permits for 2003 must land at least **100** pounds of Developmental Fisheries nearshore species and make **5** or more landings, to qualify the permit for renewal for the subsequent year.

Issue 2d. Numbers of permits

Option A (*preferred*):

Staff recommends no lottery for permits until the number of participants falls below 50, or until stock assessments and biologically based harvest levels are determined for the majority of species on the nearshore Developmental Fisheries list.

Issue 2e. Gear Restrictions

Option A (*preferred*):

Based on the majority of qualifying landings by gear type, permits would be issued for either hook-and-line gear (including longline gear) or traps (pots) for directed harvest of Developmental Fisheries nearshore species. Pot gear permittees will be limited to using 50 pots.

Issue 2f. Information Requirements

If the 21 species are added to the Category A Developmental Fisheries species list, logbooks would be required to be kept by permit holders (OAR 635-006-0890).

Issue 2g. Incidental Catch Allowance

Option A (*preferred*):

Vessels without a Developmental Fisheries permit for nearshore species may land up to twenty-five pounds of nearshore species as incidental catch, provided that the non-nearshore species comprise more than **75%** of the landed catch and are caught with legal gear.

Issue 2h. Size Limit Change on Cabezon

Option A (*preferred*):

Increase the minimum size limit for commercially caught cabezon to 15 inches (note – the Council range of options is currently 15 to 16 inches).

Issue 3. Area Restrictions

Option A (*preferred*):

Re-instate black rockfish management areas and expand the restricted area off Coos Bay to include reefs near Bandon:

(1) It is unlawful to take or retain more than 200 pounds of black rockfish, or 65 fish, whichever is greater, per vessel from a single fishing trip within one of the following areas:

(a) Tillamook Head (45° 56' 45" N. latitude) to Cape Lookout (45° 20' 15" N latitude),

(b) Cascade Head (45° 03' 50" N latitude) to Cape Perpetua (44° 18' N latitude),

(c) from a point (43° 30' N latitude) approximately 8.5 nautical miles north of the Coos Bay north jetty to a point (43° 03' N latitude) adjacent to the mouth of Four-mile Creek,

(d) Mack Arch (42° 13' 40" N latitude) to the Oregon-California border (42° N latitude).

(2) No vessel shall take, retain, possess, or land more than the allowed trip limit when fishing occurs for any species of fish within one of these restricted areas.

Issue 4. Future Management Measures (No Action)

Sustainability of the nearshore fishery is dependent on sustaining the underlying resources. As previously noted, too little is known about the abundance and population dynamics of this suite of species. A mandatory logbook program will be an important piece of developing the necessary information. Additional management measures to conserve these stocks of fish will be needed. A proposal to cap harvest of several nearshore species will be heard at the September 2002 Pacific Fishery Management Council meeting in Portland. Additional reductions in harvest may be necessary to protect the resource.

The measures could potentially include season restrictions to protect spawning and egg or larvae-bearing females, and additional size restrictions and harvest limits.

Staff recommends pursuing additional funding to develop details of a long-term fishery management plan for Oregon's nearshore fisheries.

Options: See **Appendix A – Potential Future Management Options.**

APPENDIX A

Biological Synopses

General Discussion

The Nearshore Fisheries Management approach proposed by the Oregon Department of Fish and Wildlife addresses thirty three species in four taxonomic families. (Appendix Table A-1) Synopses of the available biological and ecological information for each species or group are provided beginning on page 33. Many of these species are included under the jurisdiction of the Pacific Fishery Management Council's groundfish fishery management plan. However, none of these species have been adequately surveyed, nor have quantitative stock assessments been developed. In general, information is lacking on these species, and in many cases, the information available has been developed predominantly in California and Washington. This reflects proximity to academic research institutions combined with the difficulties and hazards of conducting research on an energetic, exposed coast as opposed to quieter waters.

There are other fishes taken in nearshore fisheries that have been deliberately excluded from this nearshore management effort. These include black rockfish, blue rockfish, canary rockfish, yelloweye rockfish and lingcod. They are excluded here because fisheries for these species are much more developed, have a much longer history, the species (except for blue rockfish) have quantified stock assessments, and they are the object of much more intensive management at the level of the Pacific Fishery Management Council.

Fisheries for many of the species discussed here have developed recently as a result of the growing demand for fish landed alive in specialty markets, and due to the contraction of other commercial fishing opportunities. Both of these factors date from the mid to late 1990s. As a result, the Marine Resources Program of the Oregon Department of Fish and Wildlife increased its monitoring of groundfish landings with a particular focus on the live fish fishery. A Brookings/Harbor office was opened in 2000; staff in this office conduct nearshore fishery research and sample fishery landings in ports of the southern Oregon coast including Port Orford, Gold Beach and Brookings. Additional species are included in this management

approach because of the potential for rapid market development and/or because changing ocean conditions may cause the range of some to expand into Oregon waters.

General Biological Notes

The lack of information specific to Oregon waters influences the context in which we put some information, including life-history parameters such as size at maturity or time of spawning, or ecological factors such as depths occupied. The available information for at least some species indicates different sizes at maturity in different portions of the range. For example, the size at 50% sexual maturity for quillback rockfish may be much smaller off California than off of Alaska, while the age at 50% maturity may be the same. This reflects the differing ecology, ocean productivity and resulting growth rates in California and Alaska waters. Similarly, depths occupied may differ with latitude, some temperature sensitive species may occupy deeper, cooler waters at the southern end of their ranges. Timing of reproduction will also vary somewhat with latitude, spawning often coincides with spring-time productivity, and we can often see a general pattern of earlier spawning in more southern waters and progressing to the north. The available information suggests that these differences are not pronounced, and may be no larger than the temporal variability observed for spawning in any one region.

Current Harvest Management of Nearshore Species

The rockfish species (genus *Sebastes*) addressed in this proposed management scheme, along with the cabezon and kelp greenling, are included in the Pacific Fishery Management Council's groundfish fishery management plan. However, there are no species-specific limits to harvest on these species due to the lack of information. Cabezon and kelp greenling are included in "other fish" specifications for purposes of setting an aggregate acceptable biological catch (ABC) level, but no calculation of optimal yield, harvest guidelines or landing limits are set. For the most part, this aggregate ABC level has been based on past landings levels and

have not been exceeded. However, aggregate harvest management leaves open the potential for applying too much fishing pressure should effort and harvest be concentrated on one or a few species, rather than being spread across the group.

Similarly, the rockfishes included are within the 'minor rockfish' group of the PFMC management scheme. In 1996, the Council conducted a limited assessment for this group. For some species that are taken in surveys and offshore fisheries, this assessment proceeded using a suite of assumptions regarding selectivity and other factors to develop an ABC using the goal of having fishing mortality approximate natural mortality, an approach adopted by the North Pacific Fishery Management Council for data poor situations. In the case of nearshore rockfishes that were not taken in trawl surveys, that component of ABC was based on historic catches. The ABC for 'minor rockfish' adopted by the Council in 1996 has been split into slope, shelf and nearshore complexes. It has also been reduced by 50% as a precautionary measure (in effect historic catch cut in half). Optimum yield and harvest guidelines are then developed by reducing ABC by amounts for estimated take in recreational fisheries and discard in other commercial fisheries. (Rogers et al. 1996, Federal Register, 11 January 2001).

The buffalo sculpin, Irish lords (2 species), greenlings other than kelp greenling and the surfperches are not managed under the Pacific Fishery Management Council's groundfish fishery management plan.

Commercial fishing is managed in Oregon by location and other means; no ocean foodfish may be harvested from Oregon bays and estuaries, or within 200 yards seaward of any jetty. There are seasonal restrictions for commercial harvest of surfperch (no harvest in August and September) and there are minimum size restrictions for cabezon, kelp greenling, copper rockfish, quillback rockfish, china rockfish and grass rockfish.

Oregon recreational harvest of rockfish species considered here is limited by an aggregate 10 fish per day bag limit.

Oregon recreational harvest of the sculpin, greenling and surfperch species considered here is limited by a 25 fish per day bag limit. This limit is an aggregate daily cap for a diverse set of species including flounder, tuna, as well as the species mentioned.

Program Objectives

The ODFW Marine Resources Program has an on-going project to map nearshore habitats, and to investigate the relationship of fish density to habitat features through sonar, remotely operated vehicle, and SCUBA surveys. Continuation and expansion of this project, coupled with effective monitoring of nearshore fishery landings and continued nearshore fishery research is needed to meet broader, integrated program objectives.

The ODFW Marine Resources Program has the following objectives for nearshore resources:

1. Develop stock assessments for nearshore species taken in recreational and commercial fisheries.
2. Measure total removals from nearshore fish populations.
3. Understand the distribution and characteristics of nearshore habitats in Oregon.
4. Understand the temporal and spatial distribution and abundance of nearshore fish species in Oregon, particularly in relation to habitat features.
5. Understand the ecological relationships among nearshore fish species and their habitats.
6. Understand the life-history characteristics of nearshore fish species including demography, longevity, age-size at maturity, site-fidelity, recruitment and dispersal.
7. Understand the effects of fishing on nearshore rockfish populations, habitat, associated species, and ecological functions.
8. Understand the patterns of fishing for nearshore fish species including timing, location, incidental

catch, effects of monitoring and management actions, and social and economic returns to harvesters and their communities.

Continuation and expansion of the ODFW Marine Resources Program nearshore habitat surveying project, in coordination with fishery monitoring (logbook information and sampling of landed catch) and controlled fishery investigations, will contribute to the attainment of most of these objectives.

Logbook Reporting

There is presently a voluntary hook-and-line logbook program that has a low level of participation by near-shore fishermen. The Developmental Fisheries Program requires permit holders to maintain and share logbook information with the Department. A mandatory log-book program, combined with appropriate monitoring and sampling of nearshore fishery landings and a commitment to analyze the resulting information, will be one basis for monitoring fishery performance and can be the foundation for indices of resource abundance (e.g. catch per unit effort analyses, size trend analyses). This information and analyses will provide a basis for evaluating management measures and increase public and fisher confidence in the nearshore management process.

Permit Renewal Requirements

The Developmental Fisheries Program has the authority to impose landing or other activity requirements for permit renewal. Generally, this requirement is intended to ensure that available permits are used, and not held idle. In the case of nearshore fisheries for which sustainable levels of harvest are not well understood, it is important that this requirement be meshed with the conservation concerns for the resource. Economic information developed for the nearshore fishery suggests that individuals participate as part of portfolio of other fishing activities, and that there is a great deal of turnover in participants from year to year as other opportunities (e.g. salmon, halibut, crab) wax and wane. Large minimum renewal (landing) requirements could lead to increased exploitation

levels for nearshore species by requiring permit holders to harvest more nearshore fishes than they otherwise would have in order to maintain their permit. Low renewal requirements may not create the incentive to ‘fish for portfolio’ that higher requirements might encourage.

Potential Future Management Options

Establishing criteria to prevent future growth in the number of participants in Oregon’s nearshore marine fisheries is one step toward ensuring sustainability of this resource and the fishery it supports.

Other potential future management steps to contribute toward meeting this goal include:

1. Permit Numbers – a limited number (e.g. 50 – 70) based on past participation and possibly geographic distribution, renewal requirements may facilitate attrition of permit numbers.
2. Gear restrictions – hook and line and pot gear only.
3. Minimum sizes can be used as a measure to preserve the reproductive potential of an exploited population if undersized fish can be safely released with low mortality rates. If not, a minimum size may cause discard wastage without conservation benefits.

Sculpins and greenlings (Family Cottidae and Hexagrammidae) do not have a gas bladder. Thus, live release of undersized individuals can be effective as trauma due to pressure change is not an issue. Minimum sizes for landing rockfishes is a more difficult management consideration. These fishes have a closed gas bladder that makes live release dependent on capture very near the surface or careful release of gas through piercing and venting of the gas bladder. Fishermen report that this is relatively easy for some species (e.g. china, grass, and black rockfishes) and not for others (e.g. copper and vermilion rockfishes) depending on ease of locating and piercing gas bladder.

Minimum size limits also bring in the question of perceived fairness across recreational and commercial sectors; there are size minimums applied to the non-trawl commercial fishery for four species of rockfishes (china rockfish, copper rockfish, quillback rockfish and grass rockfish, all at 12”), for cabezon (14”) and for greenling (12”). There are no corresponding minimum size limits for these species applied to the recreational fishery.

4. Season closures, particularly to protect spawning individuals, may make sense for some species. There is already a prohibition on commercial landings of surfperches during the months of August and September to protect young-bearing females.

The sculpins and greenlings considered in this document are nearshore nest-guarding species; a winter time closure on the harvest of these species would limit mortality on nest-guarding males and enhance future recruitment into the population.

Possible options for winter time closures could include:

- November to April
- December to March
- January to March
- January and February

A comparable spawning season closure for rockfishes would need to encompass the period between mating and release of larvae. This could cover the period from late fall to early summer given the temporal and spatial variability in spawning and the diversity of species involved. Such a closure would likely interfere more with existing fishing practices than a winter closure to protect nesting sculpin and greenling. Lack of Oregon-specific information on spawning timing for nearshore rockfishes is a hindrance.

Season closures also bring in the question of fairness across commercial and recreational sectors.

5. Fishery catch quotas leading to fishery or area closures to limit mortality to suitable levels may be needed if effort-limitation measures do not have the needed conservation effects. Quotas

presume that the knowledge of what harvest levels are sustainable and suitably risk-averse. This information is not yet available for these species in Oregon, and underscores the need for a linked log-book and fishery sampling, monitoring and analysis program.

Effects Evaluation

Information for the species discussed here is not sufficient to meet statewide planning Goal 19. Additional information is needed for all species, individually and in aggregate, to determine short-term and long-term effects of harvest on nearshore resources. These species should be managed with a conservative number of permits and restrictions. However, the measures proposed here are a precautionary step to limit the number of vessels fishing on this resource to those that have been active in recent years, and to prevent further expansion of effort in this fishery. The nearshore, and particularly the live-fish, fishery has expanded rapidly since 1997. This fishery is largely market driven. Absent management measures such as this, further expansion is likely to the detriment of the nearshore resource.

1. Sustainability of developmental fisheries resources or incidental catch under proposed future harvest:

a. Each of the species discussed is widely distributed on the west coast. Some are common in Oregon; others are addressed on the contingency that their range could extend into Oregon with changing ocean conditions.

b. Abundance, distribution and life history data of each of the species discussed is limited.

c. The sedentary and territorial nature of some of these species, combined with relatively low fecundity and long life-spans when compared to other groundfish species, suggests that their populations could be readily overexploited, particularly on local scales.

2. Biological and ecological effects on critical marine habitats, other habitats, and other species supported by those habitats:

a. Hook-and-line and pot gears would have minimal effect on habitat.

b. Incidental catches of other species need to be determined.

c. The effect on the ecosystem of a large-scale removal of any one, or more, of these species is unknown.

3. Conformity and compatibility with existing uses such as commercial and recreational fishing, non-consumptive uses, public access, etc:

a. There exist commercial and recreational fisheries for most of these species. The proposed management measures will limit numbers of participants in the commercial sector only.

b. There is a potential for recreational – commercial fishery conflict should these species be depleted, or if either sector expands unchecked.

4. Ability of the Department and other agencies to monitor the fishery for needed data and compliance with rules and regulations:

a. Oregon Department of Fish and Wildlife has added samplers in a Brookings Office to monitor nearshore fisheries in southern Oregon ports. Most nearshore fishery landings in Oregon are made into southern Oregon ports.

5. Recommendations for future fishery development including gear types and effort levels:

a. Information is not sufficient to determine optimum effort or harvest levels.

References:

Rogers, J.B., M. Wilkins, D. Kamikawa, F. Wallace, T. Builder, M. Zimmerman, M. Kander and B. Culver. 1996. Status of the remaining rockfish in the *Sebastes* complex in 1996 and recommendations for management in 1997. in Stock Assessment and Fishery Evaluation, Appendix II. Pacific Fishery Management Council, Portland, OR.
66 Federal Register 8: 2338 – 2364. 11 January 2001.

Biological Synopses of Nearshore Species

Buffalo sculpin *Enophrys bison*

Enophrys from two Greek words meaning “on eyebrow” for the ridges over the eye; *bison* refers to North American bison and the horn-like spines on the pre-opercular bones.

Ecology:

Buffalo sculpin range from Monterey, CA north to Kodiak Island in the Gulf of Alaska.

They are most commonly found in inshore rocky and sandy areas to a depth of 65 ft. (20 m). The maximum recorded depth for this species is 743 ft (227 m.).

Buffalo sculpin prey on shrimp, crabs, amphipods, isopods, mussels, and young fishes (herring, salmon, seaperch and sand lance). Algae has been noted among its gut contents; it is unclear whether this is intentional or incidental to feeding on prey associated with the alga.

Buffalo sculpin are taken by harbor seals. Juvenile and larval sculpin are probably taken by larger fishes. Larvae are probably also taken by coastal pelagic predators such as siphonophores, chaetognaths

Life History:

The maximum reported size for buffalo sculpin is 14.5 inches (37 cm).

Buffalo sculpin spawn in the late winter and early spring. Spawning takes place in February and March in British Columbia, and from January to May in California; females probably produce two clutches of eggs in the southern portions of the range.

Females produce from 19,000 to 32,000 eggs in a spawning episode. Clusters of orange-brown eggs are deposited on rocks or human structures such as pilings from the lower intertidal to depths of about 45 feet. Generally, eggs are laid in areas exposed to currents. Male sculpin guard the nests, which may hold eggs from more than one female.

Eggs hatch after five to six weeks. Eggs exposed in the intertidal are not eaten. This observation, combined with their fairly bright coloration suggests they are toxic, a property documented for cabezon eggs.

Population status:

There have been no quantitative or qualitative assessments of buffalo sculpin populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing project to map nearshore reefs; this project will provide on element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are being analyzed in the fall of 2001.

Management:

Buffalo sculpin are not included in the Pacific Fishery Management Council groundfish fishery management plan. Applicable Oregon commercial fishing regulations for this species include the requirement for a commercial fishing license, and a prohibition on commercial harvesting in coastal bay or estuary waters, or within 200 yards seaward of any jetty.

Recreational harvest of buffalo sculpin in Oregon is limited by a 25 fish per day bag limit. This limit is an aggregate daily cap for a diverse set of species including flounder, surfperch, tuna, greenling, cabezon and sea trout.

Harvest History:

There is no specific record of commercial or recreational harvest of this species in Oregon in the PACFIN or Oregon recreational creel databases. It is possible that some small volume of catch is aggregated in unspecified species categories.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as survey reports by recreational divers through the Reef Environmental Education Foundation (REEF) data collection and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

References:

Eschmeyer, W.N., E.S. Herald and H. Hammann. 1983. *Field Guide to Pacific Coast Fishes of North America*. Boston: Houghton Mifflin. 336 pp.

Froese, R. and D. Pauly. Editors. 2001. *FishBase*. World Wide Web electronic publication. www.fishbase.org.

Hart, J.L. 1973. *Pacific fishes of Canada*. Ottawa: Fisheries Research Board of Canada Bulletin 180, 740 pp.

Love, M.S. 1996. *Probably more than you want to know about the fishes of the Pacific coast*. Santa Barbara, CA: Really Big Press, 381 pp.

REEF. 2001. Reef Environmental Education Foundation Reef Survey Project. On-line database. www.reef.org/data/surveyproject.htm

Red Irish Lord *Hemilepidotus hemilepidotus*

Hemilepidotus from two Greek words meaning “half-scaled.”



Photo Credit: Marc C. Chamberlain. Reproduced with permission.

Ecology:

Red Irish lord range from central California (Mussel Point, Monterey Bay) north to Alaska and west through the Aleutian Island chain and Bering Sea to eastern Russia.

They are usually found in nearshore rocky areas from the intertidal down to depths of 158 ft (48 m). The deepest record for this species is 900 ft (275 m).

Young of this species feed on copepods. Adults feed on benthic crustaceans (e.g. hermit and tanner crabs, barnacles), mussels, polychaetes and small fishes.

They are probably themselves preyed upon by larger fishes and marine mammals. Larvae are probably also taken by coastal pelagic predators such as siphonophores, chaetognaths

Life History:

The maximum size of red Irish lord is about 20 inches (51 cm). Red Irish lord live to at least age 6, and sexual maturity is probably reached at age 4, and a size of approximately 8.5 to 12 inches (22 – 31 cm) for males and 11 to 14 inches (29 – 37 cm) for females.

Spawning takes place in March in British Columbia, and from October to January in Puget

Sound. Females will deposit from 59,000 to 126,000 pink eggs in conspicuous masses in shallow water or the low intertidal on rocks or man-made structures. Nests are often on reef crests or channel entrances where water movement due to waves or currents is high. Both parents guard the nest, and hatching occurs in about 22 to 26 days.

Population status:

There have been no quantitative or qualitative assessments of red Irish lord populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide one element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are being analyzed in the fall of 2001.

Management:

Red Irish lord are not included under the Pacific Fishery Management Council's groundfish fishery management plan. Applicable Oregon commercial fishing regulations for this species include the requirement for a commercial fishing license, and a prohibition on commercial harvesting in coastal bay or estuary waters, or within 200 yards seaward of any jetty.

Recreational harvest of red Irish lord in Oregon is limited by a 25 fish per day bag limit. This limit is an aggregate daily cap for a diverse set of species including flounder, surfperch, tuna, greenling, cabezon and sea trout.

Harvest History:

There is no specific record of commercial harvest of this species in Oregon in the PACFIN databases. It is possible that some small volume of catch is aggregated in unspecified species categories. Fishermen have reported that red Irish lord are taken incidental to other nearshore commercial fishery harvests, but that they are not retained because there is no market for them. Recreational catch figures are presented in Appendix Table A-3

and
Appendix Figure A-2.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

References:

Eschmeyer, W.N., E.S. Herald and H. Hammann. 1983. Field Guide to Pacific Coast Fishes of North America. Boston: Houghton Mifflin. 336 pp.

Froese, R. and D. Pauly. Editors. 2001. FishBase. World Wide Web electronic publication.
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www.reef.org/data/pac/species.shtml

Brown Irish lord *Hemilepidotus spinosus*

Hemilepidotus from two Greek words meaning “half-scaled”; *spinosus* from Latin for “spiny”

Ecology:

Brown Irish lord range from Santa Barbara, CA north to southeast Alaska.

They are most commonly found close to the shore on exposed coasts from. The maximum recorded depth for this species is 318 ft (97 m).

Young brown Irish lord eat bryozoan larvae, amphipods, copepods. Adults probably have a diet similar to the red Irish lord and including benthic crustaceans, mussels, polychaetes and small fishes

Life History:

The maximum recorded size for a brown Irish lord is 11 inches (29 cm).

Other life history information is lacking for this species.

Population status:

There have been no quantitative or qualitative assessments of brown Irish lord populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide on element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are under analysis.

Management:

Brown Irish lord are not included under the Pacific Fishery Management Council’s groundfish fishery management plan. Applicable Oregon fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvesting in coastal bay or estuary waters, or within 200 yards seaward of any jetty.

Recreational harvest of brown Irish lord in Oregon is limited by a 25 fish per day bag limit. This limit

is an aggregate daily cap for a diverse set of species including flounder, surfperch, tuna, greenling, cabezon and sea trout.

Harvest History:

There is no specific record of commercial harvest of this species in Oregon in the PACFIN database. It is possible that some small volume of catch is aggregated in unspecified species categories. Fishermen have reported that red Irish lord are taken incidental to other nearshore commercial fishery harvests, but that they are not retained because there is no market for them. This may hold for brown Irish lord as well. Recreational catch figures are presented in Appendix Table A-3 and Appendix Figure A-2.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

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Eschmeyer, W.N., E.S. Herald and H. Hammann. 1983. Field Guide to Pacific Coast Fishes of North America. Boston: Houghton Mifflin. 336 pp.

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Reef Environmental Education Foundation. 2001. Database of recreational dive surveys.
www.reef.org/data/pac/species.shtml

Cabezon *Scorpaenichthys marmoratus*

Scorpaenichthys from Greek for “scorpion fish” referring to this species resemblance to scorpionfish, and *marmoratus* from Latin for marbled.



Photo credit: Milton Love. Reproduced with permission.

Ecology:

Cabezon occur found from central Baja California north to southeast Alaska. The species is found in inshore waters from the intertidal out to depths of about 250 feet; it is most common at depths of 15 to 180 ft (5 – 59 m). The deepest reported depth for cabezon is 362 ft (110 m).

Cabezon are found on rocky, sandy and muddy bottoms, and in kelp beds. They inhabit restricted home ranges based on a California tagging study, There is some limited suggestion of homing ability in fish that were tagged and displaced from their home area.

Cabezon prey largely on crustaceans, with differences based on size. Adults prey on crustaceans (crabs, small lobster), mollusks (squid, octopus, abalone), smaller fishes, and fish eggs. Small juveniles prey on copepods, amphipods and larval barnacles.

Small cabezon are preyed on by larger fishes including rockfishes, lingcod, adult cabezon and other sculpins. Adults are taken by pinnipeds.

Eggs are reported to be poisonous to humans. They are lethal to laboratory test animals, and are avoided by potential natural predators such as raccoons, mink and birds.

Life History:

Cabezon are the largest member of the sculpin family (Cottidae), and have been reported to reach sizes of 39 in. (99 cm) and 30.8 lb (14 kg). Expected maximum size from age and growth observations in California and Puget Sound are closer to 25 in (64.5 cm).

Cabezon may live up to 20 years. A 25 inch (65 cm) male from Puget Sound was estimated to be 17 years old, and a 28 inch (72.5 cm) female from Puget Sound was estimated to be 16 years old. Limited information suggests that males start to mature at age 3 and all are mature at age 4. Females start to become mature at age 4, and all may be mature at age 6.

Spawning takes place from late October to March in California (peaking in January), and from November through September (peaking in March and April) in Washington. Fecundity ranges from 49,000 eggs (produced by a 43 cm female) to 152,000 eggs (produced by a 77 cm female). Females may spawn more than once during a spawning season. Eggs are deposited in clusters in shallow waters or in the low intertidal on bedrock or in crevices, Males guard the nest after spawning, and nest sites may be re-used from year to year.

Eggs hatch two to three weeks after spawning. Small juveniles spend three to four months in the water column feeding on small crustaceans and other zooplankton. At a size of about 1.5 inches, they take up a demersal life-style.

Population status:

There have been no quantitative or qualitative assessments of cabezon populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide on element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are under analysis.

Management:

Cabezon are included in the Pacific Fishery Management Council's groundfish fishery management plan as a "roundfish." No species-specific allowable biological catch (ABC), or harvest guideline is set for cabezon; they are included in a are not subject to monthly landing limits in the commercial fishery.

Oregon commercial fishery regulations prohibit the retention of cabezon smaller than fourteen inches taken with non-trawl fishing gear. Additionally, Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvesting in coastal bay or estuary waters, or within 200 yards seaward of any jetty.

Recreational harvest of cabezon in Oregon is limited by a 25 fish per day bag limit. This limit is an aggregate daily cap for a diverse set of species including flounder, surfperch, tuna, greenling, cabezon and sea trout.

Harvest History:

Recent commercial and recreational harvest of cabezon in Oregon based on the PACFIN and Oregon recreational creel databases is presented in Appendix Tables A-2 and A-3, and Appendix Figures A-1 and A-2.

Cabezon comprised three to six percent of nearshore recreational fish catch in a 1976 – 1977 study near Depoe Bay, OR.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

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Kelp Greenling *Hexagrammos decagrammus*

Hexagrammos from Greek for “six-lined”;
decagrammus from Greek for “ten lines” referring
to the total number of lateral lines.



Photo Credit: Marc C. Chamberlain. Reproduced
with permission.

Ecology:

Kelp greenling range from La Jolla, California to
Amchitka Island in the Aleutian Island chain.
They are rare south of Santa Barbara, but are
common northward. This species is generally
found in shallow waters. Between Alaska and
central California are most often found from
intertidal waters out to about 50 feet with females
tending to be at shallower depths than males. In
Puget Sound, females are most common in 10 to 25
feet of water, with males preferring 20 to 35 feet.
The deepest reported occurrence is 522 ft (158 m).

Kelp greenling are demersal fish, and are common
in kelp beds, as their name implies. They are also
found on sandy and rocky bottoms. They tend to be
solitary and territorial.

Larval kelp greenling feed on planktonic copepods,
amphipods, euphysiids, and fish eggs. Juveniles
and adults are carnivorous on a variety of prey.
Juveniles prey on smaller crustaceans, mollusks
and fish eggs. Adults prey on benthic invertebrates
including polychaete worms, brittle stars, and
mollusks as well as smaller fishes. Feeding occurs
during the day; they are inactive at night. They
themselves are preyed on by larger fishes including
lingcod, salmon and steelhead, and pinnipeds.

Life History:

Maximum reported size for kelp greenling is 23.5
in (61 cm) and 4.7 lb (2.1 kg). The expected
maximum length based on age-growth
relationships is 15.5 to 18 in (40 – 46 cm). Growth
is rapid in the first three years of life, but slows
thereafter, particularly in males. In Puget Sound, at
age 3, males average 10.6 in. and females 9.1 in.
By age 5, males average 12.6 in and females are
14.7 in. Ten year old fish average 15.5 and 16.4 in
respectively.

The maximum reported age for this species is 13+
years in a 37 cm female from Puget Sound.

In Puget Sound, 33% of 2 year old males, and 67%
of 3 year old females are believed to be sexually
mature. Size at 50% maturity is approximately 30
cm.

Spawning occurs in fall to winter (November to
January in northern California, October to
December off British Columbia and Washington,
and July to August in Alaska) Females produce
about 4300 eggs, 2.2 to 2.5 mm diam. Females
may produce up to three clutches of eggs per
spawning season. Eggs are deposited on rock
surfaces or in crevices, or on biological substrates
such as hard corals or barnacle shells. Male kelp
greenling guard the nests, which may contain up to
eleven clutches of eggs of different females, until
hatching. Eggs masses in a single nest may be
spread up to nearly two meters apart.

Eggs hatch about four to five weeks after
spawning. Larvae are planktonic for approximately
one year before settling to the bottom.

Population status:

There have been no quantitative or qualitative
assessments of kelp greenling populations in
Oregon. The Marine Resources Program of the
Oregon Department of Fish and Wildlife has an
ongoing program to map nearshore reefs; this
program will provide on element of the survey
information needed for future assessments of
nearshore fish populations found in association
with rocky habitats. Additionally, the ODFW MRP
conducted fixed gear research on nearshore fish
species during the summer and fall of 2001.
Research results being analyzed in the fall of 2001.

Management:

Kelp greenling are included in the Pacific Fishery Management Council's groundfish fishery management plan as a "roundfish" No species-specific allowable biological catch (ABC), or harvest guideline is set for kelp greenling; they are not subject to monthly landing limits in the commercial fishery.

Oregon commercial fishery regulations prohibit the retention of kelp greenling smaller than twelve inches taken with non-trawl fishing gear. Additional applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvesting in coastal bay or estuary waters, or within 200 yards seaward of any jetty.

Recreational harvest of kelp greenling in Oregon is limited by a 25 fish per day bag limit. This limit is an aggregate daily cap for a diverse set of species including flounder, surfperch, tuna, other greenling, and cabezon.

Harvest History:

Recent recreational harvest of kelp greenling in Oregon based on the Oregon recreational creel database is presented in Appendix Table A-3 and Appendix Figure A-2. Commercial harvest has been very low until the advent of the live fish fishery, and kelp greenling harvest will have been aggregated into unspecified groundfish categories.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs)

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options

Please refer to the discussion of future management considerations on page 28.

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Reef Environmental Education Foundation. 2001. Database of recreational dive surveys. www.reef.org/data/pac/species.shtml

Rock Greenling *Hexagrammos lagocephalus*

Hexagrammos from Greek for “six-lined”;
lagocephalus from Greek for “rabbit-headed”

Ecology:

Rock greenling occur from southern California north along the coast to Alaska, and west to the Bering Sea and Kuril Islands. They are uncommon south of Pt. Conception, California.

Rock greenling are found in shallow waters in rocky areas, especially on exposed coasts. This species occupies deeper waters of continental slope (300 + m) in winter off Kamchatka and the Kuril Islands.

Life History:

The maximum recorded size for rock greenling is 24 inches (61 cm) and 2.8 pounds (1300 g). Maximum age has been suggested as 8 years for males, and 11 years for females, based on work in the Western Pacific.

Other life history traits are probably similar to that of other greenling, including spawning from late summer into the winter, depending on location, and males guarding demersal nests in shallow waters.

Population status:

There have been no quantitative or qualitative assessments of rock greenling populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide one element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are under analysis.

Management:

Rock greenling are not included under the Pacific Fishery Management Council’s groundfish fishery management plan. Applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on

commercial harvesting in coastal bay or estuary waters, or within 200 yards seaward of any jetty.

Recreational harvest of rock greenling in Oregon is limited by a 25 fish per day bag limit. This limit is an aggregate daily cap for a diverse set of species including flounder, surfperch, tuna, other greenling, and cabezon.

Harvest History:

Recent recreational harvest of rock greenling in Oregon based on the Oregon recreational creel database is presented in Appendix Table A-3 and Appendix Figure A-2. Commercial harvest has been very low, and rock greenling harvest will have been aggregated into unspecified groundfish categories.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

References:

Eschmeyer, W.N., E.S. Herald and H. Hammann. 1983. Field Guide to Pacific Coast Fishes of North America. Boston: Houghton Mifflin. 336 pp.

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Whitespotted Greenling *Hexagrammos stelleri*

Hexagrammos from Greek for “six-lined”; *stelleri* after G.W. Steller, the naturalist on C.J. Bering’s exploratory voyages.

Ecology:

Whitespotted greenling are found from northern California through Washington, British Columbia, Alaska, Aleutian Islands to the Bering Sea and west to Kamchatka and northern Japan. The species is uncommon south of Puget sound.

This is an inshore species, found near rocks, pilings, and eelgrass beds out to a depth of about 150 ft (46 m). The greatest depth reported for this species is 575 feet (175 m).

Whitespotted greenling feed on invertebrates (worms, crustaceans) and small fishes.

Life History:

The largest recorded size for a whitespotted greenling is 19 inches (48 cm), and 3.5 pounds (1.6 kg).

This species spawn in the winter in the southern portion of its range, and progressively earlier in more northern areas. Individual spawning masses contain 1580 to 9660 eggs (mean 4340) in Puget Sound, with individual eggs being 2.2 – 2.5 mm in diameter. Eggs are variable in color: blue, rose, green, grey. Hatching took place about 30 days after spawning when eggs were held at 10° C in a laboratory setting.

Young grow rapidly from 30 – 40 mm in May to 90 – 120 mm in August.

Population status:

There have been no quantitative or qualitative assessments of whitespotted greenling populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide on element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish

species during the summer and fall of 2001. Research results are under analysis.

Management:

Whitespotted greenling are not included under the Pacific Fishery Management Council’s groundfish fishery management plan. Applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial fishing in coastal bay or estuary waters, or within 200 yards seaward of any jetty.

Recreational harvest of whitespotted greenling in Oregon is limited by a 25 fish per day bag limit. This limit is an aggregate daily cap for a diverse set of species including flounder, surfperch, tuna, other greenling, and cabezon.

Harvest History:

There is no specific record of commercial or recreational harvest of this species in Oregon in the PACFIN or Oregon recreational creel databases. It is possible that some small volume of catch is aggregated in unspecified species categories.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and

reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

References:

Eschmeyer, W.N., E.S. Herald and H. Hammann. 1983. Field Guide to Pacific Coast Fishes of North America. Boston: Houghton Mifflin. 336 pp.

DeMartini, E.E. 1986. Reproductive colorations, paternal behavior and egg masses of kelp greenling, *Hexagrammos decagrammus*, and whitespotted greenling, *H. stelleri*. *Northwest Science*. 60(1): 32 – 35.

Froese, R. and D. Pauly. Editors. 2001. FishBase. World Wide Web electronic publication. www.fishbase.org.

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Reef Environmental Education Foundation. 2001. Database of recreational dive surveys. www.reef.org/data/pac/species.shtml

Painted Greenling *Oxylebius pictus*

Oxylebius from the Greek *oxys*, “sharp” and *lepyis*, “kettle or fish”; *pictus* from Latin for “picture”.



Photo Credit: Marc C. Chamberlain. Reproduced with permission.

Ecology:

Painted greenling range from Baja California north to Kodiak Island, AK; they are rare north of Washington and south of La Jolla, California.

Painted greenling are found in rocky inshore waters from the intertidal to a depth of 300 feet. In southern California, they are most abundant between 50 to 100 feet; from central California north they are most abundant from 15 to 70 feet.

They are solitary bottom dwellers found on or near hard bottom in sheltered locations. They are usually associated with rocks, but also found associated with other structures – such as oil platforms and sewage pipes. Adults are territorial, and sedentary. Males prefer high relief areas; females and juveniles often found at sand-rock boundaries.

Benthic invertebrates (crabs, shrimp, amphipods, molluscs) are the principal prey of this species.

Life History:

Maximum size for painted greenling is 10 inches (25 cm). A one year old fish is about 4 inches long. A six year old fish is about 6.5 inches long off Monterey, California and about 8 inches long in Puget Sound.

Painted greenling live at least 8 years. Females are mature at 3 years, and most males are mature at 2 years.

Spawning occurs in the summer in Puget Sound, from September to March off Monterey, California, and year-round in southern California. A female will produce from 12,000 to 28,000 eggs per spawning season, depending on size. Egg masses of up to 2200 eggs are deposited on exposed rock surfaces. Nests may contain several egg masses, and are guarded by the male parent.

Population status:

There have been no quantitative or qualitative assessments of painted greenling populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide an element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are under analysis.

Management:

Painted greenling are not included under the Pacific Fishery Management Council’s groundfish fishery management plan. Applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvesting in coastal bay or estuary waters, or within 200 yards seaward of any jetty.

Recreational harvest of painted greenling in Oregon is limited by a 25 fish per day bag limit. This limit is an aggregate daily cap for a diverse set of species including flounder, surfperch, tuna, other greenling, and cabezon.

Harvest History:

There is no specific record of commercial or recreational harvest of this species in Oregon in the PACFIN or Oregon recreational creel databases. It is possible that some small volume of catch is aggregated in unspecified species categories.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options

Please refer to the discussion of future management considerations on page 28.

References:

Eschmeyer, W.N., E.S. Herald and H. Hammann. 1983. Field Guide to Pacific Coast Fishes of North America. Boston: Houghton Mifflin. 336 pp.

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Kelp Rockfish *Sebastes atrovirens*

Sebastes from Greek for 'magnificent'; *atrovirens* from Latin for 'green and black'



Photo Credit: Marc C. Chamberlain. Reproduced with permission.

Ecology:

Kelp rockfish are found from northern California (Timber Cove, Sonoma County) south to central Baja California (Punta San Pablo); they are common in southern California. This species has not yet been reported from Oregon.

They are generally found in shallow inshore waters out to a depth of 150 feet (46 m), and are most common at depths of 15 to 50 feet (5 – 15 m). They have been reported from as deep as 985 feet (300 m).

As the name implies, kelp rockfish are strongly associated with kelp forests, but they are also found on shallow rocky reefs. Typically they are found on or near the bottom, but they also rise into the water column or into the canopy of kelp forests. Tagging studies suggest adults are residential and move very little. They are not known to be territorial.

Adult kelp rockfish are nocturnal and crepuscular carnivores, preying on crustaceans, small fishes, tunicates, cephalopods, and gastropods. Benthic and pelagic crustaceans and fishes are the dominant food items based on analysis of stomach contents.

Adults are themselves preyed upon by sharks, dolphin, seals

Larvae are planktonic, and prey on smaller plankton. Larvae themselves are preyed on by siphonophores and chaetognaths,

Juveniles (1 inch to maturity) are also planktivores, feeding on crustaceans such as gammarid amphipods, barnacle larvae and juvenile fishes. They occupy kelp canopies and reefs. Juveniles are preyed upon by other larger fishes including rockfishes, lingcod, cabezon, salmon, and birds, pinnipeds and cetaceans.

Life History:

The maximum reported length for a kelp rockfish is 16.5 inches (42.5 cm); the typical maximum size is about 15 inches (38 cm), based on age-length relationships.

Kelp rockfish can live up to 20 years.

In California maturity studies, the size at first maturity is about 9 inches (23 cm) for males and 8.5 inches (22 cm) for females. Males first become sexually mature at age 4, and females at age 5. Females produce about 340 to 400 eggs per gram of body weight; this converts to about 172,000 eggs for a female 12 inches (30.5 cm) long.

As with all rockfishes of the genus *Sebastes*, kelp rockfish have internal fertilization and females bear live young. Mating takes place in the late fall and winter (peaking from December to February), larvae are born in April to May.

Larvae are pelagic for about one to two months. They settle into the kelp canopy as juveniles from April to August.

Population status:

There have been no quantitative or qualitative assessments of kelp rockfish populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide one element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish

species during the summer and fall of 2001. Research results are under analysis.

Management:

Kelp rockfish fall within the nearshore group of minor rockfish in the Pacific Fishery Management Council's groundfish fishery management plan. Harvest specifications for this species, and other rockfish species that do not have quantifiable assessments are based on an aggregate acceptable biological catch (ABC) for northern and southern management areas. The estimated ABCs for these "other" rockfish are reduced by 50% as a precautionary measure due to limited knowledge of their abundance to obtain an optimum yield (OY) figure. The OY is reduced by estimated recreational catch and discard to arrive at landed catch harvest guidelines for the commercial fishery.

Oregon commercial fishing regulations mirror those adopted by the federal fisheries management council. Additional Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvesting in coastal bay or estuary waters, or within 200 yards seaward of any jetty.

In Oregon, recreational rockfish harvest managed through a ten fish daily bag limit.

Harvest History:

There is no specific record of commercial or recreational harvest of this species in Oregon in the PACFIN or Oregon recreational creel databases. It is possible that some small volume of catch is aggregated in unspecified species categories.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into

qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

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Brown rockfish *Sebastes auriculatus*

Sebastes from Greek for “magnificent”; *auriculatus* from Latin for “eared”, probably referring to the brown patch on the gill covers.



Photo Credit: Richard Herrmann. Reproduced with permission.

Ecology:

Brown rockfish are found from central Baja California north to Prince William Sound, AK; they are most abundant from Puget Sound to southern California. Brown rockfish are sedentary bottom fishes of hard or sandy bottoms, generally near structure such as rocks, kelp or pilings.

They have been taken at depths of up to 420 feet (128 m), but are most common in shallower inshore waters less than 175 feet (53 m). Juvenile brown rockfish use shallow inshore waters such as bays and around piers or over rubble. They move to deeper water with age.

Tagging studies suggest very little movement by adults, and hint at some homing ability by juveniles displaced from the location they were caught.

Brown rockfish rely on crustaceans (shrimp, crabs), polychaetes and small fishes for prey. Early benthic juveniles feed on small crustaceans such as amphipods and copepods. At a size of about five inches, they shift to crabs and small fishes. Adults larger than 12 inches feed on larger fishes, shrimp, and crabs.

Little is known of brown rockfish predators. They are likely vulnerable to predation by the same suite of predators as other rockfishes including larger fishes, and marine mammals. It is likely that most

losses from the population due to predation occur among younger, smaller individuals.

Life History:

The largest reported brown rockfish was 22 inches long (57 cm); a more typical maximum size based on age-length relationships is likely 20 inches (51.5 cm).

The oldest reported brown rockfish was aged at 20 years.

Brown rockfish are estimated to first mature at age 3, and a size of 10 inches (26 cm). Half of the population is probably mature by age 5 and a size of 12 inches (31 cm), and all individuals are probably mature by age 10 and a size of 14.5 inches (38 cm).

As with all rockfishes of the genus *Sebastes*, brown rockfish have internal fertilization and give birth to live young. In Oregon waters females spawn (give birth) in May and June, and in Puget Sound, spawning occurs in June. The spawning season is longer off California extending from December to July; females off California probably give birth more than once per season. Fecundity (numbers of young) ranges from 42,000 (12 inch female) to 266,000 larvae (18 inch female) and up to 339,000 for 18.5 inch (47.7 cm) female.

Larvae are pelagic, and then metamorphose into pelagic juveniles that remain in the water column for three to six months. As they grow, juveniles settle to the bottom in shallow inshore waters and then migrate to deeper waters with age.

Population status:

There have been no quantitative or qualitative assessments of brown rockfish populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide one element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are under analysis.

Management:

Brown rockfish fall within the nearshore group of minor rockfish in the Pacific Fishery Management Council's groundfish fishery management plan. Harvest specifications for this species, and other rockfish species that do not have quantifiable assessments, are based on an aggregate acceptable biological catch (ABC) for northern and southern management areas. The estimated ABCs for these "other" rockfish are reduced by 50% as a precautionary measure due to limited knowledge of their abundance to obtain an optimum yield (OY) figure. The OY is reduced by estimated recreational catch and discard to arrive at landed catch harvest guidelines for the commercial fishery.

Oregon commercial fishing regulations mirror those adopted by the federal fisheries management council. Additional applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvesting in coastal bay or estuary waters, or within 200 yards seaward of any jetty.

In Oregon, recreational rockfish harvest managed through a ten fish daily bag limit.

Harvest History:

There is no specific record of commercial or recreational harvest of this species in Oregon in the PACFIN or Oregon recreational creel databases. It is possible that some small volume of catch is aggregated in unspecified species categories.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

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Gopher rockfish *Sebastes carnatus*

Sebastes from Greek for “magnificent”; *carnatus* from Greek for “flesh colored”



Photo credit: James Forte. Reproduced with permission.

Ecology:

Gopher rockfish range from central Baja California to northern California (Eureka area). They are common from Mendocino County in the north to Santa Monica Bay in the south; they are not abundant north of Sonoma County. This species has been observed infrequently in southern Oregon nearshore fishery landings.

This is an inshore species associated with holes and crevices in rocky areas and kelp beds. They are found from the shallow shallow subtidal out to 180 feet (55 m), and are most common at depths of 30 to 120 feet (9 – 37 m).

Gopher rockfish occupy restricted home ranges, and are understood to be territorial.

Gopher rockfish prey principally on benthic crustaceans such as crabs and shrimp. Fishes, cephalopods, polychaetes and echinoderms (brittle stars) are also taken. Juveniles feed on zooplankton, especially copepods and crab larvae. Larvae are planktivores.

Little is known of gopher rockfish predators. They are likely vulnerable to predation by the same suite of predators as other rockfishes including larger fishes, birds and marine mammals. It is likely that most losses from the population due to predation occur among younger, smaller individuals. Larvae are prey of siphonophores and chaetognaths.

Life History:

The largest reported gopher rockfish was 15 inches (39 cm) long. More typical maximum size is probably 13 inches, based on age-length relationships.

The maximum recorded age for a gopher rockfish is 30 years.

Gopher rockfish are estimated to be 50% mature at age 4, and a size of 6.5 inches (17 cm); all individuals are thought to be mature by age 5 and a size of 8 inches (21 cm).

As with all rockfishes of the genus *Sebastes*, gopher rockfish have internal fertilization and give birth to live young. Off north-central California, young are born from March to May. Young gopher rockfish appear on kelp beds in May and June. They first occupy the kelp canopy, then descend to bottom and leave cover with increasing age and size.

Population status:

There have been no quantitative or qualitative assessments of gopher rockfish populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide one element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are under analysis.

Management:

Gopher rockfish fall within the nearshore group of minor rockfish in the Pacific Fishery Management Council’s groundfish fishery management plan. Harvest specifications for this species, and other rockfish species that do not have quantifiable assessments, are based on an aggregate acceptable biological catch (ABC) for northern and southern management areas. The estimated ABCs for these “other” rockfish are reduced by 50% as a precautionary measure due to limited knowledge of their abundance to obtain an optimum yield (OY)

figure. The OY is reduced by estimated recreational catch and discard to arrive at landed catch harvest guidelines for the commercial fishery.

Oregon commercial fishing regulations mirror those of the federal fisheries management council. Additional applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvesting in coastal bay or estuary waters, or within 200 yards seaward of any jetty.

In Oregon, recreational rockfish harvest managed through a ten fish daily bag limit.

Harvest History:

There is no specific record of commercial or recreational harvest of this species in Oregon in the PACFIN or Oregon recreational creel databases. It is possible that some small volume of catch is aggregated in unspecified species categories.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

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Copper rockfish *Sebastes caurinus*

Sebastes from Greek for “magnificent”; *caurinus* from Latin for “northwestern” – refers to its being first described in Puget Sound, Washington



Photo credit: Marc C. Chamberlain. Reproduced with permission.

Ecology:

Copper rockfish are found from central Baja California to the Kenai Peninsula of south-central Alaska. Some authorities believe that copper rockfish are actually two distinct species, the copper rockfish in the region from Kenai peninsula Alaska to Monterey Bay, California, and the similar whitebelly rockfish, *Sebastes vexillifer* ranging from Crescent City California south to central Baja California. Recent analyses suggest that these forms represent a single, highly variable species.

Copper rockfish are found in inshore waters, particularly shallow, protected bays and inlets. They are also found in kelp beds, and on rocky reefs. Higher densities of copper rockfish have been observed in high relief areas. Based on tagging studies, individuals show little movement, and there is some suggestion of homing ability by fishes displaced away from the point of capture. These studies also suggest that the home range occupied is smaller in high-relief habitat than low-relief habitat. They are solitary, bottom dwellers.

Copper rockfish occupy depths from 33 to 600 feet (183 m), but are most common in waters shallower than 400 feet (122 m). They are usually found in waters shallower than 65 feet in British Columbia, and less than 75 feet (23 m) in Puget Sound, but occupy deeper waters in the southern portions of the range.

Copper rockfish are opportunistic carnivores and feed primarily on the bottom. Crustaceans (shrimp, crabs), mollusks (squid, octopus, bivalves and snails) and fishes are their principal prey. A food study in Humboldt Bay, California showed Dungeness crab to be the single most important prey item, particularly in the summer and fall coinciding with crab molt. Fishes become an increasingly important portion of the diet of larger, older individuals.

Juveniles feed on calanoid copepods, caridean shrimp, and gammarid amphipods.

Little is known of copper rockfish predators. They are likely vulnerable to predation by the same suite of predators as other rockfishes including larger fishes, and marine mammals. It is likely that most losses from the population due to predation occur among younger, smaller individuals.

Life History:

The largest recorded copper rockfish was 22.5 inches (58 cm) long and weighed 5.75 pounds (2.6 kg).

The maximum reported age for a copper rockfish is 55 years.

Males are estimated to be 50% mature at age 4, and a size of 12.5 inches (32 cm); while females are estimated to be 50% mature at age 6 and a size of 13 inches (33.5 cm). Males are 100% mature at age 7 and 15.5 inches (40 cm); females are 100% mature at age 8 and 16 inches.

As with all rockfishes of the genus *Sebastes*, copper rockfish have internal fertilization and give birth to live young. Reproductive output increases rapidly with size: a 10 inch (25 cm) female may produce only 20,000 larvae, while a 13 inch (34 cm) female can produce over 200,000 larvae and a 20 inch female (51 cm) may produce over 600,000 larvae.

Larvae are extruded in February off north-central California; from March to May off Washington and British Columbia, and from March to July in Alaskan waters.

Larvae are pelagic and distributed offshore. In California waters, small juveniles appear in kelp forests, high in the water column, in April and May. With growth, they later move toward the bottom and are subsequently distributed near the bottom over sand and along sand-rock boundaries, often in association with drift algae. With growth, they are increasingly found on typical rocky reef habitats of the adults.

Population status:

There have been no quantitative or qualitative assessments of copper rockfish populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide one element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are under analysis.

Management:

Copper rockfish fall within the nearshore group of minor rockfish in the Pacific Fishery Management Council's groundfish fishery management plan. Harvest specifications for this species, and other rockfish species that do not have quantifiable assessments, are based on an aggregate acceptable biological catch (ABC) for northern and southern management areas. The estimated ABCs for these "other" rockfish are reduced by 50% as a precautionary measure due to limited knowledge of their abundance to obtain an optimum yield (OY) figure. The OY is reduced by estimated recreational catch and discard to arrive at landed catch harvest guidelines for the commercial fishery.

Oregon commercial fishing regulations mirror those adopted by the federal fisheries management council. Additional applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvesting in coastal bay or estuary waters, or within 200 yards seaward of any jetty. Oregon currently imposes a 12" minimum size limit for commercially landed copper rockfish.

In Oregon, recreational rockfish harvest managed through a ten fish daily bag limit.

Harvest History:

Commercial and recreational harvest history of copper rockfish in Oregon, drawn from the PACFIN Oregon recreational creel databases, is presented in Appendix Tables A-2 and A-3, and Appendix Figures A-1 and A-2.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

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Black-and-Yellow Rockfish *Sebastes chrysomelas*

Sebastes from Greek for “magnificent”;
chrysomelas from Latin for “black and yellow”



Photo credit: James Forte. Reproduced with permission.

Ecology:

Black-and-yellow rockfish range from central Baja California north to northern California, and possibly to British Columbia. They are common from San Diego north to Mendocino County. This species has been observed infrequently in southern Oregon nearshore fishery landings.

These are inshore demersal fishes found out to depths of 120 feet (37 m) in kelp beds and rocky areas. They are most common in high-relief rocky areas at depths less than 60 feet (18 m).

When together with gopher rockfish, the black-and-yellows are more aggressive and take preferred shallower areas leading to segregation by depth. They inhabit restricted home ranges based on a California tagging study, and have been reported to be territorial.

Black-and-yellow rockfish feed on a wide variety of benthic organisms including crabs, shrimp, isopods, mollusks and juvenile fishes. Young feed on planktonic crustaceans including copepods and crab larvae.

Little is known of black-and-yellow rockfish predators. They are likely vulnerable to predation by the same suite of predators as other rockfishes including larger fishes, birds and marine mammals. It is likely that most losses from the population due to predation occur among younger, smaller

individuals. Pelagic larvae are prey to siphonophores and chaetognaths.

Life History:

The largest reported black-and-yellow rockfish was 15.5 inches (39 cm). Expected maximum sizes based on age-growth relationships are about 13 inches (33 - 34 cm).

The oldest reported black-and-yellow rockfish was aged at 22 years.

Sexual maturity is reported at age 4 to 6 for males at 9.5 to 10 inches (24 – 26 cm), and ages 6 to 7 for females at 9.5 to 10.5 inches (24 – 27 cm).

As with all rockfishes of the genus *Sebastes*, black-and-yellow rockfish have internal fertilization and bear live young. Mating occurs in the winter and young are born between January and May. Larvae are pelagic, and small juveniles are observed in kelp beds starting in July and August at a size about an inch (20 – 30 mm).

Population status:

There have been no quantitative or qualitative assessments of black-and-yellow rockfish populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide one element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are under analysis.

Management:

Black-and-yellow rockfish fall within the nearshore group of minor rockfish in the Pacific Fishery Management Council’s groundfish fishery management plan. Harvest specifications for this species, and other rockfish species that do not have quantifiable assessments, are based on an aggregate acceptable biological catch (ABC) for northern and southern management areas. The estimated ABCs for these “other” rockfish are reduced by 50% as a precautionary measure due to limited knowledge of their abundance to obtain an optimum yield (OY)

figure. The OY is reduced by estimated recreational catch and discard to arrive at landed catch harvest guidelines for the commercial fishery.

Oregon commercial fishing regulations mirror those adopted by the federal fisheries management council. Additional applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvest in coastal bay and estuary waters, or within 200 yards seaward of any jetty.

In Oregon, recreational rockfish harvest managed through a ten fish daily bag limit.

Harvest History:

There is no specific record of commercial or recreational harvest of this species in Oregon in the PACFIN or Oregon recreational creel databases. It is possible that some small volume of catch is aggregated in unspecified species categories.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

References:

- Eschmeyer, W.N., E.S. Herald and H. Hammann. 1983. Field Guide to Pacific Coast Fishes of North America. Boston: Houghton Mifflin. 336 pp.
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Calico rockfish *Sebastes dalli*

Sebastes from Greek for “magnificent”; *dalli* refers to Smithsonian zoologist William H. Dall



Photo credit: Marc C. Chamberlain. Reproduced with permission.

Ecology:

Calico rockfish are found from the central Baja California north to the San Francisco area. They have not yet been reported from Oregon waters.

This is a bottom-dwelling species found on soft bottoms, often at sand-rock boundaries, at depths of 60 to 840 feet (18 – 256 m); they are most common at depths of 200 to 300 feet (60 - 90 m).

The maximum reported size for this species is 10 inches (25 cm); a more typical maximum based on age-size relationships is 8 inches (20 cm).

Calico rockfish prey on copepods, gammarid amphipods, bivalves and crabs

Little is known of calico rockfish predators. They are likely vulnerable to predation by the same suite of predators as other rockfishes including larger fishes, birds and marine mammals. It is likely that most losses from the population due to predation occur among younger, smaller individuals. Being a relatively small rockfish, adults are probably more vulnerable to predation than are adults of other, larger rockfish species. Planktonic larvae are prey of siphonophores and chaetognaths.

Life History:

The maximum reported age for calico rockfish is 12 years. They are reported to be 50% mature at age 4 and a size of 3.5 inches (9 cm) and to be 100% mature at 5.5 inches (14 cm) for males and 4 inches (10 cm) for females.

As with all rockfishes of the genus *Sebastes*, fertilization is internal and young are born alive. Larvae are released from January through May, with a peak in February, in the southern California bight. A 4.5 inch female may produce about 3850 eggs/larvae, and maximum fecundity in a 6 inch individual has been estimated at 18,000 eggs/larvae.

Larvae are pelagic for approximately one to two months, they transform to juveniles at a size of about an inch (20 – 25 mm) at which time they settle to the bottom.

Population status:

There have been no quantitative or qualitative assessments of calico rockfish populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide an element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results being analyzed in the fall of 2001.

Management:

Calico rockfish fall within the nearshore group of minor rockfish in the Pacific Fishery Management Council’s groundfish fishery management plan. Harvest specifications for this species, and other rockfish species that do not have quantifiable assessments, are based on an aggregate acceptable biological catch (ABC) for northern and southern management areas. The estimated ABCs for these “other” rockfish are reduced by 50% as a precautionary measure due to limited knowledge of their abundance to obtain an optimum yield (OY) figure. The OY is reduced by estimated recreational catch and discard to arrive at landed catch harvest guidelines for the commercial fishery.

Oregon commercial fishing regulations mirror the specifications adopted by the federal fishery management council. Additional applicable Oregon commercial fishing regulations include the

requirement for a commercial fishing license, and a prohibition on commercial harvest in coastal bays, or within 200 yards seaward of any jetty or bay unless specifically provided for by rule.

In Oregon, recreational rockfish harvest managed through a ten fish daily bag limit.

Harvest History:

There is no specific record of commercial or recreational harvest of this species in Oregon in the PACFIN or Oregon recreational creel databases. It is possible that some small volume of catch is aggregated in unspecified species categories.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

References:

Eschmeyer, W.N., E.S. Herald and H. Hammann. 1983. Field Guide to Pacific Coast Fishes of North America. Boston: Houghton Mifflin. 336 pp.

Froese, R. and D. Pauly. Editors. 2001. FishBase. World Wide Web electronic publication. www.fishbase.org.

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Quillback rockfish *Sebastes maliger*

Sebastes from Greek for “magnificent”; *maliger* from two Latin words for “I bear a mast” referring to the high dorsal fin



Photo credit: Marc C. Chamberlain. Reproduced with permission.

Ecology:

Quillback rockfish are found from southern California (San Miguel Island) north to the Gulf of Alaska and Prince William Sound. They are common from northern California through southeast Alaska.

Quillback rockfish occupy shallow rocky bottoms and reefs, always close to cover. They are also found over coarse sand and pebble bottoms adjacent to reefs, particularly in areas with abundant kelp. In the Strait of Georgia, they are found in higher densities in areas of high relief and broken rock, and greater percent cover of flat-bladed kelp. Tagging and telemetric studies suggest that these fish move very little, and there is some evidence for homing when displaced. Home ranges are small on high relief reefs, and are larger on low relief areas.

Quillback rockfish have been taken from as deep as 900 feet (274 m), but are most frequently found in the range of 40 to 250 ft (13 – 75 m).

Quillback rely largely on crustaceans (shrimp and various crabs), mollusks, fish eggs and smaller fishes for prey.

Larvae are pelagic planktivores, and are themselves prey of siphonophores, chaetognaths.

Little is known of quillback rockfish predators. They are likely vulnerable to predation by the same

suite of predators as other rockfishes including larger fishes, birds and marine mammals. It is likely that most losses from the population due to predation occur among younger, smaller individuals.

Life History:

The maximum reported size for quillback is 24 inches (61 cm) and 5.7 pounds (2.58 kg). Individuals over 20 inches are rare. Growth and size depend on location. Off of SE Alaska, a 12 year old fish is about 12 inches long; off of southern California, a 12 year old individual is about seven inches long.

The maximum recorded age for a quillback rockfish is 90 years.

It is estimated that 50% of age 4 males, and 50% of age 6 females are sexually mature. Size at maturity depends on growth and location; individuals at the northern portion of the range being larger than those off California. Consequently, 50% of Alaskan fish may be mature at a size of 12 inches, while half of those about 9 inches long may be mature off California.

As with all rockfishes of the genus *Sebastes*, quillback rockfish have internal fertilization and bear live young. Young are born between April and July off north-central California, and from May to July in the Gulf of Alaska.

Larvae are pelagic for a period of one to two months before transforming to juveniles and occupying nearshore bottom habitats.

Population status:

There have been no quantitative or qualitative assessments of quillback rockfish populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide one element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are under analysis.

Management:

Quillback rockfish fall within the nearshore group of minor rockfish in the Pacific Fishery Management Council's groundfish fishery management plan. Harvest specifications for this species, and other rockfish species that do not have quantifiable assessments, are based on an aggregate acceptable biological catch (ABC) for northern and southern management areas. The estimated ABCs for these "other" rockfish are reduced by 50% as a precautionary measure due to limited knowledge of their abundance to obtain an optimum yield (OY) figure. The OY is reduced by estimated recreational catch and discard to arrive at landed catch harvest guidelines for the commercial fishery.

Oregon commercial fishing regulations mirror the specifications adopted by the federal fishery management council. Additional applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvest in coastal bays, or within 200 yards seaward of any jetty or bay, unless specifically provided for by rule. Oregon currently imposes a 12" minimum size limit for commercially landed quillback rockfish.

In Oregon, recreational rockfish harvest managed through a ten fish daily bag limit.

Harvest History:

Commercial and recreational harvest history of quillback rockfish in Oregon, drawn from the PACFIN and Oregon recreational creel databases, is presented in Appendix Tables A-2 and A-3, and Appendix Figures A-1 and A-2.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish

harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

References:

- Eschmeyer, W.N., E.S. Herald and H. Hammann. 1983. Field Guide to Pacific Coast Fishes of North America. Boston: Houghton Mifflin. 336 pp.
- Froese, R. and D. Pauly. Editors. 2001. FishBase. World Wide Web electronic publication. www.fishbase.org.
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Vermilion rockfish *Sebastes miniatus*

Sebastes from Greek for “magnificent”; *miniatus* from Latin for “vermillion”

CA notes decrease in average size in sport hook & line fishery from 1981 to 1989



Photo credit: James Forte. Reproduced with permission.

Ecology:

Vermilion rockfish are found from central Baja California north to the Queen Charlotte Islands of British Columbia.

Adults inhabit rocky reefs at depths of 50 to 900 feet (15 – 274 m). They are more common on shallower reefs, but have been taken from as deep as 1400 feet. Generally, they live in shallower waters in the more northerly portions of the species range. Their preferred depth in the California bight seems to be 200 to 800 feet, with larger individuals at greater depths. A California tagging study suggests that vermilion rockfish move very little. Juveniles inhabit shallow waters.

Vermilion rockfish prey on octopus, squid, small fishes (e.g. anchovies, lanternfish, and small rockfishes) and crustaceans (euphausiids and pelagic red crabs).

Pelagic young prey on small crustaceans, larvae are themselves likely prey of pelagic predators such as siphonophores and chaetognaths.

Little is known of vermilion rockfish predators. They are likely vulnerable to predation by the same suite of predators as other rockfishes including larger fishes, birds and marine mammals. It is likely that most losses from the population due to

predation occur among younger, smaller individuals.

Life History:

The largest recorded size of a vermilion rockfish is 35 inches (91 cm) and 15 pounds (6.8 kg). Age-length studies suggest that more typical maximum sizes would be 22 inches for males, and 24 inches for females.

The greatest recorded age for a vermilion rockfish is 43 years.

In California, vermilion rockfish are 50% mature at an age of 5, and a length of approximately 14.5 inches. All individuals are mature by the age of 8 or 9 years, and at a size of 17 to 18 inches.

As with all rockfishes of the genus *Sebastes*, vermilion rockfish have internal fertilization and bear live young. Fecundity (number of offspring produced) is very high: a 12.5 inch female may produce 63,000 eggs and larvae, an 18 inch individual may produce 160,000 eggs and larvae, and a 26 inch individual may produce approximately 2.7 million eggs/larvae.

Young are born over an extended period from the fall to the spring in north-central California. Peak spawning months are September in northern California, and November in southern California.

Larvae are pelagic for one to four months, and then settle to the bottom. Young of the year begin to appear in California inshore waters in February. They are not strong swimmers, and tend to be secretive.

Population status:

There have been no quantitative or qualitative assessments of vermilion rockfish populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide one element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish

species during the summer and fall of 2001. Research results are under analysis.

In California, a decrease in average size of vermilion rockfish was observed over the course of the 1980s.

Management:

Vermilion rockfish fall within the shelf group of minor rockfish in the Pacific Fishery Management Council's groundfish fishery management plan. Harvest specifications for this species, and other rockfish species that do not have quantifiable assessments, are based on an aggregate acceptable biological catch (ABC) for northern and southern management areas. The estimated ABCs for these "other" rockfish are reduced by 50% as a precautionary measure due to limited knowledge of their abundance to obtain an optimum yield (OY) figure. The OY is reduced by estimated recreational catch and discard to arrive at landed catch harvest guidelines for the commercial fishery.

Oregon commercial fishing regulations mirror the specifications adopted by the federal fisheries management council. Additional applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvest in coastal bays or within 200 yards seaward of any jetty or bay unless specifically provided for by rule.

In Oregon, recreational rockfish harvest managed through a ten fish daily bag limit.

Harvest History:

Commercial and recreational harvest history of vermilion rockfish in Oregon, drawn from the PACFIN and Oregon recreational creel databases, is presented in Appendix Tables A-2 and A-3, and Appendix Figures A-1 and A-2.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

References:

- Eschmeyer, W.N., E.S. Herald and H. Hammann. 1983. Field Guide to Pacific Coast Fishes of North America. Boston: Houghton Mifflin. 336 pp.
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Love, M.S., L. Thorsteinson, C.W. Mecklenburg and T.A. Mecklenburg. 2000. A checklist of marine and estuarine fishes of the Northeast Pacific, from Alaska to Baja California. Located at url: <http://id-www.ucsb.edu/lovelab/home.html>.

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Reef Environmental Education Foundation. 2001. Database of recreational dive surveys. www.reef.org/data/pac/species.shtml

Wyllie Echeverria, T. 1987. Thirty-four species of California rockfishes: maturity and seasonality of reproduction. Fishery Bulletin. 85(2): 229 – 250.

China rockfish *Sebastes nebulosus*

Sebastes from Greek for “magnificent”; *nebulosus* from Latin for “clouded”



Photo credit: Marc C. Chamberlain. Reproduced with permission.

Ecology:

China rockfish are found from southern California north to southeast Alaska and possibly west to Kachemak Bay. They occupy shallow waters of the open coast in association with rocks and reefs. They are abundant in Alaska, British Columbia and Washington, but less so in northern California and are rare south of Point Conception.

China rockfish are found in depths ranging from 10 to 420 feet (3 – 128 m), and are most common in the 30 to 300 foot range (9 – 90 m). They occupy progressively deeper waters in the southern portion of their range.

China rockfish are bottom dwellers, often in crevices. They are sedentary, and territorial.

In central California, crustaceans and brittle stars are the primary prey of adult China rockfish. Northern California fish also include mollusks (octopi, abalone and chitons) and small fishes in their diet.

Little is known of china rockfish predators. They are likely vulnerable to predation by the same suite of predators as other rockfishes including larger fishes, birds and marine mammals. It is likely that most losses from the population due to predation occur among younger, smaller individuals.

Larvae are planktonic, and likely prey on smaller plankton such as copepods. Larvae are likely prey

of planktonic predators such as siphonophores and chaetognaths.

Life History:

The maximum reported size for a China rockfish is 17.5 inches (45 cm). A more typical maximum size based on age-length relationships would be 14.5 inches (37 cm).

The maximum recorded age of a China rockfish is 79 years.

It is estimated that 50% of four year old fish are sexually mature and that 100% are mature by age 6. In California, size at 50% maturity would be 10.5 inches and size at 100% maturity would be 11.5 inches.

Like all rockfishes of the genus *Sebastes*, china rockfish have internal fertilization and bear live young. Larvae are extruded from January to June in California waters, in May and June off Oregon, and from April to July with a peak in May off of Alaska.

The larval phase lasts one to two months after which they transform and settle to the bottom.

Population status:

There have been no quantitative or qualitative assessments of china rockfish populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide one element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are under analysis.

Management:

China rockfish fall within the nearshore group of minor rockfish in the Pacific Fishery Management Council’s groundfish fishery management plan. Harvest specifications for this species, and other rockfish species that do not have quantifiable assessments, are based on an aggregate acceptable biological catch (ABC) for northern and southern

management areas. The estimated ABCs for these “other” rockfish are reduced by 50% as a precautionary measure due to limited knowledge of their abundance to obtain an optimum yield (OY) figure. The OY is reduced by estimated recreational catch and discard to arrive at landed catch harvest guidelines for the commercial fishery.

Oregon commercial fishery regulations mirror the specifications adopted by the federal fisheries management council. Additional applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvest in coastal bays or within 200 yards seaward of any jetty or bay unless specifically provided for by rule. Oregon currently imposes a 12” minimum size limit for commercially landed china rockfish.

In Oregon, recreational rockfish harvest managed through a ten fish daily bag limit.

Harvest History:

Commercial and recreational harvest of China rockfish in Oregon, drawn from the PACFIN and Oregon recreational creel databases, is presented in Appendix Tables A-2 and A-3, and Appendix Figures A-1 and A-2.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

References:

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Wyllie Echeverria, T. 1987. Thirty-four species of California rockfishes: maturity and seasonality of reproduction. Fishery Bulletin. 85(2): 229 – 250.

Tiger rockfish *Sebastes nigrocinctus*

Sebastes from Greek for “magnificent”;
nigrocinctus from Latin for “black” and “girdle”



Photo credit: Marc C. Chamberlain. Reproduced with permission.

Ecology:

Tiger rockfish are found from central California (Point Buchon) to the Kenai Peninsula in the Gulf of Alaska. They occupy rocky reefs at depths of 35 to 900 feet (10 – 274 m). Generally they are found at depths greater than 180 feet (55 m). Tiger rockfish are solitary and territorial, they will defend a home crevice in the reef.

Little is known of tiger rockfish predators. They are likely vulnerable to predation by the same suite of predators as other rockfishes including larger fishes, and marine mammals. It is likely that most losses from the population due to predation occur among younger, smaller individuals.

Larvae are planktonic, and likely prey on smaller plankton such as copepods. Larvae are likely prey of planktonic predators such as siphonophores and chaetognaths.

Life History:

The maximum reported size for a tiger rockfish is 24 inches (61 cm).

The maximum recorded age for this species is 116 years.

Females mature at between 11 and 18 inches (28 – 47 cm); males mature at sizes of 14 to 19 inches (36 – 49 cm).

Like all rockfishes of the genus *Sebastes*, tiger rockfish have internal fertilization and bear live

young. Larvae are extruded from February to June in Alaska waters, in May in British Columbia, and May to June off of Oregon.

The larval phase lasts one to two months, after which they transform and settle to the bottom as juveniles.

Population status:

There have been no quantitative or qualitative assessments of tiger rockfish populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide on element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are under analysis.

Management:

Tiger rockfish fall within the shelf group of minor rockfish in the Pacific Fishery Management Council’s groundfish fishery management plan. Harvest specifications for this species, and other rockfish species that do not have quantifiable assessments, are based on an aggregate acceptable biological catch (ABC) for northern and southern management areas. The estimated ABCs for these “other” rockfish are reduced by 50% as a precautionary measure due to limited knowledge of their abundance to obtain an optimum yield (OY) figure. The OY is reduced by estimated recreational catch and discard to arrive at landed catch harvest guidelines for the commercial fishery.

Oregon commercial fishing regulations mirror the specifications adopted by the federal fishery management council each year. Additional applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvest in coastal bays or within 200 yards seaward of any jetty or bay, unless specifically provided for by rule.

In Oregon, recreational rockfish harvest managed through a ten fish daily bag limit.

Harvest History:

Commercial and recreational harvest of tiger rockfish in Oregon, drawn from the PACFIN database, is presented in Appendix Tables A-2 and A-3 and Appendix Figures A-1 and A-2. The PACFIN database extends only to 1981. Prior to 1987, the small volume of tiger rockfish landed commercially in Oregon was aggregated in the unspecified rockfish category.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

References:

Barss, W.H. 1989. Maturity and reproductive cycle for 35 species from the family Scorpaenidae found off Oregon. Oregon Department of Fish and Wildlife Information Report 89-7, Portland, OR. 36 pp.

Eschmeyer, W.N., E.S. Herald and H. Hammann. 1983. Field Guide to Pacific Coast Fishes of North America. Boston: Houghton Mifflin. 336 pp.

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Reef Environmental Education Foundation. 2001. Database of recreational dive surveys. www.reef.org/data/pac/species.shtml

Wyllie Echeverria, T. 1987. Thirty-four species of California rockfishes: maturity and seasonality of reproduction. Fishery Bulletin. 85(2): 229 – 250.

Grass rockfish *Sebastes rastrelliger*

Sebastes from Greek for “magnificent”; *rastrelliger* from two Latin words meaning “I bear a small rake” in reference the species’ small gill rakers



Photo credit: Milton Love. Reproduced with permission.

Ecology:

Grass rockfish are found from Yaquina Bay, OR south to Baja California. It is most common from northern California to the south.

This is an inshore species associated with rocky bottoms of high relief, and kelp and eelgrass beds. Grass rockfish have one of the shallowest and narrowest depth ranges of any rockfish; they are generally found in waters less than 50 feet (15 m) deep. They have been taken in waters as deep as 150 feet (46 m). They are thought to be sedentary and territorial.

Grass rockfish prey on crabs, shrimp, fishes and octopus

Little is known of grass rockfish predators. They are likely vulnerable to predation by the same suite of predators as other rockfishes including larger fishes, birds and marine mammals. It is likely that most losses from the population due to predation occur among younger, smaller individuals.

Larvae are planktonic, and likely prey on smaller plankton such as copepods. Larvae are likely prey of planktonic predators such as siphonophores and chaetognaths.

Life History:

The maximum reported size for a grass rockfish is 21.5 inches (56 cm). Age-length studies suggest

that 19 to 21 inches is a more typical maximum size.

The maximum recorded age for a grass rockfish is 23 years.

Like all rockfish of the genus *Sebastes*, grass rockfish have internal fertilization and bear live young. Peak spawning off of California takes place in January and February.

Both sexes begin to mature at a size of 8.5 inches (22 cm). 50% of individuals are mature at sizes of 9 to 9.5 inches. This range represents ages of 2 to 5 years for males, and 3 to 5 years for females.

A 10 inch female (26 cm) will produce about 80,000 eggs/larvae, and an 18 inch female (46.5 cm) will produce about 760,000 eggs/larvae.

Larvae are extruded in January to March and the larval stage lasts one to two months. Juveniles appear in shallow waters during spring and summer.

Population status:

There have been no quantitative or qualitative assessments of grass rockfish populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide one element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are under analysis.

Management:

Grass rockfish fall within the nearshore group of minor rockfish in the Pacific Fishery Management Council’s groundfish fishery management plan. Harvest specifications for this species, and other rockfish species that do not have quantifiable assessments, are based on an aggregate acceptable biological catch (ABC) for northern and southern management areas. The estimated ABCs for these “other” rockfish are reduced by 50% as a precautionary measure due to limited knowledge of

their abundance to obtain an optimum yield (OY) figure. The OY is reduced by estimated recreational catch and discard to arrive at landed catch harvest guidelines for the commercial fishery.

Oregon commercial fishing regulations mirror the specifications established by the federal fisheries management council each year. Additional applicable Oregon commercial fishing regulations include a requirement for a commercial fishing license, and a prohibition on commercial harvest in coastal bays or within 200 yards seaward of any jetty or bay, unless specifically provided for by rule. Oregon currently imposes a 12" minimum size limit for commercially landed grass rockfish.

In Oregon, recreational rockfish harvest managed through a ten fish daily bag limit.

Harvest History:

Recent recreational harvest of this species in Oregon drawn from the Oregon recreational creel database is presented in Appendix Table A-3 and Appendix Figure A-2.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and

reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

References:

Barss, W.H. 1989. Maturity and reproductive cycle for 35 species from the family Scorpaenidae found off Oregon. Oregon Department of Fish and Wildlife Information Report 89-7, Portland, OR. 36 pp.

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Froese, R. and D. Pauly. Editors. 2001. FishBase. World Wide Web electronic publication. www.fishbase.org.

Lea, R.N., R.D. McAllister and D.A. VenTresca. 1999. Biological aspects of nearshore rockfishes of the genus *Sebastes* from central California. California Department of Fish and Game, Fish Bulletin 177, 107 pp.

Leet, W.S., C.M. DeWees and C.W. Haugen. 1992. California's Living Marine Resources and Their Utilization. California Sea Grant Extension Publication UCSGEP-92-12, Davis, CA.

Love, M.S. 1996. Probably more than you want to know about the fishes of the Pacific coast. Santa Barbara, CA: Really Big Press, 381 pp.

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Love, M.S., L. Thorsteinson, C.W. Mecklenburg and T.A. Mecklenburg. 2000. A checklist of marine and estuarine fishes of the Northeast Pacific, from Alaska to Baja California. Located at url: <http://id-www.ucsb.edu/lovelab/home.html>.

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Reef Environmental Education Foundation. 2001. Database of recreational dive surveys.
www.reef.org/data/pac/species.shtml

Olive rockfish *Sebastes serranoides*

Sebastes from Greek for “magnificent”; *serranoides* from a combination of Latin and Greek for “resembling a bass”



Photo credit: Milton Love. Reproduced with permission.

Ecology:

Olive rockfish are found from central Baja California to northern California (Redding Rock). They are common south of Monterey Bay to Santa Barbara and the Channel Islands. They are probably infrequently encountered in southern Oregon.

Olive rockfish are an inshore species found in depths up to 480 feet (146 m), but generally in waters shallower than 100 feet (30 m). They are almost always found associated with high hard relief (reefs, wrecks, oil platforms) and kelp beds. Olive rockfish often school in mid-water in association with blue and yellowtail rockfish. Tagging studies suggest they spend their entire life near same reef with little to no movement. Young of year appear over rocky reefs beginning in April; they aggregate over low rocks, in areas with reduced water movement, and with drift algae

Adults and larger juveniles are nocturnal, active mid-water predators. Juveniles feed on zooplankton and small fishes, adults feed on fishes, squid, crab and shrimp.

Little is known of olive rockfish predators. They are likely vulnerable to predation by the same suite of predators as other rockfishes including larger fishes, birds and marine mammals. It is likely that most losses from the population due to predation occur among younger, smaller individuals.

Larvae are planktonic, and likely prey on smaller plankton such as copepods. Larvae are likely prey of planktonic predators such as siphonophores and chaetognaths.

Life History:

The maximum reported size for an olive rockfish is 24 inches (61 cm), and up to seven to 8 pounds (3.1 to 3.6 kg). A more typical maximum size may be 21 inches (54 cm) based on age-length studies.

The maximum reported age for an olive rockfish is 25 years.

Sexual maturity is reached by 50% of the population at age 5, and a size of 13 inches (33 cm) for males and 13.5 inches (35 cm) for females. 100% of the population is mature at age 8 and a size of 14.5 inches (38 cm) for males and 15 inches (39 cm) for females.

Like all rockfishes of the genus *Sebastes*, olive rockfish have internal fertilization and bear live young. A small female (12.5 inches of 32.5 cm) might produce only 30,000 eggs/larvae, whereas large females (18 inches and above) may produce upwards of 500,000 eggs/larvae per year

Larvae are released in the winter (January to March) off of north-central California.

Larvae are planktonic for several months; then settle onto reefs and kelp beds as juveniles at size of about one to two inches (25 to 66 mm).

Population status:

There have been no quantitative or qualitative assessments of olive rockfish populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide an element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are under analysis.

Management:

Olive rockfish fall within the nearshore group of minor rockfish in the Pacific Fishery Management Council's groundfish fishery management plan. Harvest specifications for this species, and other rockfish species that do not have quantifiable assessments, are based on an aggregate acceptable biological catch (ABC) for northern and southern management areas. The estimated ABCs for these "other" rockfish are reduced by 50% as a precautionary measure due to limited knowledge of their abundance to obtain an optimum yield (OY) figure. The OY is reduced by estimated recreational catch and discard to arrive at landed catch harvest guidelines for the commercial fishery.

Oregon commercial fishing regulations mirror the specifications adopted by the federal fisheries management council each year. Additional applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvest in coastal bays or within 200 yards seaward of any jetty or bay unless specifically provided for by rule.

In Oregon, recreational rockfish harvest managed through a ten fish daily bag limit.

Harvest History:

There is no specific record of commercial or recreational harvest of this species in Oregon in the PACFIN or Oregon recreational creel databases. It is possible that some small volume of catch is aggregated in unspecified species categories.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

References:

Eschmeyer, W.N., E.S. Herald and H. Hammann. 1983. Field Guide to Pacific Coast Fishes of North America. Boston: Houghton Mifflin. 336 pp.

Froese, R. and D. Pauly. Editors. 2001. FishBase. World Wide Web electronic publication. www.fishbase.org.

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Pacific, from Alaska to Baja California. Located at url: <http://id-www.ucsb.edu/lovelab/home.html>.

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Treefish *Sebastes serriceps*

Sebastes from Greek for “magnificent”; *serriceps* from two Latin words for “saw head” in reference to the large head spines



Photo credit: James Forte. Reproduced with permission.

Ecology:

Treefish are found from central Baja California north to central California (San Francisco Bay). It is most common south of Point Conception, and is infrequent north of Sonoma County. It is probably an infrequent visitor to Oregon waters.

This is an inshore species found in depths of 15 to 300 feet (5 to 90 m), and is most common at depths of 20 to 140 feet (6 to 40 m). Like many rockfishes, individuals inhabit crevices in rocky reefs. They are solitary and territorial.

Treefish are crepuscular and/or nocturnal predators. They prey on bottom invertebrates (shrimp and crabs) and small fishes.

Little is known of olive rockfish predators. They are likely vulnerable to predation by the same suite of predators as other rockfishes including larger fishes, and marine mammals. It is likely that most losses from the population due to predation occur among younger, smaller individuals.

Larvae are planktonic, and likely prey on smaller plankton such as copepods. Larvae are likely prey of planktonic predators such as siphonophores and chaetognaths.

Life History:

The largest reported treefish was 16 inches (41 cm).

Treefish have not been aged, and little is known of their life history. Like other rockfishes of the genus *Sebastes*, treefish have internal fertilization and give birth to live young, probably in the late winter to early spring. Larvae are planktonic, and this phase probably lasts one to two months, as with others in the genus. Young are often found with drifting kelp mats.

Population status:

There have been no quantitative or qualitative assessments of treefish populations in Oregon. The Marine Resources Program of the Oregon Department of Fish and Wildlife has an ongoing program to map nearshore reefs; this program will provide one element of the survey information needed for future assessments of nearshore fish populations found in association with rocky habitats. Additionally, the ODFW MRP conducted fixed gear research on nearshore fish species during the summer and fall of 2001. Research results are under analysis.

Management:

Treefish fall within the nearshore group of minor rockfish in the Pacific Fishery Management Council’s groundfish fishery management plan. Harvest specifications for this species, and other rockfish species that do not have quantifiable assessments, are based on an aggregate acceptable biological catch (ABC) for northern and southern management areas. The estimated ABCs for these “other” rockfish are reduced by 50% as a precautionary measure due to limited knowledge of their abundance to obtain an optimum yield (OY) figure. The OY is reduced by estimated recreational catch and discard to arrive at landed catch harvest guidelines for the commercial fishery.

Oregon commercial fishing regulations mirror the specifications adopted by the federal fisheries management Council each year. Additional applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvest in coastal bays or within 200 yards seaward of any jetty or bay unless specifically provided for by rule.

In Oregon, recreational rockfish harvest managed through a ten fish daily bag limit.

Harvest History:

There is no specific record of commercial or recreational harvest of this species in Oregon in the PACFIN or Oregon recreational creel databases. It is possible that some small volume of catch is aggregated in unspecified species categories.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs): Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this species is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Methods to develop habitat-based abundance surveys are needed. These will complement the on-going nearshore rocky reef habitat mapping project of the Marine Resources Program of the Oregon Department of Fish and Wildlife.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

References:

Eschmeyer, W.N., E.S. Herald and H. Hammann. 1983. Field Guide to Pacific Coast Fishes of North America. Boston: Houghton Mifflin. 336 pp.

Froese, R. and D. Pauly. Editors. 2001. FishBase. World Wide Web electronic publication. www.fishbase.org.

Lea, R.N., R.D. McAllister and D.A. VenTresca. 1999. Biological aspects of nearshore rockfishes of the genus *Sebastes* from central California. California Department of Fish and Game, Fish Bulletin 177, 107 pp.

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Reef Environmental Education Foundation. 2001. Database of recreational dive surveys. www.reef.org/data/pac/species.shtml

Surfperches Family Embiotocidae



Calico Surfperch

Photo credit: Milton Love. Reproduced with permission.

Surfperches are a family of approximately 24 species, of which 20 are found on the west coast of North America. The family name is derived from Greek words meaning “living within” and “offspring” in reference to the characteristic of all members of this family to bear live young. They are popular sport fishes in Oregon and California, and there is growing commercial catch as well. They inhabit inshore coastal waters and are found in estuaries (especially eelgrass beds), kelp forests, over rocky reefs, and over sandy bottoms. They occupy sheltered waters as well as active surf zones.

Life History:

Maximum observed ages for surfperch in Oregon range from 7 years for silver surfperch, 8 years for walleye and calico surfperch, 10 years for white and pile surfperch, 11 years for striped surfperch, and 14 years for redbtail surfperch.

Surfperches bear live young. Mating takes place in the winter, and young are borne during the late spring and summer months. As such, fecundity (effective number of offspring produced) is very low, ranging from as low as two in some cases, up to 113 young observed in a barred surfperch. Typical numbers of young range from one to two dozen.

Population status:

There have been no quantitative or qualitative assessments of surfperch populations in Oregon.

Management:

Surfperch are not managed by the Pacific Fishery Management Council.

Applicable Oregon commercial fishing regulations include the requirement for a commercial fishing license, and a prohibition on commercial harvest in coastal bays or within 200 yards seaward of any jetty or bay unless specifically provided for by rule. Additionally, commercial take of surfperch is prohibited during August and September, coinciding with the surfperch breeding season.

In Oregon, recreational surfperch harvest managed through a 25 fish daily bag limit that applies to an aggregation of cabezon, greenling, tuna and flounder in addition to surfperch.

Harvest History:

There is no record of commercial harvest of surfperches in Oregon in the PACFIN database. It is understood that commercial harvest on the Oregon south coast is increasing, and it is possible that some small volume of catch is aggregated in unspecified species categories.

Surfperches are a significant component of marine and estuarine recreational fishing in Oregon. Harvest figures obtained from the Oregon recreational creel database are presented in Appendix Table A-3 and Appendix Figure A-2.

Effects Evaluation:

Please refer to general effects evaluation presented on page 30.

Program Objectives (research needs):

Please refer to general program objectives discussed on page 27.

Continued effort to monitor recreational and commercial landings of this family is needed. Understanding trends in size and age of fish harvested will provide some insights into qualitative changes in the population structure and abundance of this species.

Non-fishery data collection such as reports by recreational divers through the Reef Environmental Education Foundation (REEF) survey and

reporting program will also contribute to monitoring trends.

Potential Future Management Options:

Please refer to the discussion of future management considerations on page 28.

References:

Eschmeyer, W.N., E.S. Herald and H. Hammann. 1983. Field Guide to Pacific Coast Fishes of North America. Boston: Houghton Mifflin. 336 pp.

Froese, R. and D. Pauly. Editors. 2001. FishBase. World Wide Web electronic publication. www.fishbase.org.

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Appendix Table A-1: Focal Species for Oregon
Nearshore Fishery Management

Family Cottidae

Buffalo sculpin *Enophrys bison*

Red Irish Lord, *Hemilepidotus hemilepidotus*

Brown Irish lord *Hemilepidotus spinosus*

Cabezon, *Scorpaenichthys marmoratus*

Family Hexagrammidae

Kelp greenling *Hexagrammos decagrammus*

Rock greenling *Hexagrammos lagocephalus*

Whitespotted greenling *Hexagrammos stelleri*

Painted greenling *Oxylebius pictus*

Family Scorpaenidae

Kelp rockfish *Sebastes atrovirens*

Brown rockfish *Sebastes auriculatus*

Gopher rockfish *Sebastes carnatus*

Copper rockfish *Sebastes caurinus*

Black & Yellow rockfish *Sebastes chrysomelas*

Calico rockfish *Sebastes dalli*

Quillback rockfish *Sebastes maliger*

Vermilion rockfish *Sebastes miniatus*

China rockfish *Sebastes nebulosis*

Tiger rockfish *Sebastes nigrocinctus*

Grass rockfish *Sebastes rastrelliger*

Olive rockfish *Sebastes serranoides*

Family Embiotocidae

Barred surfperch *Amphistichus argenteus*

Calico surfperch *Amphistichus koelzi*

Redtail surfperch *Amphistichus rhodoterus*

Kelp perch *Brachyistius frenatus*

Shiner perch *Cymatogaster aggregata*

Striped perch *Embiota lateralis*

Spotfin surfperch *Hyperprosopon anale*

Walleye surfperch *Hyperprosopon argenteum*

Silver surfperch *Hperprosopon ellipticum*

Sharpnose surfperch *Phanerodon atripes*

White surfperch *Phanerodon furcatus*

Pile perch *Rhacochilus vacca*

Appendix Table A-2. Oregon commercial landings (metric tons) of nearshore species.
 One metric ton equals 2204.6 pounds.

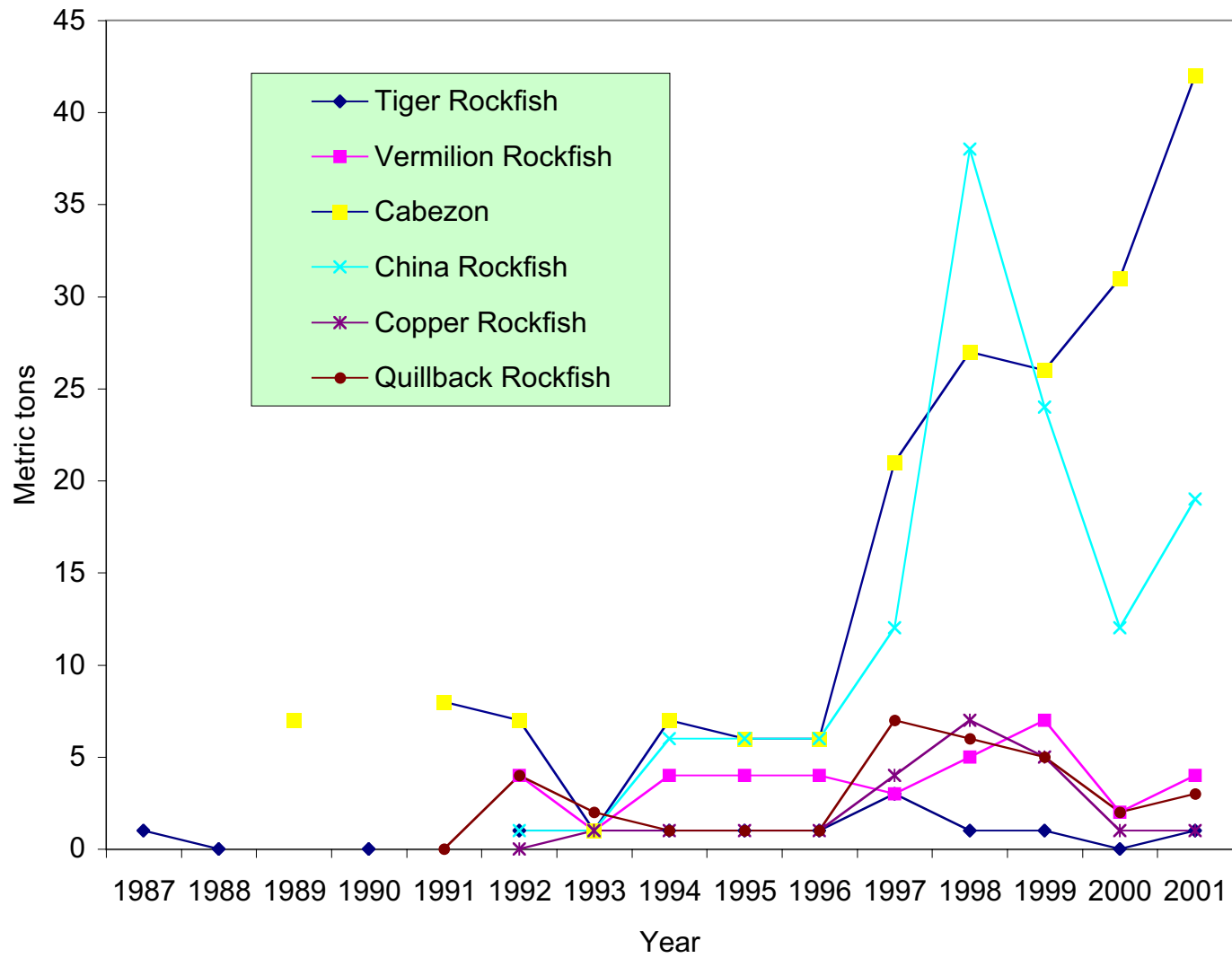
Year	China rockfish	Copper rockfish	Quillback rockfish	Tiger rockfish	Vermilion rockfish	Cabezon	Northern unspecified nearshore species
1987				1			
1988				0			
1989						7	
1990				0			
1991			0			8	
1992	1	0	4	1	4	7	
1993	1	1	2	1	1	1	
1994	6	1	1	1	4	7	
1995	6	1	1	1	4	6	
1996	6	1	1	1	4	6	
1997	12	4	7	3	3	21	
1998	38	7	6	1	5	27	
1999	24	5	5	1	7	26	
2000	12	1	2	0	2	31	5
2001	19	1	3	1	4	42	1

Appendix Table A-3. Oregon recreational landings (pounds) of neashore species, 1990-2000.

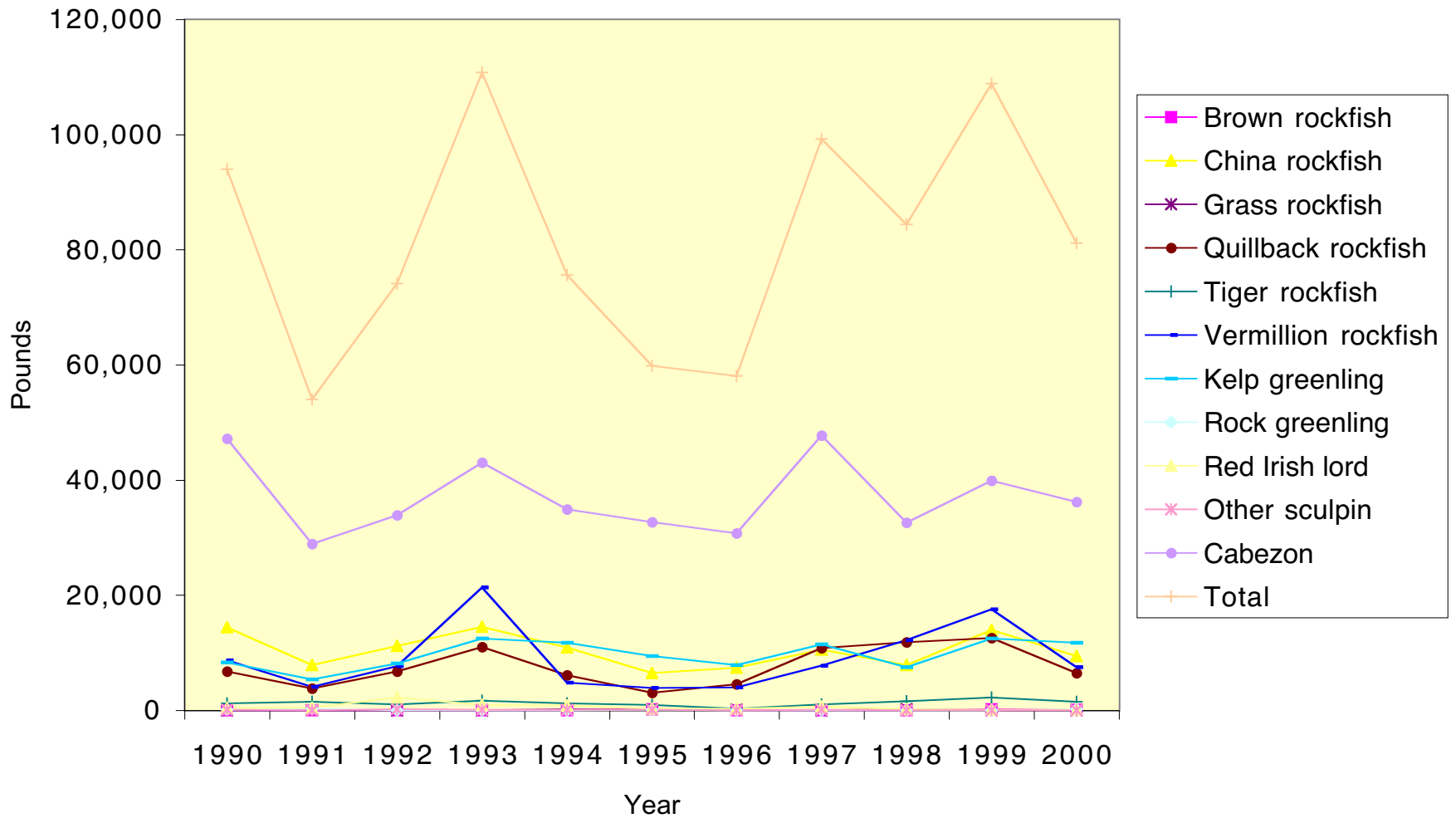
Year	Brown rockfish	China rockfish	Copper rockfish	Grass rockfish	Quillback rockfish	Tiger rockfish	Vermillion rockfish	Kelp greenling	Rock greenling	Red Irish lord	Other sculpins	Cabezon	Total
1990	0	14,367	7,076	0	6,697	1,177	8,672	8,276	124	341	51	47,152	93,933
1991	6	7,865	1,658	0	3,762	1,521	4,093	5,393	281	467	7	28,925	53,978
1992	0	11,146	3,103	31	6,747	975	7,695	8,122	0	2,216	151	33,912	74,098
1993	0	14,489	5,916	0	10,956	1,626	21,328	12,481	0	879	71	43,011	110,757
1994	0	10,915	4,944	181	6,055	1,204	4,802	11,680	0	785	115	34,930	75,611
1995	192	6,448	2,564	118	3,052	949	3,919	9,407	108	284	75	32,722	59,838
1996	4	7,419	2,942	61	4,534	306	3,968	7,867	2	238	19	30,715	58,075
1997	4	10,517	9,136	37	10,828	1,006	7,800	11,406	7	635	82	47,762	99,220
1998	0	7,849	10,425	221	11,807	1,549	12,224	7,483	28	150	10	32,629	84,375
1999	148	13,955	9,923	46	12,561	2,184	17,569	12,419	20	122	8	39,881	108,836
2000	94	9,403	8,117	24	6,430	1,433	7,515	11,714	184	51	8	36,208	81,181

Appendix Table A-4. Oregon surfperches.

Common Name	Latin binomial	Geographic range	Maximum length (cm)
Barred surfperch	<i>Amphistichus argenteus</i> (Agassiz, 1854)	Baja Calif. - N. Wash.	43
Calico surfperch	<i>Amphistichus koelzi</i> (Hubbs, 1933)	Baja Calif. - N. Wash.	30
Redtail surfperch	<i>Amphistichus rhodoterus</i> (Agassiz, 1854)	C. Calif. - Brit. Col.	41
Kelp perch	<i>Brachyistius frenatus</i> (Gill, 1862)	Baja Calif. - Brit. Col.	35
Shiner perch	<i>Cymatogaster aggregata</i> (Gibbons, 1854)	Baja Calif. - SE Alaska	21
Striped perch	<i>Embiota lateralis</i> (Agassiz, 1854)	Baja Calif. - SE Alaska	38
Spotfin perch	<i>Hyperprosopon anale</i> (Agassiz, 1861)	Baja Calif. - C. Oregon	20
Walleye surfperch	<i>Hyperprosopon argenteum</i> (Gibbons, 1854)	Baja Calif. - Brit. Col.	30
Silver surfperch	<i>Hyperprosopon ellipticum</i> (Gibbons, 1854)	Baja Calif. - Brit. Col.	27
Sharpnose seaperch	<i>Phanerodon atripes</i> (Jordan and Gilbert, 1880)	Baja Calif. - C. Oregon	35
White surfperch	<i>Phanerodon furcatus</i> (Girard, 1854)	Baja Calif. - Brit. Col.	46
Pile perch	<i>Rhacochilus vacca</i> (= <i>Damalichthys vacca</i>) (Girard, 1855)	Baja Calif. - SE Alaska	44



Appendix Figure A-1. Oregon commercial landings of selected nearshore species (metric tons).



Appendix Figure A-2: Oregon recreational landings in pounds.

APPENDIX B

Characteristics and Recent History of the Oregon Nearshore Fishery

APPENDIX B

Characteristics and Recent History of the Oregon Nearshore Fishery

Introduction

The Oregon Department of Fish and Wildlife contracted with The Research Group (Corvallis OR) to provide information and analyses to better understand historic and current harvest and participation in nearshore fisheries, and the economic significance of these fisheries. The information available from the Pacific Fishery Information Network (PACFIN) is organized somewhat differently than the species groups contemplated under the proposed management scheme presented here; it is important to be aware of the filters that can be used on the available information when interpreting the information presented. These filters are identified within each of the following appendix tables.

Recent Catch History

Live fish and shellfish have been landed in Oregon in small quantities for many years. New markets in California stimulated rapid development of a new nearshore fishery beginning in 1997. PACFIN landing information on fish and shellfish landed live were summarized from 1997-2001 f(**Appendix Table B-1**). The wide diversity of species landed and coded as 'live' is immediately obvious. The significant species or species groups for this discussion are cabezon, miscellaneous fish, and unspecified rockfish (1997 to 1999) and northern nearshore rockfish (2000 and 2001). The latter two groups are largely congruent, and the distinction represents a grouping change adopted by the PFMC and PACFIN effective in 2000.

It was decided that six species categories would be used as proxies to define the live groundfish fishery. (Unspecified Rockfish and Unspecified Nearshore Rockfish are counted as one category.) The Miscellaneous Fish category is comprised mostly of kelp greenling in the PACFIN data. The six categories accounted for about 95% of the live groundfish landings in 2000. The others species landed live include mostly species that are also caught in non-territorial waters and flatfish. The proxy categories were used as filters to define the vessel and landing characteristics displayed in the other tables. More importantly, the proxy categories are used to determine which vessels might qualify for future participation in Oregon's nearshore live groundfish fishery.

Price Trends

Live versus dead fish price for the proxy species was summarized by port from 1997-2001(**Appendix Table B-2**). The coastwide price break between dead and live landings is about \$2.50. The mean price for live landings was \$3.41 in the year 2000. The same species delivered dead had a price of \$.86 in the year 2000. Live delivered prices have

been increasing significantly during the last five years, but using results from the first half of the year 2001 indicate that prices may have stabilized.

Incidental Catch Analysis

Trips containing the proxy species during 1997-2001 were classified according to trip type (targeted or incidental catch) and disposition (dead or alive) and counted (**Appendix Table B-3**). A trip was classified as a target trip if 50% or more of the total revenue was attributed to the proxy species, otherwise the trip was classified as an incidental catch trip. Trips were classified as live if any of the proxy species were landed live. Of the 5,498 trips made in the year 2000 when any of the six proxy species groups were landed, 1,937 of the trips had live landings. Eleven percent of those trips were targeted as “live fishery” trips. A substantial portion of the live-fish catch was made on trips where live-fish were incidental catch to other dead species. The total number of trips where the proxy species were present and landed live has been increasing over time (**Appendix Figure B-1**).

Live-fish Fleet Characteristics

Oregon’s live-fish fleet is made up of small open access and limited entry vessels that participate in a variety of other fisheries up and down the coast. The live-fish fishery occurs year round with the bulk of trips occurring during the summer months (**Appendix Figure B-2**).

Vessels were grouped by magnitude of landings of live fish: under 500 pounds in any year, 500 to 1000 pounds in any year, or over 1000 pounds in any year. Vessel counts were grouped by location of buying stations in Washington, Oregon, and California. Trip counts and landing data were also summarized for various gear types used for both limited entry and open access fishers known to have landed live fish (**Appendix Table B-4**). The large increase in percent landings of live fish in 2001 on the bottom row is believed to be largely an artifact of the partial year analysis for that year.

Vessel dependency on live-fish was defined as the live-groundfish harvest value divided by the vessel’s total harvest value. Oregon’s fleet was tallied into 5 categories of increasing dependency for the years 1997-2000 and 2001 through 1 July 2001 (**Appendix Table B-5**). Vessel counts were also tallied by home port group. A clear increasing trend in dependency on live-fish was observable over time, particularly for vessels from southern Oregon.

Concern was expressed in earlier public meetings that out of state boats were responsible for increased effort in Oregon. While some recent entrants were from home-ports outside of the state, most of the new effort appeared to be from boats without any history in the fishery (**Appendix Table B-6**).

Landing Analysis for Qualification Criteria

One approach to defining a new group of qualified participants in a Developmental Fisheries Program is to examine past participation and then define some minimum level of participation in order to qualify for a future permit. The numbers of vessels that participated in the live groundfish fishery between January 1, 1997 and July 1, 2001 were tallied by three different levels of catch: <500 lbs., 500-999 lbs., and \geq 1,000 lbs. Vessel counts, average trips for the six species group categories, and share of live groundfish landing volume compared to total landing volume were summarized by years of participation (**Appendix Table B-7**). A total of 185 vessels participated between 1997 and 1 July 2001 (**Appendix Figure B-3**). Approximately 48% participated in only one year while 52 % participated in at least 2 years. Ten percent of the boats landed live-fish in all 5 years. Fifty-one percent of all of the participants landed less than 500 lbs. of live-fish.

Economic Impacts

Economic impact was defined as the total personal income adjusted to the year 2000 using GDP implicit price deflators developed by the U.S. Bureau of Economic Analysis. Live-fish landed value and primary processing sales value were determined by year for Oregon ports. The marginal economic impacts per pound were expanded to estimate total economic impacts in the local area and on a statewide basis (**Appendix Table B-8**). The statewide impact from live groundfish landings by itself was about \$1.2 million in personal income generated in Year 2000. However, the revenue from the fishery has to be viewed as keeping participating vessels viable. The 102 participating vessels in the year 2000 contributed over \$3.5 million in personal income to the State's economy. Economic impact from the live-fish fishery demonstrates a clear increasing trend over time (**Appendix Figure B-4**). Most of the economic impact is occurring in the ports of Port Orford and Brookings located along the southern Oregon coast (**Appendix Figure B-5**).

Appendix Table B-1. Live groundfish fishery Oregon landed catch (lbs.) by species and disposition, 1997-2001.

Species	PacFIN Code	Qualifying Species	1997				1998				1999				
			Live	% Live	Remaining	Total	Live	% Live	Remaining	Total	Live	% Live	Remaining	Total	
Northern Nearshore FMP Groundfish															
NOM. BLACK ROCKFISH	BLK1	*	82	0.0%	398,475	398,557	322	0.1%	435,003	435,325	1,412	0.5%	279,725	281,137	
NOR. UNSP. NEAR-SHORE ROCKFIS	NUSR	*													
NOM. BLUE ROCKFISH	BLU1	*													
Subtotal			82	0.0%	398,475	398,557	322	0.1%	435,003	435,325	1,412	0.5%	279,725	281,137	
Other FMP Groundfish															
CABEZON	CBZN	*	23,807	51.6%	22,351	46,158	51,011	86.1%	8,266	59,277	51,705	88.6%	6,620	58,325	
LINGCOD	LCOD	*	39,061	2.3%	1,655,635	1,694,696	22,190	6.2%	333,423	355,613	30,733	8.0%	351,955	382,688	
NOR. UNSP. SHELF ROCKFISH	NUSF				2,785,108	2,785,108	506	0.0%	3,791,324	3,791,830	131	0.0%	3,528,585	3,528,716	
NOM. YELLOWTAIL ROCKFISH	YTR1				1,541,917	1,541,917			1,786,477	1,786,477	612	0.1%	925,264	925,876	
NOM. CANARY ROCKFISH	CNR1				191,305	191,305	52	0.0%	106,187	106,239	33	0.0%	174,578	174,611	
SAND SOLE	SSOL				9,045,481	9,045,503	3	0.0%	5,425,301	5,425,304			6,112,792	6,112,792	
NOM. WIDOW ROCKFISH	WDW1		22	0.0%	1,934,463	1,934,463			523,279	523,279	238	0.0%	1,300,750	1,300,988	
UNSPECIFIED SKATE	USKT				6,447,515	6,447,515	90	0.0%	3,858,733	3,858,823	339	0.0%	6,549,524	6,549,863	
SABLEFISH	SABL				14,505	14,505			344,998	344,998	472	0.2%	195,460	195,932	
SPINY DOGFISH	DSRK				37	37			405	405	1,075	93.5%	75	1,150	
OTHER GROUND FISH	OGRN				3,781	3,781			3,171	3,171	510	30.7%	1,150	1,660	
SOUPFIN SHARK	SSRK				2,561,594	2,561,594			3,506,589	3,506,589			5,021,558	5,021,558	
ARROWTOOTH FLOUNDER	ARTH				1,776,543	1,776,543	3	0.0%	1,503,349	1,503,352	8	0.0%	1,486,906	1,486,914	
PETRALE SOLE	PTRL				2,143,137	2,150,822	34,987	1.6%	2,092,690	2,127,677	61,394	4.7%	1,234,933	1,296,327	
UNSP. ROCKFISH	URCK	*	7,685	0.4%	1,118,443	1,118,443			1,084,957	1,084,957	38	0.0%	706,667	706,705	
NOM. SHORTSPINE THORNYHEAD	SSP1				1,776,373	1,776,373			1,468,017	1,468,017	18	0.0%	739,985	740,003	
GEN. SHELF/SLOPE RF	POP1				27	27			17	17	15	11.5%	116	131	
THORNYHEADS (MIXED)	THDS				28,740	28,740			12,503	12,503	2	0.0%	9,703	9,705	
ROCK SOLE	RSOL				118,445	118,445	29	0.0%	115,279	115,308			48,027	48,027	
STARRY FLOUNDER	STRY				1,214,471	1,214,471	14	0.0%	1,047,186	1,047,200			768,843	768,843	
ENGLISH SOLE	EGLS				5,781	5,781	11	0.2%	5,519	5,530			5,835	5,835	
CURLFIN SOLE	CSOL				70,575	34,385,652	34,456,227	108,896	0.4%	27,017,670	27,126,566	147,323	0.5%	29,169,326	29,316,649
Subtotal			70,575	0.2%	34,385,652	34,456,227	108,896	0.4%	27,017,670	27,126,566	147,323	0.5%	29,169,326	29,316,649	
Non-FMP Groundfish															
MISCELLANEOUS FISH	MSC2	*	19,451	76.0%	6,129	25,580	20,094	80.9%	4,752	24,846	51,420	91.8%	4,614	56,034	
WOLF EEL	WEEL		27	0.7%	3,575	3,602	944	19.7%	3,859	4,803	638	18.8%	2,747	3,385	
MISC. FISH/ANIMALS	MISC														
Subtotal			19,478	66.7%	9,704	29,182	21,038	71.0%	8,611	29,649	52,058	87.6%	7,361	59,419	
Other Species Live Disposition															
PACIFIC HALIBUT	PHLB				362,678	362,678			236,569	236,569			350,405	350,405	
OTHER SHARK	OSRK				300	300			319	319	60	58.8%	42	102	
BLUE SHARK	BSRK				961	961			4,692	4,692	3	0.6%	526	529	
OTHER SHRIMP	OSRM		11,321	13.0%	75,808	87,129	50,866	36.7%	87,794	138,660	11,424	48.8%	12,004	23,428	
UNSPECIFIED OCTOPI	OCTP				42,193	42,193	141	1.4%	9,940	10,081	58	0.7%	8,071	8,129	
DUNGENESS CRAB	DCRB				7,774,409	7,774,409			7,410,210	7,410,210			12,346,015	12,346,015	
OTHER CRAB	OCRB				67,224	67,224			333	333	75	65.2%	40	115	
UNSPECIFIED SCULPIN	SCLP		3	100.0%	0	3	1	25.0%	3	4	15	29.4%	36	51	
UNSPECIFIED ECHINODERM	UECH				533	533			157	157			592	592	
RED SEA URCHIN	RURC				490,087	490,087			344,714	344,714			248,283	248,283	
UNSPECIFIED MOLLUSKS	UMSK				679	679			33	33			30	30	
CHINOOK SALMON	CHNK				1,927,842	1,927,842			1,692,495	1,692,495			948,996	948,996	
OTHER SCALLOP	OSCL				9,773	9,773			49,147	49,147			3	3	
UNSPECIFIED SMELT	SMLT				15	15									
UNSP. SEA CUCUMBERS	USCU		479	7.6%	5,796	6,275					7	100.0%	0	7	
Subtotal			11,803	0.1%	10,758,298	10,770,101	51,008	0.5%	9,836,406	9,887,414	11,642	0.1%	13,915,043	13,926,685	
Total			101,938	0.2%	45,552,129	45,654,067	181,264	0.5%	37,297,690	37,478,954	212,435	0.5%	43,371,455	43,583,890	

Data Extraction: PacFIN September 2001 and January 2002

Filter: 1. Oregon landings (AGID=O); for only species with live landings (disposition=F) or northern nearshore (complex3=NSHR)

2. EEZ landings for PFMC groundfish (PERMID="OA" or "LE" when species summary=1); non-tribal (DRVID<>"NONE" or "ZZ..")

3. Years 1997 - partial 2001 (through July 1), and Year 2001

Analysis Date: February 12, 2002

Appendix Table B-1 (continued)

Species	PacFIN Code	Qualifying Species	2000				2001p				2001			
			Live	% Live	Remaining	Total	Live	% Live	Remaining	Total	Live	% Live	Remaining	Total
Northern Nearshore FMP Groundfish														
NOM. BLACK ROCKFISH	BLK1	*	17,669	7.4%	222,179	239,848	28,878	15.1%	162,204	191,082	42,905	13.2%	283,099	326,004
NOR. UNSP. NEAR-SHORE ROCKFIS	NUSR	*	33,930	71.9%	13,268	47,198	28,805	78.4%	7,940	36,745	45,240	78.0%	12,727	57,967
NOM. BLUE ROCKFISH	BLU1	*	474	5.5%	8,150	8,624	96	2.0%	4,740	4,836	585	6.8%	8,030	8,615
Subtotal			52,073	17.6%	243,597	295,670	57,779	24.8%	174,884	232,663	88,730	22.6%	303,856	392,586
Other FMP Groundfish														
CABEZON	CBZN	*	61,298	89.1%	7,528	68,826	64,417	94.8%	3,519	67,936	96,861	94.9%	5,259	102,120
LINGCOD	LCOD	*	20,287	14.3%	121,523	141,810	18,875	30.7%	42,688	61,563	38,531	25.7%	111,416	149,947
NOR. UNSP. SHELF ROCKFISH	NUSF		5,653	7.0%	74,953	80,606	3,244	8.1%	36,569	39,813	5,189	6.3%	76,885	82,074
NOM. YELLOWTAIL ROCKFISH	YTR1		212	0.0%	4,427,508	4,427,720	21	0.0%	1,821,180	1,821,201	21	0.0%	2,425,379	2,425,400
NOM. CANARY ROCKFISH	CNR1		62	0.1%	71,284	71,346	20	0.1%	21,155	21,175	20	0.0%	42,024	42,044
SAND SOLE	SSOL		6	0.0%	81,109	81,115	7	0.0%	43,722	43,729	11	0.0%	105,196	105,207
NOM. WIDOW ROCKFISH	WDW1		2	0.0%	5,962,511	5,962,513	2	0.0%	1,503,582	1,503,584	2	0.0%	2,512,614	2,512,616
UNSPECIFIED SKATE	USKT		1,739	0.1%	1,770,522	1,772,261			901,328	901,328			1,309,904	1,309,904
SABLEFISH	SABL		970	0.0%	6,189,555	6,190,525			1,697,516	1,697,516			5,569,647	5,569,647
SPINY DOGFISH	DSRK		345	0.4%	88,276	88,621			16,901	16,901			46,779	46,779
OTHER GROUND FISH	OGRN		162	52.4%	147	309								
SOUPFIN SHARK	SSRK		148	8.8%	1,537	1,685			344	344			472	472
ARROWTOOTH FLOUNDER	ARTH		34	0.0%	2,580,273	2,580,307			1,607,066	1,607,066			2,283,044	2,283,044
PETRALE SOLE	PTRL		2	0.0%	1,896,173	1,896,175			1,454,174	1,454,174			2,034,188	2,034,188
UNSP. ROCKFISH	URCK	*												
NOM. SHORTSPINE THORNYHEAD	SSP1				628,308	628,308			306,297	306,297			491,014	491,014
GEN. SHELF/SLOPE RF	POP1				16	16								
THORNYHEADS (MIXED)	THDS													
ROCK SOLE	RSOL				1,182	1,182			1,111	1,111			9,368	9,368
STARRY FLOUNDER	STRY				48,134	48,134			5,774	5,774			16,043	16,043
ENGLISH SOLE	EGLS				542,991	542,991			481,378	481,378			896,262	896,262
CURLFIN SOLE	CSOL				1,689	1,689			2,540	2,540			10,101	10,101
Subtotal			90,920	0.4%	24,495,219	24,586,139	86,586	0.9%	9,946,844	10,033,430	140,635	0.8%	17,945,595	18,086,230
Non-FMP Groundfish														
MISCELLANEOUS FISH	MSC2	*	40,042	88.9%	5,018	45,060	37,656	94.3%	2,262	39,918	60,960	76.7%	18,536	79,496
WOLF EEL	WEEL		536	15.4%	2,940	3,476	625	40.9%	903	1,528	994	38.6%	1,582	2,576
MISC. FISH/ANIMALS	MISC		170	70.2%	72	242	10	100.0%	0	10	47	100.0%	0	47
Subtotal			40,748	83.5%	8,030	48,778	38,291	92.4%	3,165	41,456	62,001	75.5%	20,118	82,119
Other Species Live Disposition														
PACIFIC HALIBUT	PHLB				329,822	329,822	48	0.1%	78,460	78,508	48	0.0%	252,295	252,343
OTHER SHARK	OSRK		295	83.6%	58	353			70	70			73,088	73,088
BLUE SHARK	BSRK				1,114	1,114							3,921	3,921
OTHER SHRIMP	OSRM		30,712	28.4%	77,316	108,028	27,589	73.0%	10,218	37,807	59,690	76.1%	18,717	78,407
UNSPECIFIED OCTOPI	OCTP		99	2.7%	3,622	3,721	363	4.1%	8,547	8,910	121	0.6%	19,840	19,961
DUNGENESS CRAB	DCRB		4,896	0.0%	11,156,421	11,161,317	232	0.0%	2,779,573	2,779,805	286	0.0%	9,656,654	9,656,940
OTHER CRAB	OCRB		345	13.9%	2,134	2,479	114	0.2%	62,426	62,540	114	0.2%	62,426	62,540
UNSPECIFIED SCULPIN	SCLP		41	93.2%	3	44	55	90.2%	6	61	56	82.4%	12	68
UNSPECIFIED ECHINODERM	UECH		5	0.8%	625	630	5	1.3%	382	387	5	1.0%	477	482
RED SEA URCHIN	RURC		60	0.0%	983,496	983,556	15	0.0%	537,042	537,057	15	0.0%	1,253,927	1,253,942
UNSPECIFIED MOLLUSKS	UMSK													
CHINOOK SALMON	CHNK		840	0.0%	1,896,614	1,897,454			1,729,017	1,729,017			3,780,768	3,780,768
OTHER SCALLOP	OSCL		120	0.2%	62,032	62,152								
UNSPECIFIED SMELT	SMLT		50	100.0%	0	50								
UNSP. SEA CUCUMBERS	USCU				291	291			10	10			10	10
Subtotal			37,463	0.3%	14,513,548	14,551,011	28,421	0.5%	5,205,751	5,234,172	60,335	0.4%	15,122,135	15,182,470
Total			221,204	0.6%	39,260,394	39,481,598	211,077	1.4%	15,330,644	15,541,721	351,701	1.0%	33,391,704	33,743,405

- Notes: 1. Live groundfish fishery is defined to be PFMC groundfish species plus specified miscellaneous and non-PFMC groundfish fish species with a disposition code for "landed live for eventual human consumption." The miscellaneous species were selected to include those that had greater than 500 pounds landing volume in any year during the analysis period. For Oregon, this includes landings of greenling. Greenling is a PFMC managed species, but is coded for Oregon landings as a miscellaneous fish in the PacFIN database.
2. The PFMC northern nearshore complex landings in Oregon include only BLK1, NUSR, and BLU1.
3. The species used for developing vessel qualifying criteria are shown with an "*".
4. Groundfish landings exclude non-EEZ catch area, tribal allocations, violations, etc.
5. Unspecified rockfish (URCK) was discontinued as a species category in 1999. Species were coded in other categories, such as northern unspecified nearshore rockfish (NUSR) starting in 2000.

Appendix Table B-2. Live groundfish fishery price analysis for indicator species by port group, 1997-2001.

	1997			1998			1999											
	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total									
	Price	Price	Price	Price	Price	Price	Price	Price	Price									
<u>Astoria</u>																		
Mean		0.39	0.39		0.46	0.46		0.50	0.50									
Median		0.38	0.38		0.42	0.42		0.49	0.49									
Std. deviation		0.13	0.13		0.15	0.15		0.15	0.15									
<u>Tillamook</u>																		
Mean		0.62	0.62		0.54	0.54	7.50	0.66	0.68									
Median		0.57	0.57		0.50	0.50	7.50	0.59	0.59									
Std. deviation		0.16	0.16		0.14	0.14	3.54	0.16	0.43									
<u>Newport</u>																		
Mean	1.57	0.54	0.54	1.66	0.60	0.60	1.94	0.55	0.59									
Median	1.60	0.40	0.40	1.75	0.50	0.50	1.75	0.50	0.52									
Std. deviation	0.21	0.38	0.39	0.34	0.49	0.50	1.99	0.41	0.58									
<u>Coos Bay</u>																		
Mean		0.63	0.63	0.81	0.63	0.63	4.00	0.68	0.68									
Median		0.43	0.43	0.64	0.52	0.52	4.00	0.58	0.58									
Std. deviation		0.37	0.37	0.39	0.30	0.30		0.34	0.35									
<u>Port Orford</u>																		
Mean	1.40	0.71	0.82	1.97	0.74	1.08	2.73	0.86	1.58									
Median	1.37	0.59	0.72	1.95	0.61	1.03	2.75	0.74	1.44									
Std. deviation	0.30	0.27	0.32	0.52	0.31	0.51	0.63	0.33	0.86									
<u>Brookings</u>																		
Mean	2.12	0.58	0.68	2.90	0.68	0.94	2.92	0.95	1.53									
Median	2.16	0.56	0.56	2.96	0.60	0.60	2.94	0.82	1.02									
Std. deviation	0.75	0.19	0.47	0.95	0.26	0.82	0.62	0.41	1.06									
	Pounds	%	Pounds	%	Pounds	%	Pounds	%	Pounds	%	Pounds	%	Pounds	%	Pounds	%		
<u>State</u>																		
\$0.00 to 0.50			3,225,183	100%	3,225,183	75%			2,041,654	100%	2,041,654	68%			994,647	100%	994,647	48%
\$0.50 to 0.75	18	0%	663,116	100%	663,134	15%	53	0%	644,673	100%	644,726	21%	402	0%	588,027	100%	588,429	28%
\$0.75 to 1.00	318	0%	227,720	100%	228,038	5%	4,667	4%	104,500	96%	109,167	4%	116	0%	111,398	100%	111,514	5%
\$1.00 to 1.25	24,735	23%	82,338	77%	107,073	2%	13,800	18%	61,420	82%	75,220	2%	141	0%	83,843	100%	83,984	4%
\$1.25 to 1.50	30,789	46%	36,745	54%	67,534	2%	11,651	30%	27,453	70%	39,104	1%	4,271	6%	66,701	94%	70,972	3%
\$1.50 to 2.00	30,602	95%	1,735	5%	32,337	1%	44,001	97%	1,334	3%	45,335	2%	25,915	40%	39,261	60%	65,176	3%
\$2.00 to 3.00	3,511	72%	1,333	28%	4,844	0%	48,798	97%	1,565	3%	50,363	2%	99,084	100%	475	0%	99,559	5%
\$3.00 to 4.00	26	14%	159	86%	185	0%	5,131	98%	112	2%	5,243	0%	64,882	100%	100	0%	64,982	3%
\$4.00 to 6.00	87	99%	1	1%	88	0%	779	100%			779	0%	1,897	100%			1,897	0%
\$6.00+													17	100%			17	0%
	Price		Price		Price		Price		Price		Price		Price		Price		Price	
Mean	1.49		0.58		0.62		2.06		0.62		0.73		2.78		0.72		1.04	
Median	1.41		0.50		0.50		2.00		0.52		0.55		2.80		0.60		0.65	
Std. deviation	0.44		0.31		0.37		0.66		0.34		0.52		0.72		0.37		0.86	

Data Extraction: PacFIN February 2002

Filters: none

Analysis Date: February 11, 2002

Appendix Table B-2 (continued)

	2000						2001					
	Live		Dead		Total		Live		Dead		Total	
	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	Price	
<u>Astoria</u>												
Mean		0.80		0.80				0.85		0.85		
Median		1.00		1.00				1.00		1.00		
Std. deviation		0.28		0.28				0.24		0.24		
<u>Tillamook</u>												
Mean	7.86	0.76		0.84		3.37		0.88		1.05		
Median	10.00	0.72		0.73		2.44		0.81		0.82		
Std. deviation	3.08	0.17		0.84		3.38		0.20		1.11		
<u>Newport</u>												
Mean	1.49	1.03		1.05		2.08		0.87		0.89		
Median	1.75	1.00		1.00		1.60		0.93		1.00		
Std. deviation	0.82	0.33		0.35		1.13		0.30		0.38		
<u>Coos Bay</u>												
Mean	3.53	0.92		1.08		3.60		0.87		1.26		
Median	3.67	1.00		1.00		3.64		0.81		0.92		
Std. deviation	0.74	0.28		0.72		0.64		0.21		1.00		
<u>Port Orford</u>												
Mean	3.37	0.91		2.06		3.08		0.78		2.06		
Median	3.50	0.83		1.86		3.03		0.71		1.84		
Std. deviation	0.83	0.26		1.23		0.84		0.30		1.20		
<u>Brookings</u>												
Mean	3.46	1.07		2.16		3.52		0.99		2.06		
Median	3.45	0.81		2.26		3.46		0.70		1.22		
Std. deviation	0.72	0.53		1.41		0.84		0.55		1.49		
	Pounds	%	Pounds	%	Pounds	%	Pounds	%	Pounds	%	Pounds	%
<u>State</u>												
\$0.00 to 0.50			5,253	100%	5,253	1%	75	3%	2,765	97%	2,840	0%
\$0.50 to 0.75	605	0%	141,126	100%	141,731	26%			233,791	100%	233,791	32%
\$0.75 to 1.00	64	0%	119,040	100%	119,104	22%			116,643	100%	116,643	16%
\$1.00 to 1.25	530	1%	92,911	99%	93,441	17%	1,659	2%	77,034	98%	78,693	11%
\$1.25 to 1.50	1,979	10%	17,030	90%	19,009	3%	3,177	25%	9,308	75%	12,485	2%
\$1.50 to 2.00	5,891	69%	2,620	31%	8,511	2%	12,815	86%	2,074	14%	14,889	2%
\$2.00 to 3.00	46,228	97%	1,623	3%	47,851	9%	112,593	98%	2,052	2%	114,645	16%
\$3.00 to 4.00	93,596	100%	10	0%	93,606	17%	127,391	100%			127,391	17%
\$4.00 to 6.00	24,810	100%	73	0%	24,883	4%	28,473	100%			28,473	4%
\$6.00+	99	100%			99	0%	125	100%			125	0%
	Price		Price		Price		Price		Price		Price	
Mean	3.41		0.94		1.65		3.25		0.87		1.73	
Median	3.47		0.90		1.00		3.20		0.78		1.00	
Std. deviation	0.86		0.37		1.23		0.95		0.38		1.29	

- Notes: 1. Prices are from sum of the indicator species landing volume and value. Prices have not been adjusted, i.e. the prices are nominal.
2. Trips are selected for the price analysis when any of the indicator species are landed.
3. The indicator species are cabezon, lingcod, black rockfish, blue rockfish, miscellaneous species (mostly greenling), and unspecified rockfish.

Appendix Table B-3. Live groundfish fishery trip bycatch analysis for indicator species, 1997-2001.

	1997		1998		1999		2000		2001	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
<u>Trip Landing Disposition</u>										
Live										
Targeted	76	12%	81	8%	152	8%	219	11%	239	9%
Bycatch	568	88%	904	92%	1,712	92%	1,718	89%	2,454	91%
Total	644	100%	985	100%	1,864	100%	1,937	100%	2,693	100%
Dead										
Targeted	1,388	17%	1,162	19%	1,131	18%	1,214	34%	1,479	42%
Bycatch	6,567	83%	4,963	81%	5,033	82%	2,347	66%	2,055	58%
Total	7,955	100%	6,125	100%	6,164	100%	3,561	100%	3,534	100%
Total										
Targeted	1,464	17%	1,243	17%	1,283	16%	1,433	26%	1,718	28%
Bycatch	7,135	83%	5,867	83%	6,745	84%	4,065	74%	4,509	72%
Total	8,599	100%	7,110	100%	8,028	100%	5,498	100%	6,227	100%
<u>Trip Purpose</u>										
Targeted										
Live	76	5%	81	7%	152	12%	219	15%	239	14%
Dead	1,388	95%	1,162	93%	1,131	88%	1,214	85%	1,479	86%
Total	1,464	100%	1,243	100%	1,283	100%	1,433	100%	1,718	100%
Bycatch										
Live	568	8%	904	15%	1,712	25%	1,718	42%	2,454	54%
Dead	6,567	92%	4,963	85%	5,033	75%	2,347	58%	2,055	46%
Total	7,135	100%	5,867	100%	6,745	100%	4,065	100%	4,509	100%
Total										
Live	644	7%	985	14%	1,864	23%	1,937	35%	2,693	43%
Dead	7,955	93%	6,125	86%	6,164	77%	3,561	65%	3,534	57%
Total	8,599	100%	7,110	100%	8,028	100%	5,498	100%	6,227	100%

- Notes: 1. Trips are when any of the indicator species are landed. Live trips are when any of the indicator species are landed live. This means that some of the indicator species on that trip could be landed dead.
2. A trip is counted as targeted if trip revenue for the sum of the indicator species was greater than or equal to 50% of total trip revenue, otherwise it is a bycatch trip.
3. The indicator species are cabezon, lingcod, black rockfish, blue rockfish, miscellaneous species (mostly greenling), and unspecified rockfish.

Data Extraction: PacFIN February 2002

Filters: none

Analysis Date: February 11, 2002

Appendix Table B-4. Live groundfish fishery vessel characteristics, 1997-2001p.

	1997	1998	1999	2000	2001p
Vessel Count by Volume Categories for Live Groundfish Fishery Species Delivered Live					
<500 lbs	29	35	42	55	34
500-999 lbs	4	9	7	6	11
>=1,000 lbs	11	21	41	41	42
Total	44	65	90	102	87
Average vessel length	28.4	37.8	34.6	32.4	26.7
Processors/Buyers Where Vessel Delivered Any of Their Catch for All Species Harvested					
Washington	3	11	6	6	3
Oregon	27	40	41	45	35
California	6	15	13	20	6
Total	36	66	60	71	44
Annual Vessel Trip Counts					
Average when landings include live	14.6	15.9	21.1	20.0	19.1
Average for all landings	63.8	47.4	45.4	46.3	30.4
Sum for all landings	2,806	3,079	4,089	4,724	2,642
Landing Volume Live Groundfish Species					
OA FMP groundfish	57,079	71,351	105,738	97,865	94,105
LE FMP groundfish	13,578	44,564	42,997	45,401	53,791
XX non-FMP groundfish	19,478	21,055	52,058	40,748	38,291
Total	90,135	136,970	200,793	184,014	186,187
Landing Volume Live Groundfish Species Gear Group					
Hook and line					
Longline or setline	16,636	63,922	57,612	44,660	46,745
Other hook and line					
Other hook and line gear	73,499	66,940	142,831	137,937	130,842
Pole (commercial)		1,505		74	2,915
Vertical hook and line gear		3,621			
Net				170	
Other				50	42
Pot					
Crab pot		426	169	1,022	246
Fish pot		451	97		5,355
Trawl					
Groundfish trawl		92			
Troll		13	84	101	42
Total	90,135	136,970	200,793	184,014	186,187
Landing Volume All Species					
OA FMP groundfish	446,399	403,997	381,453	232,505	197,688
LE FMP groundfish	306,257	685,363	910,946	720,773	113,848
Subtotal	752,656	1,089,360	1,292,399	953,278	311,536
Pacific whiting		1,418			
Salmon	29,526	56,612	91,852	141,268	23,812
Crab/lobster	215,436	578,827	1,383,951	1,650,620	211,367
Shrimp			112,529	103,033	873
Coastal pelagic	72	1,094			
Other pelagic		63			
Highly migratory	56,510	61,539	42,911	210,858	
Halibut	5,438	11,307	33,685	34,114	7,619
Sea urchins	489,537	344,395	252,261	589,946	299,799
Other	34,916	28,877	60,303	52,224	47,174
Total	1,584,091	2,173,492	3,269,891	3,735,341	902,180
Percent live groundfish species	6%	6%	6%	5%	21%

- Notes: 1. Year 2001p includes deliveries through July 1.
 2. The live groundfish fishery includes species that are in the PFMC Fishery Management Plan (FMP) as well as other groundfish species. The FMP categorizes landings by vessels having a limited entry (LE) permit and vessels fishing for the open access (OA) allocations. Groundfish landings which are made with the live disposition code that are not in the FMP are shown as XX. The XX landings include MSC2, WEEL, and MISC.
 3. Vessel length is smallest non-zero length reported by USCG and ODFW.
 4. Landings exclude non-EEZ catch area, tribal allocations, violations, overages, etc. This means vessels with identification of "NONE" or beginning with "ZZ" are excluded. There were several "ZZ" referenced vessels that delivered live groundfish during each period year. "ZZ" type vessels are generally vessels delivering under treaty Indian allocations.

Data Extraction: PacFIN September 2001, February 2002

- Filter: 1. Vessels that landed any amount of live, EEZ groundfish in Oregon (AGID=O; disposition=F; species summary1=1, or SPID=MSC2, WEEL, or MISC; PERMID="OA" or "LE" (except for misc. species); DRVID<>"NONE" or "ZZ..")
 2. Years 1997 - partial 2001 (through July 1)

Analysis Date: January 25, 2002

Appendix Table B-5. Live groundfish fishery harvest value vessel dependency, 1997-2001p.

Vessel Dependency	Vessel Count by Home Port Group				
	Total	Washington	Northern Oregon	Southern Oregon	California
<u>Year 2001p</u>					
<10%	18		6	11	1
10-25%	10			10	
25-50%	15		2	11	2
50-75%	11			11	
>75%	33			33	
Total	87	0	8	76	3
Mean	51%		10%	56%	22%
Standard deviation	36%		16%	35%	18%
<u>Year 2000</u>					
<10%	44		11	32	1
10-25%	13			11	2
25-50%	10		1	9	
50-75%	12			12	
>75%	23		1	22	
Total	102	0	13	86	3
Mean	34%		12%	38%	12%
Standard deviation	36%		29%	36%	9%
<u>Year 1999</u>					
<10%	36		9	26	1
10-25%	12		2	10	
25-50%	15		1	14	
50-75%	11			11	
>75%	16			16	
Total	90	0	12	77	1
Mean	32%		7%	37%	1%
Standard deviation	34%		13%	34%	na
<u>Year 1998</u>					
<10%	36	1	5	29	1
10-25%	7		1	6	
25-50%	10			9	1
50-75%	5			5	
>75%	7			7	
Total	65	1	6	56	2
Mean	23%	1%	4%	25%	23%
Standard deviation	30%	na	6%	31%	23%
<u>Year 1997</u>					
<10%	31		3	27	1
10-25%	4		1	3	
25-50%	7			7	
50-75%	0				
>75%	2			2	
Total	44	0	4	39	1
Mean	12%		8%	13%	3%
Standard deviation	21%		7%	22%	na

- Notes: 1. Year 2001p includes deliveries through July 1.
 2. A vessel's home port group is the port group where the vessel had the most landings by revenue and by year.
 3. Vessel dependency is live groundfish harvest value divided by the vessel's total harvest value.
 4. Northern Oregon port groups are Astoria, Tillamook, and Newport. Southern Oregon port groups are Coos Bay, Port Orford, and Brookings.
 5. Landings exclude non-EEZ catch area, tribal allocations, violations, overages, etc. This means vessels with identification of "NONE" or beginning with "ZZ" are excluded. There were several "ZZ" referenced vessels that delivered live groundfish during each period year. "ZZ" type vessels are generally vessels delivering under treaty Indian allocations.

Data Extraction: PacFIN September 2001

- Filter: 1. Vessels that landed any amount of live, EEZ groundfish in Oregon (AGID=O; disposition=F; species summary1=1, or SPID=MSC2, WEEL, or MISC; PERMID="OA" or "LE" (except for misc. species); DRVID<>"NONE" or "ZZ..")
 2. Years 1997 - partial 2001 (through July 1)

Analysis Date: February 5, 2002

Appendix Table B-6. Home-port state in current and previous years for vessels landing live groundfish in Oregon.

Home-Port State	Vessel Counts					
	1999	2000		2001p		
	Current	Current	1 Year Ago	Current	1 Year Ago	2 Years Ago
Washington	0	0	0	0	1	1
Oregon	89	99	79	84	67	60
California	1	3	3	3	4	1
Other			20		15	25
Total	90	102	102	87	87	87

- Notes:
1. The analysis period is 1999, 2000, and 2001 through July 1, 2001.
 2. Vessels are included if they made at least one live groundfish fishery landing in Oregon in the current year.
 3. A home-port vessel's state is the state of the port group where the vessel had the most landings by revenue.
 4. The counts under home-port state for "Other" are vessels that could not be tracked in previous years. This may mean they are new vessels fishing for the first time in the current year, did not make landings to U.S. West Coast states in a previous year, re-documented, etc.
 5. Landings exclude non-EEZ catch area, tribal allocations, violations, overages, etc. This means vessels with identification of "NONE" or beginning with "ZZ" are excluded. There were several "ZZ" referenced vessels that delivered northern rockfish during each period year. "ZZ" type vessels are generally vessels delivering under treaty Indian allocations.

Data Extraction: PacFIN September 2001

- Filter:
1. Vessels that landed any amount of live, EEZ groundfish in Oregon (AGID=O; disposition=F; species summary1=1 or SPID=MSC2, WEEL, or MISC; PERMID="OA" or "LE" (except for misc. species) ; DRVID<>"NONE" or "ZZ..")
 2. Years 1999 - partial 2001 (through July 1)

Analysis Date: October 30, 2001

Appendix Table B-7. Live groundfish fishery vessel counts, average trips, and all species landings by permit status and years of participation, 1997-2001p.

	Number of Years Participating During Analysis Period																	
	1			2			3			4			5			Total		
	LE	OA	Total	LE	OA	Total	LE	OA	Total	LE	OA	Total	LE	OA	Total	LE	OA	Total
<500 lbs (counts)	8	67	75	1	9	10	8	8	1	1	1	1	1	1	10	85	95	
Cabezon (avg. trips)	0.6	1.6	1.5	8.0	5.3	5.6	7.6	8	13.0	13.0	7.0	7.0	2.6	2.6	2.6	2.6	2.6	2.0
Lingcod (avg. trips)	0.4	1.2	1.1	6.0	1.3	1.8	3.6	2.0	2.0	8.0	8.0	1.1	1.5	1.2	1.1	1.5	1.2	
Black rockfish (avg. trips)	0.1	0.3	0.3		0.6	0.5				5.0	5.0	0.1	0.4	0.3	0.1	0.4	0.3	
Blue rockfish (avg. trips)	0.1	0.0	0.0							1.0	1.0	0.1	0.0	0.0	0.1	0.0	0.0	
Misc. fish (avg. trips)		1.6	1.5	7.0	5.9	6.0		7.0	5.0	5.0	7.0	7.0	1.2	2.7	1.9	1.2	2.7	1.9
Unsp. rockfish (avg. trips)	0.3	1.5	1.3	7.0	4.3	4.6		5.4	5.0	5.0	4.0	4.0	1.4	2.2	1.6	1.4	2.2	1.6
500-999 lbs (counts)	1	5	6	1	6	7	1	2	3	0	0	0	3	13	16	3	13	16
Cabezon (avg. trips)		11.2	9.3	3.0	15.2	13.4	1.0	21.5	14.7				1.3	14.6	12.1	1.3	14.6	12.1
Lingcod (avg. trips)	1.0	3.2	2.8	3.0	6.5	6.0	3.0	15.5	11.3				2.3	6.6	5.8	2.3	6.6	5.8
Black rockfish (avg. trips)		4.0	3.3	1.0	1.7	1.6	6.0	0.5	2.3				2.3	2.4	2.4	2.3	2.4	2.4
Blue rockfish (avg. trips)							4.0	1.3					1.3	0.0	0.3	1.3	0.0	0.3
Misc. fish (avg. trips)		12.6	10.5	2.0	12.0	10.6	1.0	20.5	14.0				1.0	13.5	11.2	1.0	13.5	11.2
Unsp. rockfish (avg. trips)		12.0	10.0	4.0	12.5	11.3	8.0	24.5	19.0				4.0	14.2	12.3	4.0	14.2	12.3
>=1,000 lbs (counts)	1	8	9	4	16	20	1	14	15	6	7	13	8	9	17	20	54	74
Cabezon (avg. trips)		16.5	14.7	6.0	37.4	31.1	28.0	65.9	63.3	53.3	93.6	75.0	145.0	166.4	156.4	76.6	70.5	72.1
Lingcod (avg. trips)		9.5	8.4	4.8	16.7	14.3	15.0	33.0	31.8	25.5	42.6	34.7	94.4	90.0	92.1	47.1	35.4	38.6
Black rockfish (avg. trips)		2.1	1.9	0.3	9.1	7.3		12.9	12.0	20.7	28.0	24.6	31.6	23.9	27.5	18.9	13.9	15.3
Blue rockfish (avg. trips)					0.2	0.2		0.1	0.1	0.3	0.1	0.2	0.5	0.1	0.3	0.3	0.1	0.2
Misc. fish (avg. trips)		17.9	15.9	5.3	40.0	33.1	28.0	71.3	68.4	52.0	101.0	78.4	157.0	171.4	164.6	80.9	74.6	76.3
Unsp. rockfish (avg. trips)		16.0	14.2	5.8	39.1	32.5	36.0	66.8	64.7	56.7	101.6	80.8	150.1	165.2	158.1	80.0	72.0	74.1
Total (counts)	10	80	90	6	31	37	2	24	26	7	7	14	8	10	18	33	152	185
Cabezon (avg. trips)	0.5	3.7	3.3	5.8	23.8	20.9	14.5	42.8	38.2	47.6	93.6	70.6	145.0	150.5	148.1	47.3	27.8	30.9
Lingcod (avg. trips)	0.4	2.2	2.0	4.7	10.3	9.4	9.0	21.8	19.7	22.1	42.6	32.4	94.4	81.8	87.4	29.1	14.0	16.5
Black rockfish (avg. trips)	0.1	0.7	0.7	0.3	5.2	4.4	3.0	7.5	7.2	17.7	28.0	22.9	31.6	22.0	26.3	11.7	5.4	6.5
Blue rockfish (avg. trips)	0.1	0.0	0.0	0.0	0.1	0.1	2.0	0.0	0.2	0.3	0.1	0.2	0.5	0.2	0.3	0.3	0.1	0.1
Misc. fish (avg. trips)	0.0	4.0	3.5	5.0	24.7	21.5	14.5	45.6	41.1	45.3	101.0	73.1	157.0	155.0	155.9	49.5	29.2	32.5
Unsp. rockfish (avg. trips)	0.2	3.6	3.2	5.7	23.9	20.9	22.0	42.8	39.5	49.3	101.6	75.4	150.1	149.1	149.6	49.3	28.0	31.6

Appendix Table B-7 (continued).

	Number of Years Participating During Analysis Period																	
	1			2			3			4			5			Total		
	LE	OA	Total	LE	OA	Total	LE	OA	Total	LE	OA	Total	LE	OA	Total	LE	OA	Total
Live groundfish	1,322	18,331	19,653	491	2,064	2,555	3,602	3,602	149			149		751	751	1,962	24,748	26,710
Other groundfish	945,058	400,801	1,345,859	64,509	18,773	83,282	47,858	47,858	150,934			150,934		4,439	4,439	1,160,501	471,871	1,632,372
All species	3,039,802	4,472,453	7,512,255	177,931	412,125	590,056	936,313	936,313	424,524			424,524		29,287	29,287	3,642,257	5,850,178	9,492,435
Percent live groundfish	0.0%	0.4%	0.3%	0.3%	0.5%	0.4%	0.4%	0.4%	0.0%			0.0%		2.6%	2.6%	0.1%	0.4%	0.3%
Live groundfish	577	8,001	8,578	921	5,741	6,662	1,042	2,822	3,864							2,540	16,564	19,104
Other groundfish	367,125	6,306	373,431	105,009	78,873	183,882	42,924	10,078	53,002							515,058	95,257	610,315
All species	1,846,532	14,307	1,860,839	252,753	456,947	709,700	497,443	109,794	607,237							2,596,728	581,048	3,177,776
Percent live groundfish	0.0%	55.9%	0.5%	0.4%	1.3%	0.9%	0.2%	2.6%	0.6%							0.1%	2.9%	0.6%
Live groundfish	1,003	29,575	30,578	14,007	60,626	74,633	13,775	107,282	121,057	52,277	86,643	138,920	190,040	217,895	407,935	271,102	502,021	773,123
Other groundfish	53,316	20,712	74,028	757,181	218,523	975,704	173,967	139,397	313,364	912,152	136,423	1,048,575	965,967	437,880	1,403,847	2,862,583	952,935	3,815,518
All species	264,360	72,080	336,440	2,347,229	473,345	2,820,574	287,063	682,420	969,483	1,380,648	379,750	1,760,398	1,939,475	1,685,872	3,625,347	6,218,775	3,293,467	9,512,242
Percent live groundfish	0.4%	41.0%	9.1%	0.6%	12.8%	2.6%	4.8%	15.7%	12.5%	3.8%	22.8%	7.9%	9.8%	12.9%	11.3%	4.4%	15.2%	8.1%
Live groundfish	2,902	55,907	58,809	15,419	68,431	83,850	14,817	113,706	128,523	52,426	86,643	139,069	190,040	218,646	408,686	275,604	543,333	818,937
Other groundfish	1,365,499	427,819	1,793,318	926,699	316,169	1,242,868	216,891	197,333	414,224	1,063,086	136,423	1,199,509	965,967	442,319	1,408,286	4,538,142	1,520,063	6,058,205
All species	5,150,694	4,558,840	9,709,534	2,777,913	1,342,417	4,120,330	784,506	1,728,527	2,513,033	1,805,172	379,750	2,184,922	1,939,475	1,715,159	3,654,634	12,457,760	9,724,693	22,182,453
Percent live groundfish	0.1%	1.2%	0.6%	0.6%	5.1%	2.0%	1.9%	6.6%	5.1%	2.9%	22.8%	6.4%	9.8%	12.7%	11.2%	2.2%	5.6%	3.7%

- otes: 1. The analysis period is January 1, 1997 through July 1, 2001.
2. Live groundfish fishery is defined to be PFMC FMP groundfish species plus specified miscellaneous and non-FMP groundfish fish species with a disposition code for "landed live for eventual human consumption." The miscellaneous species were selected to include those that had greater than 500 pounds landing volume in any year during the analysis period. For Oregon, this includes landings of greenling. Greenling is a FMP managed species, but is coded for Oregon landings as a miscellaneous fish in the PacFIN database.
3. Other groundfish is defined to be PFMC FMP groundfish species plus specified miscellaneous and non-FMP groundfish fish species with a disposition code other than "landed live for eventual human consumption."
4. LE landing criteria are landings by vessels having a federal limited entry permit, inclusive of all endorsements, in any year of the period. OA landing criteria includes landings by all vessels other than LE vessels.
5. Landings exclude non-EEZ catch area, tribal allocations, violations, overages, etc. This means vessels with identification of "NONE" or beginning with "ZZ" are excluded. There were several "ZZ" referenced vessels that delivered northern rockfish during each period year. "ZZ" type vessels are generally vessels delivering under treaty Indian allocations.
6. Landing volume categories for vessel counts are the maximum of the live groundfish pounds landed during any of the analysis period years.
7. Trips cannot be summed across species because multiple species can be landed in one trip.
8. A trip is estimated by a fish ticket. This can be an overcount, because more than one ticket can be issued per delivery.
9. Landing volumes and trips are cumulative across participation categories. For example, the volumes and trips for vessels participating in three years are a sum of those three years.
10. Average trips are representative of all vessels landing in a particular volume, participation, and permit status category. This means that not all vessels having live groundfish deliveries within a volume category, permit status, and years of participation included landings of the listed species.

SPID=MSC2, WEEL, or MISC; PERMID="OA" or "LE" (except for misc. species) ; DRVID<>"NONE" or "ZZ..")

Appendix Table B-8. Live groundfish fishery annual economic impacts by port groups, 1997-2001.

Port Group	Pounds	Real	Harvest Price	Processor Sales	Processor	Marginal Impacts Per Landed Round Pound			Local Impact	State Impact
		Harvest Revenue	Per Landed Round Pound		Sales Price	Processor Impact	Harvester Impact	Total Impact		
<u>Year: 2001 (full year)</u>										
Astoria										
Tillamook	17,274	40,742	2.36	53,335	3.43	1.37	3.96	5.34	82,030	100,036
Newport	811	2,163	2.67	2,754	3.77	1.36	4.25	5.61	4,046	4,995
Coos Bay	8,191	29,741	3.63	35,712	4.84	1.41	5.49	6.90	50,280	59,857
Port Orford	188,745	565,400	3.00	702,995	4.14	1.36	4.61	5.96	1,001,448	1,236,355
Brookings	77,750	262,226	3.37	318,906	4.56	1.36	5.01	6.37	440,835	544,241
Coastwide total	292,771	900,272	3.08	1,113,702	4.23				1,578,639	1,945,485
<u>Year: 2001 (partial through July 1)</u>										
Astoria										
Tillamook	5,510	12,849	2.33	16,866	3.40	1.37	3.93	5.31	26,022	31,734
Newport										
Coos Bay	6,651	23,941	3.60	28,790	4.81	1.41	5.46	6.86	40,618	48,355
Port Orford	132,183	409,082	3.09	505,443	4.25	1.36	4.71	6.07	714,005	881,487
Brookings	39,413	132,400	3.36	161,132	4.54	1.36	5.00	6.36	222,959	275,258
Coastwide total	183,757	578,272	3.15	712,231	4.31				1,003,604	1,236,835
<u>Year: 2000</u>										
Astoria										
Tillamook										
Newport	6,689	10,031	1.50	14,907	2.48	1.36	2.98	4.34	25,830	31,889
Coos Bay	5,694	21,427	3.76	25,578	4.99	1.41	5.64	7.05	35,706	42,507
Port Orford	100,971	320,999	3.18	394,607	4.34	1.36	4.80	6.16	553,627	683,490
Brookings	70,503	239,534	3.40	290,931	4.59	1.36	5.04	6.40	401,435	495,599
Coastwide total	183,857	591,991	3.22	726,023	4.39				1,016,598	1,253,485
<u>Year: 1999</u>										
Astoria										
Tillamook										
Newport	8,814	11,825	1.34	18,250	2.30	1.36	2.81	4.17	32,691	40,359
Coos Bay										
Port Orford	125,463	335,620	2.68	427,083	3.78	1.36	4.26	5.61	626,859	773,900
Brookings	66,547	194,246	2.92	242,758	4.05	1.36	4.52	5.88	348,162	429,830
Coastwide total	200,824	541,691	2.70	688,091	3.81				1,007,712	1,244,089
<u>Year: 1998</u>										
Astoria										
Tillamook										
Newport	2,335	4,168	1.79	5,870	2.79	1.36	3.29	4.65	9,660	11,926
Coos Bay										
Port Orford	114,412	212,772	1.86	296,179	2.88	1.36	3.37	4.73	481,580	594,543
Brookings	13,243	39,688	3.00	49,342	4.14	1.36	4.61	5.96	70,282	86,767
Coastwide total	129,990	256,628	1.97	351,391	3.00				561,521	693,236
<u>Year: 1997</u>										
Astoria										
Tillamook										
Newport	5,486	9,108	1.66	13,107	2.65	1.36	3.16	4.51	22,035	27,204
Coos Bay										
Port Orford	78,977	114,598	1.45	172,173	2.42	1.36	2.93	4.29	301,267	371,934
Brookings	5,672	11,518	2.03	15,653	3.07	1.36	3.56	4.91	24,811	30,631
Coastwide total	90,135	135,225	1.50	200,933	2.48				348,113	429,769

- Notes: 1. Revenue, prices, and economic impacts adjusted to Year 2000 dollars using the GDP implicit price deflator developed by the U.S. Bureau of Economic Analysis.
 2. Economic impacts expressed as total personal income.
 3. Landings at port groups, when less than 500 pounds per year, are omitted due to exaggerated harvest price variability.
 4. Assumptions for determining sales price include 90% yield, \$0.41 other variable costs, and \$0.40 contributed (fixed costs and profit) costs per finished pound.

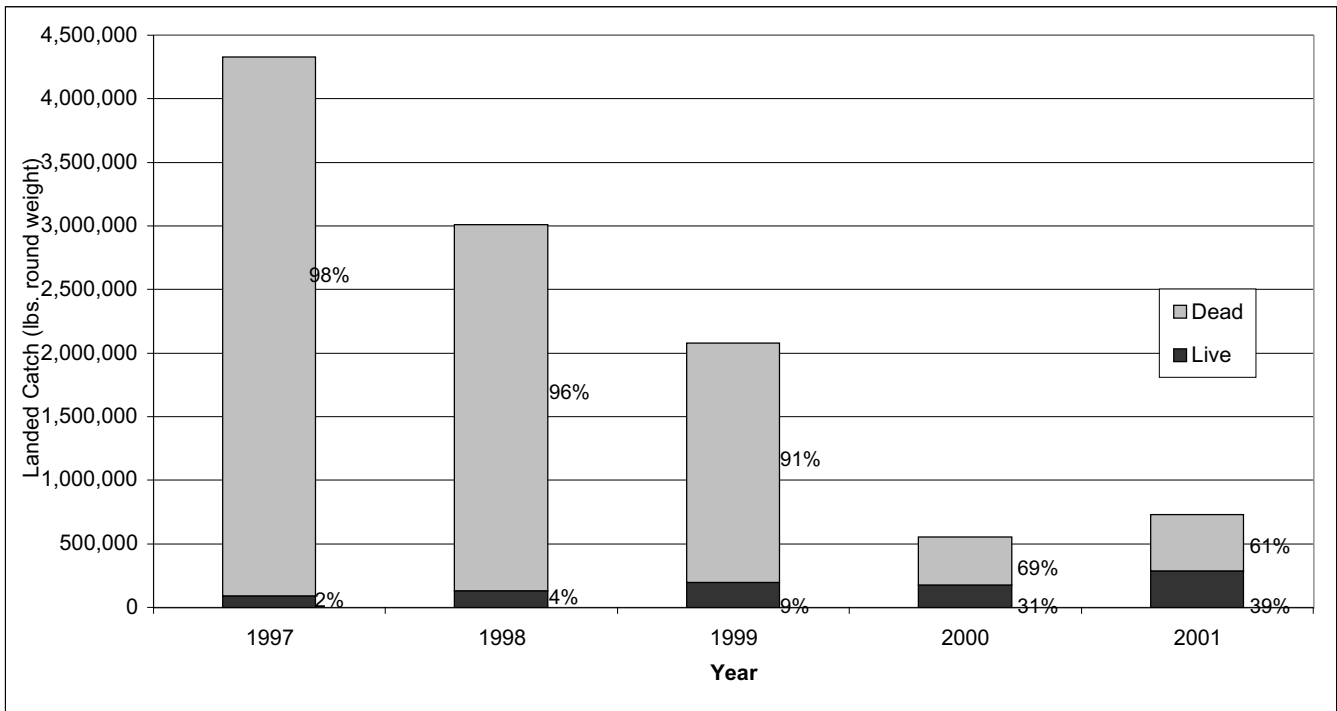
Data Extraction: PacFIN September 2001 and January 2002

Statement: Economic impacts for LIVE GROUND FISH

- Filter: 1. Landings of live, EEZ groundfish in Oregon (AGID=O; disposition=F; species summary1=1, or SPID=MSC2, WEEL, or MISC; PERMID="OA" or "LE" (except for misc. species))
 2. Years 1997 - partial 2001 (through July 1), and Year 2001 full

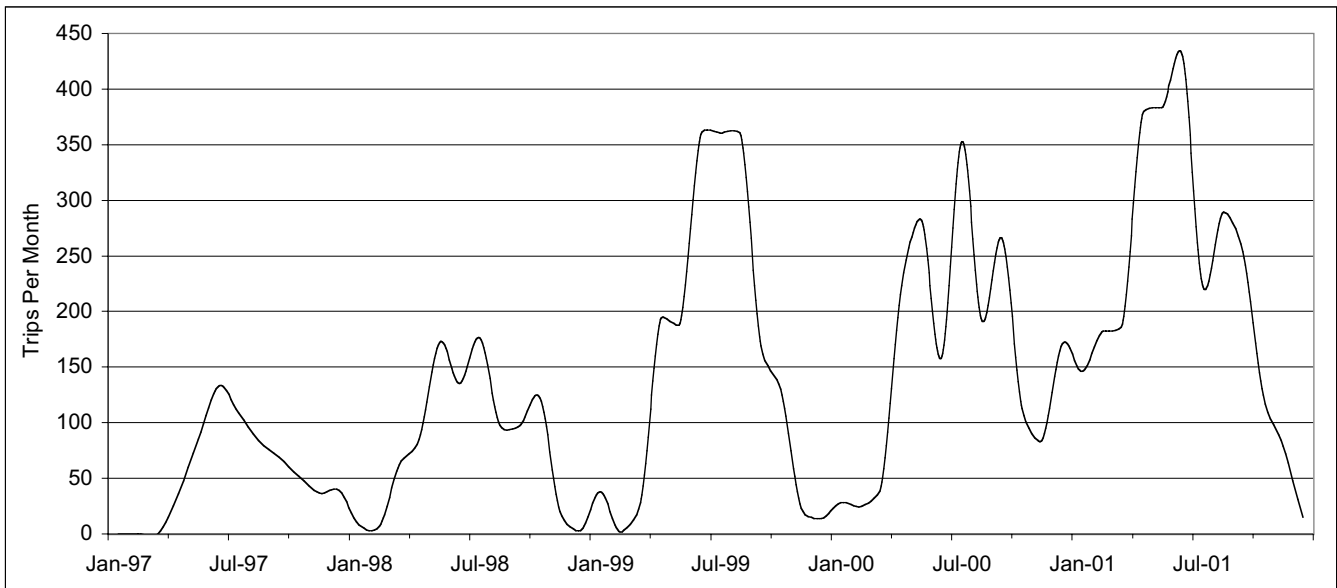
Analysis Date: January 30, 2002

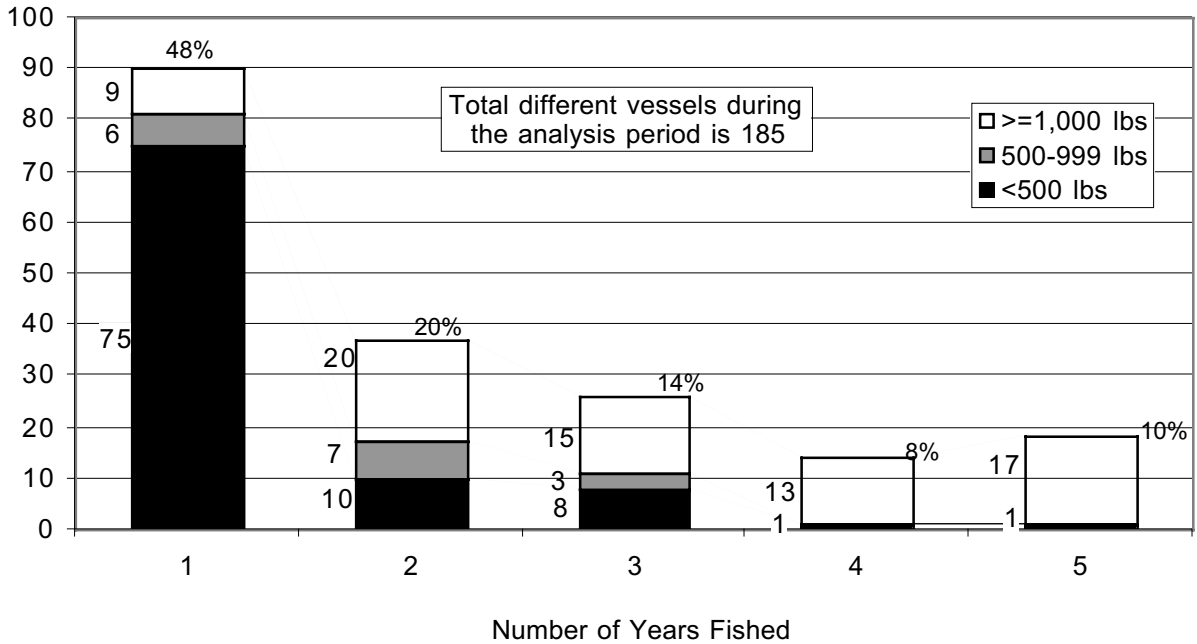
Appendix Figure B-1. Live groundfish fishery landed catch (lbs.) for indicator species by disposition, 1997-2001.



Notes: 1. The indicator species (PacFIN species codes) are cabezon (CBZN), lingcod (LCOD), black rockfish (BLK1), blue rockfish (BLU1), miscellaneous species (mostly greenling) (MSC2), and unspecified rockfish (URCK and NUSR).

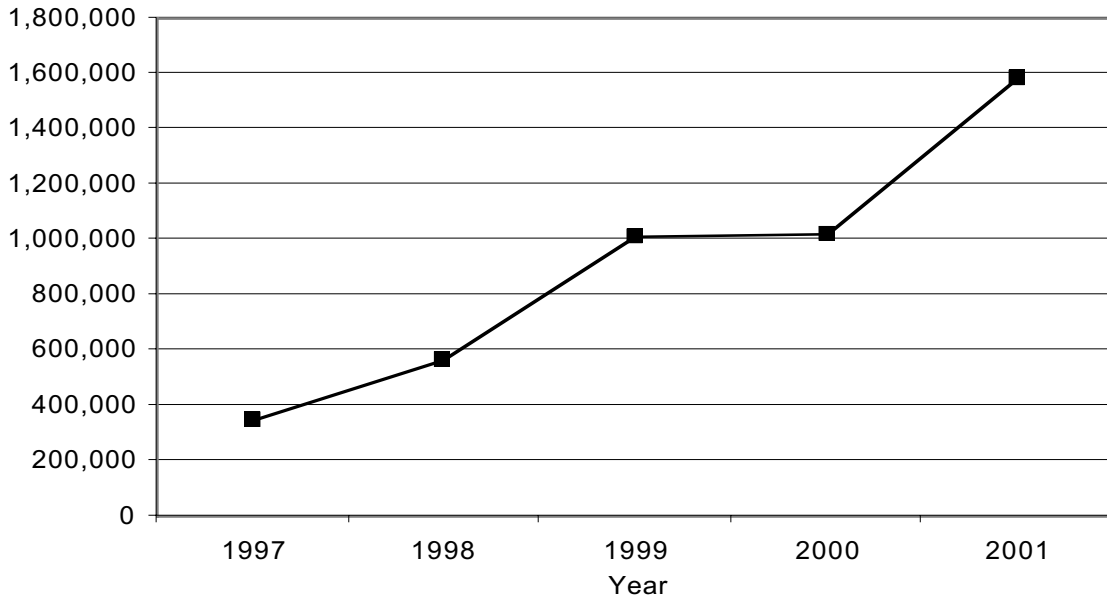
Appendix Figure B-2. Live groundfish fishery trips per month for indicator species, 1997-2001.





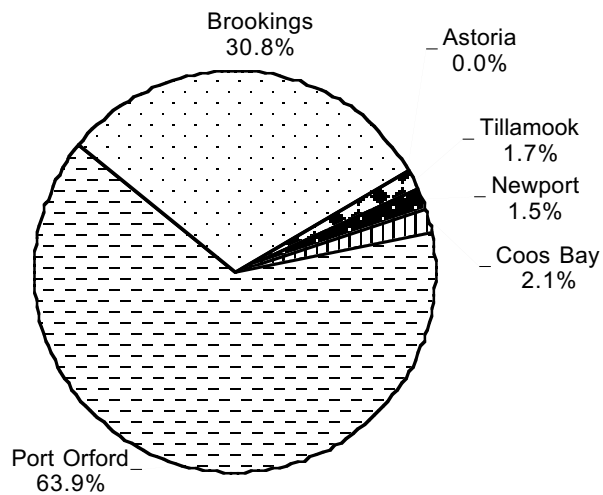
Notes: 1. The analysis period is 1997 through July 1, 2001p.
 2. The volume categories are for only live groundfish landings.

Appendix Figure B-3. Live groundfish fishery participation by landing volume categories, 1997-2001p.



Notes: 1. Economic impacts expressed as total personal income in Year 2000 dollars using the GDP implicit price deflator developed by the U.S. Bureau of Economic Analysis.

Appendix Figure B-4. Live groundfish fishery coastal economic impact trends, 1997-2001.



- Notes: 1. Harvest revenue is ex-vessel value in Year 2000 dollars using the GDP implicit price deflator developed by the U.S. Bureau of Economic Analysis.
2. Port group shares are the sum during the analysis period. Landing values by port when less than 500 pounds per year are omitted due to exaggerated price variability.
3. Astoria area includes Gearheart/Seaside and Cannon Beach; Tillamook area includes Garibaldi, Netarts, and Pacific City; Newport area includes Depoe Bay and Salmon River; Coos Bay area includes Florence, Charleston, Winchester Bay, and Bandon; and Brookings area includes Gold Beach.

Appendix Figure B-5. Live groundfish fishery coastal harvest revenue by port group, 1997-2001.