

Data Report and Summary Analyses of Open Access Fixed-Gear Fisheries in Waters Less Than 50 Fathoms

West Coast Groundfish Observer Program

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Photo: NOAA Fisheries

Table of Contents

INTRODUCTION	3
Overview.....	3
West Coast Nearshore Open Access Fishery.....	3
West Coast Groundfish Observer Program.....	5
Program Goals.....	5
METHODS	6
Permit Selection Process for the Open Access Nearshore Fishery.....	6
Vessel Coverage.....	7
Fixed-Gear Data Collection.....	8
Data Quality Control and Management.....	9
Data Processing.....	10
Analysis.....	11
RESULTS AND DISCUSSION	11
Conclusion.....	14
REFERENCES	15
APPENDICES	
Appendix A: Oracle Database.....	16
Appendix B: Port Groups.....	17
TABLES	
Table 1: Metric tons (mt) of retained catch observed by port group and gear type from open access fixed-gear trips occurring in less than 50 fathoms from January 1, 2004 to April 30, 2006.....	18
Table 2: Weights for selected species/species groups from observed sets at depths less than 50 fm and from fish tickets from the open access, fixed-gear fishery by area from January 1, 2004 to April 30,2006.....	19
Table 3: Number of observed open access fixed-gear trips occurring at less than 50 fm by port group and gear type from January 1, 2004 to April 30, 2006.....	20
Table 4: Number of observed open access fixed-gear sets occurring at less than 50 fm by port group and gear type from January 1, 2004 to April 30, 2006.....	21
Table 5: Number of open access fixed-gear vessels observed fishing at less than 50 fm by port group and gear type from January 1, 2004 to April 30, 2006.....	22
Table 6: Number of observed open access, fixed-gear sets occurring by area, depth, season, and gear from January 1, 2004 to April 30, 2006.....	23
Table 7: Discard rates for species taken from observed open access, fixed-gear fishery at depths less than 50 fm by depth, season, and area from January 1, 2004 to April 30, 2006.....	24
Table 8: Discard rates for rebuilding species taken from observed open access, fixed-gear fishery at depths less than 50 fm by depth, season, and area from January 1, 2004 to April 30, 2006.....	30
Table 9: Ratio estimate and standard error for the total bycatch of eight overfished species per 100 pounds of nearshore fish by area, depth and season from January 1, 2004 to April 30, 2006 on observed open access fixed-gear sets.....	36

INTRODUCTION

Overview

This report summarizes discarded catch data collected by the West Coast Groundfish Observer Program (WCGOP) from the open access fixed-gear fisheries in shallow water (average of start and end depths < 50 fathoms) from September 1, 2004 through April 30, 2006. The WCGOP collects at-sea data from limited-entry (LE) trawl and fixed-gear fisheries, as well as from open access nearshore, prawn/shrimp, California halibut, and deep-water fisheries. The WCGOP's goal is to improve total catch estimates by collecting information on the discarded catch (fish returned at-sea) of west coast groundfish species. The data is used in assessing and managing a variety of groundfish species. This report focuses on the open access nearshore (< 50 fathoms) fishery, but will also include any other open access fixed-gear trips that occur in depths of less than 50 fathoms.

West Coast Nearshore Open Access Fishery

The US west coast nearshore groundfish open access commercial fleet operates from southern California to northern Oregon (Washington does not have a nearshore commercial fleet). Prior to 2003, the fishery was not permitted by federal or state agencies. In 2003, the state of California began permitting some of their fisheries, including the nearshore fishery. Oregon permitted their nearshore fishing fleet in 2004. A variety of fixed gear is used including hand-lines, cable gear, fishing poles, and pots. As permits for this fishery are issued by the states, the specific management differs between California and Oregon, however an optimum yield (OY) is determined for groundfish species (including nearshore species) on a coast-wide basis by the Pacific Fishery Management Council. (Cumulative trip limits set by the states for nearshore species fished in those states can be and often are more restrictive than the federal limits.) The groundfish fishery is divided into two distinct management areas: north of 40°10' N. latitude and south of 40°10' N. latitude.

Vessels participating in the nearshore fishery range in size from 10 to 50 feet and average approximately 25 feet. The majority of fishing in shallow water (< 50 fathoms) north of 40°10' N. latitude occurs between Port Orford, Oregon and Crescent City, California. In general, black rockfish and blue rockfish are the principal targets, along with cabezon and kelp greenling and multiple species of nearshore species. However, depending on a vessel's endorsement (permit-type), the principal target can vary. For example, in Oregon, black rockfish and blue rockfish are the principal target of the 'Black/Blue rockfish' permitted vessels while kelp greenling, cabezon and other nearshore rockfish (principally China rockfish) are the principal targets of the 'Nearshore rockfish endorsed' permitted vessels. The nearshore fishery south of 40°10' N. latitude also targets a wide variety of species, including California sheephead, cabezon, kelp greenling, and an array of nearshore rockfish species.

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 open access fishery 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 the 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 which is not marketable or which regulations prohibit from landing is discarded at-sea. This is a very market driven fishery, so fishers may discard certain size fish or dead fish to maximize the value of their landed catch. Fishers endeavor to discard individuals gently, attempting to release them alive.

California

California licenses individuals for commercial fishing, including individuals who participate in the nearshore fisheries. The state issues two permits for fishing within the nearshore area: the Deep Nearshore permit and the Shallow Nearshore permit. Fishers can either have a permit for just one of the fisheries (Deep or Shallow) or for both of the fisheries. In 2005, there were a total of 205 California nearshore permits. The Deep 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, greenling, California scorpionfish, California sheephead, china rockfish, gopher rockfish, grass rockfish, and kelp rockfish. Most live fish landings consist of species in the Shallow Nearshore group.

California started permitting Deep and Shallow Nearshore fisheries in 2003. The US West Coast groundfish fisheries were constrained by eight overfished species in 2005 under complex management. Federal management for the California open access fishery was split into two zones: north and south of 40°10' N. latitude near Cape Mendocino. In addition, California state management designates four zones along the coastline; 1) the south coast: south of Point Conception (34°27' N); 2) the south-central coast: from Point Conception (34°27' N) to Point Ano Nuevo (37°07' N); 3) the north-central coast: from Point Ano Nuevo (34°27' N) to 40°10' N. latitude near Cape Mendocino; and 4) the north coast: from 40°10' North latitude to the Oregon-California border (42°00' N). There are a number of fishing area closures in both federal (3-200 miles offshore) and state (0-3 miles from the coastline) waters.

Oregon

Oregon licenses individuals for commercial fishing, including individuals who participate in the state limited entry nearshore fishery. Oregon's nearshore commercial fishery (hook & line, pot and longline) typically occurs in the shallow water zone (≤ 30 fathoms) and targets nearshore species such as black, blue, china, copper, quillback, and grass rockfish, cabezon and greenling. In order to fish for black rockfish and blue rockfish Oregon requires a state limited entry black/blue rockfish permit. In 2005,

Oregon issued 63 limited entry permits for black/blue rockfish which allows for the landing of black rockfish and blue rockfish. Also, 73 black/blue rockfish permits with a nearshore endorsement were issued which allows landing of black rockfish and blue rockfish along with 21 other Oregon designated nearshore groundfish species.

Washington

The State of Washington does not allow commercial fishing of nearshore rockfish within its territorial waters (0-3 miles from the coastline). This prohibition removes nearly all fishing grounds shallower than 50 fathoms from access by commercial fishers.

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 tickets are used to ensure that each vessel's landings do not exceed the vessel's trip limits. California and Oregon have each instituted a nearshore logbook program. In 2004, Oregon began requiring that nearshore fishers complete these vessel logbooks. California instituted a voluntary nearshore logbook program in 2005. Fish tickets only provide information on the amount of fish landed. In order to ensure that total catch does not exceed 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' ability to require that California and Oregon vessels which only fish in the 0-3 mile state territorial zone to also carry observers. The program deploys observers along the US west coast from Bellingham, Washington to San Diego, California.

Program Goals

The WCGOP's goal is to improve estimates of total catch and discard by observing groundfish fisheries along the US west coast. Originally, the WCGOP deployed observers in the limited entry trawl and

fixed-gear fisheries. In 2002, the WCGOP began deploying observers in open access fisheries while increasing coverage of the limited-entry trawl fishery. In 2005, the WCGOP increased its coverage of the limited-entry fixed-gear fishery and in 2006, the WCGOP increased its existing coverage of the open access nearshore fishery. Currently, the WCGOP coverage goal is to maintain, at minimum, 20% coverage of the limited-entry trawl and fixed gear fisheries while continuing to improve coverage in the open access fisheries.

METHODS

Permit Selection Process for the Open Access Nearshore Fishery

Permits/licenses are selected for observation using stratified random sampling. First, the WCGOP determines the amount of time (based on available resources) it will take to select the entire fleet; this is termed the selection cycle. The selection cycle varies due to changing priorities and observer resources. Because of the data and timeline requirements for fisheries management and historical observer program vessel coverage, the selection cycles do not coincide with the date range of the observer data analyzed in this report. The data in this report were collected during multiple selection cycles outlined in the table below (Table A).

Table A. *Observer Program Selection Cycles in the Nearshore Fishery*

	2004												2005												2006											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
CA Nearshore	Selection Cycle 2						Selection Cycle 3						Selection Cycle 4						Selection Cycle 5																	
OR Black/Blue Rockfish	No coverage-state legislative change in process						Selection Cycle 1						Selection Cycle 2						Selection Cycle 3																	
OR Nearshore	No coverage-state legislative change in process						Selection Cycle 1						Selection Cycle 2						Selection Cycle 3																	
Report Data																																				

Due to the number of high number of permits in these fisheries, conventions were developed to narrow down the lists to those permits that are most active in the nearshore fishery 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 getting observations in all geographical and temporal strata.

For the California Nearshore selection cycle 5, the Oregon Black/Blue selection cycle 3, and the Oregon Nearshore selection cycle 3, the following conventions were used to select vessels:

- Any vessel that landed less than 1000 lbs of rockfish between January 1, 2004 and July 31, 2005 were excluded from the selection list.

Any vessel that did not use fixed gear to catch nearshore species was excluded from the selection list.

Any permit that was not assigned to a vessel was excluded from the selection list (Oregon fisheries only).

Any vessel less than or equal to 17 feet was excluded from the selection list.

Therefore, the number of permits selected from each fishery was a subset of all permits in the fishery and varied for each selection cycle.

Fishery	Selection Cycle	# of permits selected for observer coverage
CA Nearshore	3	197
CA Nearshore	4	203
CA Nearshore	5	129
OR Black/Blue	1	117
OR Black/Blue	2	55
OR Black/Blue	3	36
OR Nearshore	1	91
OR Nearshore	2	63
OR Nearshore	3	53

In selecting permits for coverage, the WCGOP aggregates ports along the US west coast into port groups, which are considered strata. 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 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 California Nearshore, Oregon Black/Blue Rockfish, and Oregon Nearshore fleets 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>.

Vessel Coverage

Due to limited resources, the WCGOP prioritizes its deployment of observers. The program places a higher priority on observing higher volume limited-entry trawl and fixed gear trips. 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 fishery became the WCGOP's third highest

priority, ahead of all other open access fisheries. The goal of increasing priority for the nearshore fishery is to cover more trips per vessel during a two-month period and to cover more vessels that participate in the fishery.

However, 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. Some vessels may receive a coverage period waiver. Coverage period waivers allow a vessel to fish all trips during a two-month period without an observer. Coverage period waivers are given for a variety of reasons, including vessel size/space constraints, observer availability, and vessel safety. Vessels are given a coverage period waiver for a specific two-month time 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 lists until either an observer covers them or until the selection cycle ends, whichever comes first.

A few open access 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.

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 (NMFS 2005, current manual available at: <http://www.nwfsc.noaa.gov/research/divisions/fram/observer/observermanual/observermanual.cfm>).

Data collected by observers on a trip basis include:

- Start time, end time, and location of the set/retrieval of gear
- Gear type and fishing strategy
- Fish ticket identification numbers

Data collected by 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
 - Special biological collections (otoliths, maturity, food habits, genetic samples, etc.)

For more information on observer sampling in the nearshore open access fixed-gear fleets, refer to the WCGOP Observer Manual, Chapter 6 – Fixed Gear Sampling on Small Boats at: <http://www.nwfsc.noaa.gov/research/divisions/fram/observer/observermanual/observermanual.cfm>.

Data Quality Control and Management

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

Data are collected at-sea by the observer following protocols in the WCGOP Manual (NMFS 2005).

Data are entered into the database system. The data are entered into a centralized Oracle database located at the Northwest Fisheries Science Center (NWFSC). Data within the Oracle database are accessible via a web-based GUI or by direct SQL queries to the database. A list of data base tables is located in Appendix A.

Observers are debriefed by WCGOP staff after every two-month cumulative trip limit 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 the debriefing are updated in the database program.

Database Quality Control Queries - Quality control queries are run to detect data that fall outside specified ranges and identify other inconsistencies between data elements. These database quality control queries are run every six months to a year on all data collected during a specified time period.

Database Update - The raw data from all entries that are highlighted by the QC queries are reviewed and the electronic data are updated.

Finally, the data are then considered complete and are released to the analyst.

Data Processing

After quality control, WCGOP data are processed and analyzed. First, subsamples of catch categories are expanded to the entire catch category at the set level. A set-level expansion is needed to estimate the total weight retained and discarded of each species in the catch because of the sampling procedure that derives the species composition. If the species composition of a catch category is mixed, an observer may take a subsample from the catch category. The following equation is used to calculate the subsample weight by summing across the observed weights of the individual species:

$$w_j = \sum_i x_{ij}$$

where

x_{ij} = observed weight of the species i in catch category j in the subsample,

w_j = weight of the subsample from catch category j .

The sampling ratio used to scale the subsample weights to the amount in the catch category is calculated by dividing the subsample weight by the total weight of the catch category using the equation:

$$R_j = w_j / y_j$$

where

y_j = the total weight of the catch category j .

The set-level expanded weight of species i in the category j is calculated by dividing the species weight in the subsample by the sampling ratio:

$$X_{ij} = x_{ij} / R_j$$

where

X_{ij} = the weight of species i in catch categories j .

Tallying the weight (X_{ij}) of the species i across all categories j 's within a set provides the total weight of the species retained or discarded.

Analysis

Bycatch rates were calculated for species weight (pounds) caught per one-hundred pounds of nearshore fish retained. The ratio estimator technique (Cochran 1977) was used to estimate bycatch rates for selected species. Fish species selected for bycatch rate calculation were all of the overfished stocks. The ratio estimates (R_{ijkl}) are calculated by area (i), depth range (j), target strategy (k), and period (l):

$$R_{ijkl} = \frac{\sum_t y_{ijklt}}{\sum_t x_{ijklt}}$$

where

y_{ijklt} is the pounds of a species in set t .

x_{ijklt} is the retained pounds in set t of nearshore species, which are: black rockfish, blue rockfish, brown rockfish, black and yellow rockfish, china rockfish, calico rockfish, copper rockfish, gopher rockfish, grass rockfish, kelp rockfish, Puget Sound rockfish, quillback rockfish, short-belly rockfish, treefish, other nearshore rockfish, lingcod, cabezon, California sheephead, kelp greenling, and rock greenling.

The variance of R_{ijk} is approximated by using the following equation (Cochran 1977):

$$Var(R_{ijk}) = \frac{1}{n} \left(\frac{\bar{y}_{ijk}}{\bar{x}_{ijk}} \right)^2 \left[\frac{s^2(y_{ijklt})}{\bar{y}_{ijk}^2} + \frac{s^2(x_{ijklt})}{\bar{x}_{ijk}^2} - 2 \left(\frac{\sum_t (y_{ijklt} - \bar{y}_{ijk})(x_{ijklt} - \bar{x}_{ijk})}{\bar{y}_{ijk} \bar{x}_{ijk}} \right) \right]$$

where

\bar{x}_{ijk} and \bar{y}_{ijk} are the means of x_{ijklt} and y_{ijklt} over the tows and
 $s(x_{ijklt})$ and $s(y_{ijklt})$ are the standard errors of x_{ijklt} and y_{ijklt} .

Note that $Var(R_{ijk})$ cannot be calculated when $y_{ijklt} = 0$ or $x_{ijklt} = 0$ for all tows and should be used with extreme caution when R_{ijk} is equal to one. This variance estimator was chosen in place of the previously used estimator from Pikitch et al. (1998) because the estimator from Cochran (1977) does not assume independence of the numerator and denominator.

RESULTS AND DISCUSSION

Since we are still expanding our program to fully include the open access fishery, observations were limited. Low numbers of observations may lead to unbalanced sampling across ports or another important dimension of fishery participation, such as two-month period limits. 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.

Observed retained catch (in metric tons) from observed open access fixed-gear sets in less than 50 fathoms is reported in Table 1 by port group. Ports within each port group are detailed in Appendix B. During 2004 and 2005, approximately 40% of the observed retained catch was landed in the Crescent City area (including Eureka), followed by ports in the southern Oregon and the Morro Bay areas.

A comparison of observed retained catch and fish ticket landings is provided in Table 2 by species group. Since 2004, observed catch of minor nearshore rockfish species ranged between 3% and 6% of the amount reported on fish tickets for the area south of 40°10' N. latitude, and between 6% and 9% for the area north of 40°10' N. latitude. Observed catch of cabezon and kelp greenling ranged between 1% and 6% of fish ticket landings in the south and between 4% and 13% in the north. For California sheephead, which is not included in the Pacific Coast Groundfish Fishery Management Plan, observed catch ranged between 0% and 13% of the amount reported on fish tickets in the south.

In order to relate observer program discard information to a fishery landings data, the program links observer data with fish tickets (landing receipts). For observed fisheries, such as limited entry trawl, relating a discard rate with the total retained catch of the fleet is an important management tool. However, when attempting to match the open access fixed-gear trips to fish tickets, a number of issues arose.

Some nearshore vessels would fish a series of day trips prior to officially 'landing' their catch (a single fish ticket would be produced at the end of the last day trip). Thus, a series of day trips could be represented on a single fish ticket. Occasionally, an observer was only available for a portion of the series of day trips; therefore observers did not always observe all fishing represented by a fish ticket. Consequently, the observed retained catch was less than what was recorded on a fish ticket. The program recognized this issue in 2005 and subsequently has started to document the occurrence. As this report combines data before and after the documentation of this situation, this analysis shouldn't include fish ticketing matching.

There were also cases where the retained catch weight recorded by an observer was substantially higher than the landed weight recorded on fish ticket(s) which were otherwise apparent matches for observed trips. This indicates that there may be an additional fish ticket(s) associated with a trip. In the presence of observers covering only a part of a series of day trips, the ability to detect missing fish tickets is impossible. Therefore, the analyses do not include matching observer data to fish tickets. However, the smaller volume of catch in the nearshore fishery allows for a larger observer sample of retained catch, minimizing the effects of not matching observer data with fish tickets.

The number of observed open access trips with sets at less than 50 fathoms is reported in Table 3 by gear type and port group. The number of observed open access sets at less than 50 fathoms is summarized in Table 4 by gear type and port group. As with observed poundage, the highest number of trips and sets occurred in the Crescent City area, followed by the Southern Oregon and Morro Bay areas.

The number of vessels observed, by port and gear group, is reported in Table 5. Since trips made in Eureka and San Francisco for 2004 and 2005 were made by less than three vessels in each port, those observations have been pooled with trips from Crescent City and Monterey, respectively. Also, because of the small number of vessels using pot gear, particularly in the north, most of the analysis that follows combines the pot with the hook and line gear. As expected, the largest number of hook-and-line vessels were observed in port groups that have the highest number of active nearshore vessels including southern Oregon, Crescent City, Monterey and Morro Bay.

Table 6 provides a more detailed summary of the distribution of observed sets, adding the dimensions of season and depth to the area and gear stratification of Table 4. For purposes of this summary, the summer season was defined as the months from May through October, with remaining months assigned to the winter season. The vast majority of observed hook-and-line sets in both areas occurred during the summer season. However, a significant portion of the observed pot sets occurred during the winter months. This likely reflects the fact that most observed pot trips were in southern California which generally has milder winter weather than the north. Observed line and pot sets in the south primarily occurred in depths less than 10 fm. In the northern area, more than half of the line gear sets occurred in waters deeper than 10 fm. This likely reflects the reliance on black rockfish, which is distributed deeper than many other nearshore species.

Table 7 summarizes observed poundage and rates of discard for nearshore species categories. Discarded and retained poundage is reported for three depth intervals, as well as for all depths combined, by area and season. In the southern area, results are also stratified by gear for cabezon and California sheephead. In the south, overall discard percentages were generally in the 10-30% range for the species categories summarized. Higher rates were observed for kelp greenling and California sheephead. In the north, observed discard of black rockfish ranged between 1% and 7% of total black rockfish catch. For other species categories, generally less than 20% of the amount caught was discarded. It is important to note that these rates are for total discards, they do not represent mortality from discards. Mortality of discards will likely vary by species and the depth at which fish are caught.

Table 8 provides a similar summary of discarded and retained poundage of rebuilding species, by area, season, and depth. No cowcod, Pacific ocean perch, or darkblotched rockfish were caught in observed sets. Bocaccio rockfish were only observed in the south. The majority of the sets discarded little or no widow rockfish, canary rockfish, bocaccio rockfish, or yelloweye rockfish. However, larger amounts of lingcod were caught in a number of the sets. It should be noted that lingcod appear to be targeted on some of the trips as some landing of lingcod is allowed. It is noted that the discard rates for canary and yelloweye rockfish follow from a prohibition on retention of these species.

Bycatch rates of rebuilding species are provided in Table 9 by area, season, and depth. No cowcod rockfish, Pacific ocean perch, or darkblotched rockfish were caught on observed sets with nearshore

species. With the exception of lingcod, bycatch ratios increased with depth for the rebuilding species, which is expected, given their depth distributions.

Conclusion

The observer coverage of nearshore open-access fisheries in California and Oregon provides a valuable first look at bycatch and discarding practices in the nearshore groundfish fishery. It also provides information on how best to expand our observations in this fleet. However, given the limitations in the amount and distribution of coverage, caution should be exercised in applying the results summarized in this report to the nearshore fleet as a whole. The goal of the observing program is to continue to expand the observations on this fleet.

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APPENDIX A. Oracle Database

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 in the table below are a subset of the total tables contained in the Oracle database. They represent the tables that are actually used to contain the observer data collected by the WCGOP.

BIO_SPECIMENS	Sets of species physical measurements resulting from sampling catches occurring in a haul 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 haul or set
CATCH_CATEGORIES	PacFIN catch categories
DISSECTIONS	Physical specimens collected for an individual fish, mammal or bird
FISHING_ACTIVITIES	Fishing hauls or sets occurring during a trip
FISHING_LOCATIONS	Locations of hauls 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 haul 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. Port Groups

State	Port Group	Port	
OR	Astoria	Astoria / Warrenton	
		Pacific City	
		Garibaldi (Tillamook)	
	Newport	Newport	
		Coos Bay	Bandon
	Southern Oregon	Charleston (Coos Bay)	
		Florence	
		Winchester Bay	
		Brookings	
		Gold Beach	
		Port Orford	
		CA	Crescent City
	Eureka		
Fields Landing			
Trinidad			
Fort Bragg	Albion		
	Point Arena		
	Bodega Bay		
Monterey	Fort Bragg		
	Oakland		
	Richmond		
	San Francisco		
	San Francisco Area		
	Santa Cruz		
	Monterey		
	Moss Landing		
	Princeton (Half Moon Bay)		
	Morro Bay		Avila
Morro Bay			
San Luis Obispo Area			
San Simeon			
Santa Barbara			
Santa Barbara	Ventura		
	Oxnard		
Los Angeles	Santa Barbara		
	Dana Point Harbor		
	Los Angeles Area		
	Los Angeles		
	Newport Beach		
	Oceanside		
	San Diego		
	San Diego Area		
Marina Del Rey			