

Data Report and Summary Analyses of the U.S. West Coast Nearshore Fixed Gear Groundfish Fishery

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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, 2008 through April 30, 2009. The WCGOP collects at-sea data from limited-entry (LE) trawl and fixed gear fisheries, as well as from nearshore, 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 overboard at-sea) of west coast groundfish species. The data are used in assessing and managing a variety of groundfish species.

U.S. West Coast Nearshore Fixed Gear Fisheries

The U.S. 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 state-permitted nearshore fixed gear fisheries can belong to either federal sector. There are a number of fishing area closures designated in federal groundfish management that apply to the commercial nearshore fixed gear fisheries.

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, as well as two month cumulative trip limits and annual landing caps (maximum landed weight in a 12 month period). 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 2008, Oregon issued 60 black/blue rockfish permits, which allow for the landing of black rockfish and blue rockfish, and 71 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 2009, Oregon issued 55 black/blue rockfish permits and 70 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.). In 2008, state management closed the areas south of 40° 10' N. latitude during March and April. The north coast area (north of 40° 10' N. latitude to the Oregon-California border) remained open year-round.

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 2008, there were a total of 215 California nearshore permits and in 2009, there were 319 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 U.S. 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 groundfish 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 2008 - Apr 2009) were collected during two selection cycles, January 1, 2008 through December 31, 2008 (selection cycle 5) and January 1, 2009 through December 31, 2009 (selection cycle 6). 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 2008 - Apr 2009) were also collected during two selection cycles, January 1, 2008 through December 31, 2008 (selection cycle 7) and January 1, 2009 through December 31, 2009 (selection cycle 8).

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:

- State 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 during an 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 116 (out of 215) in 2008 and 101 (out of 319) in 2009. There were 30 (out of 60) OR blue/black rockfish permits selected in 2008 and 30 (out of 55) 2009. For OR blue/black rockfish permits with a nearshore endorsement, there were 48 (out of 71) permits selected in 2008 and 57 (out of 70) in 2009.

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 nearshore 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 2008). 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 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 2008).

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 2008).
2. Data are entered into a secure database system. A 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

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 groundfish 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:

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

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:

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

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

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 2008 and January through April of 2009.

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 $Var(R_i)$ 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 2008 and from January through April 2009 is summarized in Table 1 by WCGOP port group, gear type and state. 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 that were 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 that is not included in the Pacific Coast Groundfish Fishery Management Plan.

On a coastwide basis, observer coverage in the nearshore fixed gear fisheries decreased in 2008 relative to 2007, from 7% to 4% (NMFS 2008). However, 2008 landings of nearshore groundfish species increased in both states relative to 2007. Overall coverage of Oregon nearshore vessels dropped to 8% in 2008, compared with 9% in 2007. The highest Oregon coverage occurred in the combined Astoria/Newport port groups, yet the coverage value still decreased from 16% in 2007 to 11% in 2008. Nearshore coverage rates in California also decreased from 2007 to 2008, from 5% to 2% overall. The Crescent City port group had the highest level of California observer coverage at 6%, consistent with the highest nearshore landings in this port group.

Although the nearshore fixed gear fishery is 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 U.S. west coast in the nearshore fixed gear groundfish 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, as well as the largest nearshore fishery landings (Table 1). The second largest number of observed trips, sets, and vessels in 2008 were from the Astoria/Newport port groups. Although landings in these ports remained almost constant from 2007 to 2008 at 35.7 to 35.8 mt, fewer trips and sets were observed in 2008. Relatively large landings are also associated with port groups in central and southern California, including Monterey, Morro Bay, Santa Barbara and Los Angeles, however a much smaller percentage of nearshore landings in these port groups were observed.

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 in the 2008 nearshore fixed gear fishery are presented in Table 2a by gear type and state. Table 2b presents the same information for the nearshore fishery in January through April of 2009. Observed catch weights for hook-and-line gears are larger than those for pot gear, and reflect the relative amount of effort associated with each gear type in the nearshore fixed gear groundfish fisheries. Observed coastwide total catch (discarded + retained) from hook-and-line gears was largely comprised of black rockfish, lingcod, kelp greenling, cabezon, and other nearshore rockfish (including blue rockfish). California sheephead, unspecified mollusk, cabezon, and kelp bass were the primary components of observed catch from pot gear. Unidentified mollusks were caught and landed in southern California, and were thought to consist primarily of whelks. Of the rebuilding species, canary rockfish, widow rockfish, and yelloweye rockfish were caught in Oregon and California with hook-and-line gears in 2008. In addition, bocaccio was also caught in California with this gear type during the first four months of 2009. For protected species, a small amount of coho salmon was caught in 2008 with hook-and-line gears 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 2008 data only (Tables 3a-b) and January through April 2009 (Table 3c). These depth intervals were employed in order to be consistent with methodology used in annual estimation of fleet-wide discard in nearshore groundfish fisheries. In both Oregon and California, black rockfish constituted the largest component of nearshore catch, and was caught primarily in the 0-10 and 11-20 fm depth intervals. Lingcod, kelp greenling, and cabezon also made up a large portion of observed catch in Oregon. On California nearshore vessels, lingcod, California sheephead, brown rockfish, and other nearshore rockfish species were also commonly observed. In both states, total catch weight was greatest in the 11-20 fm depth interval. In 2008, 50% of Oregon's total observed catch and 74% of California's total observed catch came from this depth interval (11-20 fm). In comparison, observed catch in 0-10 fm

represented 47% of the total in Oregon and 24% of the total in California.

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, and is under minimum size restrictions in the federal groundfish regulations. In Oregon, larger amounts of black rockfish, blue rockfish, and kelp greenling were also discarded; all of which are state-managed with two-month cumulative trip limits. In California, kelp bass, California sheephead, blue rockfish, and kelp greenling constituted the largest components of non-rebuilding species discard after lingcod. Although some retention was recorded for most of these species, 100% of kelp bass catch was recorded as discard.

Relative to 2007, observed catch and discard of canary rockfish and yelloweye rockfish decreased, however, this may be due primarily to decreased coverage rates in 2008. In order to evaluate discard of rebuilding species, it is more appropriate to examine discard weight in relation to some metric or proxy of fishing effort. Table 4 presents discard ratios and standard errors for the 2008 nearshore fixed gear fisheries by depth interval and state. Species are grouped for ratio calculations according to Appendix B and all discard ratios are computed using retained nearshore species weight in the denominator. For canary rockfish, discard ratios decreased from 2007 to 2008 in all strata, except for depths between 0 and 10 fm in California, where the discard ratio increased very slightly. Compared with 2007, discard ratios for yelloweye rockfish in 2008 increased in most strata, especially in the deepest depth interval (21-50 fm) in both states, where discard ratios for this species more than doubled. Effort in this depth range is low compared with that in 0-10 and 11-20 fm. Of the total observed landings of nearshore target species in Oregon, 46% occurred in 0-10 fm, 52% in 11-20 fm, and 2% in 21-50 fm. Comparably, in California, 30% of observed nearshore species landings came from 0-10 fm, 69% from 11-20 fm, and 1% from 21-50 fm.

Table 5 provides bycatch ratios for the 2008 nearshore fixed gear groundfish fisheries by depth interval and by federal management area (north and south of 40° 10' N. latitude). These ratios are produced in order to inform projection modeling in the nearshore groundfish fishery that is conducted by the Groundfish Management Team (GMT) of the Pacific Fishery Management Council (PFMC). Bycatch ratios were computed as the total catch weight of rebuilding and nearshore groundfish species divided by the total retained weight of nearshore target species, as specified in Appendix B.

Bycatch ratios for rebuilding groundfish species are also calculated by state and represented graphically in Figure 1 to provide perspective on bycatch trends over time. Rebuilding species bycatch has fluctuated over time. For canary rockfish, bycatch ratios in both Oregon and California increased steadily from 2003 onward, but decreased slightly in 2008. For yelloweye rockfish, bycatch ratios have fluctuated more between years, but show a steady increasing trend in Oregon from 2005 through 2008. Figure 2 presents the 2008 bycatch ratios for canary and yelloweye rockfish by depth strata. For both species, bycatch is highest in the deepest depth stratum (21-50 fm), where retained catch of nearshore target species and fishing effort is lowest.

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 2009 are summarized in Table 6. The length frequency distributions of discarded groundfish rebuilding species from biological data are presented for the nearshore fixed gear groundfish fisheries in Figure 3. Figure 4 presents length frequency distributions of discarded non-rebuilding groundfish 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 groundfish fisheries from September 2003 through April 2009. 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 2008 through April 2009 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 coastwide mortality in these fisheries. The collected biological data will also be available for use by stock assessment authors.

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FIGURES

Figure 1. Bycatch ratios over time for rebuilding species observed in nearshore fixed gear groundfish fishery in Oregon (solid circles) and California (outlined circles). Bycatch ratios were computed as the observed total catch of rebuilding species divided by the weight of retained nearshore target species (see Appendix B).

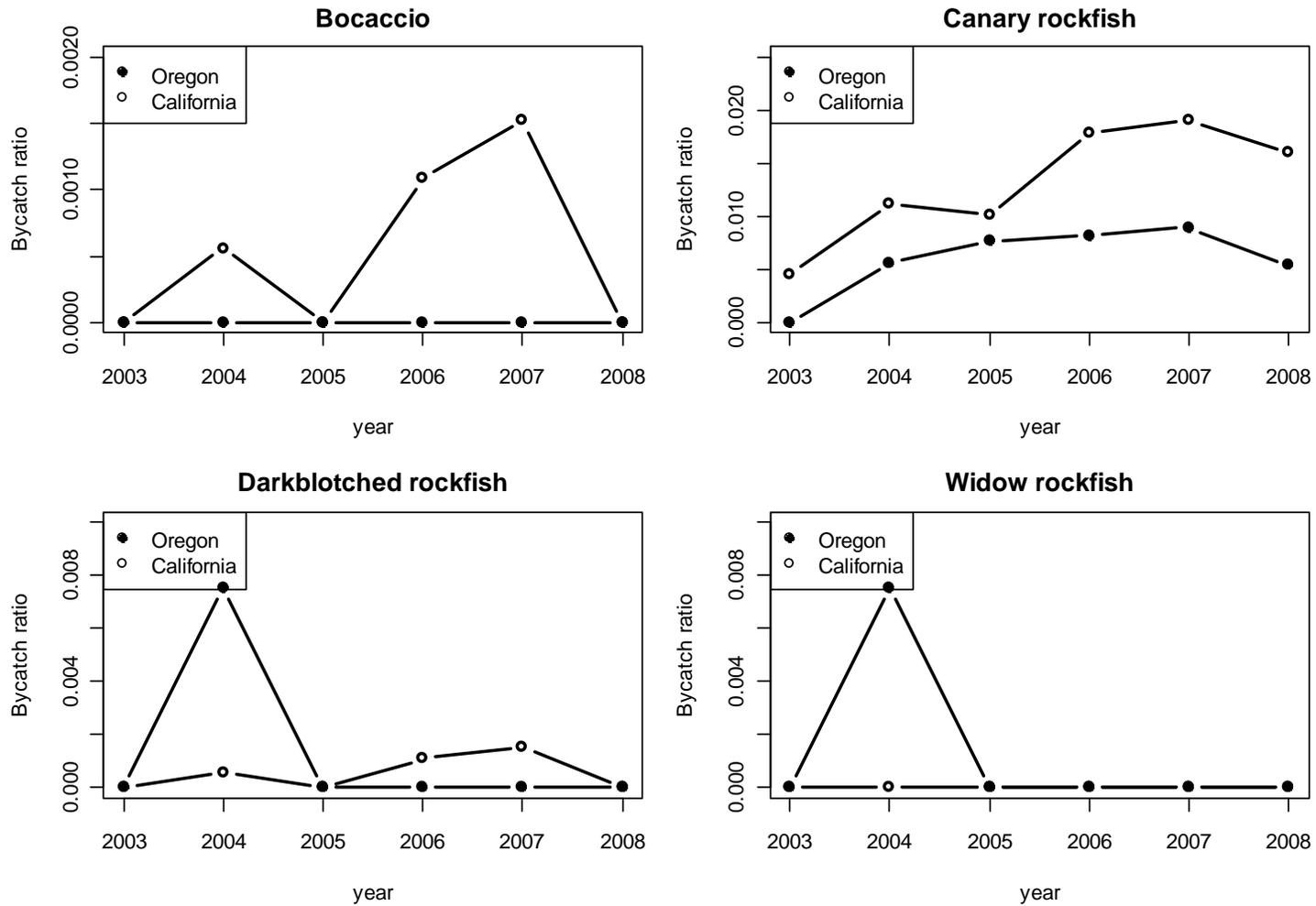


Figure 1 continued. Bycatch ratios over time for rebuilding species observed in nearshore fixed gear groundfish fishery in Oregon (solid circles) and California (outlined circles). Bycatch ratios were computed as the observed total catch of rebuilding species divided by the weight of retained nearshore target species (see Appendix B).

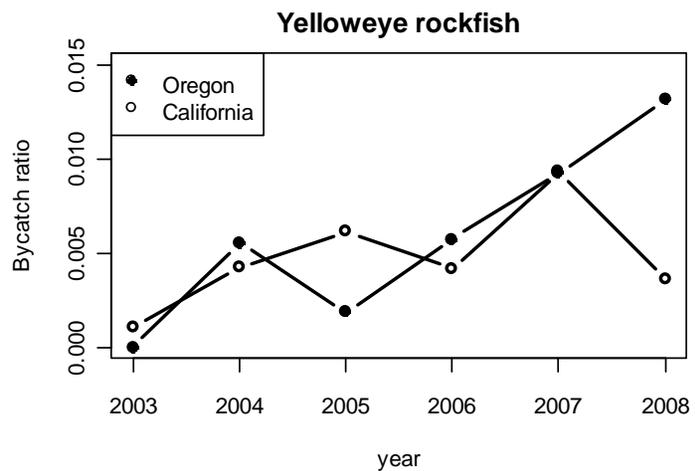


Figure 2. Bycatch ratios by depth interval observed in the 2008 nearshore fixed gear groundfish fishery (Oregon and California) for canary rockfish (left) and yelloweye rockfish (right). Bycatch ratios were computed as the observed total catch weight of rebuilding species divided by the weight of retained nearshore target species (see Appendix B).

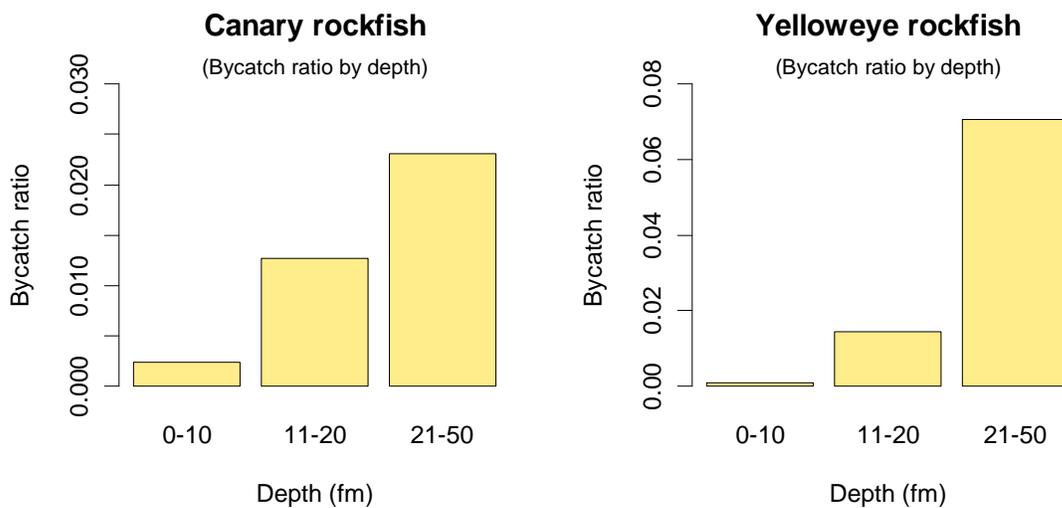


Figure 3. Length frequency distributions of discarded rebuilding groundfish species observed in the nearshore fixed gear groundfish fishery from September 2003 - April 2009.

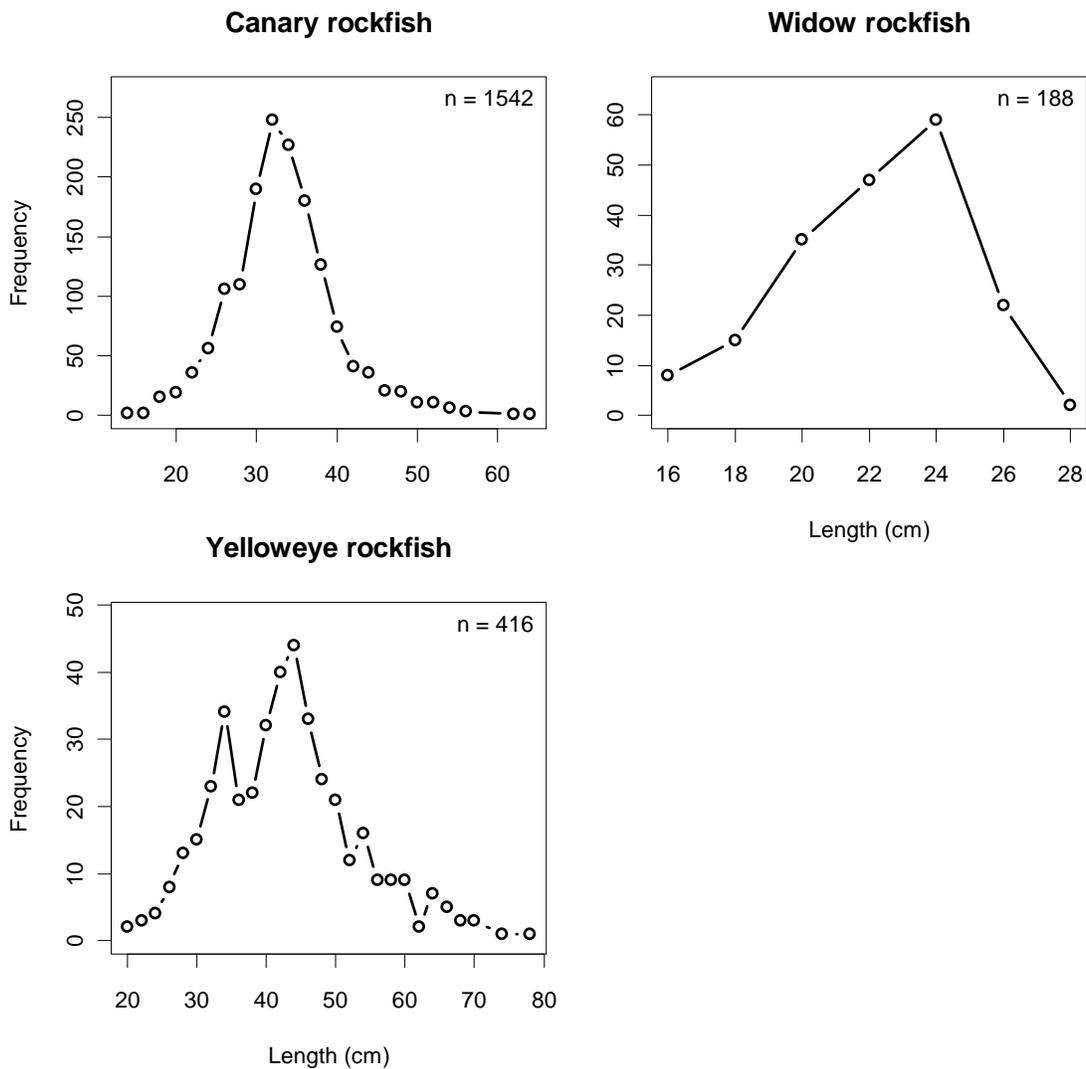


Figure 4. Length frequency distributions of discarded (non-rebuilding) groundfish species observed in the nearshore fixed gear groundfish fishery from September 2003 - April 2009. Length frequency distributions are provided for species for which there are at least 50 observations.

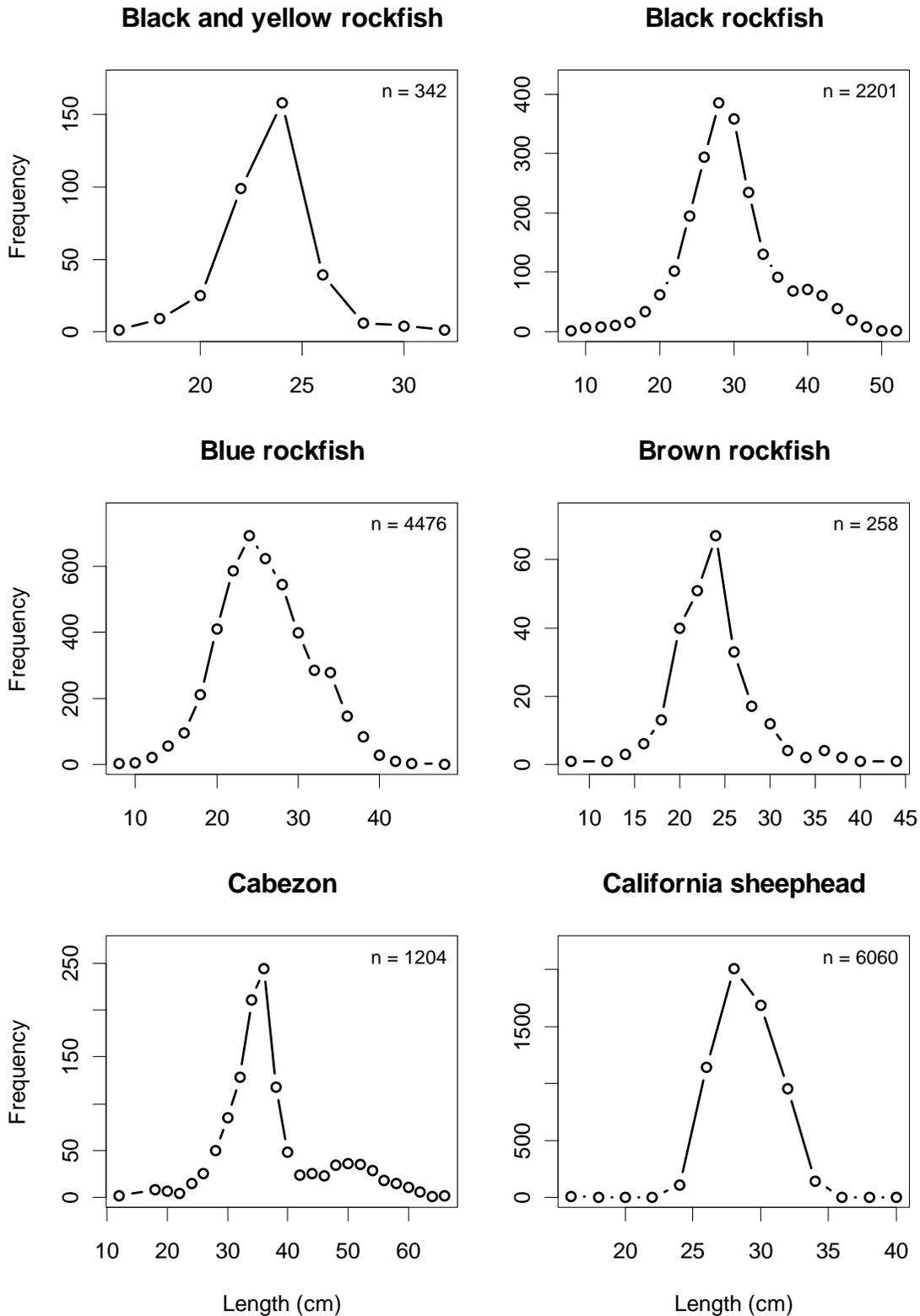


Figure 4 continued. Length frequency distributions of discarded (non-rebuilding) groundfish species observed in the nearshore fixed gear groundfish fishery from September 2003 - April 2009. Length frequency distributions are provided for species for which there are at least 50 observations.

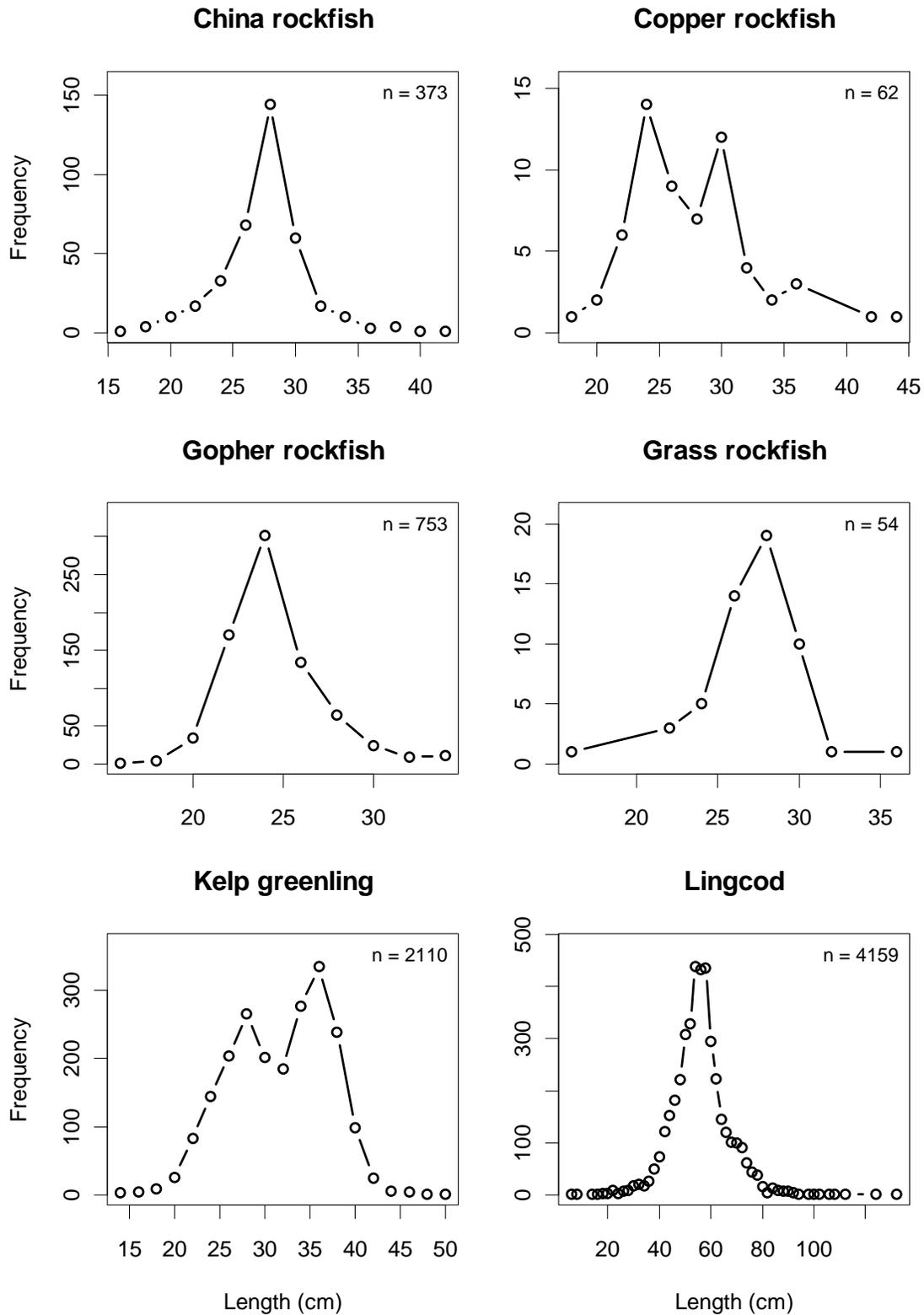
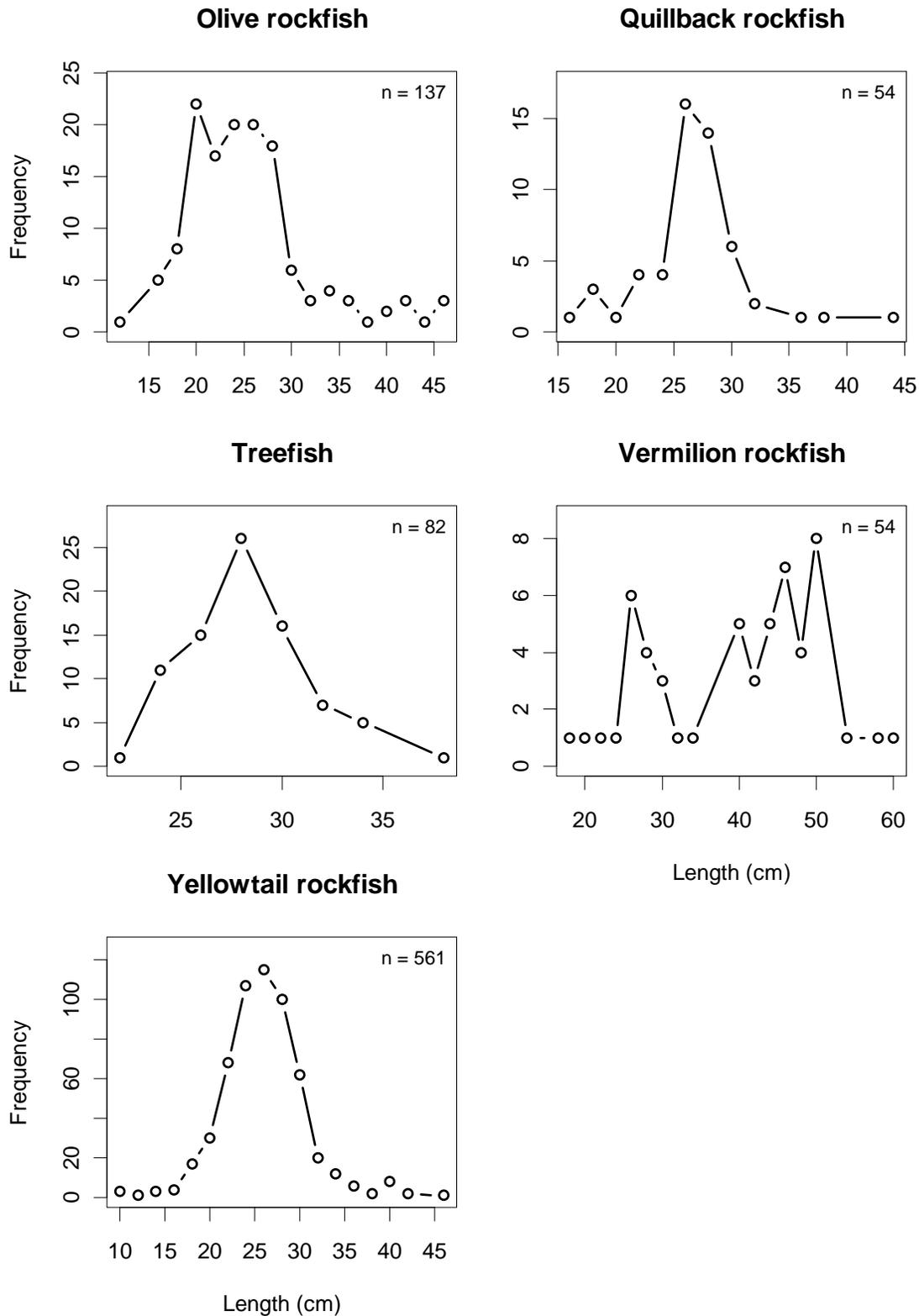


Figure 4 continued. Length frequency distributions of discarded (non-rebuilding) groundfish species observed in the nearshore fixed gear groundfish fishery from September 2003 - April 2009. Length frequency distributions are provided for species for which there are at least 50 observations.



TABLES

Table 1. Total trips, sets, vessels and nearshore species landings observed in the nearshore fixed gear groundfish fisheries in 2008 (above) and from January through April 2009 (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
2008	Bellingham	--	--	--	--	--	--
	Neah Bay	--	--	--	--	--	--
	Astoria	41	50	14	4.0	35.7	11%
	Newport						
	Coos Bay	--	--	--	--	1.9	--
	Crescent City **	159	190	41	16.2	269.7	6%
	Eureka	--	--	--	--	10.4	--
	Fort Bragg	18	21	9	0.9	29.5	3%
	San Francisco						
	Monterey	6	8	5	0.2	83.2	0%
	Morro Bay						
	Santa Barbara	7	11	3	0.3	51.7	1%
	Los Angeles						
	Hook-and-line gear	224	268	69	21.2	432.4	5%
	Pot gear	8	12	4	0.5	49.7	1%
	Oregon	153	188	45	14.8	189.1	8%
	California	78	92	27	6.9	293.0	2%
Coastwide	231	280	72	21.7	482.1	4%	
Jan - Apr 2009	Bellingham	--	--	--	--	--	--
	Neah Bay	--	--	--	--	--	--
	Astoria	7	7	4	0.4	4.2	8%
	Newport	--	--	--	--	3.0	--
	Coos Bay						
	Crescent City **	53	59	16	4.7	70.0	7%
	Eureka	--	--	--	--	1.5	--
	Fort Bragg	--	--	--	--	2.3	--
	San Francisco	*	*	*	*	0.9	*
	Monterey	--	--	--	--	2.3	--
	Morro Bay	--	--	--	--	11.8	--
	Santa Barbara	--	--	--	--	2.7	--
	Los Angeles	*	*	*	*	7.5	*
	Hook-and-line gear	64	71	22	5.1	95.6	5%
	Pot gear	*	*	*	*	10.7	*
	Oregon	44	49	18	2.8	55.9	5%
	California	20	24	4	2.2	50.5	4%
Coastwide	*	*	*	*	106.3	*	

* 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 in the 2008 nearshore fixed gear groundfish fishery by gear type and state (when possible). There were not sufficient data to report discard from pot gear separately by state. Rebuilding and protected species are presented alphabetically while other species are ranked by total catch coastwide.

	Hook-and-Line Gear						Pot gear		
	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
Rebuilding species									
Canary rockfish	0.078	0.078	100.0%	0.109	0.109	100.0%	--	--	--
Widow rockfish	0.002	0.000	14.3%	0.004	0.000	0.0%	--	--	--
Yelloweye rockfish *	0.191	0.191	100.0%	0.024	0.024	100.0%	--	--	--
Non-rebuilding species									
Black-and-yellow rockfish	0.002	0.000	0.0%	0.026	0.003	12.9%	0.002	0.000	14.3%
Black rockfish	8.812	0.375	4.3%	4.538	0.038	0.8%	--	--	--
Brown rockfish	0.001	0.000	0.0%	0.352	0.001	0.2%	--	--	--
Cabezon	1.666	0.107	6.4%	0.201	0.046	22.6%	0.189	0.023	12.4%
California scorpionfish	--	--	--	--	--	--	0.001	0.000	0.0%
Gopher rockfish	0.003	0.000	0.0%	0.174	0.015	8.7%	0.005	0.001	14.3%
Grass rockfish	0.001	0.000	0.0%	0.059	0.005	8.8%	--	--	--
Kelp greenling	1.814	0.227	12.5%	0.118	0.086	73.0%	0.014	0.003	24.9%
Kelp rockfish	--	--	--	--	--	--	0.001	0.000	0.0%
Leopard shark	--	--	--	0.007	0.007	100.0%	--	--	--
Lingcod	3.597	1.773	49.3%	0.599	0.249	41.6%	0.012	0.008	63.8%
Nearshore rockfish	1.411	0.413	29.2%	0.930	0.129	13.8%	0.001	0.001	100.0%
Blue rockfish		0.333			0.105			--	
Calico rockfish		--			0.000			--	
China rockfish		0.061			0.022			--	
Copper rockfish		0.001			0.002			0.001	
Quillback rockfish		0.017			0.000			--	
Unspecified nearshore rockfish		--			0.000			--	
Olive rockfish	0.001	0.001	55.6%	0.006	0.000	5.1%	--	--	--
Pacific sanddab	--	--	--	0.000	0.000	100.0%	--	--	--
Rock sole	--	--	--	0.013	0.006	47.2%	--	--	--
Rosy rockfish	0.075	0.001	1.4%	0.016	0.000	0.8%	--	--	--
Sand sole	--	--	--	0.001	0.001	100.0%	--	--	--

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

Table 2a continued.

	Hook-and-Line Gear						Pot gear		
	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
Non-rebuilding species (cont.)									
Shelf rockfish	0.285	0.027	9.3%	0.106	0.001	0.6%	0.000	0.000	--
Rosethorn rockfish		0.003			0.001			--	
Starry rockfish		--			0.000			--	
Tiger rockfish		0.000			0.000			--	
Vermilion rockfish		0.023			0.000			--	
Unspecified shelf rockfish		--			0.000			--	
Skates	0.032	0.000	0.0%	0.002	0.002	100.0%	0.000	0.000	--
Longnose skate	0.017	0.000	0.0%	--	--	--	--	--	--
Starry skate	--	--	--	0.002	0.002	100.0%	--	--	--
Unspecified skate	0.015	0.000	0.0%	--	--	--	--	--	--
Slope rockfish	0.000	0.000	--	0.009	0.000	0.0%	0.000	0.000	--
Bank rockfish		--			0.000			--	
Blackgill rockfish		--			0.000			--	
Unspecified slope rockfish		--			0.000			--	
Spiny dogfish	--	--	--	0.088	0.088	100.0%	--	--	--
Spotted ratfish	--	--	--	0.013	0.013	100.0%	--	--	--
Starry flounder	--	--	--	0.001	0.000	0.0%	--	--	--
Treefish	--	--	--	0.001	0.000	0.0%	0.001	0.000	0.0%
Yellowtail rockfish	0.147	0.035	23.9%	0.030	0.009	28.6%	--	--	--
Non-groundfish species									
Barred sand bass	--	--	--	--	--	--	0.005	0.005	100.0%
Black surfperch	--	--	--	--	--	--	0.083	0.083	100.0%
Blacksmith	--	--	--	--	--	--	0.000	0.000	100.0%
Bull sculpin	0.001	0.001	100.0%	0.000	0.000	100.0%	--	--	--
California moray	--	--	--	--	--	--	0.002	0.002	100.0%
California sheephead	--	--	--	0.006	0.000	0.0%	0.402	0.106	26.4%
California spiny lobster	--	--	--	--	--	--	0.052	0.000	0.0%
Decorator/spider crab (unidentified)	0.000	0.000	100.0%	--	--	--	--	--	--
Dungeness crab	--	--	--	0.022	0.000	0.0%	--	--	--
Jack smelt	--	--	--	0.006	0.006	100.0%	--	--	--
Jackmackerel	--	--	--	0.012	0.000	0.0%	--	--	--
Jellyfish (unidentified)	0.011	0.011	100.0%	--	--	--	--	--	--

Table 2a continued.

	Hook-and-Line Gear						Pot gear		
	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
Non-groundfish species (cont.)									
Kelp bass	--	--	--	--	--	--	0.171	0.171	100.0%
Mollusk (unidentified)	--	--	--	--	--	--	0.336	0.000	0.0%
Monkeyface prickleback	--	--	--	0.003	0.000	0.0%	--	--	--
Ocean whitefish	--	--	--	--	--	--	0.010	0.006	55.6%
Octopus (unidentified)	--	--	--	0.000	0.000	100.0%	0.001	0.001	100.0%
Pacific halibut	0.027	0.027	100.0%	--	--	--	--	--	--
Pacific mackerel	--	--	--	0.030	0.029	96.6%	--	--	--
Pacific sardine	--	--	--	0.001	0.000	0.0%	--	--	--
Rainbow surfperch	--	--	--	--	--	--	0.001	0.001	100.0%
Red Irish lord sculpin	0.009	0.009	100.0%	--	--	--	--	--	--
Red rock crab	--	--	--	0.012	0.011	92.3%	0.001	0.001	100.0%
Red sea urchin	--	--	--	--	--	--	0.049	0.000	0.0%
Rock crab	--	--	--	0.003	0.003	100.0%	0.001	0.000	0.0%
Rubberlip surfperch	--	--	--	--	--	--	0.001	0.001	100.0%
Sculpin (unidentified)	0.033	0.032	97.2%	0.013	0.011	84.6%	--	--	--
Sea cucumber (unidentified)	0.021	0.021	100.0%	0.000	0.000	100.0%	0.009	0.000	0.0%
Silver (coho) salmon	0.013	0.013	100.0%	--	--	--	--	--	--
Smelt (unidentified)	--	--	--	0.000	0.000	0.0%	--	--	--
Striped surfperch	0.001	0.001	100.0%	--	--	--	--	--	--
Surfperch (unidentified)	--	--	--	--	--	--	0.000	0.000	100.0%
Urchin (unidentified)	--	--	--	--	--	--	0.000	0.000	100.0%
White croaker	--	--	--	0.001	0.000	0.0%	--	--	--
Wolf-eel	0.007	0.004	52.6%	0.004	0.004	100.0%	--	--	--

Table 2b. Observed catch weight (mt), discard weight (mt) and percent discarded in the nearshore fixed gear groundfish fishery from January through April 2009 by gear type and state (when possible). There were not sufficient data to report discard from pot gear in the first four months of 2009. Rebuilding and protected species are presented alphabetically while other species are ranked by total catch coastwide.

	Hook-and-Line Gear					
	Oregon			California		
	Total catch (mt)	Discard (mt)	Total % discarded	Total catch (mt)	Discard (mt)	Total % discarded
Rebuilding species						
Bocaccio	--	--	--	0.013	0.000	0.0%
Canary rockfish	0.011	0.011	100.0%	0.059	0.059	100.0%
Widow rockfish	--	--	--	0.005	0.001	13.0%
Yelloweye rockfish *	0.000	0.000	100.0%	0.002	0.002	100.0%
Non-rebuilding species						
Black rockfish	1.989	0.131	6.6%	1.819	0.016	0.9%
Brown rockfish	--	--	--	0.009	0.001	8.4%
Cabezon	0.222	0.017	7.5%	0.019	0.004	22.3%
Gopher rockfish	--	--	--	0.007	0.007	100.0%
Grass rockfish	0.001	0.000	0.0%	--	--	--
Kelp greenling	0.746	0.085	11.4%	0.022	0.011	51.9%
Lingcod	0.527	0.527	100.0%	0.047	0.047	100.0%
Nearshore rockfish	0.185	0.085	46.1%	0.454	0.066	14.4%
Blue rockfish		0.076			0.064	
China rockfish		0.006			0.001	
Copper rockfish		0.000			0.000	
Quillback rockfish		0.003			0.000	
Unspecified nearshore rockfish		--			0.000	
Olive rockfish	--	--	--	0.007	0.003	41.2%
Rosy rockfish	--	--	--	0.000	0.000	0.0%
Shelf rockfish	0.019	0.003	17.1%	0.098	0.001	0.7%
Flag rockfish		--			0.000	
Greenblotched rockfish		--			0.000	
Greenspotted rockfish		--			0.000	
Greenstriped rockfish		--			0.001	
Speckled rockfish		--			0.000	
Starry rockfish		--			0.000	
Vermilion rockfish		0.003			0.000	
Unspecified shelf rockfish		--			0.000	
Squarespot rockfish	--	--	--	0.001	0.000	0.0%
Yellowtail rockfish	0.008	0.002	27.5%	0.053	0.009	17.1%
Non-groundfish species						
King (Chinook) salmon	0.004	0.004	100.0%	--	--	--
Pacific mackerel	--	--	--	0.002	0.000	0.0%
Ocean whitefish	--	--	--	0.002	0.000	0.0%
Pacific sardine	--	--	--	0.001	0.001	100.0%
Striped surfperch	0.001	0.000	0.0%	--	--	--
Surfperch (unidentified)	0.001	0.001	100.0%	--	--	--
Other nongroundfish	--	--	--	0.001	0.000	0.0%
Mackerel (unidentified)	--	--	--	0.007	0.000	0.0%
Octopus (unidentified)	0.008	0.000	0.0%	--	--	--
Sculpin (unidentified)	0.012	0.012	97.4%	0.000	0.000	100.0%

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

Table 3a. Observed catch weight (mt), discard weight (mt) and percent discarded from observed Oregon nearshore fixed gear groundfish vessels in 2008 by depth.

Oregon 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
Rebuilding species									
Canary rockfish	0.019	0.019	100.0%	0.054	0.054	100.0%	0.006	0.006	100.0%
Widow rockfish	--	--	--	0.002	0.000	14.3%	--	--	--
Yelloweye rockfish *	0.009	0.009	100.0%	0.165	0.165	100.0%	0.018	0.018	100.0%
Non-rebuilding species									
Black-and-yellow rockfish	0.002	0.000	0.0%	--	--	--	--	--	--
Black rockfish	4.444	0.235	5.3%	4.238	0.131	3.1%	0.130	0.009	7.0%
Brown rockfish	0.001	0.000	0.0%	--	--	--	--	--	--
Cabezon	0.754	0.078	10.3%	0.899	0.029	3.2%	0.147	0.001	0.7%
Gopher rockfish	0.002	0.000	0.0%	0.001	0.000	0.0%	--	--	--
Grass rockfish	0.001	0.000	0.0%	--	--	--	--	--	--
Kelp greenling	0.947	0.089	9.4%	0.857	0.138	16.1%	0.010	0.001	6.1%
Lingcod	1.276	0.733	57.4%	2.204	0.954	43.3%	0.116	0.086	73.6%
Nearshore rockfish	0.449	0.141	31.3%	0.919	0.259	28.2%	0.043	0.013	30.4%
Blue rockfish		0.117			0.202			0.013	
China rockfish		0.020			0.041			0.000	
Copper rockfish		0.000			0.001			0.000	
Quillback rockfish		0.003			0.014			0.000	
Olive rockfish	0.001	0.001	55.6%	--	--	--	--	--	--
Rosy rockfish	--	--	--	0.074	0.000	0.0%	0.001	0.001	100.0%
Shelf rockfish	0.066	0.007	10.5%	0.213	0.020	9.2%	0.006	0.000	0.0%
Rosethorn rockfish		--			0.003			--	
Tiger rockfish		0.000			0.000			0.000	
Vermilion rockfish		0.007			0.016			0.000	
Skates	0.000	0.000	--	0.032	0.000	0.0%	0.000	0.000	--
Longnose skate		--			0.000			--	
Unspecified skate		--			0.000			--	
Yellowtail rockfish	0.015	0.006	36.0%	0.038	0.025	67.8%	0.094	0.004	4.4%

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

Table 3a continued.

Oregon 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-groundfish species									
Bull sculpin	0.001	0.001	100.0%	0.001	0.001	100.0%	--	--	--
Decorator/spider crab (unidentified)	--	--	--	0.000	0.000	100.0%	--	--	--
Jellyfish (unidentified)	--	--	--	0.011	0.011	100.0%	--	--	--
Pacific halibut	--	--	--	0.027	0.027	100.0%	--	--	--
Red Irish lord sculpin	0.005	0.005	100.0%	0.004	0.004	100.0%	--	--	--
Sculpin (unidentified)	0.023	0.023	100.0%	0.010	0.009	90.7%	--	--	--
Sea cucumber (unidentified)	0.006	0.006	100.0%	0.015	0.015	100.0%	--	--	--
Striped surfperch	0.001	0.001	100.0%	--	--	--	--	--	--
Wolf-eel	0.003	0.000	0.0%	0.004	0.004	100.0%	--	--	--

Table 3b. Observed catch weight (mt), discard weight (mt) and percent discarded from observed California nearshore fixed gear groundfish vessels in 2008 by depth.

California 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
Rebuilding species									
Canary rockfish	0.002	0.002	100.0%	0.103	0.103	100.0%	0.004	0.004	100.0%
Widow rockfish	--	--	--	0.004	0.000	0.0%	--	--	--
Yelloweye rockfish *	--	--	--	0.012	0.012	100.0%	0.013	0.013	100.0%
Non-rebuilding species									
Black-and-yellow rockfish	0.026	0.004	13.7%	0.001	0.000	0.0%	--	--	--
Black rockfish	1.458	0.021	1.5%	3.064	0.017	0.6%	0.015	0.000	0.0%
Brown rockfish	0.030	0.000	0.8%	0.322	0.000	0.1%	--	--	--
Cabezon	0.096	0.016	16.6%	0.160	0.052	32.4%	--	--	--
California scorpionfish	0.001	0.000	0.0%	0.000	0.000	0.0%	--	--	--
Flatfish	--	--	--	0.000	0.000	100.0%	--	--	--
Gopher rockfish	0.041	0.003	8.1%	0.118	0.012	10.6%	0.020	0.000	0.0%
Grass rockfish	0.054	0.005	9.6%	0.005	0.000	0.0%	--	--	--
Kelp greenling	0.049	0.037	76.3%	0.074	0.044	59.5%	0.008	0.008	100.0%
Kelp rockfish	0.000	0.000	0.0%	0.000	0.000	0.0%	--	--	--
Leopard shark	0.007	0.007	100.0%	--	--	--	--	--	--
Lingcod	0.144	0.039	26.8%	0.431	0.198	45.9%	0.036	0.020	56.7%
Nearshore rockfish	0.072	0.011	14.7%	0.796	0.106	13.3%	0.063	0.014	21.6%
Blue rockfish		0.010			0.092			0.002	
Calico rockfish		--			0.000			--	
China rockfish		0.000			0.010			0.011	
Copper rockfish		0.000			0.003			0.000	
Quillback rockfish		--			0.000			0.000	
Unspecified nearshore rockfish		0.000			0.000			--	
Olive rockfish	0.000	0.000	0.0%	0.005	0.000	5.5%	--	--	--
Rock sole	--	--	--	0.005	0.001	19.0%	0.009	0.005	63.0%
Rosy rockfish	--	--	--	0.008	0.000	1.7%	0.008	0.000	0.0%
Sand sole	--	--	--	0.001	0.001	100.0%	--	--	--

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

Table 3b continued.

California 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.)									
Shelf rockfish	0.002	0.000	0.0%	0.088	0.001	0.8%	0.016	0.000	0.0%
Rosethorn rockfish		--			0.001			--	
Starry rockfish		--			0.000			0.000	
Tiger rockfish		--			--			0.000	
Vermilion rockfish		0.000			0.000			0.000	
Unspecified shelf rockfish		--			0.000			0.000	
Skates	0.000	0.000	--	0.002	0.002	100.0%	0.000	0.000	--
Starry skate		--			0.002			--	
Slope rockfish	0.001	0.000	0.0%	0.008	0.000	0.0%	0.000	0.000	--
Bank rockfish		0.000			--			--	
Blackgill rockfish		--			0.000			--	
Unspecified slope rockfish		--			0.000			--	
Spiny dogfish	0.024	0.024	100.0%	0.064	0.064	100.0%	--	--	--
Spotted ratfish	--	--	--	0.011	0.011	100.0%	0.002	0.002	100.0%
Starry flounder	--	--	--	0.001	0.000	0.0%	--	--	--
Treefish	0.000	0.000	0.0%	0.002	0.000	0.0%	--	--	--
Yellowtail rockfish	0.001	0.001	59.2%	0.026	0.008	29.7%	0.002	0.000	0.0%
Non-groundfish species									
Barred sand bass	--	--	--	0.005	0.005	100.0%	--	--	--
Black surfperch	0.055	0.055	100.0%	0.028	0.028	100.0%	--	--	--
Blacksmith	0.000	0.000	100.0%	--	--	--	--	--	--
Bull sculpin	--	--	--	0.000	0.000	100.0%	--	--	--
California moray	--	--	--	0.002	0.002	100.0%	--	--	--
California sheephead	0.223	0.057	25.6%	0.185	0.049	26.6%	--	--	--
California spiny lobster	--	--	--	0.052	0.000	0.0%	--	--	--
Dungeness crab	0.022	0.000	0.0%	--	--	--	--	--	--
Jack smelt	0.006	0.006	100.0%	--	--	--	--	--	--
Jackmackerel	--	--	--	0.012	0.000	0.0%	--	--	--
Kelp bass	0.085	0.085	100.0%	0.086	0.086	100.0%	--	--	--
Mixed species	0.006	0.000		--	--	--	--	--	--
Mollusk (unidentified)	0.099	0.000	0.0%	0.237	0.000	0.0%	--	--	--
Monkeyface prickleback	0.003	0.000	0.0%	--	--	--	--	--	--

Table 3b continued.

California 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.)									
Ocean whitefish	0.005	0.005	100.0%	0.005	0.001	11.1%	--	--	--
Octopus (unidentified)	0.001	0.001	100.0%	0.000	0.000	100.0%	--	--	--
Pacific mackerel	--	--	--	0.030	0.029	96.6%	--	--	--
Pacific sardine	--	--	--	0.001	0.000	0.0%	--	--	--
Rainbow surfperch	0.000	0.000	100.0%	0.001	0.001	100.0%	--	--	--
Red rock crab	0.010	0.009	90.7%	0.003	0.003	100.0%	--	--	--
Red sea urchin	0.049	0.000	0.0%	--	--	--	--	--	--
Rock crab	0.001	0.000	0.0%	0.003	0.003	100.0%	--	--	--
Rubberlip surfperch	0.001	0.001	100.0%	--	--	--	--	--	--
Sculpin (unidentified)	0.004	0.002	45.9%	0.009	0.009	100.0%	--	--	--
Sea cucumber (unidentified)	0.009	0.000	1.3%	--	--	--	--	--	--
Smelt (unidentified)	--	--	--	0.000	0.000	0.0%	--	--	--
Surfperch (unidentified)	0.000	0.000	100.0%	--	--	--	--	--	--
Urchin (unidentified)	0.000	0.000	100.0%	--	--	--	--	--	--
White croaker	--	--	--	0.001	0.000	0.0%	--	--	--
Wolf-eel	--	--	--	0.004	0.004	100.0%	--	--	--

Table 3c. Observed catch weight (mt), discard weight (mt) and percent discarded from observed nearshore fixed gear groundfish vessels from January through April of 2009. Data are reported coastwide to ensure confidentiality.

Oregon & California Jan - Apr 2009 (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 *	--	--	--	--	--	--	0.013	0.000	0.0%
Canary rockfish	0.001	0.001	100.0%	0.068	0.068	100.0%	--	--	--
Widow rockfish	--	--	--	0.005	0.001	13.0%	--	--	--
Yelloweye rockfish *	--	--	--	0.003	0.003	100.0%	--	--	--
Non-rebuilding species									
Black rockfish	1.203	0.085	7.1%	2.552	0.061	2.4%	0.052	0.000	0.0%
Brown rockfish	0.010	0.000	4.7%	0.004	0.001	21.6%	--	--	--
Cabezon	0.173	0.017	10.1%	0.067	0.003	4.9%	--	--	--
Gopher rockfish	0.007	0.007	100.0%	--	--	--	--	--	--
Grass rockfish	0.001	0.000	0.0%	--	--	--	--	--	--
Kelp greenling	0.610	0.071	11.7%	0.157	0.024	15.3%	0.001	0.001	100.0%
Lingcod	0.385	0.385	100.0%	0.184	0.184	100.0%	0.005	0.005	100.0%
Nearshore rockfish	0.092	0.032	34.9%	0.541	0.118	21.7%	0.006	0.001	21.6%
Blue rockfish		0.030			0.109			0.001	
China rockfish		0.002			0.006			--	
Copper rockfish		0.000			0.000			0.000	
Quillback rockfish		--			0.003			--	
Unspecified nearshore rockfish		0.000			--			--	
Olive rockfish	--	--	--	0.007	0.003	41.2%	--	--	--
Other groundfish	0.000	0.000	100.0%	--	--	--	--	--	--
Rosy rockfish	--	--	--	--	--	--	0.000	0.000	0.0%
Shelf rockfish	0.012	0.000	0.0%	0.042	0.003	7.5%	0.063	0.001	1.1%
Flag rockfish		--			--			0.000	
Greenblotched rockfish		--			--			0.000	
Greenspotted rockfish		--			--			0.000	
Greenstriped rockfish		--			--			0.001	
Speckled rockfish		--			--			0.000	
Starry rockfish		--			--			0.000	

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

Table 3c continued.

Oregon & California Jan - Apr 2009 (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.)									
Shelf rockfish	0.012	0.000	0.0%	0.042	0.003	7.5%	0.063	0.001	1.1%
Vermilion rockfish		0.000			0.003			0.000	
Unspecified shelf rockfish		--			--			0.000	
Squarespot rockfish	--	--	--	--	--	--	0.001	0.000	0.0%
Yellowtail rockfish	0.002	0.001	37.5%	0.059	0.010	17.7%	--	--	--
Non-groundfish species									
Barred sand bass	0.002	0.002	100.0%	0.001	0.001	100.0%	--	--	--
Black surfperch	0.001	0.001	100.0%	0.001	0.001	100.0%	--	--	--
California sheephead	0.009	0.004	48.1%	0.020	0.010	52.8%	--	--	--
Kelp bass	0.006	0.006	100.0%	0.004	0.004	100.0%	--	--	--
King (Chinook) salmon	--	--	--	0.004	0.004	100.0%	--	--	--
Mackerel (unidentified)	0.007	0.000	0.0%	--	--	--	--	--	--
Ocean whitefish	--	--	--	0.001	0.000	0.0%	0.002	0.000	0.0%
Octopus (unidentified)	--	--	--	0.008	0.000	0.0%	--	--	--
Other nongroundfish	--	--	--	--	--	--	0.001	0.000	0.0%
Pacific mackerel	0.002	0.000	0.0%	--	--	--	--	--	--
Pacific sardine	0.001	0.001	100.0%	--	--	--	--	--	--
Rainbow surfperch	0.000	0.000	100.0%	0.000	0.000	100.0%	--	--	--
Sculpin (unidentified)	0.011	0.011	97.2%	0.001	0.001	100.0%	--	--	--
Sea cucumber (unidentified)	0.000	0.000	100.0%	--	--	--	--	--	--
Striped surfperch	0.001	0.000	0.0%	--	--	--	--	--	--
Surfperch (unidentified)	0.001	0.001	100.0%	--	--	--	--	--	--

Table 4. Discard ratios and standard errors from observed nearshore fixed gear groundfish vessels in Oregon (above) and California (below) in 2008. Ratios are computed as the observed discarded weight divided by the weight of retained nearshore species (see Appendix B) for all gears.

	Depth interval					
	0 - 10 fm		11 - 20 fm		21 - 50 fm	
	Discard ratio	Standard error	Discard ratio	Standard error	Discard ratio	Standard error
Oregon						
Rebuilding species						
Canary rockfish	0.0028	0.0596	0.0072	0.0341	0.0175	0.1385
Widow rockfish	0.0000	NA	0.0000	0.0129	0.0000	NA
Yelloweye rockfish	0.0013	0.0717	0.0221	0.1872	0.0533	NA
Non-rebuilding species						
Black rockfish (South of 46°16' N. lat.)	0.0360	0.0410	0.0176	0.0376	0.0269	0.0965
Blue rockfish	0.0180	0.0371	0.0271	0.0637	0.0385	0.2485
Cabazon	0.0119	0.0342	0.0039	0.0134	0.0030	0.0388
Kelp greenling	0.0136	0.0231	0.0185	0.0536	0.0019	0.0302
Lingcod	0.1124	0.1790	0.1279	0.1887	0.2544	1.3212
Longnose skate	0.0000	NA	0.0000	NA	0.0000	NA
Minor shelf rockfish	0.0011	0.0384	0.0026	0.0284	0.0030	0.0272
Other minor nearshore rockfish	0.0036	0.0107	0.0076	0.0099	0.0000	NA
Unspecified skate	0.0000	NA	0.0000	NA	0.0000	NA
Yellowtail rockfish	0.0009	0.0164	0.0034	0.0231	0.0122	0.0415
Non-groundfish species						
Other nongroundfish	0.0054	0.0396	0.0062	0.0370	0.0283	NA
California						
Rebuilding species						
Canary rockfish	0.0010	0.0241	0.0227	0.1862	0.0434	0.3032
Widow rockfish	0.0000	NA	0.0000	NA	0.0000	NA
Yelloweye rockfish	0.0000	NA	0.0026	0.4548	0.1339	NA
Non-rebuilding species						
Black rockfish	0.0108	0.0394	0.0038	0.0086	0.0000	NA
Blackgill rockfish (South of 40°10' N. lat.)	0.0000	NA	0.0000	NA	0.0000	NA
Blue rockfish	0.0051	0.0242	0.0204	0.0320	0.0225	0.0692
Cabazon	0.0081	0.0739	0.0115	0.1597	0.0000	NA
California scorpionfish	0.0000	NA	0.0000	NA	0.0000	NA
Deeper nearshore rockfish	0.0004	0.0054	0.0008	0.0044	0.0000	NA
Gopher rockfish (South of 40°10' N. lat.)	0.0017	0.0159	0.0028	0.0242	0.0000	NA
Kelp greenling	0.0188	0.1145	0.0097	0.0413	0.0844	NA
Lingcod	0.0194	0.0640	0.0438	0.0991	0.2109	1.0806
Minor shelf rockfish	0.0000	NA	0.0002	0.0016	0.0000	NA
Minor slope rockfish	0.0000	NA	0.0000	NA	0.0000	NA
Other flatfish	0.0000	NA	0.0005	0.0258	0.0564	1.0716
Other groundfish	0.0034	NA	0.0024	0.2916	0.0209	NA
Shallow nearshore rockfish	0.0044	0.0370	0.0023	0.0159	0.1194	0.6484
Spiny dogfish	0.0121	0.3043	0.0142	0.9103	0.0000	NA
Starry flounder	0.0000	NA	0.0000	NA	0.0000	NA
Unspecified skate	0.0000	NA	0.0005	NA	0.0000	NA
Yellowtail rockfish (North of 40°10' N. lat.)	0.0003	0.0124	0.0014	0.0145	0.0000	NA
Yellowtail rockfish (South of 40°10' N. lat.)	0.0000	NA	0.0003	0.0309	0.0000	NA
Non-groundfish species						
California sheephead	0.0288	0.2928	0.0109	0.3761	0.0000	NA
Dungeness crab	0.0000	NA	0.0000	NA	0.0000	NA
Other nongroundfish	0.0835	0.2142	0.0376	0.1946	0.0000	NA

Table 5. Bycatch ratios for rebuilding and nearshore groundfish species in the 2008 nearshore fixed gear groundfish fishery. Bycatch ratios are computed as the observed total catch weight divided by the observed weight of retained nearshore target species (see Appendix B).

	Depth interval		
	0 - 10 fm	11 - 20 fm	21 - 50 fm
North of 40°10' N. lat.			
Rebuilding species			
Canary rockfish	0.0024	0.0125	0.0187
Widow rockfish	0.0000	0.0005	0.0000
Yelloweye rockfish	0.0011	0.0158	0.0780
Nearshore species			
Black rockfish (South of 46°16' N. lat.)	0.7211	0.6535	0.3671
Blue rockfish	0.0312	0.0876	0.0939
Cabazon	0.1036	0.0841	0.3723
Kelp greenling	0.1193	0.0807	0.0264
Lingcod	0.1639	0.2150	0.3249
Other minor nearshore rockfish	0.0341	0.0562	0.1030
South of 40°10' N. lat.			
Rebuilding species			
Canary rockfish	0.0015	0.0206	0.0702
Widow rockfish	0.0000	0.0000	0.0000
Yelloweye rockfish	0.0000	0.0012	0.0000
Nearshore species			
Black rockfish	0.0875	0.0303	0.0000
Blue rockfish	0.0092	0.0647	0.1131
Cabazon	0.0188	0.1435	0.0000
California scorpionfish	0.0014	0.0004	0.0000
California sheephead	0.6076	0.2159	0.0000
Deeper nearshore rockfish	0.0803	0.4158	0.1786
Gopher rockfish	0.2028	0.1496	0.5119
Kelp greenling	0.0660	0.0384	0.2119
Lingcod	0.2336	0.2826	0.6250
Shallow nearshore rockfish	0.1169	0.0337	0.4429

Table 6. Summary of the number of length measurements and the number of individual fish sexed by WCGOP observers in the nearshore fixed gear groundfish fishery from September 2003 through April 2009. 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 2009	1542	2
Widow rockfish	2004 - Apr 2009	188	0
Yelloweye rockfish	2004 - Apr 2009	416	0
Other species			
Black and yellow rockfish	2004 - 2008	342	2
Black rockfish	2004 - Apr 2009	2201	0
Blue rockfish	2004 - Apr 2009	4476	0
Brown rockfish	2004 - Apr 2009	258	0
Cabazon	2004 - Apr 2009	1204	4
California sheephead	2004 - Apr 2009	6060	623
China rockfish	2004 - Apr 2009	373	2
Copper rockfish	2004 - 2008	62	0
Gopher rockfish	2004 - Apr 2009	753	1
Grass rockfish	2004 - 2007	54	0
Kelp greenling	2004 - Apr 2009	2110	1704
Kelp rockfish	2004 - 2007	44	0
Lingcod	2004 - Apr 2009	4159	1
Olive rockfish	2004 - Apr 2009	137	0
Quillback rockfish	2004 - Apr 2009	54	2
Treefish	2004 - 2007	82	0
Vermilion rockfish	2004 - 2008	54	0
Yellowtail rockfish	2004 - Apr 2009	561	0

Table 7. Summary of biological data for protected resources collected by WCGOP observers in the nearshore fixed gear groundfish fishery from September 2003 through April 2009. 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	NS Species
ALBC	ALBACORE	Other nongroundfish	Other nongroundfish	
APLC	ALASKA PLAICE	Other non-FMP flatfish	Other non-FMP 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	Bank rockfish (Remaining rockfish)	
BCAC	BOCACCIO	Bocaccio (Remaining rockfish)	Bocaccio	
BCC1	NOM. BOCACCIO	Bocaccio (Remaining rockfish)	Bocaccio	
BCLM	BUTTER CLAM	Other nongroundfish	Other nongroundfish	
BGL1	NOM. BLACKGILL ROCKFISH	Minor slope rockfish	Blackgill (Remaining rockfish)	
BKCR	BLUE KING CRAB	Other nongroundfish	Other nongroundfish	
BLCK	BLACK ROCKFISH	Black rockfish	Black rockfish	yes
BLGL	BLACKGILL ROCKFISH	Minor slope rockfish	Blackgill (Remaining 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 MACKEREL	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	Bank rockfish (Remaining 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 RK	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 RK	Other minor nearshore rockfish	Shallow nearshore rockfish	yes
CBZ1	NOM. CABEZON	Cabezon	Cabezon	yes
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	

PacFIN Species ID	PacFIN Common Name	Species Group - North of 40° 10' N latitude	Species Group - South of 40° 10' N latitude	NS Species
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	Chilipepper (Remaining rockfish)	Chilipepper	
CLPR	CHILIPEPPER	Chilipepper (Remaining rockfish)	Chilipepper	
CMCK	CHUB MACKEREL	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 non-FMP flatfish	Other non-FMP 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	
DFLT	UNSP. DEEP FLOUNDERS	Other flatfish	Other flatfish	
DOVR	DOVER SOLE	Dover sole	Dover sole	
DRDO	DORADO	Other nongroundfish	Other nongroundfish	
DSOL	DEEPSEA SOLE	Other non-FMP flatfish	Other non-FMP flatfish	
DSRK	SPINY DOGFISH	Spiny dogfish	Spiny dogfish	
DTRB	DIAMOND TURBOT	Other non-FMP flatfish	Other non-FMP 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	
EGLS	ENGLISH SOLE	English sole	English sole	
ESTR	EASTERN OYSTER	Other nongroundfish	Other nongroundfish	
ETNA	BIGEYE TUNA	Other nongroundfish	Other nongroundfish	
EULC	EULACHON	Eulachon	Eulachon	
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 non-FMP flatfish	Other non-FMP flatfish	
FRCK	FRECKLED 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	NS Species
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 RK	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	Gopher rockfish (Remaining rockfish)	yes
GPHR	GOPHER ROCKFISH	Other minor nearshore rockfish	Gopher rockfish (Remaining rockfish)	yes
GPRW	GOLDEN PRAWN	Other nongroundfish	Other nongroundfish	
GRAS	GRASS ROCKFISH	Other minor nearshore rockfish	Shallow nearshore rockfish	yes
GRDR	UNSP. GRENADIERS	Unspecified grenadiers	Unspecified grenadiers	
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 non-FMP flatfish	Other non-FMP 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 non-FMP flatfish	Other non-FMP flatfish	
ISRK	BIGEYE THRESHER SHARK	Other nongroundfish	Other nongroundfish	
JCLM	CALIFORNIA JACKKNIFE CLAM	Other nongroundfish	Other nongroundfish	
JMCK	JACK MACKEREL	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
KLPG	KELP GREENLING	Kelp greenling	Kelp greenling	yes
KLPR	KELP ROCKFISH	Other minor nearshore rockfish	Shallow nearshore rockfish	yes
KMKA	KAMCHATKA FLOUNDER	Other non-FMP flatfish	Other non-FMP 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 non-FMP flatfish	Other non-FMP flatfish	
LDB1	NOM. LONGFIN SANDDAB	Other non-FMP flatfish	Other non-FMP flatfish	
LOBS	CALIF. 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	

PacFIN Species ID	PacFIN Common Name	Species Group - North of 40° 10' N latitude	Species Group - South of 40° 10' N latitude	NS Species
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 RK	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 RK	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	
OCTP	UNSP. OCTOPUS	Other nongroundfish	Other nongroundfish	
ODSR	OTHER DEMERSAL RKFSH	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 RKFSH	Other groundfish	Other groundfish	
ORCK	OTHER ROCKFISH	Minor slope rockfish	Minor slope rockfish	
ORCK	OTHER ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
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 RKFSH	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	

PacFIN Species ID	PacFIN Common Name	Species Group - North of 40° 10' N latitude	Species Group - South of 40° 10' N latitude	NS Species
OTCR	OPILO TANNER CRAB	Tanner crab	Tanner crab	
OTNA	OTHER TUNA	Other nongroundfish	Other nongroundfish	
OURC	OTHER SEA URCHINS	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 RF	Minor slope rockfish	Minor slope rockfish	
POP2	NOMINAL POP	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	
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	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 RCKFSH	Minor shelf rockfish	Minor shelf rockfish	
RCK2	UNSP. BOLINA RCKFSH	Other minor nearshore rockfish	Deeper nearshore rockfish	yes
RCK3	UNSP. DPWTR REDS RCKFSH	Minor slope rockfish	Minor slope rockfish	
RCK4	UNSP. REDS RCKFSH	Other groundfish	Other groundfish	
RCK5	UNSP. SMALL REDS RCKFSH	Other groundfish	Other groundfish	
RCK6	UNSP. ROSEFISH RCKFSH	Other groundfish	Other groundfish	
RCK7	UNSP. GOPHER RCKFSH	Other minor nearshore rockfish	Gopher rockfish (Remaining rockfish)	yes
RCK8	CANARY+VERMILION RCKFSH	Canary rockfish	Canary rockfish	

PacFIN Species ID	PacFIN Common Name	Species Group - North of 40° 10' N latitude	Species Group - South of 40° 10' N latitude	NS Species
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	Redstripe rockfish (Remaining 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	
RSL1	NOM. ROCK SOLE	Other flatfish	Other flatfish	
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. SHORTBELLY ROCKFISH	Shortbelly rockfish	Shortbelly rockfish	
SBLY	SHORTBELLY 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. CALIF. SCORPIONFISH	Other minor nearshore rockfish	Shallow nearshore rockfish	yes
SDB1	NOM. SPECKLED SANDDAB	Other non-FMP flatfish	Other non-FMP flatfish	
SFL1	NOM. STARRY FLOUNDER	Starry flounder	Starry flounder	
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	Sharpchin rockfish (Remaining rockfish)	Sharpchin rockfish (Remaining rockfish)	
SKCR	SCARLET KING CRAB	Other nongroundfish	Other nongroundfish	
SLGR	SILVERGREY ROCKFISH	Silvergray rockfish (Remaining rockfish)	Minor shelf rockfish	
SLNS	SLENDER SOLE	Other non-FMP flatfish	Other non-FMP flatfish	
SMLT	UNSP. SMELT	Other nongroundfish	Other nongroundfish	
SNOS	SPLITNOSE ROCKFISH	Splitnose rockfish	Splitnose rockfish	

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		(Remaining rockfish)		
SNS1	NOM. SPLITNOSE ROCKFISH	Splitnose rockfish (Remaining 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 non-FMP flatfish	Other non-FMP flatfish	
SSHR	SOUTHERN NEAR-SHORE RK	Southern nearshore rockfish	Deeper nearshore rockfish	yes
SSHR	SOUTHERN NEAR-SHORE RK	Southern nearshore rockfish	Shallow nearshore rockfish	yes
SSLF	SOUTHERN SHELF ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
SSLP	SOUTHERN SLOPE ROCKFISH	Minor slope rockfish	Minor slope rockfish	
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. Nearshore RF	Southern nearshore rockfish	Deeper nearshore rockfish	yes
SSRK	SOUPFIN SHARK	Other groundfish	Other groundfish	
SSRS	Shallow So. Nearshore 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	Starry flounder	Starry flounder	
SUSF	SOU. UNSP. SHELF ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
SUSP	SOU. UNSP. SLOPE ROCKFISH	Minor slope rockfish	Minor slope rockfish	
SUSR	SOU. UNSP. NEAR-SHORE RK	Southern nearshore rockfish	Deeper nearshore rockfish	yes
SUSR	SOU. UNSP. NEAR-SHORE RK	Southern nearshore rockfish	Shallow nearshore rockfish	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	Mixed thornyheads	Mixed thornyheads	
THDS	THORNYHEADS (MIXED)	Mixed thornyheads	Mixed thornyheads	
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	

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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 RKFSH	Other groundfish	Other groundfish	
UDW1	SHORTRAKER+ROUGHEYE	Minor slope rockfish	Minor slope rockfish	
UECH	UNSPECIFIED ECHINODERM	Other nongroundfish	Other nongroundfish	
UFL1	FLOUNDERS (NO FSOL)	Other flatfish	Other flatfish	
UFLT	UNSP. FLATFISH	Other flatfish	Other flatfish	
UGRN	UNSP. GROUND FISH	Other groundfish	Other groundfish	
UHAG	UNSPECIFIED HAGFISH	Other nongroundfish	Other nongroundfish	
UHLB	UNSPECIFIED HALIBUT	Other nongroundfish	Other nongroundfish	
UJEL	UNSP. JELLYFISH	Other nongroundfish	Other nongroundfish	
UKCR	UNSP. KING CRAB	Other nongroundfish	Other nongroundfish	
UMCK	UNSP. MACKEREL	Other nongroundfish	Other nongroundfish	
UMSK	UNSPECIFIED MOLLUSKS	Other nongroundfish	Other nongroundfish	
UPLG	UNSP. PELAGIC RKFSH	Other groundfish	Other groundfish	
UPOP	UNSP. POP GROUP	Pacific ocean perch	Minor slope rockfish	
URCK	UNSP. ROCKFISH	Minor slope rockfish	Minor slope rockfish	
URCK	UNSP. ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
URK1	SRKR+REYE+NRCK+SHRP	Minor slope rockfish	Minor slope rockfish	
URND	UNSP. ROUND FISH	Other groundfish	Other groundfish	
USCL	UNSPECIFIED SCALLOP	Other nongroundfish	Other nongroundfish	
USCU	UNSP. SEA CUCUMBERS	Other nongroundfish	Other nongroundfish	
USF1	UNSP. SHALLOW-91 FLOUNDERS	Other flatfish	Other flatfish	
USHR	UNSP. NEAR-SHORE ROCKFISH	Other minor nearshore rockfish	Deeper nearshore rockfish	yes
USHR	UNSP. NEAR-SHORE ROCKFISH	Other minor nearshore rockfish	Shallow nearshore rockfish	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 RKFSH	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	UNSPECIFIED OYSTER	Other nongroundfish	Other nongroundfish	
UTCR	UNSP. TANNER CRAB	Tanner crab	Tanner crab	
UTNA	UNSPECIFIED TUNA	Other nongroundfish	Other nongroundfish	
UTRB	UNSP. TURBOTS	Other flatfish	Other flatfish	
UURC	UNSP. SEA URCHINS	Other nongroundfish	Other nongroundfish	
VRM1	NOM. VERMILLION ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
VRML	VERMILION ROCKFISH	Minor shelf rockfish	Minor shelf rockfish	
WABL	WHITE ABALONE	Other nongroundfish	Other nongroundfish	
WBAS	WHITE SEABASS	Other nongroundfish	Other nongroundfish	

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WCLM	WASHINGTON CLAM	Other nongroundfish	Other nongroundfish	
WCRK	WHITE CROAKER	Other nongroundfish	Other nongroundfish	
WDOW	WIDOW ROCKFISH	Widow rockfish	Widow rockfish	
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	Yellowmouth rockfish (Remaining rockfish)	Minor slope rockfish	
YSOL	YELLOWFIN SOLE	Other non-FMP flatfish	Other non-FMP flatfish	
YTNA	YELLOWFIN TUNA	Other nongroundfish	Other nongroundfish	
YTR1	NOM. YELLOWTAIL ROCKFISH	Yellowtail rockfish	Yellowtail rockfish (Remaining rockfish)	
YTRK	YELLOWTAIL ROCKFISH	Yellowtail rockfish	Yellowtail rockfish (Remaining rockfish)	