

***Data Report and Summary
Analyses of the West Coast
Nearshore Fixed
Gear Fishery***

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West Coast Groundfish Observer Program



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Table of Contents

INTRODUCTION.....	1
Overview.....	1
West Coast Nearshore Fixed Gear Fisheries.....	1
<i>Washington</i>	1
<i>Oregon</i>	2
<i>California</i>	2
Commercial Nearshore Fisheries Data.....	3
West Coast Groundfish Observer Program.....	3
Program Goals.....	3
METHODS.....	3
Nearshore Fisheries Permit Selection.....	3
Coverage of the Nearshore Fisheries.....	5
Fixed Gear Data Collection.....	5
Data Quality Control and Management.....	6
Data Processing.....	7
Analysis.....	9
RESULTS AND DISCUSSION.....	10
Overall Coverage Levels.....	10
Spatial Distribution of Observations.....	11
Observed Total Catch, Discard Ratios, and Bycatch Ratios.....	11
Biological Data Collection and Summary.....	13
Summary.....	13
REFERENCES.....	14
Figure 1. Bycatch ratios over time for rebuilding species observed in nearshore fixed-gear fisheries in Oregon and California.....	15
Figure 2. Bycatch ratios by depth interval in 2007 for canary rockfish (left) and yelloweye rockfish (right).....	16
Figure 3. Length frequency distributions of discarded rebuilding species observed in nearshore fisheries from September 2003 - April 2008.....	17
Figure 4. Length frequency distributions of discarded (non-rebuilding) species observed in nearshore fisheries from September 2003 - April 2008.....	18
Table 1. Total trips, sets, vessels and nearshore species landings observed in the nearshore fishery in 2007 and in January through April of 2008.....	20
Table 2a. Observed catch weight (mt), discard weight (mt) and percent discarded from nearshore vessels using hook-and-line gear from January 2007 through April 2008.....	21

Table 3a. Observed catch weight (mt), discard weight (mt) and percent discarded from observed Oregon nearshore vessels in 2007 by depth.....	24
Table 3b. Observed catch weight (mt), discard weight (mt) and percent discarded from observed California nearshore vessels in 2007 by depth.....	26
Table 3c. Observed catch weight (mt), discard weight (mt) and percent discarded from observed nearshore vessels in January through April 2008.....	29
Table 4. Discard ratios and standard errors from observed nearshore vessels in Oregon and California in 2007.....	31
Table 5. Bycatch ratios and standard errors from observed nearshore vessels in Oregon and California in 2007.....	32
Table 6. Summary of the number of length measurements and the number of individual fish sexed by WCGOP observers in the nearshore fixed-gear fisheries from September 2003 through April 2008.....	33
Table 7. Summary of biological data for protected resources collected by WCGOP observers in the nearshore fixed-gear fisheries from September 2003 through April 2008.....	34
Appendix A. WCGOP Database Table Hierarchy.....	35
Appendix B. Species identification codes used in the Pacific Coast Fisheries Information Network (PacFIN) database and assigned to WCGOP observer data, with aggregated species groups used in this report (Tables 4-6)	36

INTRODUCTION

Overview

This report summarizes discarded catch data collected by the West Coast Groundfish Observer Program (WCGOP) from the Oregon and California state-permitted nearshore fixed gear fisheries (generally in depths < 50 fathoms) from January 1, 2007 through April 30, 2008. The WCGOP collects at-sea data from limited-entry (LE) trawl and fixed gear fisheries, as well as from near-shore, prawn/shrimp, California halibut, and deep-water fisheries. The WCGOP's goal is to improve total catch estimates by collecting information on the discarded catch (fish returned over-board at-sea) of west coast groundfish species. The data are used in assessing and managing a variety of groundfish species.

West Coast Nearshore Fixed Gear Fisheries

The US west coast nearshore groundfish commercial fleet operates from northern Oregon to southern California. Historically, nearshore fisheries were accessible to everyone. However, due to the increasing number of participants and concerns of overcapacity, California and Oregon began requiring state permits in 2003 and 2004, respectively. Regulations for the nearshore fisheries are set by both the Pacific Fishery Management Council (PFMC) and the states. The Pacific Fishery Management Council sets the optimum yield (OY) for groundfish species and harvest guidelines. The commercial fishery has two sectors, the limited-entry sector which requires federally issued groundfish permits and the open access sector, which does not require federal permits. Vessels that participate in the nearshore fixed gear fishery can belong to either sector.

In addition to regulations set by the PFMC, each state manages its nearshore fishery independently by issuing state regulations on the cumulative trip limits of nearshore species in their state waters. Cumulative trip limits are a specified weight of fish that can be landed during a particular time period, usually two-months. Often, cumulative trip limits set by the states are more restrictive than the federal limits. Additional management measures for each state are highlighted in the sections below. Further information on state nearshore fishery regulations can also be found online for Oregon at: www.dfw.state.or.us/fish/commercial/ and for California at: www.dfg.ca.gov/marine/regulations.asp#commercial.

Vessels participating in the nearshore fisheries range in size from 10 to 50 feet, with an average length of 25 feet. They use a variety of fixed gear including hand-lines, cable gear, fishing poles, and pots. In shallow water, fishers often fish in coves or drift along a reef. They set and retrieve their gear multiple times a day and generally land their fish on a daily basis. Quotas for the nearshore fisheries are small; generally between 100 to 2,000 lbs every two months. Many of those who fish in shallow water participate in the live fish market, necessitating careful handling of retained fish. They sell live fish for as much as \$8 per pound to restaurants or other vendors. These vessels retain only the portion of their catch that is marketable and permitted to be landed. The portion of catch that is not marketable or prohibited from landing is discarded at-sea. Fishers may discard certain size fish or dead fish to maximize the value of their landed catch.

Washington

The State of Washington does not allow commercial fishing within its territorial waters (0-3 miles from the coastline). This prohibition removes fishing grounds from access by commercial nearshore fishers.

Oregon

Oregon's nearshore commercial fishery (hook & line, pot, and longline) typically occurs in shallow water (< 30 fathoms) and targets species such as black rockfish, blue rockfish, china rockfish, copper rockfish, quillback rockfish, grass rockfish, cabezon, and greenlings. Oregon's nearshore permitting process assigns permits to vessels. State nearshore management employs minimum size limits for many nearshore species and employs two month cumulative trip limits. Black rockfish trip limits are tied to four Oregon Black Rockfish Zones: 1) Tillamook Head (45° 56' 45" N. lat) to Cape Lookout (45° 20' 15" N. lat); 2) Cascade Head (45° 03' 50" N. lat) to Cape Perpetua (44° 18' N. lat); 3) from a point (43° 30' N. lat), approximately 8.5 miles north of the Coos Bay north jetty to a point (43° 03' N. lat), about 4.5 miles south of the Bandon south jetty; and 4) Mack Arch (42° 13' 40" N. lat) to the Oregon-California border (42° N. lat). In 2004, Oregon began requiring that nearshore fishers complete a vessel logbook.

In 2007, Oregon issued 63 black/blue rockfish permits, which allow for the landing of black rockfish and blue rockfish, and 74 black/blue rockfish permits with a nearshore endorsement, which allows landing of black rockfish and blue rockfish along with 21 additional Oregon designated nearshore groundfish species. In 2008, Oregon issued 60 black/blue rockfish permits and 71 black/blue rockfish permits with a nearshore endorsement.

California

California state management designates four geographic zones along the coastline: 1) the south coast - south of Point Conception (34° 27' N. lat.); 2) the south-central coast - from Point Conception (34° 27' N. lat.) to Point Ano Nuevo (37° 07' N. lat.); 3) the north-central coast - from Point Ano Nuevo (34° 27' N. lat.) to 40° 10' N. latitude near Cape Mendocino; and 4) the north coast - from 40° 10' N. latitude to the Oregon-California border (42° N. lat.). There are a number of fishing area closures designated in federal groundfish management.

The state of California issues two permits for fishing within the nearshore area: a shallow nearshore species fishery permit and a deeper nearshore species fishery permit. In 2007, there were a total of 352 California nearshore permits and in 2008, there were 215 permits. The permits are assigned to an individual person and can only be used in the one regional management area specified on the permit. Fishers can either have a single nearshore permit (deeper or shallow) or hold both types of permits. A trap endorsement can also be tied to a shallow nearshore permit to allow for the use of trap gear when fishing for nearshore species. In addition, a nearshore fishery bycatch permit can be issued for trawl gear or entangling nets to allow for small amounts of nearshore landings per trip, but only in the south-central and south coast regions.

The deeper nearshore permit is required for landing black rockfish, blue rockfish, brown rockfish, calico rockfish, copper rockfish, olive rockfish, quillback rockfish, and treefish. The shallow nearshore permit is required for landing black-and-yellow rockfish, cabezon, greenlings, California scorpionfish, California sheephead, china rockfish, gopher rockfish, grass rockfish, and kelp rockfish. Lingcod is also commonly targeted with shallow nearshore permit species. Most live fish landings consist of species in the shallow nearshore group. State nearshore management employs minimum size limits for many nearshore species and two month cumulative trip limits. A limit on the number of hooks per vessel or line also exists for certain areas. California instituted a voluntary nearshore logbook program in 2005.

Commercial Nearshore Fisheries Data

Fisheries managers and enforcement officers use state-issued sales receipts, referred to as fish tickets, to monitor fishery landings. This information is transferred to the Pacific Coast Fisheries Information Network (PacFIN) regional database system by state fishery agencies in Washington, Oregon, and California. Fish ticket information is uploaded to PacFIN on a monthly basis and subject to updates frequently thereafter. Fish tickets are trip-aggregated sales receipts for market species/categories. As fish tickets only provide information on the amount of fish landed, to ensure that total catch does not exceed the annual OY, managers also need discard information for each managed species. One of the best means of acquiring accurate data needed to estimate the amount of discarded catch is through an at-sea observer program.

West Coast Groundfish Observer Program

On May 24, 2001, NOAA Fisheries (National Marine Fisheries Service, NMFS) established the WCGOP in accordance with the Pacific Coast Groundfish Fishery Management Plan (50 CFR Part 660) (66 FR 20609). This regulation requires all vessels that catch groundfish in the United States Exclusive Economic Zone (EEZ) from 3-200 miles offshore to carry an observer when notified to do so by NMFS or its designated agent. Subsequent state rule-making has extended NMFS's ability to require that California and Oregon vessels which only fish in the 0-3 mile state territorial zone also carry observers. Observers are stationed along the US west coast from Bellingham, Washington to San Diego, California.

Program Goals

The WCGOP's goal is to improve estimates of total catch and discard by observing groundfish fisheries along the US west coast. Originally, the WCGOP focused observer effort in the LE trawl and fixed gear fisheries. In 2002, the WCGOP began deploying observers in open access fisheries while increasing its coverage of the LE trawl fishery. In 2005, the WCGOP increased its coverage of the LE fixed gear fishery and in 2006, the WCGOP improved coverage of the nearshore fishery. Currently, the WCGOP coverage goal is to maintain, at a minimum, 20% coverage of the LE trawl and fixed gear fisheries by landings, while continuing to improve coverage in open access and nearshore fisheries. The observer coverage plan is available at: <http://www.nwfsc.noaa.gov/research/divisions/fram/observer/observersamplingplan.pdf>.

METHODS

Nearshore Fisheries Permit Selection

From a sampling standpoint, the WCGOP recognizes three distinct sectors that are part of nearshore fixed gear fisheries on the west coast. These include Oregon black/blue rockfish, Oregon black/blue rockfish with a nearshore endorsement, and California nearshore. In all cases, state-issued nearshore permits are selected for observation using stratified random sampling. First, the WCGOP determines the amount of time (based on available resources) it will take to observe the entire fleet of that sector; this is termed the selection cycle. The selection cycle varies due to changing priorities and observer resources. Because of data and timeline requirements for fisheries managers and historical observer program vessel coverage, selection cycles do not coincide with the date range of the observer data analyzed in this report. For Oregon black/blue rockfish and Oregon black/blue rockfish with a nearshore endorsement, the data in this report (Jan 2007 -

Apr 2008) were collected during two selection cycles, January 1, 2007 through December 31, 2007 (selection cycle 4) and January 1, 2008 through December 21, 2008 (selection cycle 5). Random stratified samples were pulled separately from each of these two sectors even though the sampling time frames were identical. For California nearshore, the data in this report (Jan 2007 - Apr 2008) were also collected during two selection cycles, January 1, 2007 through December 31, 2007 (selection cycle 6) and January 1, 2008 through December 21, 2008 (selection cycle 7).

Due to the large number of permits in these fisheries, criteria were developed to narrow down the selection lists to those permits that are most active in each sector and to vessels that have sufficient space to carry an observer. This increases the probability that the vessels selected will be actively fishing and observable, thereby increasing the probability of obtaining observations in all geographical and temporal strata.

Selection lists for the two Oregon nearshore fixed gear sectors were developed based on permit information from the Oregon Department of Fish and Wildlife and additional information from the PacFIN database. For each Oregon nearshore permit, it was first determined whether the vessel/permit holder had a nearshore endorsement. Separate lists were compiled for permits that were associated with a nearshore endorsement and permits that were not endorsed, as the two groups are subject to different landings limits and thus may differ in fishing behavior. The following criteria were then used to narrow down the selection lists for both Oregon nearshore fixed gear sectors:

- Permit was assigned to a vessel.
- Vessel landed more than 1,000 lbs of rockfish during an 18-month period prior to the start of the selection cycle.
- Vessel used fixed gear to land rockfish.
- Vessel was greater than 17 feet.

The selection list for the California nearshore sector was developed based on permit information from the California Department of Fish and Game and additional information from the PacFIN database. It included all permits that met the following criteria:

- Permit was valid in one of the four state-designated management zones.
- Permit holder landed 1,000 lbs of groundfish or more 18-month period prior to the start of the selection cycle.
- Permit was used on a fixed gear vessel greater than 17 feet.

The number of permits selected from each nearshore sector was thus a subset of all permits issued in the fishery and varied for each selection cycle. The number of permits selected for the CA nearshore fishery was 120 (out of 352) in 2007 and 116 (out of 215) in 2008. There were 30 (out of 63) OR blue/black rockfish permits selected in 2007 and 30 (out of 60) 2008. For OR blue/black rockfish permits with a nearshore endorsement, there were 43 (out of 74) permits selected in 2007 and 48 (out of 71) in 2008.

The WCGOP aggregates ports along the US west coast into port groups, which are considered strata. Nearshore permits are assigned to a port group based upon the location of the previous year's landings. Within each port group, permits are randomly selected for coverage during a two-month period, which coincides with the two-month cumulative trip limit periods. After the entire

fleet has been selected, a new selection cycle begins. This selection process is designed to produce a logistically feasible sampling plan with a distribution of observations throughout the entire geographic range of the fishery over time. Based on this design and the current level of WCGOP funding, the program is currently cycling through the fleets with California and Oregon state near-shore permits every year.

For more information on the rationale behind vessel selection, see the observer coverage plan at: <http://www.nwfsc.noaa.gov/research/divisions/fram/observer/observersamplingplan.pdf>.

Coverage of the Nearshore Fisheries

Due to limited resources, the WCGOP prioritizes its deployment of observers. A list of fisheries in order of priority for observer coverage can be found in the WCGOP observer training manual (NWFSC 2007). The program places a higher priority on observing higher volume limited-entry trawl and fixed gear fisheries. As a result, when observers have had timing conflicts between trips of limited-entry and open access vessels, open access trips have been missed. Beginning in 2006, the nearshore fixed gear fisheries became the WCGOP's third highest priority, ahead of all other open access fisheries. The goal of increasing priority for the nearshore fixed gear fisheries is to cover more trips per vessel during a two-month period and to cover more vessels that participate in each sector.

Some vessels whose permits are selected for a specific two-month period may not be covered by an observer during that period or may not be covered on all trips during that period. Single trips may be waived from observer coverage due to observer availability, a safety issue that can be fixed in a relatively short period of time, or vessel space issues that arise when an extra person is aboard. A few nearshore vessels are given selection cycle waivers. A selection cycle waiver allows the vessel to fish without an observer during all trips taken during the entire selection cycle. Selection cycle waivers are given when a vessel has a serious safety concern that cannot be easily remedied or if the vessel is too small or space is too limiting to safely carry an observer. These issues may create some bias when trying to expand observer data to the entire fleet but cannot be avoided at this time. In the future, as alternative methods of monitoring these vessels become available, they will be applied.

Some vessels may receive a coverage period waiver. Coverage period waivers allow a vessel to fish all trips during a two-month period without an observer. Coverage period waivers are given for a variety of reasons, including vessel size/space constraints, observer availability, and vessel safety. Vessels are given a coverage period waiver for a specific two-month period. These vessels are added to the selection list for the next two-month period. For instance, if a vessel is given a coverage period waiver for January 1 through February 28, that vessel is automatically selected for observer coverage for the period March 1 through April 30. Vessels continue to be added to the subsequent selection list until either an observer covers them or until the selection cycle ends, whichever comes first.

Fixed Gear Data Collection

Fisheries observers are trained professionals who monitor and record catch data on commercial fishing vessels by following protocols in the WCGOP Manual (NWFSC 2007).

Data collected by the observers on a trip basis include:

- Start time, end time, depth, and the location of set/retrieval of gear

- Gear type and fishing strategy
- Fish ticket identification numbers

Data collected by the observers on a set basis include:

- Estimated total catch weight (including sets for which there is 100% discard)
- Weight of discard by catch category
- Reason for discard by catch category or species
- Species composition of discard by catch category
- Weight of fish retained by catch category
- Species composition of fish retained by catch category
- Catch of prohibited species and incidental take of protected species
- Size composition, tags, and viability assessments for Pacific halibut
- Size composition of discarded fish
- Basic taxonomic composition of non-fish bycatch
- Biological collections (length, sex, otoliths, etc.)

For more information regarding observer sampling on small boats using fixed gear, refer to the WCGOP Observer Training Manual, Chapter 6.

Data Quality Control and Management

The WCGOP uses the following procedure to ensure that the quality of data collected is maintained:

1. Data are collected at-sea by the observer following protocols in the WCGOP Manual (NWFSC 2007).
2. Data are entered into the database system. The data are entered into a centralized Oracle database located at the Northwest Fisheries Science Center (NWFSC). Data within the Oracle database are accessible via a web-based GUI or by direct SQL queries to the database. The database table hierarchy is located in Appendix A.
3. Observers are debriefed by WCGOP staff after every two-month period. The debriefing includes:
 - Calculation, Data Form, and Sampling Methodology Checks - Observers send data to a debriefer on a monthly basis. The debriefer checks all calculations for accuracy, reviews data forms for completeness, and ensures appropriate sampling methodologies were employed.
 - Observer Logbook Review - Observers keep logbooks detailing the events of each trip, basic deck schematics, sampling methods used, communication logs, and confirmation of a current safety decal. Any sets during which sampling problems occurred are documented in the logbook and reviewed during debriefing.
 - Interview - The observer is interviewed by the debriefer. During the interview, sampling methodologies employed on all trips are discussed and data errors are updated.

- Evaluation - Observers are evaluated on their performance based upon WCGOP generated criteria.
 - Data Entry Check - Electronic data are compared to the raw data for keypunch errors. Also, all corrections discovered during debriefing are updated in the database program.
4. Database Quality Control Queries - Quality control queries are run to detect data that fall outside specified ranges and identify other inconsistencies between data elements. These database quality control queries are run every six months to a year on all data collected during a specified time period.
 5. Database Update - The raw data from all entries that are highlighted by the quality control queries are reviewed and the electronic data are updated.

Data Processing

Data processing includes the following steps: expand the subsample of species composition to the set-level; translate observer species codes to the appropriate PacFIN fish ticket data codes; identify and select the observer data records to match to fish tickets; query and process PacFIN fish ticket data associated with the nearshore fixed gear fisheries including the observed trips; and then merge observer data and fish ticket data. The translation of WCGOP to PacFIN species codes allows a more seamless match of observer data with fish ticket data and provides consistent information for calculating observer coverage of overall fishery landings.

The WCGOP database administrator expands the subsamples of catch categories to the set level. In cases where the observer was only able to sample a portion of a particular set, a set-level expansion is needed. The following equation is used to calculate the weight of the retained and discarded catch of each species in a set:

$$X_s = \frac{x_s}{h} \times H$$

where:

X_s = the calculated weight of species s in the set,

x_s = observed weight of the species s in the subsample,

h = the number of hooks sampled in a set,

H = the total number of hooks in a set.

Once the set-level expansion is complete, a data file that includes all fields necessary for the analysis is produced.

Observer data that meet the following criteria are removed for the fish ticket matching process:

- Trips with sets where no retained or discarded information is recorded.
- All discarded catch information.
- Trips where no fish ticket could be found.
- Partial trips (trips where the vessel was observed for less than 100% of their landed catch).

Next, the translation step of the process adds coding to the WCGOP observer data that allows for the appropriate match to the coding system used to record data on fish tickets in PacFIN.

Once these two steps are completed, the retained catch records from the observer data are merged with fish ticket data to provide more accurate estimates of retained catch. Fish tickets are trip-aggregated sales receipts for market species/categories. Fish ticket information is uploaded from state databases into the regional PacFIN database on a monthly basis and is subject to update frequently thereafter. The WCGOP data are linked to fish tickets by direct fish ticket number(s) obtained by the observer and/or by comparing the return date recorded by the observer with the dates of fish tickets from the vessel. For trips with multiple fish tickets, the fish ticket data are combined for analysis purposes. For trips with missing fish tickets, the observer retained catch data are not adjusted.

The WCGOP data are adjusted so that the total trip pounds of retained fish in a catch category matches the total trip pounds on the fish ticket, because the fish ticket weight is often more accurate and fish tickets are legally binding documents. To match the total trip pounds, the weights within each observer retained catch category are scaled up or down by the ratio of fish ticket and observer trip weights for that category, using the following equation to calculate the adjustment factor:

$$A_{mtk} = x_{mtk} / \sum_k x_{mtk}$$

where:

x_{mtk} = lbs in catch category k in set t in trip m

A_{mtk} = adjustment factor used for catch category k in set t in trip m .

The equation used to adjust the WCGOP data is:

$$x_{mtk} = A_{mtk} \times C_{mk}$$

where:

C_{mk} = lbs in catch category k for trip m recorded on the fish ticket.

When a catch category in the WCGOP data cannot be matched to a fish ticket catch category, the WCGOP data are not adjusted. Catch categories found only on the fish tickets are distributed across the observed sets using the proportion of the observed catch per set divided by the total observed catch per trip using the following equation:

$$B_{mk} = \sum_k \sum_s x_{mtks} / \sum_t \sum_k \sum_s x_{mtks}$$

$$C_{mtk} = B_{mt} \times C_{mk}$$

where:

B_{mt} = the proportion of observed catch in set t in trip m ,

C_{mtk} = lbs in catch category k for set t in trip m recorded on the fish ticket.

Upon completion of the observer data merge and adjustment with fish ticket data, the data that had been previously removed for the matching process are then incorporated back into the data file for analysis.

Starting in 2006, observer retained catch was matched to fish ticket landings in the nearshore fixed gear fisheries. In previous years, the combination of the possibility of an undetected second fish ticket for a trip, along with the inability to determine when a fish ticket was only partially observed made matching observed landings to fish ticket landings problematic. Some nearshore vessels fish a series of day trips prior to landing their catch and generating a fish ticket. Occasionally, an observer was only available for a portion of the series of day trips, resulting in only a portion of the landings on the fish ticket being observed. In 2005, the program recognized this issue and started to document occurrences of partial coverage.

Analysis

Observer coverage rates in the nearshore fixed gear fisheries were calculated as the proportion of fleet-wide landings of nearshore species observed. A list of nearshore species and nearshore catch category assignments is provided in Appendix B. Coverage rates were computed based on the complete dataset for 2007 and January through April of 2008.

After coverage rates were calculated but prior to subsequent analyses, data that met the following criteria were removed:

- Data where WCGOP data quality standards were not met.
- Sets where no retained or discarded information was recorded.
- Sets where the species composition of discarded catch was not known (unsampled discard).

Once these steps had been applied, the ratio estimator technique (Cochran 1977) was used to estimate bycatch and discard rates for each major species or species group. Rates were calculated for all of the stocks currently managed under rebuilding plans, prohibited species in each fishery (Pacific halibut), and all stocks for which discard is estimated annually on a fleet-wide basis. The ratio estimates (R_i) were calculated by area (i):

$$R_i = \frac{\sum_t y_{it}}{\sum_t x_{it}}$$

where:

y_{it} = the discarded or total catch pounds of a species in the set t .

x_{it} = the retained pounds of nearshore species in the set t .

The variance of R_i is approximated by using the following equation:

$$Var(R_i) = \left(\frac{\bar{y}_i}{\bar{x}_i}\right)^2 \left[\frac{s^2(y_{it})}{\bar{y}_i^2} + \frac{s^2(x_{it})}{\bar{x}_i^2} - \left(\frac{s^2(y_{it})}{\bar{y}_i^2} \cdot \frac{s^2(x_{it})}{\bar{x}_i^2} \right) \right]$$

where:

\bar{x}_i and \bar{y}_i = the means of x_{it} and y_{it} over the sets.

$s^2(x_{it})$ and $s^2(y_{it})$ = the standard errors of x_{it} and y_{it} over all sets.

This variance estimator is that which was employed by Pikitch et al. (1998) and is based on methods presented by Cochran (1977). Note that $\text{Var}(R_i)$ cannot be calculated when $x_{it} = 0$ or $y_{it} = 0$ for all sets and should be considered with extreme caution when R_i is equal to one. In order to best support fishery management, variance was calculated separately for data from each state. Variance estimates, therefore, do not relate back directly to the random stratified sampling framework employed by WCGOP, where vessels/permits within each port group were the sampling unit.

Discard ratios were computed as the observed discard weight of a particular species over the observed weight of all retained nearshore species (Appendix B). Similarly, bycatch ratios were calculated as the observed total catch weight (discarded + retained) divided by the observed weight of retained nearshore species.

In all cases where a nearshore species grouping was used to compute discard and bycatch ratios, any retained weights that were recorded by the observer but that did not appear on fish tickets were excluded from the denominator. This was done to prevent double counting associated with differences in the species codes used by observers and processors. For instance, while observers record rockfish catch at the species level, various species of rockfish are often grouped, weighed and recorded together on the fish ticket by the processor under a grouped species code such as NUSR - northern unspecified nearshore rockfish. In some cases, this difference in species coding prevents observer and fish ticket weights from matching and adjusting properly. Species coding on fish tickets varies considerably between processors and over time, and it is not possible to make assumptions regarding which individual species likely coincide with species grouping codes on fish tickets. Instead, by using only the nearshore species weight from fish tickets in discard and bycatch ratio denominators, we prevent double counting of retained weights. This is not a factor when using a single species in the denominator, such as sablefish in the non-nearshore fixed gear fisheries, as any weights in observer and fish ticket data that share the same species code will match and adjust properly.

RESULTS AND DISCUSSION

Overall Coverage Levels

The total number of trips, sets, and vessels observed in the nearshore fixed gear fisheries in 2007 and in January through April 2008 is summarized in Table 1 by WCGOP port group. Although the WCGOP selects a random sample separately from each of the three nearshore sectors (Oregon Black/Blue rockfish, Oregon Black/Blue rockfish with nearshore endorsement and California nearshore), observer coverage is summarized jointly for all three sampling frames. Coverage rates in the nearshore fisheries were calculated as the proportion of nearshore species landings observed (Table 1). A list of nearshore species and nearshore catch category assignments is provided in Appendix B. California sheephead is the only nearshore species which is not included in the Pacific Coast Groundfish Fishery Management Plan.

Observer coverage in the nearshore fixed gear fisheries in 2007 relative to 2006 remained relatively constant on a coastwide basis at 7% (NMFS 2007). The distribution of coverage was higher in Oregon (9%), than in California (2%). Coverage rates ranged between port groups in 2007 from 16% to 0%, with the highest coverage rates in Astoria/Newport and Crescent City (a port group that includes Port Orford and Gold Beach, OR). Nearshore landings in Coos Bay, Eureka, or Santa Barbara in 2007 were not covered by the observer program.

Although nearshore fixed gear fisheries are the third highest priority for the WCGOP, observations in some port groups were limited due to the logistical difficulties of observing nearshore vessels whose small size limits observability. Low numbers of observations may lead to unbalanced sampling across ports or another important dimension of fishery participation, such as two-month period. Some areas or periods may have been more heavily covered than others, which may skew the analysis to the areas and periods of higher coverage. The WCGOP controls only the selection of permits for coverage. Fishing activity of selected vessels can vary in unpredictable ways. Therefore, the program cannot control the percentage of landings or the number of trips that are actually observed. As a result, coverage levels may vary from year to year depending on which permits were selected.

Spatial Distribution of Observations

The distribution of observed trips and sets among port groups provides perspective on where observer coverage was focused on the US west coast in the nearshore fixed gear fisheries. Overall, the port group of Crescent City, which includes the California port of Crescent City, as well as the Oregon ports of Brookings, Gold Beach, and Port Orford, had the largest number of observed trips, sets, and vessels, consistent with the largest total nearshore fishery landings. Coverage rates for Astoria/Newport remained at 16% from 2006 to 2007 while coverage rates in California increased in most port groups, resulting in an overall increase from 3% to 5% for the state. Most notably, observer coverage increased between 2006 and 2007 in San Francisco from 4% to 7%.

Although the random sampling design employed by the WCGOP is stratified by port group, commercial nearshore fishing permits in California and black rockfish trip limits in Oregon are tied to specific spatial zones. State spatial zoning and observer coverage are not necessarily consistent and thus, it would be inappropriate to base analyses of observer data within the context of nearshore management zones. However, catch composition and bycatch trends may vary spatially within each state.

Observed Total Catch, Discard Ratios, and Bycatch Ratios

The observed total catch weight (mt), discard weight (mt), and the percent discarded for all species are presented in Tables 2a-b by gear type and state, using combined calendar year 2007 and January through April 2008 data. Observed catch weights are proportionally consistent with the gear types used in this fishery, reflecting a larger majority of effort using longline gear, and lesser effort using pot gear. Observed coastwide total catch (discarded + retained) from hook-and-line gear was largely comprised of black rockfish, lingcod, blue rockfish, kelp greenling, and cabezon. California sheephead and cabezon were the largest components of observed catch from pot gear. Of the rebuilding species, canary rockfish, yelloweye rockfish, and widow rockfish were caught in Oregon with hook-and-line gear. In addition to these rebuilding species, bocaccio was also caught in California with this gear type. For protected species, a small amount of coho salmon was also caught with hook-and-line gear in Oregon. No rebuilding or protected species were observed in association with pot gear.

Tables 3a-c further present observed total catch weight (mt), discard weight (mt), and the percent discarded for all species by depth interval (0-10, 11-20, 21-50 fathoms) and state, using calendar year 2007 data only (Tables 3a-b) and January through April 2008 (Table 3c). These depth intervals were employed in order to be consistent with methodology used in annual estimation of fleet-wide discard. The major species caught in both Oregon and California were black rockfish, ling-

cod, cabezon and kelp greenling. In addition, California sheephead, gopher rockfish, and vermilion rockfish made up a large component of the observed catch in California. Catch weight was greatest in 11 to 20 fathoms, and this was also the depth strata associated with the largest amounts of rebuilding species catch in both states.

For non-rebuilding species, the decision to discard is dependent not only upon levels of cumulative retained catch and corresponding landing limits, but also upon the size, condition, and marketability of the catch. Lingcod constituted the largest component of observed discard coastwide. In Oregon, larger amounts of black rockfish, blue rockfish, cabezon, and kelp greenling were also discarded and more than 60% of blue rockfish caught in 11 to 20 fathoms was discarded, compared with approximately 40% in 0 to 10 and 21 to 50 fathoms. In California, California sheephead, cabezon, unspecified bass, and blue rockfish constituted the largest components of observed discard after lingcod. A larger percentage of these species was discarded in 11 to 20 fathoms.

Relative to 2006, observed catch of canary rockfish and yelloweye rockfish in Oregon decreased across all depth intervals except 11 to 20 fathoms, where catch of these species increased slightly. In California, catch increased for all rebuilding species in 2007 except widow rockfish. Increases, although slight, were most notable for canary rockfish in 20 to 50 fathoms. Observed catch of black rockfish and California sheephead was considerably larger in 2007 than in 2006. Larger catch weights of blue rockfish, lingcod, vermilion rockfish and gopher rockfish were also observed in 2007. It should be noted that observer data in previous reports was aggregated north and south of 40° 10' N. latitude rather than by state, and the numbers presented here cannot therefore be compared directly with those reported in 2006. However, the same trends described above are evident when data from previous years are re-analyzed using current methodology.

Table 4 presents discard ratios and standard errors for the 2007 nearshore fixed gear fisheries by depth interval and state. Discard ratios for non-rebuilding species have not previously been reported for nearshore fisheries, but are provided here in a manner consistent with subsequent estimation methods to calculate fleet-wide discard. As such, species are grouped for ratio calculations according to Appendix B and all discard ratios are computed using retained nearshore species weight in the denominator. Discard ratios varied between species in each of the three depth intervals, with the highest ratio occurring for lingcod in the 11 to 20 fathom depth interval in Oregon. The highest discard rate observed among rebuilding species was for canary rockfish in 21 to 50 fathoms in California, although the discard ratio for yelloweye rockfish was also relatively high in this area.

Table 5 provides bycatch ratios for the 2007 nearshore fixed gear fisheries by depth interval and state. Retained nearshore species weight was again used in the denominator for bycatch ratio calculations. Bycatch ratios were highest for species that make up the largest component of coast-wide catch, including black rockfish, cabezon, kelp greenling, and California sheephead. Similarly, bycatch ratios for blue rockfish were highest in depth intervals where this species was most commonly retained: in California between 11 to 20 fathoms and 21 to 50 fathoms. Relative to 2006, bycatch and discard ratios for canary rockfish in both Oregon and California decreased slightly in the two shallowest depth intervals but increased between 21 to 50 fathoms. The opposite trend occurred in Oregon for yelloweye rockfish, which had a slightly higher bycatch ratio in the two shallowest depth strata in 2007. In California, yelloweye rockfish had a higher bycatch ratio across all depths in 2007 compared with 2006.

Figure 1 presents bycatch ratios for rebuilding species over time in Oregon and California. The scale used to present bycatch ratios for widow rockfish and bocaccio cover a much smaller range of values than that for other species. In both states, bycatch ratios for most rebuilding species followed a gradually increasing trend over time. However, ratios for bocaccio in California and yelloweye rockfish in Oregon exhibited a considerable drop in 2005. Despite the apparent increase in bycatch of widow rockfish in California, rates for this species are still quite low relative to other rebuilding species. Furthermore, as demonstrated in Tables 4 and 5, bycatch ratios vary considerably across different depth strata. Figure 2 provides a graphical representation of bycatch ratios for canary and yelloweye rockfish in each depth interval. Bycatch of both species is consistently highest in 21 to 50 fathoms coastwide.

Biological Data Collection and Summary

WCGOP observers collect four major types of biological data from non-protected resources. These include lengths, sexes, otoliths for aging, and viabilities (Pacific halibut only). Biological data are collected from randomly selected individuals within a species composition sample and only from the discarded portion of the total catch. Biological data collected in the nearshore fixed gear fisheries for non-protected resources from September 2003 through April 2008 are summarized in Table 6.

The length frequency distributions of discarded rebuilding species from biological data are reported for the nearshore fixed gear fisheries in Figure 3. Figure 4 presents length frequency distributions of other discarded species.

For protected resources, including any species regulated under the Endangered Species Act (ESA), additional types of biological data are collected whenever possible. It is the policy of the WCGOP to collect lengths, photographs, and tissue samples from all green sturgeon observed, as well as sexes and fin ray samples from all dead individuals. For salmon, observers record length and sex for all individuals, as well as record weight, note presence or absence of an adipose fin, and collect scales and snouts for a subsample.

Table 7 summarizes the biological data for protected fish resources collected by observers in the nearshore fixed gear fisheries from September 2003 through April 2008. Observers sampled a total of 3 chinook salmon and 3 coho salmon across all years.

Summary

The bycatch and discard rates calculated from observer data collected aboard nearshore fixed gear vessels from January 2007 through April 2008 are now available for use in the management process. The observer data will be used in conjunction with additional commercial nearshore fishery data to inform current fishery management in projection modeling of bycatch. In addition, these discard rates will be used to estimate discard at the fleet-wide level to account for annual coast-wide mortality in these fisheries. The collected biological data will also be available for use by stock assessment authors.

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Figure 1: Bycatch ratios over time for rebuilding species observed in nearshore fixed-gear fisheries in Oregon (above) and California (below). Bycatch ratios were computed as the observed total catch of a rebuilding species divided by the weight of retained nearshore species.

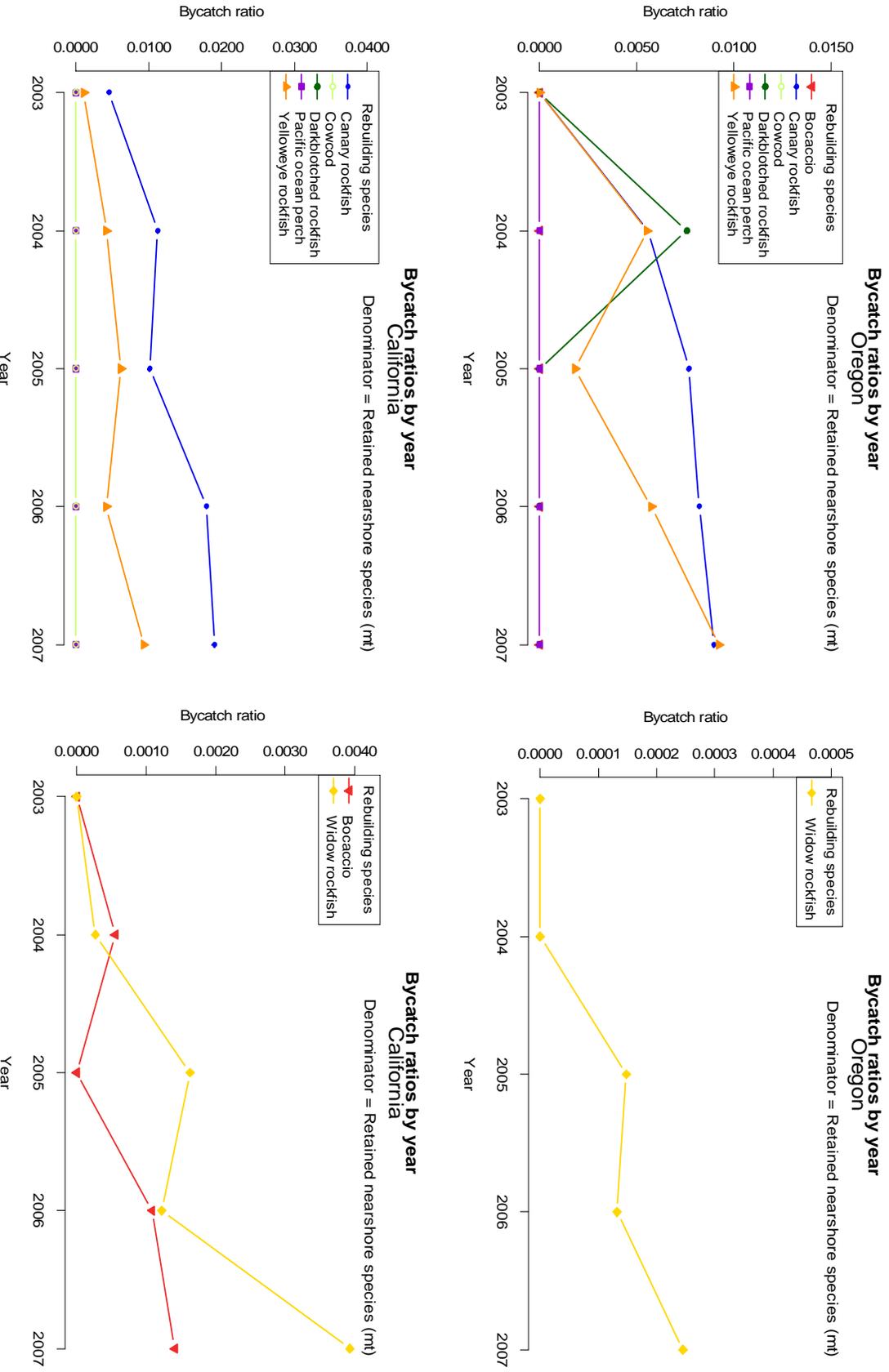


Figure 2: Bycatch ratios by depth interval in 2007 for canary rockfish (left) and yelloweye rockfish (right). Bycatch ratios were computed as the observed total catch of a rebuilding species divided by the weight of retained nearshore species.

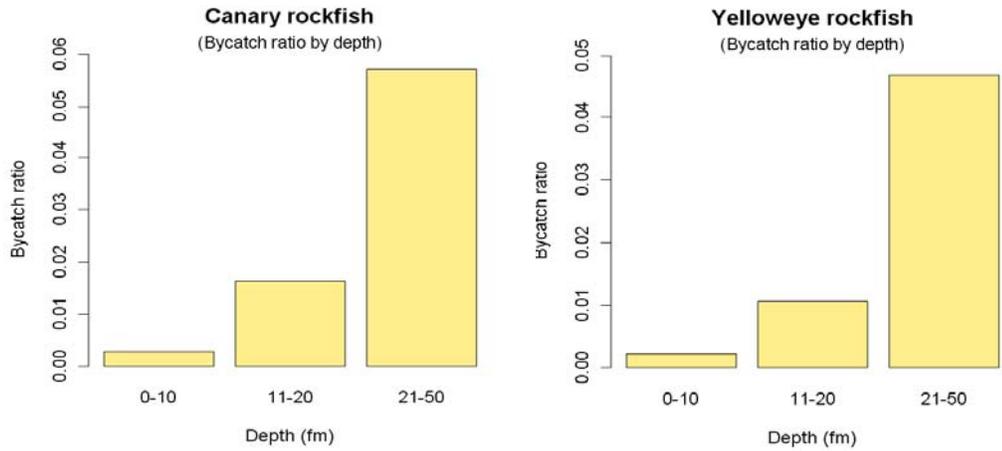


Figure 3: Length frequency distributions of discarded rebuilding species observed in nearshore fisheries from September 2003 - April 2008.

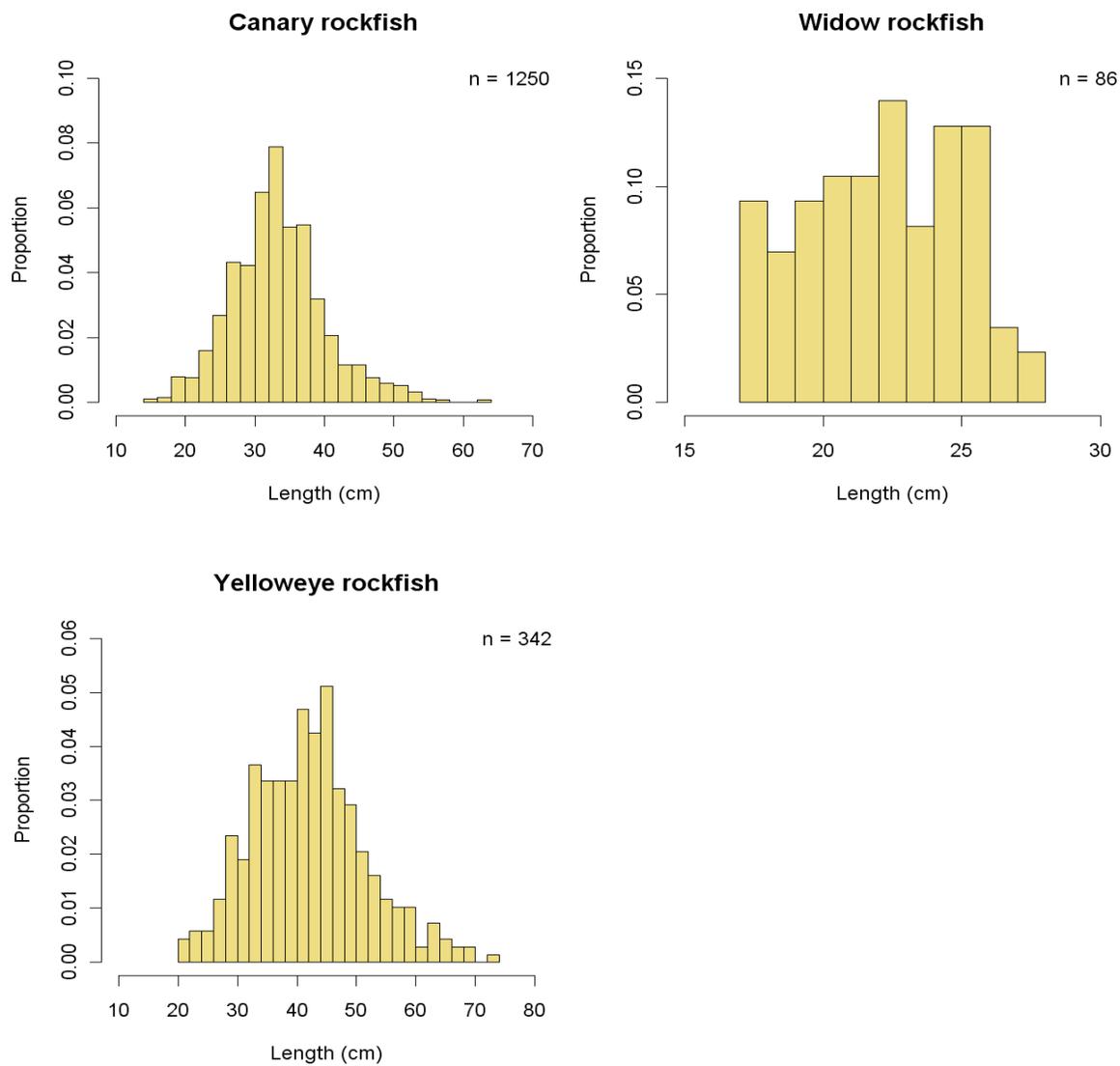


Figure 4: Length frequency distributions of discarded (non-rebuilding) species observed in nearshore fisheries from September 2003 - April 2008.

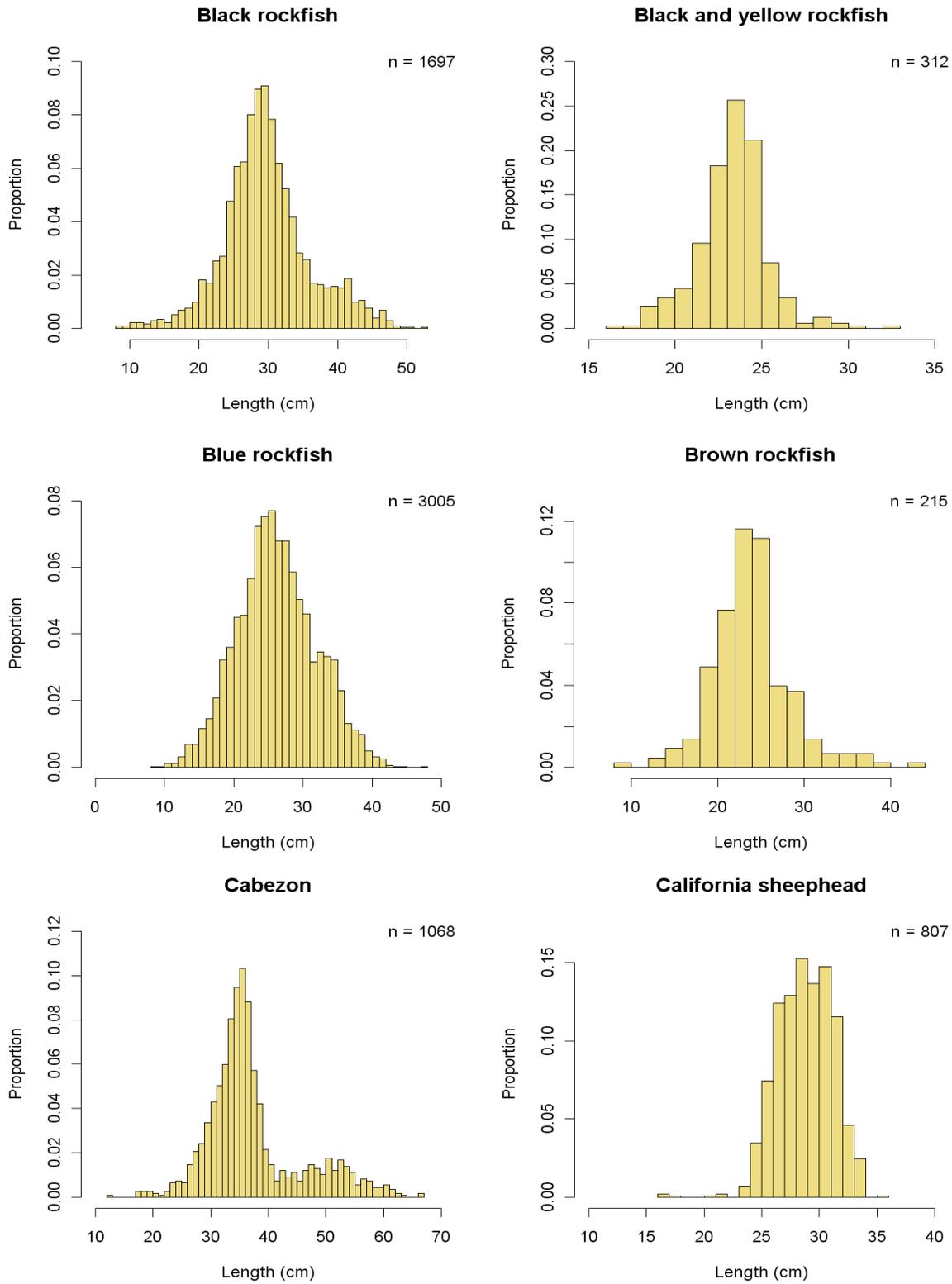


Figure 4 (cont.): Length frequency distributions of discarded (non-rebuilding) species observed in nearshore fisheries from September 2003 - April 2008.

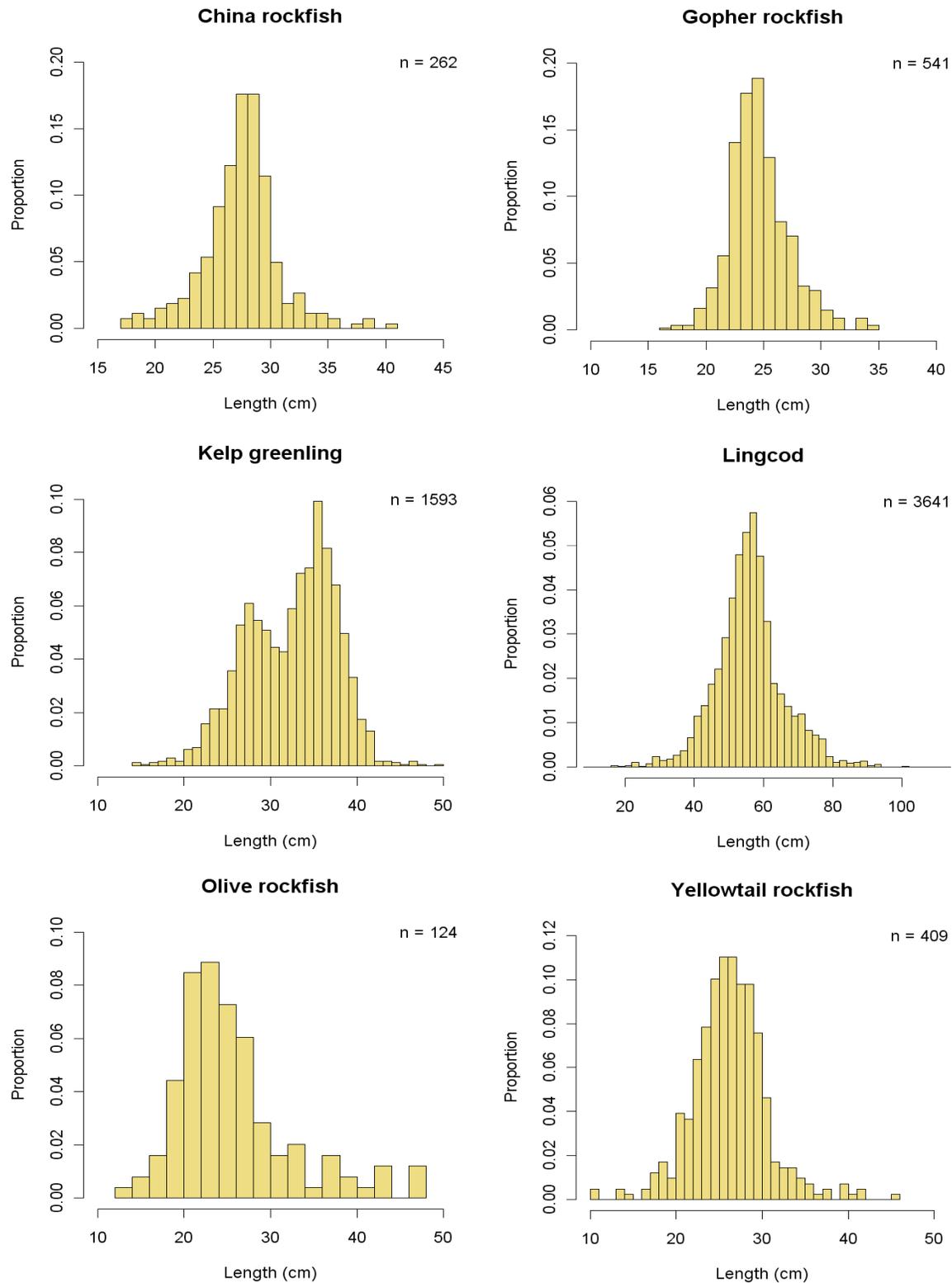


Table 1: Total trips, sets, vessels and nearshore species landings observed in the nearshore fishery in 2007 (above) and in January through April of 2008 (below). Coverage rates (far-right column) for each port group and state are computed as the proportion of total nearshore species landings that were observed. A list of designated nearshore species is provided in Appendix B. Data are combined as needed to ensure confidentiality.

	Port Group	Number of observed trips	Number of observed sets	Number of observed vessels	Observed nearshore species landings (mt)	Total nearshore species landings (mt)	% of nearshore species landings observed
2007	Bellingham	--	--	--	--	--	--
	Neah Bay	--	--	--	--	--	--
	Astoria	61	109	11	5.6	35.8	16%
	Newport						
	Coos Bay	--	--	--	--	2.8	0%
	Crescent City **	172	239	36	20.9	242.6	9%
	Eureka	--	--	--	--	10.7	0%
	Fort Bragg	4	5	3	0.1	18.9	1%
	San Francisco	29	78	10	0.8	11.8	7%
	Monterey	4	5	4	0.1	13.4	1%
	Morro Bay	27	42	10	1.1	69.9	2%
	Santa Barbara	--	--	--	--	14.9	0%
	Los Angeles	11	18	4	0.9	28.1	3%
	Hook-and-line gear	301	463	76	27.7	412.4	7%
	Pot gear	26	31	4	2.0	38.7	5%
Oregon	165	250	36	17.1	180.4	9%	
California	143	246	42	12.5	270.8	5%	
Coastwide	308	496	78	29.6	451.1	7%	
Jan - Apr 2008	Bellingham	--	--	--	--	--	--
	Neah Bay	--	--	--	--	--	--
	Astoria	11	14	6	1.2	3.6	34%
	Newport	--	--	--	--	0.7	0%
	Coos Bay						
	Crescent City **	48	59	15	5.4	65.5	8%
	Eureka	--	--	--	--	0.8	0%
	Fort Bragg	--	--	--	--	1.3	0%
	San Francisco	*	*	*	*	0.3	*
	Monterey	--	--	--	--	0.8	0%
	Morro Bay	--	--	--	--	7.8	0%
	Santa Barbara	--	--	--	--	2.9	0%
	Los Angeles	*	*	*	*	6.9	*
	Hook-and-line gear	58	72	21	6.5	81.1	8%
	Pot gear	*	*	*	*	9.5	*
Oregon	42	56	17	4.1	36.4	11%	
California	21	22	6	2.9	54.2	5%	
Coastwide	*	*	*	*	90.5	*	

* Not reported due to confidentiality.

** The Crescent City port group includes ports in both Oregon and California.

Note: Sets for which there was no gear type recorded were excluded when summarizing coverage by gear type.

Table 2a: Observed catch weight (mt), discard weight (mt) and percent discarded from nearshore vessels using hook-and-line gear from January 2007 through April 2008. Weights and percentages are reported separately by gear type, but combined across years to ensure adequate sample size. Rebuilding and protected species are presented alphabetically while other species are ranked by total catch coastwide.

	Hook-and-Line Gear			Pot Gear		
	Oregon			California		
	Total catch (mt)	Discard (mt)	Total % discarded	Total catch (mt)	Discard (mt)	Total % discarded
Rebuilding species						
Bocaccio *	--	--	--	0.019	0.000	0.0%
Canary rockfish	0.189	0.189	100.0%	0.300	0.300	100.0%
Cowcod *	--	--	--	--	--	--
Darkblotched rockfish *	--	--	--	--	--	--
Pacific ocean perch *	--	--	--	--	--	--
Widow rockfish	0.004	0.000	0.0%	0.049	0.018	36.4%
Yelloweye rockfish *	0.194	0.194	100.0%	0.117	0.117	100.0%
Non-rebuilding species						
Black-and-yellow rockfish	0.004	0.000	0.0%	0.101	0.009	8.8%
Black rockfish	13.041	0.463	3.6%	8.451	0.057	0.7%
Brown rockfish	0.001	0.000	0.0%	0.438	0.022	5.1%
Cabezon	2.333	0.078	3.3%	0.692	0.274	39.7%
California scorpionfish	--	--	--	--	--	--
Unspecified flatfish	--	--	--	0.005	0.000	0.0%
Gopher rockfish	0.003	0.000	0.0%	0.549	0.102	18.6%
Gross rockfish	0.005	0.000	0.0%	0.282	0.005	1.7%
Kelp greenling	1.821	0.116	6.4%	0.156	0.112	71.8%
Kelp rockfish	--	--	--	0.006	0.001	15.6%
Leopard shark	--	--	--	0.046	0.019	42.0%
Lingcod	4.223	2.467	58.4%	1.427	0.632	44.3%
Nearshore rockfish	2.263	0.451	19.9%	3.412	0.338	9.9%
Blue rockfish		0.403			0.309	
Calico rockfish		--			0.000	
China rockfish		0.033			0.019	
Copper rockfish		0.003			0.010	
Quillback rockfish		0.012			0.001	
Unspecified nearshore rockfish		0.000			0.000	

* Mislabeled or grouping of these species on non-distributed fish tickets may cause retained catch weights to be underestimated.

	Hook-and-Line Gear			Pot Gear		
	Oregon			Oregon & California		
	Total catch (mt)	Discard (mt)	Total % discarded	Total catch (mt)	Discard (mt)	Total % discarded
Non-rebuilding species (cont.)						
Olive rockfish	0.005	0.003	55.7%	0.100	0.010	9.9%
Other unspecified rockfish	--	--	--	0.005	0.000	0.0%
Petrale sole	--	--	--	0.006	0.001	13.4%
Rock sole	0.001	0.001	100.0%	0.001	0.001	100.0%
Rosy rockfish	--	--	--	0.013	0.001	8.9%
Sand sole	0.000	0.000	100.0%	0.004	0.003	77.5%
Shelf rockfish	0.369	0.005	1.3%	0.710	0.005	0.7%
Flag rockfish	--	--	--	0.000	0.000	--
Greenblotched rockfish	--	--	--	0.000	0.000	--
Greenspotted rockfish	--	--	--	0.000	0.000	--
Honeycomb rockfish	--	--	--	0.000	0.000	--
Rosehorn rockfish	--	--	--	0.000	0.000	--
Starry rockfish	--	--	--	0.000	0.000	--
Tiger Rockfish	0.000	0.000	--	0.000	0.000	--
Unspecified shelf rockfish	--	--	--	0.000	0.000	--
Vermilion rockfish	0.004	0.004	2.6%	0.005	0.005	0.000
Skates	0.052	0.001	2.6%	0.002	0.002	100.0%
Longnose skate	0.001	0.001	--	--	--	--
Thornback skate	--	--	--	0.002	0.002	--
Unspecified skate	0.000	0.000	--	--	--	--
Unspecified slope rockfish	--	--	--	0.017	0.000	0.0%
Spiny dogfish	0.007	0.000	0.0%	0.068	0.068	100.0%
Spotted ratfish	0.004	0.004	100.0%	0.000	0.000	100.0%
Starry flounder	--	--	--	0.002	0.000	0.0%
Treefish	--	--	--	0.040	0.007	17.5%
Yellowtail rockfish	0.231	0.020	8.7%	0.159	0.016	9.9%
Non-groundfish species						
Barred sand bass	--	--	--	--	--	--
Bat ray	--	--	--	0.038	0.038	100.0%
Bivalves (unidentified)	0.001	0.001	100.0%	--	--	--
Black surfperch	--	--	--	--	--	--
Brown smoothhound shark	--	--	--	0.004	0.001	14.7%
Buffalo sculpin	0.002	0.001	61.9%	--	--	--

Non-groundfish species (cont.)	Oregon			California			Oregon & California		
	Total catch (mt)	Discard (mt)	Total % discarded	Total catch (mt)	Discard (mt)	Total % discarded	Total catch (mt)	Discard (mt)	Total % discarded
Bull sculpin	0.002	0.002	100.0%	--	--	--	--	--	--
California moray	--	--	--	--	--	--	0.002	0.002	100.0%
California sheephead	--	--	--	0.005	0.000	0.0%	1.704	0.540	31.7%
California spiny lobster	--	--	--	--	--	--	0.052	0.000	0.0%
Crab (unidentified)	--	--	--	0.001	0.001	100.0%	--	--	--
Croaker (unidentified)	--	--	--	0.001	0.000	0.0%	--	--	--
Decorator/spider crab (unidentified)	0.001	0.001	100.0%	--	--	--	0.005	0.005	100.0%
Dungeness crab	--	--	--	0.011	0.001	6.9%	0.015	0.015	100.0%
Finescale triggerfish	--	--	--	--	--	--	0.001	0.001	100.0%
Garibaldi	--	--	--	--	--	--	0.012	0.012	100.0%
Jellyfish (unidentified)	0.002	0.002	100.0%	--	--	--	--	--	--
Kelp bass	--	--	--	--	--	--	0.430	0.430	100.0%
Mackerel (unidentified)	0.001	0.001	100.0%	0.000	0.000	0.0%	--	--	--
Ocean whitefish	--	--	--	0.002	0.000	0.0%	0.025	0.011	45.4%
Octopus (unidentified)	0.012	0.000	0.0%	0.015	0.000	0.4%	0.283	0.001	0.5%
Other unidentified nongroundfish	--	--	--	0.001	0.000	0.0%	0.011	0.000	0.0%
Pacific halibut	0.008	0.008	100.0%	--	--	--	--	--	--
Pacific mackerel	0.005	0.005	87.2%	0.003	0.002	83.3%	--	--	--
Pacific rock crab	--	--	--	0.005	0.005	100.0%	0.051	0.051	100.0%
Pacific sardine	0.001	0.001	100.0%	--	--	--	--	--	--
Rainbow surfperch	--	--	--	--	--	--	0.003	0.003	100.0%
Red Irish lord sculpin	0.013	0.011	85.9%	--	--	--	0.001	0.001	100.0%
Red rock crab	--	--	--	0.040	0.021	53.9%	0.088	0.002	1.8%
Rubberlip surfperch	--	--	--	--	--	--	0.003	0.003	100.0%
Sculpin (unidentified)	0.015	0.013	89.4%	0.004	0.003	81.0%	--	--	--
Sea cucumber (unidentified)	0.013	0.013	100.0%	0.006	0.006	100.0%	--	--	--
Sevengill Shark	--	--	--	0.002	0.000	0.0%	--	--	--
Striped Surfperch	0.001	0.001	100.0%	--	--	--	0.000	0.000	100.0%
Surfperch Undid	--	--	--	--	--	--	0.000	0.000	100.0%
Swell Shark	--	--	--	0.010	0.010	100.0%	--	--	--
Unspecified Crab	--	--	--	0.006	0.000	0.0%	0.044	0.000	0.0%
Unspecified Mollusks	--	--	--	0.080	0.000	0.0%	0.690	0.000	0.0%
White Croaker	--	--	--	0.001	0.000	31.0%	--	--	--
Wolf-eel	0.031	0.024	78.8%	--	--	--	--	--	--

Table 3a: Observed catch weight (mt), discard weight (mt) and percent discarded from observed Oregon nearshore vessels in 2007 by depth.

Oregon	2007 (all gears)				Depth intervals							
	0 - 10 fm				11 - 20 fm				21 - 50 fm			
	Total catch (mt)	Discard (mt)	Total % discarded		Total catch (mt)	Discard (mt)	Total % discarded		Total catch (mt)	Discard (mt)	Total % discarded	
Rebuilding species												
Bocaccio *	--	--	--	--	--	--	--	--	--	--	--	--
Canary rockfish	0.027	0.027	100.0%		0.109	0.109	100.0%		0.017	0.017	100.0%	
Cowcod *	--	--	--		--	--	--		--	--	--	
Darkblotched rockfish *	--	--	--		--	--	--		--	--	--	
Pacific ocean perch *	--	--	--		--	--	--		--	--	--	
Widow rockfish	--	--	--		0.001	0.000	0.0%		0.003	0.000	0.0%	
Yelloweye rockfish *	0.019	0.019	100.0%		0.128	0.128	100.0%		0.011	0.011	100.0%	
Non-rebuilding species												
Black-and-yellow rockfish	--	--	--		0.002	0.000	0.0%		--	--	--	
Black rockfish	4.336	0.170	3.9%		5.770	0.184	3.2%		0.210	0.012	5.5%	
Cabezon	0.327	0.023	7.0%		2.063	0.086	4.2%		0.103	0.000	0.0%	
Gopher rockfish	--	--	--		0.001	0.000	0.0%		0.001	0.000	0.0%	
Grass rockfish	0.004	0.000	0.0%		0.001	0.000	0.0%		--	--	--	
Kelp greenling	0.639	0.065	10.1%		0.621	0.031	5.0%		0.009	0.000	0.0%	
Lingcod	0.901	0.351	39.0%		2.113	0.842	39.8%		0.106	0.007	6.9%	
Nearshore rockfish	0.480	0.088	18.4%		1.460	0.284	19.5%		0.106	0.004	3.3%	
Blue rockfish		0.081				0.264				0.003		
China rockfish		0.004				0.013				0.000		
Copper rockfish		0.002				0.000				0.000		
Quillback rockfish		0.001				0.007				0.000		
Unspecified nearshore rockfish		0.000				0.000				0.000		
Olive rockfish	0.003	0.001	30.8%		0.002	0.002	100.0%		--	--	--	
Rock sole	--	--	--		0.001	0.001	100.0%		--	--	--	
Sheff rockfish	0.024	0.004	17.2%		0.231	0.000	0.2%		0.008	0.000	0.0%	
Tiger rockfish		--				0.000				--		
Vermillion rockfish		0.004				0.000				0.000		

* Mislabeled or grouping of these species on non-distributed fish tickets may cause retained catch weights to be underestimated.

Oregon 2007 (all gears)	0 - 10 fm			11 - 20 fm			21 - 50 fm		
	Total catch (mt)	Discard (mt)	Total % discarded	Total catch (mt)	Discard (mt)	Total % discarded	Total catch (mt)	Discard (mt)	Total % discarded
Non-rebuilding species (cont.)									
Skates									
Longnose skate	0.001	0.000	0.0%	0.019	0.001	7.1%	--	--	--
Unspecified skate	--	0.000	--	0.001	0.001	0.0%	--	--	--
Spiny dogfish	--	--	--	0.007	0.000	0.0%	--	--	--
Spotted ratfish	--	--	--	0.004	0.004	100.0%	--	--	--
Yellowtail rockfish	0.007	0.002	36.5%	0.038	0.012	30.7%	0.089	0.001	1.0%
Non-groundfish species									
Bivalves (unidentified)	--	--	--	0.001	0.001	100.0%	--	--	--
Buffalo sculpin	--	--	--	0.002	0.001	61.9%	--	--	--
Bull sculpin	0.002	0.002	100.0%	--	--	--	--	--	--
Decorator/spider crab (unidentified)	--	--	--	0.001	0.001	100.0%	--	--	--
Dungeness crab	--	--	--	0.015	0.015	100.0%	--	--	--
Hermit crab (unidentified)	--	--	--	0.000	0.000	100.0%	--	--	--
Jellyfish (unidentified)	--	--	--	0.002	0.002	100.0%	--	--	--
Mackerel (unidentified)	--	--	--	0.001	0.001	100.0%	--	--	--
Octopus (unidentified)	--	--	--	0.293	0.000	0.0%	--	--	--
Pacific halibut	--	--	--	0.008	0.008	100.0%	--	--	--
Pacific mackerel	--	--	--	0.005	0.005	87.2%	--	--	--
Pacific sardine	--	--	--	0.001	0.001	100.0%	--	--	--
Red Irish lord sculpin	0.005	0.004	84.9%	0.005	0.004	77.7%	--	--	--
Sculpin (unidentified)	0.001	0.001	49.2%	0.002	0.002	100.0%	0.000	0.000	100.0%
Sea cucumber (unidentified)	0.001	0.001	100.0%	0.011	0.011	100.0%	--	--	--
Wolf-eel	0.005	0.005	100.0%	0.018	0.015	82.5%	0.004	0.004	100.0%

Table 3b: Observed catch weight (mt), discard weight (mt) and percent discarded from observed California nearshore vessels in 2007 by depth.

California	0 - 10 fm				Depth intervals				21 - 50 fm				
	Total catch		Discard		Total catch		Discard		Total catch		Discard		
	(mt)	(mt)	(mt)	(mt)	(mt)	(mt)	(mt)	(mt)	(mt)	(mt)	(mt)	(mt)	
Rebuilding species													
Bocaccio *	--	--	--	--	0.001	0.000	0.000	0.000	0.018	0.000	0.000	0.000	0.0%
Canary rockfish	0.004	0.004	0.004	100.0%	0.166	0.166	100.0%	0.068	0.068	100.0%	0.068	100.0%	100.0%
Cowcod *	--	--	--	--	--	--	--	--	--	--	--	--	--
Darkblotched rockfish *	--	--	--	--	--	--	--	--	--	--	--	--	--
Pacific ocean perch *	--	--	--	--	--	--	--	--	--	--	--	--	--
Widow rockfish	--	--	--	--	0.046	0.015	33.5%	0.003	0.003	0.002	0.002	78.1%	78.1%
Yelloweye rockfish *	0.006	0.006	0.006	100.0%	0.052	0.052	100.0%	0.059	0.059	0.059	0.059	100.0%	100.0%
Non-rebuilding species													
Black-and-yellow rockfish	0.091	0.008	0.008	9.3%	0.020	0.001	2.5%	--	--	--	--	--	--
Black rockfish	2.701	0.025	0.025	0.9%	3.415	0.028	0.8%	0.286	0.000	0.000	0.000	0.0%	0.0%
Brown rockfish	0.156	0.008	0.008	5.4%	0.250	0.013	5.1%	0.032	0.006	0.006	0.006	17.9%	17.9%
Cabezon	0.586	0.192	0.192	32.8%	0.220	0.111	50.3%	0.037	0.017	0.017	0.017	47.2%	47.2%
California scorpionfish	0.001	0.001	0.001	100.0%	--	--	--	--	--	--	--	--	--
Unspecified flatfish	--	--	--	--	--	--	--	--	0.005	0.000	0.000	0.0%	0.0%
Gopher rockfish	0.369	0.053	0.053	14.4%	0.182	0.051	28.2%	0.006	0.006	0.003	0.003	48.1%	48.1%
Grass rockfish	0.256	0.006	0.006	2.2%	0.033	0.000	0.0%	--	--	--	--	--	--
Kelp greenling	0.079	0.055	0.055	70.1%	0.058	0.045	77.5%	0.010	0.010	0.010	0.010	100.0%	100.0%
Kelp rockfish	0.006	0.002	0.002	26.3%	0.000	0.000	0.0%	--	--	--	--	--	--
Leopard shark	0.009	0.009	0.009	100.0%	0.037	0.010	27.8%	--	--	--	--	--	--
Lingcod	0.482	0.177	0.177	36.8%	0.770	0.350	45.4%	0.129	0.044	0.044	0.044	33.8%	33.8%
Nearshore rockfish	0.387	0.069	0.069	17.9%	1.888	0.179	9.5%	0.552	0.026	0.026	0.026	4.8%	4.8%
Blue rockfish		0.059				0.166				0.020			
Calico rockfish		--				0.000				--			
China rockfish		0.005				0.008				0.004			
Copper rockfish		0.005				0.005				0.002			
Quillback rockfish		0.000				0.000				0.001			
Unspecified nearshore rockfish		0.000				0.000				0.000			

* Mislabeing or grouping of these species on non-distributed fish tickets may cause retained catch weights to be underestimated.

California 2007 (all gears)	0 - 10 fm			Depth intervals 11 - 20 fm			21 - 50 fm		
	Total catch (mt)	Discard (mt)	Total % discarded	Total catch (mt)	Discard (mt)	Total % discarded	Total catch (mt)	Discard (mt)	Total % discarded
Non-rebuilding species (cont.)									
Olive rockfish	0.016	0.000	2.2%	0.056	0.006	10.9%	0.029	0.004	12.3%
Other unspecified rockfish	--	--	--	0.005	0.000	0.0%	--	--	--
Petrale sole	--	--	--	--	--	--	0.006	0.001	13.4%
Rock sole	--	--	--	0.001	0.001	100.0%	--	--	--
Rosy rockfish	--	--	--	0.001	0.001	54.5%	0.012	0.000	3.2%
Sand sole	0.001	0.000	0.0%	0.003	0.003	100.0%	--	--	--
Shelf rockfish	0.090	0.000	0.3%	0.315	0.004	1.3%	0.255	0.000	0.1%
Flag rockfish	--	--	--	--	--	--	--	0.000	--
Greenblotched rockfish	--	--	--	--	--	--	--	0.000	--
Greenspotted rockfish	--	--	--	--	--	--	--	0.000	--
Honeycomb rockfish	--	--	--	--	--	--	--	0.000	--
Rosehorn rockfish	--	--	--	--	0.000	--	--	0.000	--
Starry rockfish	--	0.000	--	--	0.000	--	--	0.000	--
Tiger rockfish	--	--	--	--	0.000	--	--	0.000	--
Unspecified shelf rockfish	--	0.000	--	--	0.000	--	--	0.000	--
Vermilion rockfish	--	0.000	--	--	0.004	--	--	0.000	--
Thornback Skate	0.002	0.002	100.0%	--	--	--	--	--	--
Unspecified slope rockfish	--	--	--	0.001	0.000	0.0%	0.017	0.000	0.0%
Spiny dogfish	0.026	0.026	100.0%	0.039	0.039	100.0%	0.003	0.003	100.0%
Spotted rattfish	--	--	--	0.000	0.000	100.0%	--	--	--
Squarespot rockfish	--	--	--	--	--	--	0.000	0.000	0.0%
Starry flounder	--	--	--	--	--	--	0.002	0.000	0.0%
Treefish	0.024	0.010	41.8%	0.019	0.000	1.9%	--	--	--
Yellowtail rockfish	0.004	0.001	36.3%	0.101	0.009	8.8%	0.044	0.001	2.6%
Non-groundfish species									
Barred sand bass	0.017	0.017	100.0%	0.013	0.013	100.0%	--	--	--
Bat ray	0.032	0.032	100.0%	0.006	0.006	100.0%	--	--	--
Black surfperch	0.073	0.073	100.0%	0.022	0.022	100.0%	--	--	--
Brown smoothhound shark	--	--	--	0.004	0.001	14.7%	--	--	--
California sheephead	1.045	0.322	30.9%	0.283	0.115	40.8%	--	--	--

California	0 - 10 fm				Depth intervals				21 - 50 fm			
	Total catch (mt)	Discard (mt)	Total % discarded		Total catch (mt)	Discard (mt)	Total % discarded		Total catch (mt)	Discard (mt)	Total % discarded	
Non-groundfish species (cont.)												
Crab (unidentified)	--	--	--		--	--	--		0.001	0.001	100.0%	
Croaker (unidentified)	--	--	--		0.001	0.000	0.0%		--	--	--	
Decorator/spider crab (unidentified)	0.004	0.004	100.0%		--	--			--	--	--	
Dungeness crab	--	--	--		0.011	0.001	6.9%		--	--	--	
Finescale triggerfish	0.001	0.001	100.0%		--	--			--	--	--	
Garibaldi	0.012	0.012	100.0%		--	--			--	--	--	
Kelp bass	0.223	0.223	100.0%		0.038	0.038	100.0%		--	--	--	
Ocean whiterfish	0.007	0.001	18.8%		0.008	0.005	54.1%		0.002	0.000	0.0%	
Octopus (unidentified)	0.001	0.000	11.5%		0.015	0.000	0.0%		--	--	--	
Other unidentified nongroundfish	0.007	0.000	0.0%		0.004	0.000	0.0%		0.001	0.000	0.0%	
Pacific mackerel	--	--	--		0.000	0.000	0.0%		0.002	0.002	100.0%	
Pacific rock crab	0.056	0.056	100.0%		0.000	0.000	100.0%		--	--	--	
Rainbow surfperch	0.002	0.002	100.0%		--	--			--	--	--	
Red rock crab	0.027	0.022	81.8%		0.082	0.000	0.6%		0.018	0.000	0.6%	
Rubberlip surfperch	0.002	0.002	100.0%		0.001	0.001	100.0%		--	--	--	
Sculpin (unidentified)	0.002	0.002	78.3%		0.001	0.001	80.4%		0.000	0.000	100.0%	
Sea cucumber (unidentified)	0.000	0.000	100.0%		0.005	0.005	100.0%		0.001	0.001	100.0%	
Sevengill shark	--	--	--		0.002	0.000	0.0%		--	--	--	
Swell shark	0.010	0.010	100.0%		--	--			--	--	--	
Unspecified crab	0.019	0.000	0.0%		0.025	0.000	0.0%		0.006	0.000	0.0%	
Unspecified mollusks	0.001	0.000	0.0%		0.356	0.000	0.0%		0.080	0.000	0.0%	
White croaker	0.001	0.000	20.0%		0.000	0.000	100.0%		--	--	--	

Table 3c: Observed catch weight (mt), discard weight (mt) and percent discarded from observed nearshore vessels in January through April of 2008. Data are reported coastwide to ensure adequate sample size and ensure confidentiality.

Oregon & California	Depth intervals								
	0 - 10 fm			11 - 20 fm			21 - 50 fm		
Jan - Apr 2008 (all gears)	Total catch (mt)	Discard (mt)	Total % discarded	Total catch (mt)	Discard (mt)	Total % discarded	Total catch (mt)	Discard (mt)	Total % discarded
Rebuilding species									
Bocaccio *	--	--	--	--	--	--	--	--	--
Canary rockfish	0.012	0.012	100.0%	0.083	0.083	100.0%	0.002	0.002	100.0%
Cowcod *	--	--	--	--	--	--	--	--	--
Darkblotched rockfish *	--	--	--	--	--	--	--	--	--
Pacific ocean perch *	--	--	--	--	--	--	--	--	--
Widow rockfish	--	--	--	--	--	--	--	--	--
Yelloweye rockfish *	0.004	0.004	100.0%	0.032	0.032	100.0%	--	--	--
Non-rebuilding species									
Black-and-yellow rockfish	0.002	0.000	10.5%	0.000	0.000	0.0%	--	--	--
Black rockfish	1.352	0.063	4.7%	3.410	0.037	1.1%	0.016	0.001	7.9%
Brown rockfish	0.001	0.000	0.0%	0.004	0.000	0.0%	--	--	--
Cabezon	0.377	0.015	4.0%	0.227	0.013	5.6%	0.133	0.001	0.8%
California scorpionfish	0.001	0.000	0.0%	0.000	0.000	0.0%	--	--	--
Gopher rockfish	0.006	0.000	4.0%	0.000	0.000	0.0%	--	--	--
Kelp greenling	0.425	0.023	5.5%	0.162	0.011	7.0%	0.004	0.000	0.0%
Lingcod	0.614	0.614	100.0%	0.739	0.739	100.0%	0.016	0.016	100.0%
Nearshore rockfish	0.169	0.028	16.5%	0.677	0.113	16.7%	0.004	0.001	25.0%
Blue rockfish		0.015			0.104			0.001	
China rockfish		0.013			0.006			--	
Copper rockfish		0.000			0.001			--	
Quillback rockfish		0.000			0.003			0.000	
Shelf rockfish	0.040	0.000	0.0%	0.117	0.000	0.0%	--	--	--
Tiger Rockfish		--			0.000			--	
Vermillion Rockfish		0.000			0.000			--	

* Mislabeling or grouping of these species on non-distributed fish tickets may cause retained catch weights to be underestimated.

Oregon & California Jan - Apr 2008 (all gears)	Depth intervals								
	0 - 10 fm			11 - 20 fm			21 - 50 fm		
	Total catch (mt)	Discard (mt)	Total % discarded	Total catch (mt)	Discard (mt)	Total % discarded	Total catch (mt)	Discard (mt)	Total % discarded
Non-rebuilding species (cont.)									
Skates	--	--	--	0.032	0.000	0.0%	--	--	--
Longnose Skate		--			0.000			--	
Unspecified skate		--			0.000			--	
Treefish	0.000	0.000	0.0%	0.000	0.000	0.0%	--	--	--
Yellowtail rockfish	0.003	0.001	49.6%	0.015	0.006	37.9%	0.090	0.003	2.8%
Non-groundfish species									
Barred sand bass	--	--	--	0.004	0.004	100.0%	--	--	--
Black surfperch	0.055	0.055	100.0%	0.028	0.028	100.0%	--	--	--
Blacksmith	0.000	0.000	100.0%	--	--	--	--	--	--
California moray	--	--	--	0.002	0.002	100.0%	--	--	--
California sheephead	0.204	0.054	26.4%	0.177	0.049	27.5%	--	--	--
California spiny lobster	--	--	--	0.052	0.000	0.0%	--	--	--
Kelp bass	0.083	0.083	100.0%	0.086	0.086	100.0%	--	--	--
Ocean whitefish	0.005	0.005	100.0%	0.005	0.001	11.1%	--	--	--
Octopus (unidentified)	0.001	0.001	100.0%	--	--	--	--	--	--
Rainbow surfperch	0.000	0.000	100.0%	0.001	0.001	100.0%	--	--	--
Red Irish lord sculpin	0.004	0.004	100.0%	--	--	--	--	--	--
Sculpin (unidentified)	0.010	0.010	100.0%	0.001	0.000	33.3%	--	--	--
Sea cucumber (unidentified)	0.001	0.001	100.0%	0.001	0.001	100.0%	--	--	--
Striped surfperch	0.001	0.001	100.0%	--	--	--	--	--	--
Unspecified mollusks	0.096	0.000	0.0%	0.237	0.000	0.0%	--	--	--
Wolf-eel	0.003	0.000	0.0%	--	--	--	--	--	--

Table 4: Discard ratios and standard errors from observed nearshore vessels in Oregon (above) and California (below) in 2007. Ratios are computed as the observed discarded weight divided by the weight of retained nearshore species for all gears.

2007 (all gears)	Depth intervals					
	0 - 10 fm		11 - 20 fm		21 - 50 fm	
	Discard ratio	SE	Discard ratio	SE	Discard ratio	SE
Oregon						
Rebuilding species						
Bocaccio	NA	NA	NA	NA	NA	NA
Canary rockfish	0.0047	0.0436	0.0110	0.0620	0.0371	0.7389
Cowcod	NA	NA	NA	NA	NA	NA
Darkblotched rockfish	NA	NA	NA	NA	NA	NA
Pacific ocean perch	NA	NA	NA	NA	NA	NA
Widow rockfish	NA	NA	0.0000	NA	0.0000	NA
Yelloweye rockfish	0.0033	0.0993	0.0129	0.1743	0.0239	0.1564
Other species						
Black rockfish	0.0297	0.0243	0.0186	0.0269	0.0254	0.1256
Blue rockfish	0.0141	0.0409	0.0266	0.0852	0.0067	0.0484
Cabazon	0.0040	0.0127	0.0087	0.0145	0.0000	NA
Dungeness crab	NA	NA	0.0015	0.0900	NA	NA
Kelp greenling	0.0113	0.0249	0.0031	0.0062	0.0000	NA
Lingcod	0.0613	0.0891	0.0848	0.1148	0.0162	0.0493
Longnose skate	NA	NA	0.0001	0.0740	NA	NA
Minor shelf rockfish	0.0007	0.0443	0.0000	0.0012	0.0000	NA
Other flatfish	NA	NA	0.0001	0.0215	NA	NA
Other groundfish	NA	NA	0.0004	0.0203	NA	NA
Other minor nearshore rockfish	0.0015	0.0034	0.0022	0.0024	0.0010	0.0033
Other nongroundfish	0.0023	0.0333	0.0045	0.0269	0.0097	0.2274
Pacific halibut	NA	NA	0.0008	NA	NA	NA
Spiny dogfish	NA	NA	0.0000	NA	NA	NA
Unspecified skate	0.0000	NA	0.0000	NA	NA	NA
Yellowtail rockfish	0.0004	0.0102	0.0012	0.0094	0.0020	0.0244
California						
Rebuilding species						
Bocaccio	NA	NA	NA	NA	0.0000	NA
Canary rockfish	0.0008	0.1377	0.0272	0.1421	0.0785	0.4162
Cowcod	NA	NA	NA	NA	NA	NA
Darkblotched rockfish	NA	NA	NA	NA	NA	NA
Pacific ocean perch	NA	NA	NA	NA	NA	NA
Widow rockfish	NA	NA	0.0025	0.0652	0.0028	0.2204
Yelloweye rockfish	0.0011	NA	0.0086	0.1365	0.0678	0.9776
Other species						
Black rockfish	0.0049	0.0235	0.0045	0.0197	0.0000	NA
Blue rockfish	0.0114	0.0534	0.0271	0.0602	0.0232	0.0980
Cabazon	0.0373	0.0666	0.0181	0.1752	0.0201	0.7259
California sheephead	0.0625	1.0410	0.0189	2.8917	NA	NA
Deeper nearshore rockfish	0.0047	0.0166	0.0039	0.0053	0.0137	0.0234
Dungeness crab	NA	NA	0.0001	0.0323	NA	NA
Kelp greenling	0.0107	0.0491	0.0074	0.0483	0.0114	0.2176
Lingcod	0.0343	0.0921	0.0572	0.1090	0.0504	0.3915
Minor shelf rockfish	0.0000	0.0017	0.0008	0.0054	0.0007	0.0013
Minor slope rockfish	NA	NA	0.0000	NA	0.0000	NA
Other flatfish	0.0000	0.0042	0.0006	0.0186	0.0000	NA
Other groundfish	0.0018	NA	0.0018	0.0774	NA	NA
Other nongroundfish	0.0888	0.2004	0.0152	0.1022	0.0058	0.0383
Petrale sole	NA	NA	NA	NA	0.0009	0.0390
Shallow nearshore rockfish	0.0145	0.0175	0.0098	0.0227	0.0077	0.0417
Spiny dogfish	0.0050	0.1424	0.0064	0.2402	0.0036	0.1069
Unspecified skate	0.0004	NA	NA	NA	NA	NA
Yellowtail rockfish	0.0003	0.0467	0.0015	0.0139	0.0013	0.0298

Table 5: Bycatch ratios and standard errors from observed nearshore vessels in Oregon (above) and California (below) in 2007. Ratios are computed as the observed total catch weight divided by the weight of retained nearshore species for all gears.

2007 (all gears)	Depth intervals					
	0 - 10 fm		11 - 20 fm		21 - 50 fm	
	Bycatch ratio	SE	Bycatch ratio	SE	Bycatch ratio	SE
Oregon						
Rebuilding species						
Bocaccio	NA	NA	NA	NA	NA	NA
Canary rockfish	0.0047	0.0436	0.0110	0.0620	0.0371	0.7389
Cowcod	NA	NA	NA	NA	NA	NA
Darkblotched rockfish	NA	NA	NA	NA	NA	NA
Pacific ocean perch	NA	NA	NA	NA	NA	NA
Widow rockfish	NA	NA	0.0001	NA	0.0070	NA
Yelloweye rockfish	0.0033	0.0993	0.0129	0.1743	0.0239	0.1564
Other species						
Black rockfish	0.7573	0.5169	0.5815	0.4798	0.4616	1.5156
Blue rockfish	0.0357	0.0779	0.0442	0.0996	0.0154	0.0572
Cabazon	0.0571	0.1671	0.2079	0.3075	0.2266	2.2463
Dungeness crab	NA	NA	0.0015	0.0900	NA	NA
Kelp greenling	0.1116	0.1358	0.0626	0.0946	0.0195	0.2031
Lingcod	0.1573	0.1595	0.2129	0.1663	0.2331	1.1870
Longnose skate	NA	NA	0.0011	0.4512	NA	NA
Minor shelf rockfish	0.0043	0.0520	0.0233	0.1101	0.0172	NA
Other flatfish	NA	NA	0.0002	0.0178	NA	NA
Other groundfish	NA	NA	0.0004	0.0203	NA	NA
Other minor nearshore rockfish	0.0494	0.0511	0.1035	0.0614	0.2197	0.3623
Other nongroundfish	0.0025	0.0310	0.0346	0.1955	0.0097	0.2274
Pacific halibut	NA	NA	0.0008	NA	NA	NA
Spiny dogfish	NA	NA	0.0007	NA	NA	NA
Unspecified skate	0.0002	NA	0.0008	NA	NA	NA
Yellowtail rockfish	0.0012	0.0209	0.0038	0.0204	0.1945	1.4729
California						
Rebuilding species						
Bocaccio	NA	NA	NA	NA	0.0204	0.3942
Canary rockfish	0.0008	0.1377	0.0272	0.1421	0.0785	0.4162
Cowcod	NA	NA	NA	NA	NA	NA
Darkblotched rockfish	NA	NA	NA	NA	NA	NA
Pacific ocean perch	NA	NA	NA	NA	NA	NA
Widow rockfish	NA	NA	0.0076	0.1150	0.0036	0.1984
Yelloweye rockfish	0.0011	NA	0.0086	0.1365	0.0678	0.9776
Other species						
Black rockfish	0.5233	2.2640	0.5588	1.4986	0.3301	2.1214
Blue rockfish	0.0548	0.2721	0.2549	0.5335	0.3550	1.4019
Cabazon	0.1136	0.1758	0.0361	0.2515	0.0426	0.7975
California sheephead	0.2024	2.1790	0.0462	2.9205	NA	NA
Deeper nearshore rockfish	0.0531	0.1926	0.0945	0.0953	0.3226	0.3636
Dungeness crab	NA	NA	0.0018	0.2256	NA	NA
Kelp greenling	0.0153	0.0588	0.0096	0.0498	0.0114	0.2176
Lingcod	0.0933	0.2228	0.1260	0.2114	0.1491	0.6968
Minor shelf rockfish	0.0174	0.2017	0.0520	0.1322	0.3138	0.3118
Minor slope rockfish	NA	NA	0.0000	NA	0.0000	NA
Other flatfish	0.0002	0.0606	0.0006	0.0186	0.0078	0.0642
Other groundfish	0.0018	NA	0.0070	0.1503	NA	NA
Other nongroundfish	0.0964	0.2079	0.0959	0.9269	0.1283	1.5799
Petrale sole	NA	NA	NA	NA	0.0066	0.1443
Shallow nearshore rockfish	0.1451	0.1435	0.0514	0.1052	0.0367	0.1398
Spiny dogfish	0.0050	0.1424	0.0064	0.2402	0.0036	0.1069
Unspecified skate	0.0004	NA	NA	NA	NA	NA
Yellowtail rockfish	0.0007	0.0885	0.0165	0.1370	0.0449	0.5436

Table 6: Summary of the number of length measurements and the number of individual fish sexed by WCGOP observers in the nearshore fixed-gear fisheries from September 2003 through April 2008. The date range of biological data for each species is also provided. Biological data is only summarized for species with more than 30 observations.

	Years available	# lengths	# sexes
Rebuilding species			
Bocaccio	2004	2	0
Canary rockfish	2004 - Apr 2008	1250	2
Cowcod	--	--	--
Darkblotched rockfish	--	--	--
Pacific ocean perch	--	--	--
Widow rockfish	2004 - 2007	86	0
Yelloweye rockfish	2004 - Apr 2008	342	0
Other species			
Black and yellow rockfish	2004 - 2007	312	2
Black rockfish	2004 - Apr 2008	1697	0
Blue rockfish	2004 - Apr 2008	3005	0
Brown rockfish	2004 - 2007	215	0
Cabezon	2004 - Apr 2008	1068	3
California sheephead	2004 - Apr 2008	807	101
China rockfish	2004 - Apr 2008	262	2
Copper rockfish	2004 - Apr 2008	56	0
Gopher rockfish	2004 - Apr 2008	541	1
Grass rockfish	2004 - 2007	54	0
Kelp greenling	2004 - Apr 2008	1593	1236
Kelp rockfish	2004 - 2007	43	0
Lingcod	2004 - Apr 2008	3641	1
Olive rockfish	2004 - 2007	124	0
Quillback rockfish	2004 - Apr 2008	31	2
Treefish	2004 - 2007	76	0
Vermilion rockfish	2004 - 2007	45	0
Yellowtail rockfish	2004 - Apr 2008	409	0

Table 7: Summary of biological data for protected resources collected by WCGOP observers in the nearshore fixed-gear fisheries from September 2003 through April 2008. The number of length measurements and the number of individuals sexed is reported for each year where data are available.

	# lengths	# sexes
Salmon		
Chinook salmon		
2004	2	0
2006	1	0
Coho salmon		
2004	2	0
2007	1	0

APPENDIX A.

WCGOP Database Table Hierarchy.

TRIPS
 FISHING_ACTIVITIES
 FISHING_LOCATIONS
 CATCHES
 SPECIES COMPOSITION
 SPECIES_COMPOSITION_ITEMS
 BIO_SPECIMENS
 BIO_SPECIMEN_ITEMS
 DISSECTIONS

Database Table Descriptions

The database tables listed below are a subset of the tables contained in the entire Oracle database. They represent the tables that are actually used to contain the WCGOP data collected by the WCGOP.

BIO_SPECIMENS	Sets of species physical measurements resulting from sampling catches occurring in a tow or set
BIO_SPECIMEN_ITEMS	Physical measurements collected for an individual fish, mammal or bird occurring in a biological sample
CATCHES	PacFIN catch category based on estimates of fish caught during a tow or set
CATCH_CATEGORIES	PacFIN catch categories
DISSECTIONS	Physical specimens collected for an individual fish, mammal or bird
FISHING_ACTIVITIES	Fishing tows or sets occurring during a trip
FISHING_LOCATIONS	Locations of tows or sets
PORTS	Coastal cities where fishing activity is based out of
SPECIES	Fish, mammal, and bird species that might be encountered during fishing
SPECIES_COMPOSITIONS	Sets of species weights and counts resulting from sampling catches occurring in a tow or set
SPECIES_COMPOSITIONS_ITEMS	Weights and counts for individual species occurring in a species composition sample
TRIPS	Sets of fishing activities that occur between the time a vessel leaves port and when it returns
VESSELS	Trawl, longline, pot, or other fishing vessels

APPENDIX B.

Species identification codes used in the Pacific Coast Fisheries Information Network (PacFIN) database and assigned to WCGOP observer data, with aggregated species groups used in this report.

PacFIN Species ID	PacFIN Common Name	Species Group - North of 40° 10' N latitude	Species Group - South of 40° 10' N latitude	Nearshore Species
ALBC	ALBACORE	Other nongroundfish	Other nongroundfish	
APLC	ALASKA PLAICE	Other flatfish	Other flatfish	
ARR1	NOM. AURORA ROCKFISH	Minor slope rockfish	Minor slope rockfish	
ARRA	AURORA ROCKFISH	Minor slope rockfish	Minor slope rockfish	
ART1	NOM. ARROWTOOTH FLOUNDER	Arrowtooth flounder	Arrowtooth flounder	
ARTH	ARROWTOOTH FLOUNDER	Arrowtooth flounder	Arrowtooth flounder	
ASRK	PACIFIC ANGEL SHARK	Other nongroundfish	Other nongroundfish	
BABL	BLACK ABALONE	Other nongroundfish	Other nongroundfish	
BANK	BANK ROCKFISH	Minor slope rockfish	Minor slope rockfish	
BCAC	BOCACCIO	Minor shelf rockfish	Bocaccio	
BCC1	NOM. BOCACCIO	Minor shelf rockfish	Bocaccio	
BCLM	BUTTER CLAM	Other nongroundfish	Other nongroundfish	
BGL1	NOM. BLACKGILL ROCKFISH	Minor slope rockfish	Minor slope rockfish	
BKCR	BLUE KING CRAB	Other nongroundfish	Other nongroundfish	
BLCK	BLACK ROCKFISH	Black rockfish	Black rockfish	yes
BLGL	BLACKGILL ROCKFISH	Minor slope rockfish	Minor slope rockfish	
BLK1	NOM. BLACK ROCKFISH	Black rockfish	Black rockfish	yes
BLU1	NOM. BLUE ROCKFISH	Blue rockfish	Blue rockfish	yes
BLUR	BLUE ROCKFISH	Blue rockfish	Blue rockfish	yes
BMCK	BULLET MACKERAL	Other nongroundfish	Other nongroundfish	
BMRL	BLUE MARLIN	Other nongroundfish	Other nongroundfish	
BMSL	BLUE OR BAY MUSSEL	Other nongroundfish	Other nongroundfish	
BNK1	NOM. BANK ROCKFISH	Minor slope rockfish	Minor slope rockfish	
BRNZ	BRONZESPOTTED ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
BRW1	NOM. BROWN ROCKFISH	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
BRWN	BROWN ROCKFISH	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
BRZ1	NOM. BRONZESPOTTED RF	Minor shelf rockfish	Minor shelf rockfish	
BSJK	BLACK SKIPJACK	Other nongroundfish	Other nongroundfish	
BSKT	BIG SKATE	Big skate	Big skate	
BSOL	BUTTER SOLE	Other flatfish	Other flatfish	
BSRK	BLUE SHARK	Other nongroundfish	Other nongroundfish	
BSRM	UNSP. BAIT SHRIMP	Other nongroundfish	Other nongroundfish	
BTCR	BAIRDI TANNER CRAB	Tanner crab	Tanner crab	
BTNA	BLUEFIN TUNA	Other nongroundfish	Other nongroundfish	
BTRY	BAT RAY	Other nongroundfish	Other nongroundfish	
BYEL	BLACK-AND-YELLOW ROCKFISH	Other minor nearshore rockfish	Shallow nearshore rockfish*	yes
BYL1	NOM. BLACK-AND-YELLOW RF	Other minor nearshore rockfish	Shallow nearshore rockfish*	yes
CBZ1	NOM. CABEZON	Cabezon	Cabezon	yes

PacFIN Species ID	PacFIN Common Name	Species Group - North of 40° 10' N latitude	Species Group - South of 40° 10' N latitude	Nearshore Species
CBZN	CABEZON	Cabezon	Cabezon	yes
CEEL	SPOTTED CUSK-EEL	Other nongroundfish	Other nongroundfish	
CHL1	NOM. CALIFORNIA HALIBUT	California halibut	California halibut	
CHLB	CALIFORNIA HALIBUT	California halibut	California halibut	
CHN1	NOM. CHINA ROCKFISH	Other minor nearshore rockfish	Shallow nearshore rockfish*	yes
CHNA	CHINA ROCKFISH	Other minor nearshore rockfish	Shallow nearshore rockfish*	yes
CHNK	CHINOOK SALMON	Other nongroundfish	Other nongroundfish	
CHUM	CHUM SALMON	Other nongroundfish	Other nongroundfish	
CKLE	BASKET COCKLE	Other nongroundfish	Other nongroundfish	
CLC1	NOM. CALICO ROCKFISH	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
CLCO	CALICO ROCKFISH	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
CLP1	NOM. CHILIPEPPER	Minor shelf rockfish	Chilipepper	
CLPR	CHILIPEPPER	Minor shelf rockfish	Chilipepper	
CMCK	CHUB MACKERAL	Other nongroundfish	Other nongroundfish	
CMEL	CHAMELEON ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
CML1	NOM. CHAMELEON ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
CMSL	CALIFORNIA MUSSEL	Other nongroundfish	Other nongroundfish	
CNR1	NOM. CANARY ROCKFISH	Canary rockfish	Canary rockfish	
CNRY	CANARY ROCKFISH	Canary rockfish	Canary rockfish	
COHO	COHO SALMON	Other nongroundfish	Other nongroundfish	
COP1	NOM. COPPER ROCKFISH	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
COPP	COPPER ROCKFISH	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
CPLN	CAPELIN	Other nongroundfish	Other nongroundfish	
CSKT	CALIFORNIA SKATE	Unspecified skate	Unspecified skate	
CSOL	CURLFIN SOLE	Other flatfish	Other flatfish	
CTRB	C-O SOLE	Other flatfish	Other flatfish	
CUDA	PACIFIC BARRACUDA	Other nongroundfish	Other nongroundfish	
CWC1	NOM. COWCOD ROCKFISH	Minor shelf rockfish	Cowcod	
CWCD	COWCOD ROCKFISH	Minor shelf rockfish	Cowcod	
DBR1	NOM. DARKBLOTCHED ROCKFISH	Darkblotched rockfish	Darkblotched rockfish	
DBRK	DARKBLOTCHED ROCKFISH	Darkblotched rockfish	Darkblotched rockfish	
DCRB	DUNGENESS CRAB	Dungeness crab	Dungeness crab	
DLFT	UNSP. DEEP FLOUNDERS	Other flatfish	Other flatfish	
DOVR	DOVER SOLE	Dover sole	Dover sole	
DRDO	DORADO	Other nongroundfish	Other nongroundfish	
DSOL	DEEPSEA SOLE	Other flatfish	Other flatfish	
DSRK	SPINY DOGFISH	Spiny dogfish	Spiny dogfish	
DTRB	DIAMOND TURBOT	Other flatfish	Other flatfish	
DUSK	DUSKY ROCKFISH	Other groundfish	Other groundfish	
DVR1	NOM. DOVER SOLE	Dover sole	Dover sole	
DWRF	DWARF-RED ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
EELS	UNSPECIFIED EELS	Other nongroundfish	Other nongroundfish	
EGL1	NOM. ENGLISH SOLE	English sole	English sole	

PacFIN Species ID	PacFIN Common Name	Species Group - North of 40° 10' N latitude	Species Group - South of 40° 10' N latitude	Nearshore Species
EGLS	ENGLISH SOLE	English sole	English sole	
ESTR	EASTERN OYSTER	Other nongroundfish	Other nongroundfish	
ETNA	BIGEYE TUNA	Other nongroundfish	Other nongroundfish	
EULC	EULACHON	Other nongroundfish	Other nongroundfish	
EURO	EUROPEAN OYSTER	Other nongroundfish	Other nongroundfish	
FLAG	FLAG ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
FLG1	NOM. FLAG ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
FNTS	FANTAIL SOLE	Other flatfish	Other flatfish	
FRCK	FRECKLED ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
FSOL	FLATHEAD SOLE	Other flatfish	Other flatfish	
GABL	GREEN ABALONE	Other nongroundfish	Other nongroundfish	
GBAS	GIANT SEA BASS	Other nongroundfish	Other nongroundfish	
GBL1	NOM. GREENBLOTCHED RF	Minor shelf rockfish	Minor shelf rockfish	
GBLC	GREENBLOTCHED ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
GCLM	GAPER CLAM	Other nongroundfish	Other nongroundfish	
GDUK	GEODUCK	Other nongroundfish	Other nongroundfish	
GKCR	GOLDEN KING CRAB	Other nongroundfish	Other nongroundfish	
GPH1	NOM. GOPHER ROCKFISH	Other minor nearshore rockfish	Shallow nearshore rockfish*	yes
GPHR	GOPHER ROCKFISH	Other minor nearshore rockfish	Shallow nearshore rockfish*	yes
GPRW	GOLDEN PRAWN	Other nongroundfish	Other nongroundfish	
GRAS	GRASS ROCKFISH	Other minor nearshore rockfish	Shallow nearshore rockfish*	yes
GRDR	UNSP. GRENADIERS	Other groundfish	Other groundfish	
GRS1	NOM. GRASS ROCKFISH	Other minor nearshore rockfish	Shallow nearshore rockfish*	yes
GSP1	NOM. GREENSPOTTED ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
GSPT	GREENSPOTTED ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
GSQD	GIANT SQUID	Other nongroundfish	Other nongroundfish	
GSR1	NOM. GREENSTRIPED ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
GSRK	GREENSTRIPED ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
GSRM	GHOST SHRIMP	Other nongroundfish	Other nongroundfish	
GSTG	GREEN STURGEON	Green sturgeon	Green sturgeon	
GTRB	GREENLAND TURBOT	Other flatfish	Other flatfish	
HBRK	HALFBANDED ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
HCLM	HORSE CLAMS	Other nongroundfish	Other nongroundfish	
HLQN	HARLEQUIN ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
HNY1	NOM. HONEYCOMB ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
HNYC	HONEYCOMB ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
HTRB	HORNYHEAD TURBOT	Other flatfish	Other flatfish	
ISRK	BIGEYE THRESHER SHARK	Other nongroundfish	Other nongroundfish	
JCLM	CALIFORNIA JACKKNIFE CLAM	Other nongroundfish	Other nongroundfish	
JMCK	JACK MACKERAL	Other nongroundfish	Other nongroundfish	
KFSH	GIANT KELPFISH	Other nongroundfish	Other nongroundfish	
KGL1	NOM. KELP GREENLING	Kelp greenling	Kelp greenling	yes
KLP1	NOM. KELP ROCKFISH	Other minor nearshore rockfish	Shallow nearshore rockfish*	yes

PacFIN Species ID	PacFIN Common Name	Species Group - North of 40° 10' N latitude	Species Group - South of 40° 10' N latitude	Nearshore Species
KLPG	KELP GREENLING	Kelp greenling	Kelp greenling	yes
KLPR	KELP ROCKFISH	Other minor nearshore rockfish	Shallow nearshore rockfish*	yes
KMKA	KAMCHATKA FLOUNDER	Other flatfish	Other flatfish	
KSTR	KUMAMOTO OYSTER	Other nongroundfish	Other nongroundfish	
LCD1	NOM. LINGCOD	Lingcod	Lingcod	yes
LCLM	NATIVE LITTLENECK	Other nongroundfish	Other nongroundfish	
LCOD	LINGCOD	Lingcod	Lingcod	yes
LDAB	LONGFIN SANDDAB	Other flatfish	Other flatfish	
LDB1	NOM. LONGFIN SANDDAB	Other flatfish	Other flatfish	
LOBS	CALIFORNIA SPINY LOBSTER	Other nongroundfish	Other nongroundfish	
LSKT	LONGNOSE SKATE	Longnose skate	Longnose skate	
LSP1	NOM. LONGSPINE THORNYHEAD	Longspine thornyhead	Longspine thornyhead	
LSPN	LONGSPINE THORNYHEAD	Longspine thornyhead	Longspine thornyhead	
LSRK	LEOPARD SHARK	Other groundfish	Other groundfish	
LSTR	OLYMPIA OYSTER	Other nongroundfish	Other nongroundfish	
LUVR	LOUVAR	Other nongroundfish	Other nongroundfish	
MACL	MUD CLAMS	Other nongroundfish	Other nongroundfish	
MAKO	SHORTFIN MAKO SHARK	Other nongroundfish	Other nongroundfish	
MCLM	MANILA CLAM	Other nongroundfish	Other nongroundfish	
MEEL	MONKEYFACE EEL	Other nongroundfish	Other nongroundfish	
MISC	MISC. FISH/ANIMALS	Other nongroundfish	Other nongroundfish	
MOLA	COMMON MOLA	Other nongroundfish	Other nongroundfish	
MRLN	STRIPED MARLIN	Other nongroundfish	Other nongroundfish	
MSC2	MISCELLANEOUS FISH	Other nongroundfish	Other nongroundfish	
MSHP	PLAINFIN MIDSHIPMAN	Other nongroundfish	Other nongroundfish	
MSQD	MARKET SQUID	Other nongroundfish	Other nongroundfish	
MSRM	MUD SHRIMP	Other nongroundfish	Other nongroundfish	
MXR1	NOM. MEXICAN ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
MXRF	MEXICAN ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
NANC	NORTHERN ANCHOVY	Other nongroundfish	Other nongroundfish	
NRCK	NORTHERN ROCKFISH	Other groundfish	Other groundfish	
NSHR	NORTHERN NEAR-SHORE RF	Other minor nearshore rockfish	Northern nearshore rockfish	yes
NSLF	NORTHERN SHELF ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
NSLP	NORTHERN SLOPE ROCKFISH	Minor slope rockfish	Minor slope rockfish	
NUSF	NOR. UNSP. SHELF ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
NUSP	NOR. UNSP. SLOPE ROCKFISH	Minor slope rockfish	Minor slope rockfish	
NUSR	NOR. UNSP. NEAR-SHORE RF	Other minor nearshore rockfish	Northern nearshore rockfish	yes
OABL	OTHER ABALONE	Other nongroundfish	Other nongroundfish	
OANC	OTHER ANCHOVY	Other nongroundfish	Other nongroundfish	
OBAS	OTHER BASS	Other nongroundfish	Other nongroundfish	
OCLM	OTHER CLAM	Other nongroundfish	Other nongroundfish	
OCRB	OTHER CRAB	Other nongroundfish	Other nongroundfish	
OCRK	OTHER CROAKER	Other nongroundfish	Other nongroundfish	

PacFIN Species ID	PacFIN Common Name	Species Group - North of 40° 10' N latitude	Species Group - South of 40° 10' N latitude	Nearshore Species
OCTP	UNSP. OCTOPUS	Other nongroundfish	Other nongroundfish	
ODSR	OTHER DEMERSAL ROCKFISH	Other groundfish	Other groundfish	
OECH	OTHER ECHINODERM	Other nongroundfish	Other nongroundfish	
OFLT	OTHER FLATFISH	Other flatfish	Other flatfish	
OGRN	OTHER GROUND FISH	Other groundfish	Other groundfish	
OLV1	NOM. OLIVE ROCKFISH	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
OLVE	OLIVE ROCKFISH	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
OMSK	OTHER MOLLUSKS	Other nongroundfish	Other nongroundfish	
OPLG	OTHER PELAGIC ROCKFISH	Other groundfish	Other groundfish	
ORCK	OTHER ROCKFISH	Minor slope rockfish (>150 fm)	Minor slope rockfish (>150 fm)	
ORCK	OTHER ROCKFISH	Minor shelf rockfish (<150 fm)	Minor shelf rockfish (<150 fm)	
ORND	OTHER ROUND FISH	Other groundfish	Other groundfish	
OSCL	OTHER SCALLOP	Other nongroundfish	Other nongroundfish	
OSKT	OTHER SKATES	Unspecified skate	Unspecified skate	
OSLR	OTHER SLOPE ROCKFISH	Minor slope rockfish	Minor slope rockfish	
OSRK	OTHER SHARK	Other nongroundfish	Other nongroundfish	
OSRM	OTHER SHRIMP	Other nongroundfish	Other nongroundfish	
OSTR	OTHER OYSTER	Other nongroundfish	Other nongroundfish	
OTCR	OPILIO TANNER CRAB	Tanner crab	Tanner crab	
OTNA	OTHER TUNA	Other nongroundfish	Other nongroundfish	
OURC	OTHER SEA URCHIN	Other nongroundfish	Other nongroundfish	
OWFS	OCEAN WHITEFISH	Other nongroundfish	Other nongroundfish	
PABL	PINK ABALONE	Other nongroundfish	Other nongroundfish	
PBNT	PACIFIC BONITO	Other nongroundfish	Other nongroundfish	
PBTR	PACIFIC BUTTERFISH	Other nongroundfish	Other nongroundfish	
PCLM	PISMO CLAM	Other nongroundfish	Other nongroundfish	
PCOD	PACIFIC COD	Pacific cod	Pacific cod	
PDAB	PACIFIC SANDDAB	Other flatfish	Other flatfish	
PDB1	NOM. PACIFIC SANDDAB	Other flatfish	Other flatfish	
PGMY	PYGMY ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
PHLB	PACIFIC HALIBUT	Pacific halibut	Pacific halibut	
PHRG	PACIFIC HERRING	Other nongroundfish	Other nongroundfish	
PINK	PINK SALMON	Other nongroundfish	Other nongroundfish	
PLCK	WALLEYE POLLOCK	Other groundfish	Other groundfish	
PNK1	NOM. PINK ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
PNKR	PINK ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
POMF	PACIFIC POMFRET	Other nongroundfish	Other nongroundfish	
POP	PACIFIC OCEAN PERCH	Pacific ocean perch	Minor slope rockfish	
POP1	GEN. SHELF/SLOPE ROCKFISH	Minor slope rockfish	Minor slope rockfish	
POP2	NOM. PACIFIC OCEAN PERCH	Pacific ocean perch	Minor slope rockfish	
PRCL	PURPLE CLAM	Other nongroundfish	Other nongroundfish	
PROW	PROWFISH	Other nongroundfish	Other nongroundfish	
PRR1	NOM. PINKROSE ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	

PacFIN Species ID	PacFIN Common Name	Species Group - North of 40° 10' N latitude	Species Group - South of 40° 10' N latitude	Nearshore Species
PRRK	PINKROSE ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
PSDN	PACIFIC SARDINE	Other nongroundfish	Other nongroundfish	
PSHP	PINK SHRIMP	Other nongroundfish	Other nongroundfish	
PSRK	PELAGIC THRESHER SHARK	Other nongroundfish	Other nongroundfish	
PSTR	PACIFIC OYSTER	Other nongroundfish	Other nongroundfish	
PTR1	NOM. PETRALE SOLE	Petrale sole	Petrale sole	
PTRL	PETRALE SOLE	Petrale sole	Petrale sole	
PUGT	PUGET SOUND ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
PWHT	PACIFIC WHITING (HAKE)	Pacific hake	Pacific hake	
QCLM	NORTHERN QUAHOG CLAM	Other nongroundfish	Other nongroundfish	
QFSH	QUEENFISH	Other nongroundfish	Other nongroundfish	
QLB1	NOM. QUILLBACK ROCKFISH	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
QLBK	QUILLBACK ROCKFISH	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
RABL	RED ABALONE	Other nongroundfish	Other nongroundfish	
RATF	SPOTTED RATFISH	Other groundfish	Other groundfish	
RCK1	BOCACCIO+CHILIPEPPER RF	Minor shelf rockfish	Minor shelf rockfish	
RCK2	UNSP. BOLINA ROCKFISH	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
RCK3	UNSP. DPWTR REDS ROCKFISH	Minor slope rockfish	Minor slope rockfish	
RCK4	UNSP. REDS ROCKFISH	Other groundfish	Other groundfish	
RCK5	UNSP. SMALL REDS ROCKFISH	Other groundfish	Other groundfish	
RCK6	UNSP. ROSEFISH ROCKFISH	Other groundfish	Other groundfish	
RCK7	UNSP. GOPHER ROCKFISH	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
RCK8	CANARY+VERMILION ROCKFISH	Canary rockfish	Canary rockfish	
RCK9	BLACK+BLUE ROCKFISH	Black rockfish	Black rockfish	yes
RCKG	ROCK GREENLING	Other nongroundfish	Other nongroundfish	
RCLM	RAZOR CLAM	Other nongroundfish	Other nongroundfish	
RCRB	ROCK CRAB	Other nongroundfish	Other nongroundfish	
RDB1	NOM. REDBANDED ROCKFISH	Minor slope rockfish	Minor slope rockfish	
RDBD	REDBANDED ROCKFISH	Minor slope rockfish	Minor slope rockfish	
REDS	REDSTRIPE ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
REX	REX SOLE	Other flatfish	Other flatfish	
REX1	NOM. REX SOLE	Other flatfish	Other flatfish	
REYE	ROUGHEYE ROCKFISH	Minor slope rockfish	Minor slope rockfish	
RFLT	REMAINING FLATFISH	Other flatfish	Other flatfish	
RGL1	NOM. ROCK GREENLING	Other nongroundfish	Other nongroundfish	
RGRN	REMAINING GROUND FISH	Other groundfish	Other groundfish	
RHRG	ROUND HERRING	Other nongroundfish	Other nongroundfish	
RKCR	RED KING CRAB	Other nongroundfish	Other nongroundfish	
ROS1	NOM. ROSY ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
ROSY	ROSY ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
RPRW	RIDGEBACK PRAWN	Other nongroundfish	Other nongroundfish	
RRCK	REMAINING ROCKFISH	Other groundfish	Other groundfish	
RRND	REMAINING ROUND FISH	Other groundfish	Other groundfish	

PacFIN Species ID	PacFIN Common Name	Species Group - North of 40° 10' N latitude	Species Group - South of 40° 10' N latitude	Nearshore Species
RSOL	ROCK SOLE	Other flatfish	Other flatfish	
RST1	NOM. ROSETHORN ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
RSTN	ROSETHORN ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
RURC	RED SEA URCHIN	Other nongroundfish	Other nongroundfish	
RZCL	ROSY RAZOR CLAM	Other nongroundfish	Other nongroundfish	
SABL	SABLEFISH	Sablefish	Sablefish	
SAIL	SAILFISH	Other nongroundfish	Other nongroundfish	
SARY	PACIFIC SAURY	Other nongroundfish	Other nongroundfish	
SBL1	NOM. SHORBELLY ROCKFISH	Shortbelly rockfish	Shortbelly rockfish	
SBLY	SHORBELLY ROCKFISH	Shortbelly rockfish	Shortbelly rockfish	
SCLM	SOFT-SHELLED CLAM	Other nongroundfish	Other nongroundfish	
SCLP	UNSP. SCULPIN	Other nongroundfish	Other nongroundfish	
SCOR	CALIFORNIA SCORPIONFISH	Other minor nearshore rockfish	Shallow nearshore rockfish*	yes
SCR1	NOM. CALIFORNIA SCORPIONFISH	Other minor nearshore rockfish	Shallow nearshore rockfish*	yes
SDB1	NOM. SPECKLED SANDDAB	Other flatfish	Other flatfish	
SFL1	NOM. STARRY FLOUNDER	Other flatfish	Other flatfish	
SFLT	UNSP. SHALLOW FLOUNDERS	Other flatfish	Other flatfish	
SHAD	UNSPECIFIED SHAD	Other nongroundfish	Other nongroundfish	
SHP1	NOM. CALIFORNIA SHEEPHEAD	California sheephead	California sheephead	yes
SHPD	CALIFORNIA SHEEPHEAD	California sheephead	California sheephead	yes
SHRP	SHARPCHIN ROCKFISH	Minor slope rockfish	Minor slope rockfish	
SKCR	SCARLET KING CRAB	Other nongroundfish	Other nongroundfish	
SLGR	SILVERGREY ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
SLNS	SLENDER SOLE	Other flatfish	Other flatfish	
SMLT	UNSP. SMELT	Other nongroundfish	Other nongroundfish	
SNOS	SPLITNOSE ROCKFISH	Minor slope rockfish	Splitnose rockfish	
SNS1	NOM. SPLITNOSE ROCKFISH	Minor slope rockfish	Splitnose rockfish	
SOCK	SOCKEYE SALMON	Other nongroundfish	Other nongroundfish	
SPK1	NOM. SPECKLED ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
SPKL	SPECKLED ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
SPRW	SPOTTED PRAWN	Other nongroundfish	Other nongroundfish	
SQID	UNSP. SQUID	Other nongroundfish	Other nongroundfish	
SQR1	NOM. SQUARESPOT	Minor shelf rockfish	Minor shelf rockfish	
SQRS	SQUARESPOT ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
SRFP	SURFPERCH SPP.	Other nongroundfish	Other nongroundfish	
SRKR	SHORTRAKER ROCKFISH	Minor slope rockfish	Minor slope rockfish	
SSCL	SHARPNOSE SCULPIN	Other nongroundfish	Other nongroundfish	
SSDB	SPECKLED SANDDAB	Other flatfish	Other flatfish	
SSHR	SOUTHERN NEAR-SHORE RF	So. nearshore rockfish (>10 fm)	Deeper nearshore rockfish* (>10 fm)	yes
SSHR	SOUTHERN NEAR-SHORE RF	So. nearshore rockfish (<10 fm)	Shallow nearshore rockfish* (<10 fm)	yes
SSLF	SOUTHERN SHELF ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
SSLP	SOUTHERN SLOPE ROCKFISH	Minor slope rockfish	Minor slope rockfish	

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SSO1	NOM. SAND SOLE	Other flatfish	Other flatfish	
SSOL	SAND SOLE	Other flatfish	Other flatfish	
SSP1	NOM. SHORTSPINE THORNYHEAD	Shortspine thornyhead	Shortspine thornyhead	
SSPN	SHORTSPINE THORNYHEAD	Shortspine thornyhead	Shortspine thornyhead	
SSRD	DEEP SO. NEAR-SHORE RF	Southern nearshore rockfish	Deeper nearshore rockfish*	yes
SSRK	SOUPFIN SHARK	Other groundfish	Other groundfish	
SSRS	SHALLOW SO. NEAR-SHORE RF	Southern nearshore rockfish	Shallow nearshore rockfish*	yes
STAR	STARRY ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
STL1	NOM. STRIPETAILED ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
STLH	STEELHEAD	Other nongroundfish	Other nongroundfish	
STNA	SKIPJACK TUNA	Other nongroundfish	Other nongroundfish	
STR1	NOM. STARRY ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
STRK	STRIPETAILED ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
STRY	STARRY FLOUNDER	Other flatfish	Other flatfish	
SUSF	SO. UNSP. SHELF ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
SUSP	SO. UNSP. SLOPE ROCKFISH	Minor slope rockfish	Minor slope rockfish	
SUSR	SO. UNSP. NEAR-SHORE RF	So. nearshore rockfish (>10fm)	Deeper nearshore rockfish* >10fm)	yes
SUSR	SO. UNSP. NEAR-SHORE RF	So. nearshore rockfish (<10fm)	Shallow nearshore rockfish* (<10fm)	yes
SWRD	SWORDFISH	Other nongroundfish	Other nongroundfish	
SWS1	NOM. SWORDSPINE ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
SWSP	SWORDSPINE ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
TCOD	PACIFIC TOMCOD	Other nongroundfish	Other nongroundfish	
TGR1	NOM. TIGER ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
THD1	NOM. THORNYHEADS	Shortspine thornyhead (60%)	Shortspine thornyhead (60%)	
THD1	NOM. THORNYHEADS	Longspine thornyhead (40%)	Longspine thornyhead (40%)	
THDS	THORNYHEADS (MIXED)	Shortspine thornyhead (60%)	Shortspine thornyhead (60%)	
THDS	THORNYHEADS (MIXED)	Longspine thornyhead (40%)	Longspine thornyhead (40%)	
TIGR	TIGER ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
TRE1	NOM. TREEFISH	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
TREE	TREEFISH	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
TSRK	COMMON THRESHER SHARK	Other nongroundfish	Other nongroundfish	
UABL	UNSPECIFIED ABALONE	Other nongroundfish	Other nongroundfish	
UCLM	UNSPECIFIED CLAM	Other nongroundfish	Other nongroundfish	
UCRB	UNSPECIFIED CRAB	Other nongroundfish	Other nongroundfish	
UDAB	UNSP. SANDDABS	Other flatfish	Other flatfish	
UDF1	UNSP. DEEP-91 FLOUNDERS	Other flatfish	Other flatfish	
UDF2	UNSP. DEEP-95 FLOUNDERS	Other flatfish	Other flatfish	
UDM1	UNSP. DEMERSAL-91	Other groundfish	Other groundfish	
UDNR	UNSP. DEEP NEAR-SHORE RF	Other minor nearshore rockfish	Deeper nearshore rockfish*	yes
UDSR	UNSP. DEMERSAL ROCKFISH	Other groundfish	Other groundfish	
UDW1	SHORTTRAKER+ROUGHEYE RF	Minor slope rockfish	Minor slope rockfish	
UECH	UNSPECIFIED ECHINODERM	Other nongroundfish	Other nongroundfish	

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UFL1	FLOUNDERS (NO FSOL)	Other flatfish	Other flatfish	
UFLT	UNSP. FLATFISH	Other flatfish	Other flatfish	
UGRN	UNSP. GROUND FISH	Other groundfish	Unspecified groundfish	
UHAG	UNSP. HAGFISH	Other nongroundfish	Other nongroundfish	
UHLB	UNSP. HALIBUT	Other nongroundfish	Other nongroundfish	
UJEL	UNSP. JELLYFISH	Other nongroundfish	Other nongroundfish	
UKCR	UNSP. KING CRAB	Other nongroundfish	Other nongroundfish	
UMCK	UNSP. MACKERAL	Other nongroundfish	Other nongroundfish	
UMSK	UNSP. MOLLUSKS	Other nongroundfish	Other nongroundfish	
UPLG	UNSP. PELAGIC ROCKFISH	Other groundfish	Other groundfish	
UPOP	UNSP. POP GROUP	Pacific ocean perch	Minor slope rockfish	
URCK	UNSP. ROCKFISH	Minor shelf rockfish (<150 fm)	Minor shelf rockfish (<150 fm)	
URCK	UNSP. ROCKFISH	Minor slope rockfish (>150 fm)	Minor slope rockfish (>150 fm)	
URK1	SRKR+REYE+NRCK+SHRP	Minor slope rockfish	Minor slope rockfish	
URND	UNSP. ROUND FISH	Other groundfish	Other groundfish	
USCL	UNSP. SCALLOP	Other nongroundfish	Other nongroundfish	
USCU	UNSP. SEA CUCUMBER	Other nongroundfish	Other nongroundfish	
USF1	UNSP. SHALLOW-91 FLOUNDERS	Other flatfish	Other flatfish	
USHR	UNSP. NEAR-SHORE ROCKFISH	Other minor nearshore RF (>10fm)	Deeper nearshore rockfish* (>10fm)	yes
USHR	UNSP. NEAR-SHORE ROCKFISH	Other minor nearshore RF (<10fm)	Shallow nearshore rockfish* (<10fm)	yes
USKT	UNSP. SKATE	Unspecified skate	Unspecified skate	
USLF	UNSP. SHELF ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
USLP	UNSP. SLOPE ROCKFISH	Minor slope rockfish	Minor slope rockfish	
USLR	UNSP. SLOPE ROCKFISH	Minor slope rockfish	Minor slope rockfish	
USMN	UNSP. SALMON	Other nongroundfish	Other nongroundfish	
USR1	UNSP. SLOPE-91	Other groundfish	Other groundfish	
USR2	UNSP. SLOPE-93	Other groundfish	Other groundfish	
USRK	UNSP. SHARK	Other nongroundfish	Other nongroundfish	
USRM	UNSP. OCEAN SHRIMP	Other nongroundfish	Other nongroundfish	
USTG	UNSP. STURGEON	Other nongroundfish	Other nongroundfish	
USTR	UNSP. OYSTER	Other nongroundfish	Other nongroundfish	
UTCR	UNSP. TANNER CRAB	Tanner crab	Tanner crab	
UTNA	UNSP. TUNA	Other nongroundfish	Other nongroundfish	
UTRB	UNSP. TURBOTS	Other flatfish	Other flatfish	
UURC	UNSP. SEA URCHIN	Other nongroundfish	Other nongroundfish	
VRM1	NOM. VERMILLION ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
VRML	VERMILLION ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
WABL	WHITE ABALONE	Other nongroundfish	Other nongroundfish	
WBAS	WHITE SEABASS	Other nongroundfish	Other nongroundfish	
WCLM	WASHINGTON CLAM	Other nongroundfish	Other nongroundfish	
WCRK	WHITE CROAKER	Other nongroundfish	Other nongroundfish	
WDOW	WIDOW ROCKFISH	Widow rockfish	Widow rockfish	

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WDW1	NOM. WIDOW ROCKFISH	Widow rockfish	Widow rockfish	
WEEL	WOLF EEL	Other nongroundfish	Other nongroundfish	
WHOO	WAHOO	Other nongroundfish	Other nongroundfish	
WSTG	WHITE STURGEON	Other nongroundfish	Other nongroundfish	
YEY1	NOM. YELLOWEYE ROCKFISH	Yelloweye rockfish	Yelloweye rockfish	
YEYE	YELLOWEYE ROCKFISH	Yelloweye rockfish	Yelloweye rockfish	
YLTL	YELLOWTAIL	Other nongroundfish	Other nongroundfish	
YMTH	YELLOWMOUTH ROCKFISH	Minor slope rockfish	Minor slope rockfish	
YSOL	YELLOWFIN SOLE	Other flatfish	Other flatfish	
YTNA	YELLOWFIN TUNA	Other nongroundfish	Other nongroundfish	
YTR1	NOM. YELLOWTAIL ROCKFISH	Yellowtail rockfish	Minor shelf rockfish	
YTRK	YELLOWTAIL ROCKFISH	Yellowtail rockfish	Minor shelf rockfish	