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Observed and Estimated Total Bycatch of Salmon in the 2002-2013 US West Coast Fisheries

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Executive Summary

Salmon catch estimates are provided for 2002 through 2013 for all groundfish fishery sectors observed by the West Coast Groundfish Observer Program and the At-Sea Hake Observer Program (Tables 30-31). This report updates the previous report which contained data through 2010. We include data from 2002-2010; however, we discussion is focused on changes in catch since 2010. General salmon catch trends for Chinook and coho salmon can be found in Figures 1 and 2.

In non-hake sectors, Chinook salmon catch increased from 2010 to 2013. Catch shares bottom trawl Chinook catch remained low relative to pre-trawl rationalization, but was higher than all other non-hake sectors, other than the nearshore fixed gear sector in 2013. In 2013, the nearshore fixed gear sector in the north caught the largest estimated amounts of both Chinook and coho salmon for this sector since the WCGOP was established. In non-hake sectors, coho salmon catch was fairly low in 2012, but the catch in 2013 was six-times higher than the peak catch in 2004.

A single chum salmon was observed between 2011 and 2013 in non-hake sectors, in Individual Fishing Quotas (a.k.a. IFQs or catch shares) non-hake midwater trawl. Pink salmon was observed in a non-hake sector for the second time since the establishment of WCGOP: 2 pink salmon were caught in the IFQ non-hake sector in 2012. Sockeye salmon was encountered for the first time in the catch shares bottom trawl sector: one sockeye was caught in 2011.

Chinook salmon bycatch in the hake fishery shows inter-annual variation and has been higher in recent years. By comparison the other salmonid species encountered in the hake fishery are seen in low numbers. Coho bycatch was low in 2012 and higher in 2011 and 2013. Pink salmon bycatch shows a strong biannual flux with relatively small amounts in even years. Chum bycatch is consistently low, with less than 120 fish caught annually. Sockeye are extremely rare, with only 6 seen in the last decade.

New data and improvements have been included in this report. First, the current report presents both the count and weight of salmon catch by species. The number of individuals caught is used for fisheries management, whereas the total weight provides useful information for conservation efforts and comparisons with other mortality estimates. Second, observer coverage of each sector is presented in tables separate from the observed salmon catch. Third, we present estimates of salmon catch from sectors managed under IFQ, originally implemented January 2011. Fourth, we include data from the Catch Monitor Program (CMP) to account for the large amount of salmon sorted shoreside in the shoreside midwater trawl fisheries. Finally, for the first time, we include salmon catch estimates from two sectors without previous salmon bycatch (Oregon pink shrimp trawl, and Open Access California halibut).

Introduction

The primary objective of this report is to provide estimates of salmon bycatch in U.S. West Coast groundfish fisheries for the years 2002-2013. We present observed bycatch ratios and estimated bycatch (number of individual fish and total weight) for five salmon species observed in the groundfish fisheries: Chinook salmon (*Oncorhynchus tshawytscha*), pink salmon (*Oncorhynchus gorbuscha*), coho salmon (*Oncorhynchus kisutch*), chum salmon (*Oncorhynchus keta*), and sockeye salmon (*Oncorhynchus nerka*). We also present bycatch estimates for salmon not identified to species (unspecified salmon). This report includes bycatch estimates for all fisheries observed by the Fisheries Observation Science Program (FOS) which encountered salmon. These include the following commercial fisheries:

- Limited entry (LE) bottom trawl (2002-2010)
- Catch shares non-hake, bottom and midwater trawl (also referred to as individual fishing quota (IFQ)) (2011-2013)
- Open access (OA) and LE bottom trawl - targeting California halibut
- State-permitted nearshore fixed gear
- Oregon pink shrimp trawl
- LE fixed gear sablefish primary (tier endorsed)
- Shoreside hake catch shares
- At-sea hake fishery, catcher-processor, mothership, and tribal

Commercial fisheries observed by the WCGOP which did not have any observed bycatch of salmon during the 2002-2013 period included:

- OA fixed gear
- Pink shrimp trawl in Washington and California
- LE fixed gear daily trip or quota limits

Salmon bycatch in the shoreside tribal and shoreside exempted fishing permit (EFP) sectors is also reported, based on data compiled by the NOAA Fisheries West Coast Regional Office (WCR). This report does not include recreation and research catch or fishery sectors not covered for the FOS program. Discard survivorship rates have not been applied to these estimates.

Endangered Species Act (ESA) listing determinations for 16 Evolutionarily Significant Units (ESUs) of Pacific salmon (*Oncorhynchus sp.*) were issued in 2005 (70 FR 37160). These listings consisted of two sockeye salmon ESUs (one listed as endangered), nine Chinook salmon ESUs (two listed as endangered), three coho salmon ESUs (one listed as endangered), and two chum salmon ESUs. Recent status review updates for all of the listed ESUs maintained the listing level issued in 2005 (Ford 2011, Williams 2011). Additionally, one coho salmon ESU was listed as threatened in 2008 and re-affirmed in 2011 (76 FR 20558).

Data Sources

Data sources for this report include data from: 1) observers aboard commercial fishing vessels (recorded and maintained by FOS programs), 2) PacFIN logbooks, and 3) PacFIN landing receipt data, referred to as fish tickets.

Observer Data

Bycatch estimates are derived from independent scientific observation of catch conducted on commercial groundfish vessels at sea by the Northwest Fisheries Science Center (NWFSC) Fishery Resource Analysis and Monitoring Division (FRAM) FOS program. This program consists of two major components, the West Coast Groundfish Observer Program (WCGOP) and the At-Sea Hake Observer Program (A-SHOP). The WCGOP and the A-SHOP observe distinct sectors of the groundfish fishery. The WCGOP observes several federally-managed sectors of the groundfish fishery, including the limited entry (LE) groundfish bottom trawl, LE and open access (OA) fixed gear, and LE catch shares non-hake bottom and midwater trawl and catch shares shoreside hake. The WCGOP also observes several state-managed fisheries that incidentally catch groundfish, including the nearshore fixed gear fisheries in California and Oregon, California halibut trawl, and Oregon pink shrimp trawl fisheries. The A-SHOP observes federally-managed and tribal-managed fisheries that target Pacific hake using midwater trawl gear and process catch at-sea. More information on each of these programs is available at the FOS website (http://www.nwfsc.noaa.gov/research/divisions/fram/observer/). For a list of groundfish sectors not observed by FOS, see the description of observer coverage provided in the most recent groundfish mortality report (Somers et al. 2014).

The WCGOP's goal is to improve total bycatch estimates by collecting information on the discarded catch (fish returned overboard at-sea) of west coast groundfish species. For more details about WCGOP goals, vessel selection, and data collection, see the WCGOP website at http://www.nwfsc.noaa.gov/research /divisions/fram/observer/. The website also provides estimates of observer coverage, observed catch, and a summary of observed fishing depths for each sector. A list of fisheries, in order of coverage priority, and detailed information on data collection methods employed in each observed sector can be found in the WCGOP manual (NWFSC 2014a, NWFSC 2014b).

Prior to estimating fleet-wide bycatch for each sector, both observed salmon bycatch and landed catch (used for expansion) must meet data quality standards and pass data quality control. Observer and fish ticket data QAQC is described in detail on the FOS website (http://www.nwfsc.noaa.gov/research/divisions/fram/observer/). During QAQC processing, salmon observations that do not meet QAQC standards are removed from the analysis. All subsequent data processing steps specific to this report are described in the methods section below.

When salmon are encountered by an observer, the observer documents weight, number, length, and sex. In the WCGOP, this data is collected for all salmon, while in the A-SHOP this data is collected only for salmon within the observer's species-composition sample (~50% of the total haul weight). In the WCGOP, observers check all salmon species for the presence or absence of an adipose fin, take a genetic sample in the form of a fin clip, and collect the snout to be later scanned for coded wire tags (CWTs). In the ASHOP, only Chinook and coho salmon are checked for adipose status and scanned for CWTs, and fin clips are taken only from Chinook salmon.

Logbook Data

Vessel logbook record-keeping is a state-mandated requirement for the LE groundfish trawl sector in Washington, Oregon, and California. A common-format logbook is used by all three states and vessel completed logbook information is entered into state agency databases. The electronic logbook data are then uploaded by state agencies to the Pacific Coast Fisheries Information Network (PacFIN) regional database, which is maintained by the Pacific States Marine Fisheries Commission (PSMFC).

Trawl logbook data for 2002-2010 were retrieved from the PacFIN database PacFIN logbook data was queried in March 2014 and divided into groundfish fishery sectors as indicated in Figure 3. All subsequent data processing steps are described in the methods section below. Logbook data from the OA groundfish trawl sector were not included in our analyses.

Landings Data

Fleet-wide landing receipts, also referred to as fish tickets, are the cornerstone of retained catch information for all sectors of the commercial groundfish fishery operating off the west coast of the United States. Fish tickets are trip-aggregated sales receipts issued to vessels by fish-buyers in each port for each delivery of fish. Fish tickets are designed and issued by a state agency (Washington, Oregon, or California) and must be returned to the agency for processing. Each state conducts species-composition sampling for market categories (single species or a mix of species) reported on fish tickets. Fish ticket and species-composition data are submitted by state agencies to the PacFIN database. For analytical purposes, the percentage of weight of each species within market categories obtained from species composition sampling was applied to the fish ticket data used in our analyses. In doing so, landed weights from sampled market categories were distributed to individual species whenever possible. PacFIN data for fish ticket landings with state species composition sampling applied (*vdrfd* table) was queried in March 2014 (for 2011-2013) and November 2012 (for 2002-2010). All additional data processing steps are described in the methods section below.

Methods

Salmon Bycatch Estimation Methods

In non-catch shares sectors, a deterministic approach was used to estimate salmon bycatch by expanding observed bycatch rates to the fleet-level. First, bycatch ratios were computed from observer data as the observed bycatch of salmon (number or weight) divided by the observed retained weight of the target species or group, which varies by fishery sector. Depending on the sector, retained catch used as the denominator in bycatch ratios is calculated as the observed landed weight of one of the following species or groups: all landed groundfish species included in the groundfish fishery management plan (FMP) (excluding Pacific hake); California halibut; nearshore species; pink shrimp; pacific hake; or sablefish. Fleet-wide estimates of salmon bycatch (number or weight of fish) were obtained by multiplying bycatch ratios by the fleet-wide landed weight as recorded on fish tickets of the appropriate target species or group for the sector. Due to differences in data availability and management structure among sectors, this approach was applied with slight modifications for each sector as described below.

Expansion methods for salmon bycatch in WCGOP-observed bycatch shares fisheries (catch shares trawl and shoreside hake) were conducted by stratum. The proportion of unsampled hauls was relatively low: 0.6% in 2011 and 2012 and 0.2% in 2013 in the catch shares bottom trawl and 0% for catch shares midwater trawl. Expanded salmon estimates were only produced for strata where both salmon and unsampled hauls co-occurred. The unsampled salmon weight (or count) was estimated by multiplying the total unsampled weight (or count) in the stratum by the ratio of the sampled salmon weight (or count) in the stratum to the total sampled, retained groundfish for the catch shares trawl sector and total sampled, retained Pacific hake in the shoreside hake sector. The total weight (or count) of bycatch is calculated by combining this estimated unsampled salmon weight (or count) with the total sampled salmon weight (or count) in the stratum. .

When the FMP groundfish species grouping was used to compute 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 necessary to prevent double-counting associated with differences in the species codes used by observers and processors. For instance, while observers may record rockfish catch at the species level, multiple species of rockfish are often grouped, weighed, and recorded together on the fish ticket under a grouped species code such as NUSP - northern unspecified slope rockfish. By using only the retained groundfish weight from fish tickets in catch ratio denominators, we prevent double-counting of retained weights. This is not an issue when using a single species in the denominator (e.g., California halibut, sablefish) as any retained weights in observer and fish ticket data that share the same species code will match and adjust properly.

Species were defined and/or grouped for this report according to the WCGOP Data Processing Appendix, found at: http://www.nwfsc.noaa.gov/research/divisions/fram/observer/data_processing.cfm. A complete listing of groundfish species is defined in the Groundfish Fishery Management Plan (PFMC 2014: Chapter 3, Part 1, page 15).

Expansion methods for the At-Sea Hake sectors used the small proportion of unsampled hauls to sampled hauls (average 0.4% from 2010-2013) to expand to sector-wide estimates.

For all sectors where confidentiality could be maintained, observer data were stratified into four latitudinal areas, described in Table 1 and illustrated in Figure 4. These areas correspond to the coastline attributed to ESUs of Chinook salmon and coho salmon.

Salmon bycatch in each sector was seasonal, presumably due to seasonal migration patterns. Therefore, data was partitioned into season strata to present the salmon bycatch estimation. In all fisheries other than At-Sea Hake, seasons were defined as winter (January-April and November-December) and summer (May-October), when sample sizes were large enough. In the At-Sea Hake fisheries, seasons were defined as spring (May 15 to June 30) and fall (July 1 to December 31).

Depth strata (0-125, 126-250, > 250 fathoms) were used in the LE and catch shares trawl fisheries because salmon were caught almost exclusively in the 0-250 fathom depth range (Tables 2-4, 19-20). For LE trawl (2002-2010), we used the legally-mandated logbooks to apportion fleet-wide catch to depth strata and expand bycatch estimates accordingly. For catch shares trawl, observer-recorded depth was available due to 100% coverage. Depth stratification was not possible in other sectors due to a lack of fleet-wide, haul-level fishing depth information.

We aggregated fishery data using a minimum of three vessels per stratum to ensure that we met confidentiality mandates. Bycatch ratios were calculated directly using observer data only when data from three or more vessels could be aggregated per stratum. When the three vessel aggregation could not be met, bycatch ratios were produced by applying non-parametric bootstrap resampling, which enabled us to simultaneously meet confidentiality guidelines and estimate bycatch ratios. The non-parametric bootstrap model was implemented in R (R Core Team 2013). The model re-sampled observed hauls, with replacement, within a single stratum across three years (year of interest, plus one year before and one year after the year of interest or, for 2013 data, year of interest and the two previous years). For each selected haul, all hauls from the given vessel were included in the dataset and used to produce a bycatch ratio. We repeated this process over 10,000 iterations. We then calculated the mean of the 10,000 resampled bycatch ratios to produce an estimate of the bycatch ratio estimate for the given year and stratum. An estimate of the error around the 10,000 resamples was used to construct 95% confidence interval around the mean bycatch ratio. Standard errors (SE) of bycatch ratios were calculated based on the methods described in Pikitch et al. (1998). Note that for strata with a very low occurrence of bycatch, SE of ratios can be equivalent to the bycatch ratio. In the rare case where less than 3 vessels were present in the dataset for bootstrapping, we do not provide an estimate due to low sample size.

Point estimates of bycatch fluctuate due to a number of non-biological factors, including annual variation in observer coverage rates, fishing behavior, and various physical characteristics. Currently, it is not possible to fully quantify uncertainty for bycatch estimates presented in this report, as measures of the variability associated with all data sources are not available. Estimates of observer data uncertainty are presented in this report in the form of bycatch ratio standard errors.

Although this report utilizes the same methods as those in the previous salmon bycatch report (Al-Humaidhi 2012), estimates in the report were constructed with the most current observer and fish ticket data and slightly different rounding rules. Therefore, minor differences exist in some sectors between the two reports.

Limited Entry Bottom Trawl

Fleet-wide salmon bycatch estimates for the LE bottom (non-midwater) trawl sector were derived from WCGOP observer, logbook, and fish ticket landings data (Figure 3). Note that after 2010, this sector was modified into an individual fishing quota (IFQ) program and is now included in the LE catch shares sector. The analyses described in this section only apply to the years 2002-2010. After 2010, IFQ methods (below) were used to estimate salmon bycatch.

Several additional filtering steps were applied to the data to ensure that the LE bottom trawl data was defined appropriately. We investigated tows and landings with more than 2 mt of Pacific hake, to exclude effort that was targeted exclusively towards this species. On the basis of this criterion, nine observed tows between 2002 and 2010 met the criterion and were removed.

LE bottom trawl vessels can hold a California halibut bottom trawl permit and participate in the state-permitted California halibut fishery. California halibut tows can occur on the same trip as tows targeting groundfish and were identified based on the following criteria: 1) the reported tow target was California halibut or 2) the tow target was nearshore mix, sand sole, or other flatfish, and the tow took place in less than

30 fathoms and south of 40°10' N. latitude. All tows in the observer data that met at least one of the above requirements were removed from the LE bottom trawl data and included as data for the California halibut fishery (see below). Tow targets are typically determined by the vessel captain.

Observer data and trawl logbook data were then stratified by area, season, and depth. Records were separated into four spatial areas (Figure 4) and each area was divided into three depth strata (0-125, 126-250, > 250 fathoms). Two-month cumulative trip limit periods were combined to form two seasonal strata in each year: winter (January-April and November-December) and summer (May-October).

We used observer data to compute bycatch ratios for each stratum and multiplied these ratios by the fleet-wide fish ticket landing weight in the stratum, using the equation:

$$\widehat{D}_{sx} = \frac{\sum_t b_{sxt}}{\sum_t r_{sxt}} \times adj(R_{sx})$$

where:

- *s*: salmon species
- *x*: index strata (year, area, season, depth)
- *t*: tows in observer data
- *b*: observed number of catch individuals of species *s*
- *r*: observed retained weight of all FMP groundfish except Pacific hake
- $adj(R_{sx})$: fish ticket adjusted weight of retained FMP groundfish (except Pacific hake) recorded on logbooks (see below)
- *D*: catch estimate for species *s* in each index stratum

Pacific hake was excluded from the denominator of observed bycatch ratios and the adjusted logbook expansion factors. Vessels that target or land large amounts of Pacific hake are classified as part of the Pacific hake midwater trawl sector, distinct from the LE groundfish bottom trawl sector.

Although logbooks describe the depth distribution of fishing effort, they are not submitted for all trawl trips and can underestimate bottom trawl fishing effort. In addition, logbook retained weights are vessel-supplied estimates, whereas fish ticket landings record actual weights and are legally binding. As a result, it was necessary to adjust the initial retained logbook weights of FMP groundfish (excluding Pacific hake) by strata to reflect the level of effort indicated by fish ticket landings. We aggregated both the fish ticket and logbook data by year, latitudinal area, and bimonthly period, to be consistent with cumulative trip limit periods. An adjusted logbook weight was then computed for each year, area, and bimonthly period as the weight of FMP groundfish (except Pacific hake) recorded on fish tickets divided by that recorded in logbooks. Each adjustment ratio was multiplied by coinciding depth-distributed logbook catches and then summed across bimonthly periods:

$$adj(R_{sx}) = \sum_n \sum_b \left(R_{sxbn} \times \frac{F_{yabn}}{R_{yabn}} \right)$$

where:

- *x*: index strata (year, area, season, depth)
- *y*: year

b: bimonthly period
a: latitudinal area
n: state
F: weight of retained FMP groundfish (except Pacific hake) recorded on fish tickets
R: weight of retained FMP groundfish (except Pacific hake) recorded on logbooks
$adj(R_{sx})$: fish ticket adjusted weight of retained FMP groundfish (except Pacific hake) recorded on logbooks

Adjustment ratios were computed separately for each state and bimonthly period to account for differences between individual states' logbook submission rates and fish ticket recording methods. An adjustment ratio value less than 1 indicated that more FMP groundfish weight was recorded in logbooks than on fish tickets. Conversely, adjustment ratios greater than 1 occurred when fish ticket FMP groundfish weights were larger than logbook weights.

Observed number of salmon, bycatch ratios, and estimated fleet-wide bycatch of salmon by year, area, season, and depth are presented in Tables 2-4 for the LE bottom trawl sector for the years 2002-2010.

California Halibut Bottom Trawl

Fleet-wide salmon bycatch estimates in the California halibut bottom trawl fishery were derived from WCGOP observer data and fish ticket landings data. California halibut vessels are permitted by the state of California. Even so, this fishery consists of both LE and OA components (i.e. vessels that do not have federal LE groundfish permits). The WCGOP provides observer coverage for both LE and OA vessels. The WCGOP provides observer coverage under the LE groundfish bottom trawl sector. Data for the LE component of the California halibut fishery is isolated based on the following criteria: the tow target was California halibut or the tow target was nearshore mix, sand sole or other flatfish, and took place in less than 30 fathoms and south of 40°10' N. latitude. All tows in the observer data set that met at least one of the above requirements were included in the LE California halibut bottom trawl dataset. The WCGOP randomly samples the OA California halibut component separately. The LE and OA components of the California halibut trawl fishery are reported separately when possible. When fewer than 3 vessels were observed by WCGOP within a stratum, bycatch ratios were bootstrapped as described above. In 2010, we combined the LE and OA components of the California halibut fishery due to an extremely small number of vessels, in a stratum of the LE sector where salmon bycatch occurred.

Bycatch ratios were computed for this fishery using the retained weight of California halibut in the denominator. The fleet-wide landed weight of California halibut was then used as a multiplier to expand observed salmon bycatch ratios to the fleet level. To isolate fish tickets from trips on which California halibut was targeted, landings were only compiled from fish tickets that had greater than 150 lbs of California halibut during the period 2002-2006.

Starting in 2007, the state of California required vessels participating in the LE and OA trawl fisheries landing more than 150 lbs of California halibut to possess a California halibut bottom trawl permit. While all OA vessels that landed more than 150 lbs of California halibut in 2007 possessed a permit, not all LE vessels did. To account for all California halibut fishing in 2007, the permit list was used to identify California halibut vessels in the OA component, while the total weight of California halibut was used to isolate California halibut trips in the LE component of the fishery as before.

By 2008, California halibut bottom trawl permits for both the LE and OA trawl components represented all vessels targeting California halibut. Thus, landed California halibut weights from 2008-2010 for both the LE and OA components were compiled from "non-midwater" trawl fish tickets (see Figure 3) for those vessels that had a state-issued California halibut bottom trawl permit.

Salmon bycatch estimates were computed for both the LE and OA components, although salmon bycatch was observed in the OA component only in 2011 and 2013. All California halibut fishing activity occurred south of Cape Mendocino, California. Estimates were generated for each salmon species by year and season based on the following equation:

$$\widehat{D}_{sx} = \frac{\sum_t b_{sxt}}{\sum_t r_{sxt}} \times F_x$$

where:

s: salmon species
x: index strata (year, season)
t: tows in observer data
b: observed number of catch individuals of species *s*
r: observed retained weight (mt) of California halibut
F: weight (mt) of retained California halibut recorded on all fish tickets
D: catch estimate for species *s* in each index stratum

LE groundfish trawl tows can be differentiated from California halibut tows during observed trips by the observer. However, fish tickets are reported at the trip level, and landings cannot be differentiated between tows. This inability to distinguish between bycatch from LE trawl tows and California halibut tows is not expected to be a major source of bias in our analysis, as the primary species retained on observed California halibut tows were non-groundfish (NWFSC 2011). However, because some flatfish species were retained on these tows, it is possible that bycatch estimates in California for the LE groundfish bottom trawl sector could have been positively biased due to slightly larger expansion factors (caused by the inclusion of landed flatfish that were in fact caught on California halibut tows). Examination of the species composition on fish tickets in the areas where California halibut is typically landed suggests that the impact of other landed species on bycatch estimates is minor.

Number of observed vessels, trips, and hauls, observed number and weight of salmon, bycatch ratios, and estimated fleet-wide bycatch of salmon by year and season are presented in Tables 5-7 for the LE component and Tables 8-9 for the OA component of the California halibut fishery. In 2010, the LE and OA components are combined to maintain confidentiality; this data is presented in Tables 10-11.

Nearshore Fixed Gear

Fleet-wide bycatch estimates for the commercial nearshore fixed gear groundfish sector were derived from WCGOP observer data and fish ticket landings data. Fish ticket data were assigned to this sector using the classification system outlined in Figure 3 and included only those fish tickets with recorded nearshore species weight. A list of nearshore species and associated species groups used in this analysis are listed in the WCGOP Data Processing Appendix available at: http://www.nwfsc.noaa.gov/research/divisions/fram/observer/data_processing.cfm.

The WCGOP provides coverage for the commercial nearshore fisheries in California and Oregon based on a selection process of state-issued nearshore permits/licenses. The state of Washington does not allow commercial fishing within coastal state waters. State regulations in California and Oregon have extended the authority of the WCGOP to require that observers be carried by vessels participating in these state nearshore fisheries. Due to these differences, we separated nearshore fisheries into two sections, north and south of the salmon conservation area division at 40.16° N lat., and analyzed them separately.

Bycatch ratios for this fishery were calculated by dividing the observed bycatch of each salmon species (number or weight of fish) by the observed retained weight (mt) of nearshore species. The fleet landed weight of nearshore species was then used as a multiplier to expand observed salmon bycatch ratios to the fleet. The equation for the expansion of bycatch ratios in the nearshore sector is identical to that presented for the California halibut fishery, where r represents the retained weight of nearshore species, x represents index strata of year, area, and season and F represents the weight of retained nearshore species recorded on fish tickets.

Number of observed vessels, trips, and hauls, observed number of salmon, bycatch ratios, and estimated fleet-wide bycatch of salmon by year, area, and season are presented in Tables 12-14 for the nearshore fixed gear groundfish sector in the north.

Oregon Pink Shrimp Trawl

Salmon bycatch was only observed in the Oregon sector of the pink shrimp fishery and only occurred on one vessel in 2011. Fleet-wide bycatch estimates for this sector were derived from WCGOP observer data and fish ticket landings data. All fish tickets that listed pink shrimp as the target species and were landed in Oregon waters were included in the analysis of this sector.

Bycatch ratios for this fishery were calculated by dividing the observed bycatch of each salmon species (number or weight of fish) by the observed retained weight (mt) of pink shrimp. The fleet landed weight of pink shrimp was then used as a multiplier to expand observed salmon bycatch ratios to the fleet. The equation for the expansion of bycatch ratios in the pink shrimp sector is again identical to that presented for the California halibut fishery, where r represents the retained weight of pink shrimp, x represents index strata of year, area, and season and F represents the weight of retained pink shrimp recorded on fish tickets.

Number of observed vessels, trips, and hauls, observed number of salmon, bycatch ratios, and estimated fleet-wide bycatch of salmon by year, area, and season are presented in Tables 15-16 for the Oregon pink shrimp sector.

Non-Nearshore Fixed Gear Sector: Limited Entry Sablefish Primary

Salmon were only observed on hook-and-line vessels in the LE sablefish primary sector of the non-nearshore fixed gear groundfish fleet. Fleet-wide bycatch estimates for the commercial LE fixed gear sablefish primary sector were derived from WCGOP observer and fish ticket landings data. For further information about how this sector is defined refer to the 2013 Groundfish Mortality report (Somers et al. 2014).

Bycatch ratios for this sector were calculated by dividing the observed bycatch of each salmon species (number of fish) by the observed retained weight (mt) of sablefish. The fleet landed weight of sablefish was then used as a multiplier to expand observed salmon bycatch ratios to the fleet. The equation for the expansion of bycatch ratios in the LE sablefish primary sector is identical to that presented for the California halibut fishery, where r represents the retained weight of sablefish, x represents index strata of year and area, and F represents the weight of retained sablefish recorded on fish tickets.

Number of observed vessels, trips, and hauls, observed number of salmon, bycatch ratios, and estimated fleet-wide bycatch of salmon by year and area are presented in Tables 17-18 for the LE sablefish primary fixed gear groundfish sector.

Catch Shares: Non-hake IFQ

In 2011, new regulations governing the LE bottom trawl fishery, led to the induction of Individual Fishing Quotas (IFQs). With this change, each vessel is now required to carry a WCGOP observer at all times, resulting in 100% observer coverage. In addition, permit holders with IFQ and a trawl endorsement can fish multiple gear types (although not within the same trip), including bottom or midwater trawl gear or hook and line or pot gear. No salmon was observed in the hook and line or pot gear sectors, so only bottom and midwater trawl are reported. LE California halibut are included in this sector, as they are now regulated under IFQ regulations. Because there is a complete census of vessels, fleet-wide bycatch for this sector were derived entirely from WCGOP observer data. To maintain confidentiality standards, we combined bottom and midwater with LE California halibut in 2011 and bottom trawl and LE California halibut in 2013. We are unable to report 2012 LE California halibut data.

All Catch Shares trips are observed, but a small portion may be unsampled due to observer illness or other circumstance. Salmon weight occurs only when unsampled catch weight occurred in strata where salmon bycatch was observed. Three potential types of unsampled catch can occur: unsorted catch (all species including discarded and retained), non-IFQ species, or sorted but unsampled discard. For unsorted catch, unsampled salmon is estimated as the product of the sum of all unsorted catch weight in the strata and the ratio of the salmon in the strata to the sampled weight of all species (retained and discarded) in the strata. For unsampled non-IFQ species, unsampled salmon is estimated as the product of the sum of all unsampled non-IFQ species weight in the strata and the ratio of the salmon in the strata to the sampled weight of all discarded non-IFQ species in the strata. For unsampled miscellaneous, unsampled salmon is estimated as the product of the sum of all unsampled miscellaneous discarded weight in the strata and the ratio of the salmon in the strata to the sampled discarded weight of all species in the strata. The total weight of salmon bycatch is estimated as the sum of the total observed salmon weight in the strata and all estimations of unsampled salmon as described above.

Catch Shares vessels fishing midwater trawl gear function as maximum retention fishery, with little to no at-sea discard. Catch is sorted on-shore, so any protected species catch is discarded shoreside rather than at-sea. This can also occur on occasion in bottom trawl sectors. Shoreside discards of salmon are recorded by the Catch Monitor Program (CMP) and uploaded to e-Tix (https://etix.psmfc.org/). Salmon bycatch data for

2011-2013 was queried on 1-13-2015. This data was matched to WCGOP data using PacFIN Fish Ticket numbers and is reported separately for each sector.

Fleet-wide bycatch of salmon and total weight of groundfish retained by year, area, depth, and season are presented in Tables 19-21 for the bottom trawl portion of the non-hake IFQ fishery and Tables 22-23 for the midwater trawl portion.

Catch Shares: Shoreside Hake IFQ

Under the catch shares program and regulations, each shoreside hake vessel is now required to carry a WCGOP observer, resulting in 100% observer coverage. Estimation for the small amount of unsampled catch was performed using the same methods as described above for the non-hake IFQ fishery. Additionally, in 2012, 80 lbs of unspecified salmon weight, with no observed count, was discarded at sea in 2012. We estimated a count based on the weight/count ratio in the same season and area for 2012 and 2013.

Most salmon caught in the Shoreside Hake fishery is discarded shoreside, so CMP data is also included for this sector. Fleet-wide bycatch of salmon and total weight of shoreside hake retained by year, area, and season are presented in Tables 24-26 for the shoreside hake IFQ fishery.

Bycatch values from the shoreside tribal and EFP Pacific hake sectors were compiled from season summaries of the Pacific hake fishery by the Northwest Regional Office found at http://www.nwr.noaa.gov/Groundfish-Halibut/Groundfish-Fishery-Management/Whiting-Management/. Estimates of salmon species bycatch counts were not available for the shoreside Pacific hake sectors prior to 2007, except for Chinook salmon. Estimates of salmon bycatch weight were not available in the shoreside EFP and tribal sectors.

At-Sea Hake

All motherships and catcher processors fishing in the at-sea hake fishery carry two A-SHOP observers for every fishing day. Catcher vessels delivering to the motherships carry one WCGOP observer for every fishing day, therefore, expansion of bycatch estimates to the fleet level using ratio estimation is not necessary. A-SHOP observers sample approximately 50% of each haul and recorded salmon bycatch numbers and weights were extrapolated to the remainder of a single haul. Also, in some cases, not all hauls are sampled, so the extrapolated haul-level bycatch numbers and weights were expanded further to account for the very small proportion of hauls that were not sampled each year (0.04% to 1.6% in 2002-2013). Documentation of A-SHOP data collection methods can be found in the observer manual (NWFSC 2014). Extrapolated haul level data were provided by the A-SHOP. The bycatch numbers and weights were then expanded using the provided expansion factors.

The number of individual salmon caught and the total weight of the salmon was reported by each observed at-sea hake sector: tribal and non-tribal motherships and catcher-processors. Fleet-wide bycatch of salmon and total weight of hake retained by year and season are presented in Tables 27-29.

Biological Data Collection

For protected resources, including any species regulated under the Endangered Species Act (ESA), additional biological data are collected whenever possible. Depending on the salmon species, WCGOP, A-SHOP, and CMP record a variety of information, potentially including length, sex, presence/absence of adipose fin (absence indicates hatchery fish), and collect scales, snouts and pectoral fin clips. Snouts are collected to detect the presence of coded-wire tags (CWT). CMP data in this report is limited to biological data associated with salmon with CWTs, but additional data will be available from the CMP by mid-2015.

Pectoral fin clip and snout samples are used for genetic mixed stock analysis (also known as "genetic stock identification") to estimate Chinook salmon stock composition and to better understand the stock-specific, spatial, and temporal distribution of bycatch. Results from genetic mixed stock analysis of 2008 WCGOP and A-SHOP salmon bycatch were provided in a report to the Northwest Regional Office (Moran et al. 2009). Most of the Chinook salmon collected by WCGOP in 2008 came from the Klamath River with a smaller fraction coming from the Oregon and California coastal populations. Those three stocks accounted for more than 70% of the WCGOP samples in 2008. WCGOP and A-SHOP have collected a number of genetic samples from 2008 to the present (Tables 32, 34). Analysis by the Genetic and Evolution Laboratory at the NWFSC for WCGOP samples is planned for the near future, once enough samples have been collected. The results of analysis of 2009 and 2010 A-SHOP samples were recently reported (Moran and Tuttle 2011).

CWT data is delivered to a regional database, the Regional Mark Information System (RMIS) (http://www.rmpc.org). CWT data have been used to study the marine distribution of Chinook salmon (Weitkamp 2010), and coho salmon (Weitkamp and Neely 2002) in the Pacific Ocean. Researchers have used coded-wire tags (CWTs) to track salmon since 1981 in fisheries off the West Coast of North America (Celewycz et al. 2012). Upon recovery, these tags inform scientists about distances traveled from release, stock population, and brood and run year, amongst other important data.

Tables 32-35 summarize salmon biological data collected by WCGOP, CMP, and A-SHOP, respectively.

Results

Salmon bycatch was estimated for all fisheries observed by the FOS in which salmon were reported for the 2002-2013 period. These included the LE bottom trawl sector (Tables 2-4), the LE and OA components of the California halibut fishery (Tables 5-11), the nearshore fixed gear sector (Tables 12-14), the Oregon portion of the pink shrimp trawl (Tables 15-16), the LE sablefish primary sector of the non-nearshore fixed gear groundfish fleet (Tables 17-18), the catch shares non-hake IFQ(Tables 19-23), the catch shares shoreside hake fishery (Tables 24-26), and the at-sea hake fishery (Tables 27-29).

A summary of annual estimated salmon bycatch (number of fish) for each sector from 2002 to 2013 is provided in Table 30. Annual estimated salmon bycatch weights for these sectors are also provided in Table 31.

Chinook Salmon (*Oncorhynchus tshawytscha*)

Bycatch of Chinook salmon decreased between 2002 and 2010 across most of the WCGOP observed sectors (Tables 30-31). The largest estimate of salmon bycatch in the non-hake groundfish sectors occurred in 2003 when ~16,500 fish (~24 mt) were estimated to have been caught by all of the sectors combined. Most of the

2003 individuals (~99%) were caught by the LE trawl sector. Chinook salmon bycatch levels in the non-hake sectors dropped by an order of magnitude in 2004 and had decreased to less than 200 fish (0.35 mt) in 2006. Chinook salmon bycatch levels then hovered between 300 and 400 fish (0.5 to 0.8 mt) until 2010, which had the lowest Chinook salmon bycatch level since observations began in 2002 and was estimated at 86 fish or 0.24 mt.

However, this trend of decreasing bycatch has not held for 2011 to 2013. Salmon bycatch was observed in some fishery sectors for the first time: the OA California halibut sector caught an estimated 32 fish (0.02 mt) in 2011 and 25 (0.01 mt) in 2013. The Oregon pink shrimp sector caught 2 Chinook salmon (0.001 mt) in 2012. Additionally, the nearshore fixed gear sector in the north has increased since 2010, with the highest record Chinook salmon bycatch for that sector, 404 fish (2.4 mt), occurring in 2013. The bottom trawl portion of the catch shares non-hake IFQ recorded 175 Chinook salmon (0.3 mt) in 2011, compared to a 53 Chinook salmon (0.13 mt) in the LE trawl sector in 2010 (Figure 1). In 2012, Chinook salmon bycatch in the catch shares non-hake IFQ sector nearly doubled to 304 (0.5 mt) fish and remained high in 2013, with 323 salmon (0.2 mt). In total across all sectors, 2011 showed an increase from the low levels of bycatch in 2010 to more than 200 fish (0.4 mt), and 2012 further increased to an estimated bycatch of 382 Chinook salmon or 0.8 mt. In 2013, this number doubled again to 807 or 3.2 mt.

From 2011 to 2013, the bottom trawl sector was the largest contributor to Chinook salmon bycatch in the non-hake IFQ fishery. The majority of Chinook salmon bycatch in both the LE and the catch shares trawl sectors is attributed to areas north of Cape Mendocino, California in all years (Tables 2-4, 19-23).

Hake sectors, which utilize mid-water trawl gear, have consistently caught the greatest amount of salmon. Salmon bycatch increased to a peak in 2005 of 11,956 salmon, with relatively lower numbers until a second peak in 2011 of 8622 salmon (24 mt). Since 2011, salmon bycatch in all hake sectors has decreased to 6022 salmon (15 mt), which remains higher than about half of the previous years. The total salmon caught in hake sectors in 2012 and 2013 are less than one-third of the numbers caught in 2003: the peak of 22,956 salmon. However, these numbers are almost double those of many previous years.

Chum Salmon (*Oncorhynchus keta*)

In the non-hake sectors, chum salmon has been observed only in the limited entry trawl and catch shares non-hake midwater trawl sectors. The bycatch peaked in 2003 at 36 chum salmon (0.12 mt), decreasing to 0 until 2013, when 1 chum salmon was caught in the catch shares non-hake midwater trawl.

In the hake sectors, chum salmon bycatch has fluctuated, with peaks of 111 fish in both 2006 and 2011 and 290 fish in 2007 and minimums of ~ 20 in 2003 and 2010 (Tables 30-31). Largely, however, the bycatch of chum salmon has remained between about 50 and 85 fish between 2002 and 2013. Estimates prior to 2007 should be considered underestimates because estimates for all salmon species except Chinook salmon were not available for the shoreside tribal and EFP Pacific hake sectors.

Coho Salmon (*Oncorhynchus kisutch*)

Bycatch of coho salmon in the non-hake groundfish sectors showed a maximum of 630 fish in 2013, with the nearshore fixed gear sector in the north contributing most of the bycatch (Figure 2, Tables 30-31). Previous to 2013, the coho bycatch peaked at 103 fish (0.4 mt) in 2004. The lowest bycatch, 11 coho salmon (0.03 mt) occurred in 2005. In all other years, coho salmon bycatch was less than 85 fish. Bycatch of coho salmon in non-hake sectors was predominantly from the LE trawl sector in 2002-2005, was exclusively from the LE California halibut component in 2006, and was exclusively from the nearshore fixed gear sector in 2008-2009. The LE trawl and nearshore fixed gear sectors comprised all of the salmon bycatch in 2004 and 2010-2013. Coho salmon bycatch in 2009-2013 has been consistently higher than those of all previous years except 2004.

In Pacific hake sectors, coho salmon bycatch has alternated between high bycatch years in odd years and low bycatch years in even years since a peak in 2005 (Figure 2). Estimates prior to 2007 should be considered underestimates because estimates for all salmon species except Chinook salmon were not available for the shoreside tribal and EFP Pacific hake sectors.

Pink Salmon (*Oncorhynchus gorbuscha*)

Pink salmon bycatch in non-hake sectors remains extremely low, with a total of 4 observed salmon from 2002 to 2012. In the summer of 2009, the LE bottom trawl sector caught an estimated 2 pink salmon (0.002 mt) south of Cape Mendocino, CA in the 0 to 125 fm depth range (Tables 2-4). In the winter of 2012, the LE catch shares bottom trawl sector caught 2 pink salmon between Cape Falcon, OR and Cape Blanco OR in the 0 to 250 fm depth range (Table 19-21).

In Pacific hake sectors, pink salmon bycatch is mainly attributable to tribal mothership and tribal shoreside sectors in all years except 2011, when the catch shares shoreside hake sector caught more pink salmon (~6110) than had previously been caught by all hake sectors from 2002 to 2010 (Tables 30-31). Besides this high peak in 2011, pink salmon bycatch in recent years has decreased to less than 50 fish per year. Estimates prior to 2007 should be considered underestimates because estimates for all salmon species except Chinook salmon were not available for the shoreside tribal and EFP Pacific hake sectors.

Sockeye Salmon (*Oncorhynchus nerka*)

Sockeye salmon has been observed very rarely in both non-hake and hake sectors (Tables 30-31). In 2010, the catch shares non-hake bottom trawl fishery caught 1 sockeye salmon. In both 2008 and 2010, the At-Sea Hake catcher processor sector caught 2 sockeye salmon, while shoreside EFP caught 2 in 2010 and Shoreside Tribal caught 2 in 2011. Estimates prior to 2007 should be considered underestimates because estimates for all salmon species except Chinook salmon were not available for the shoreside tribal and EFP Pacific hake sectors. In 2012 and 2013, no sockeye salmon was observed in any of these fisheries.

Unspecified salmon

In the non-hake sectors, unspecified salmon species bycatch was highest in 2002 at 159 fish mostly from the LE California halibut fishery (Tables 30-31). Between 2005 and 2009, no unspecified salmon were recorded, suggesting improved sampling and identification of salmon species. There are still cases when identifying salmon to species is not possible, such as when a salmon is observed on fishing gear but drops off the gear before reaching the deck. Two observed salmon fell into this category in 2010 in the nearshore fixed gear groundfish sector in the north, explaining the increase from zero to 26 unspecified salmon. Similarly, 2 unspecified salmon were recorded in the catch shares trawl sector in 2012.

In the hake sector, a maximum of 186 unspecified salmon were observed in 2003, all in the tribal mothership sector. In all other years between 2002 and 2012, the maximum number of unspecified salmon observed was 18. However, in 2012, the catch shares shoreside hake sector recorded 11 unspecified salmon.

Biological Data

Between 2002 and 2013, across all WCGOP-observed fishery sectors, the WCGOP observed 1382 Chinook salmon, ranging in length from 18 to 84 cm (Table 32, Figure 5) and 1 to 44 kg. 639 of these fish were identified as female, 633 as male, and 110 not classified. 343 genetic samples were taken and 69 readable CWTs were scanned. 75% of Chinook salmon checked had clipped adipose fins. The mean length of Chinook salmon bycatch in bottom trawl fisheries both before and after catch shares implementations fluctuates around 50 cm (Table 32). However, both the minimum and maximum lengths of Chinook caught by bottom trawl has increased, with no fish less than 31 cm measured from 2011 to 2013, and two of the three highest maximum lengths observed after catch shares implementation.

Between 2004 and 2013, observers recorded biological data for 82 coho salmon, ranging in length from 32 to 72 cm (Table 32, Figure 5) and 4 to 26 kg. 42 were identified as female, 31 as male, and 9 were unidentified.

Biological data were collected for 2 chum salmon in only 2003 and 2004 in the LE trawl fishery, both of similar length (around 50 cm) and weight (around 12 kg); one chum salmon was recorded in the catch shares non-hake fishery in 2013, with a weight of about 20 kg and a length of about 70 cm. WCGOP observed 6 pink salmon in the years 2009, 2011, and 2012, which showed a mean length of about 45 cm and a mean weight of about 16.5 kg. One sockeye salmon, 37 cm and 3.1 kg, was observed in 2011 in the catch shares non-hake trawl sector. Five unspecified salmon were observed: 3 in 2004 in the LE trawl sector and 2 in 2012 in the catch shares non-hake trawl sector. These salmon ranged from 41 to 71 cm and 4.4 to 20 kg.

Between 2008 and 2013, the CM program collected biological data for a large number of salmon caught by the Shoreside Hake fishery. In this report, we only provide data for those uploaded to the RMIS, consisting of 997 Chinook salmon and 24 coho salmon (Table 33). 505 of the Chinook salmon were identified as female and 459 as male, with the rest unidentified. Chinook lengths ranged from 5 to 102 cm, and weights ranged from 1.3 to 141 kg. 566 of the Chinook salmon had readable CWTs and 73% had clipped fins. 14 coho salmon were identified as female, while 10 were identified as male. Lengths ranged from 41 to 74 cm, and weights ranged from 4.2 to 56 kg. 11 had readable CWTs and 75% had clipped adipose fins.

The A-SHOP has collected salmon data since the 1970s. Here we report biological data from 1976 to 2013 and CWT data from 1981 to 2013 (Tables 34-35, Figure 6). Data before 1991 is grouped as one sector. From 1976 to 2013, A-SHOP observers recorded biological data for 92,243 Chinook salmon. 43,618 of these were identified as female, 47,388 were identified as male. From 1976 to 1990, lengths ranged from 15 to 116 cm, with a mean of 57 cm. From 1991 to 2013, a similar distribution has been observed, with a range of 16 to 123 cm and a mean of 60 cm; weights ranged from 0.3 to 37 kg with a mean of 9 kg. Since 1981, A-SHOP has found 4292 readable CWTs on Chinook salmon and, since 2008, taken 6,744 genetic samples from Chinook.

Biological data was recorded by the A-SHOP for 7434 coho salmon, identifying 3748 females and 3534 males. Lengths ranged from 25 to 105 cm, with a mean of 57 cm. From 1981 to 2013, 202 had readable CWTs.

From 1976 to 2013, biological data for 1178 chum salmon was recorded by the A-SHOP. 619 were identified as female, and 542 were identified as male. Lengths ranged from 21 to 97 cm, with a mean of 66 cm.

Biological data for 2435 pink salmon has been recorded by the A-SHOP, identifying 1233 females and 1195 males. Lengths ranged from 24 to 83 cm, with a mean of 48 cm.

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Figures

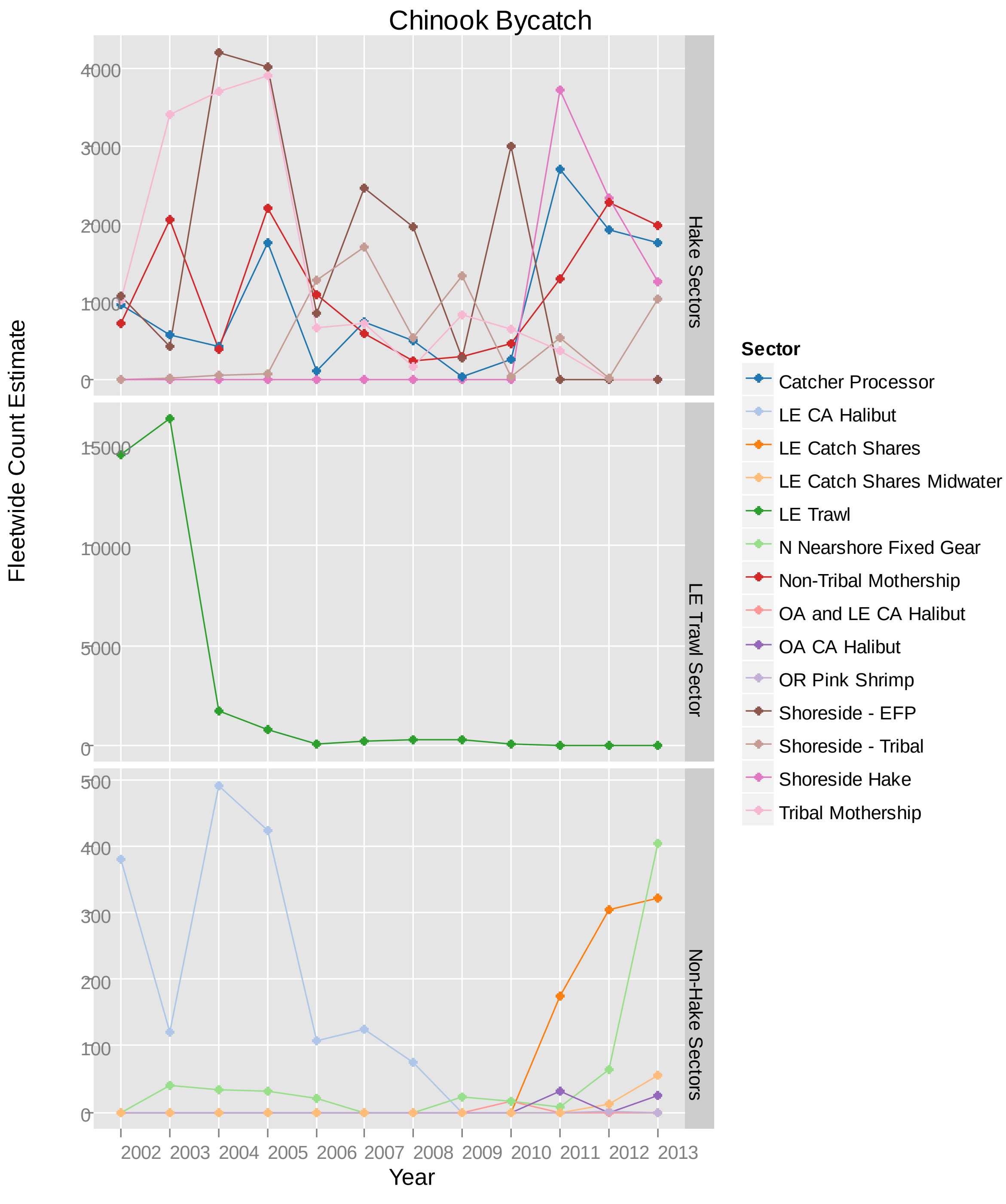

Figure 1. Chinook bycatch in all observed fisheries.

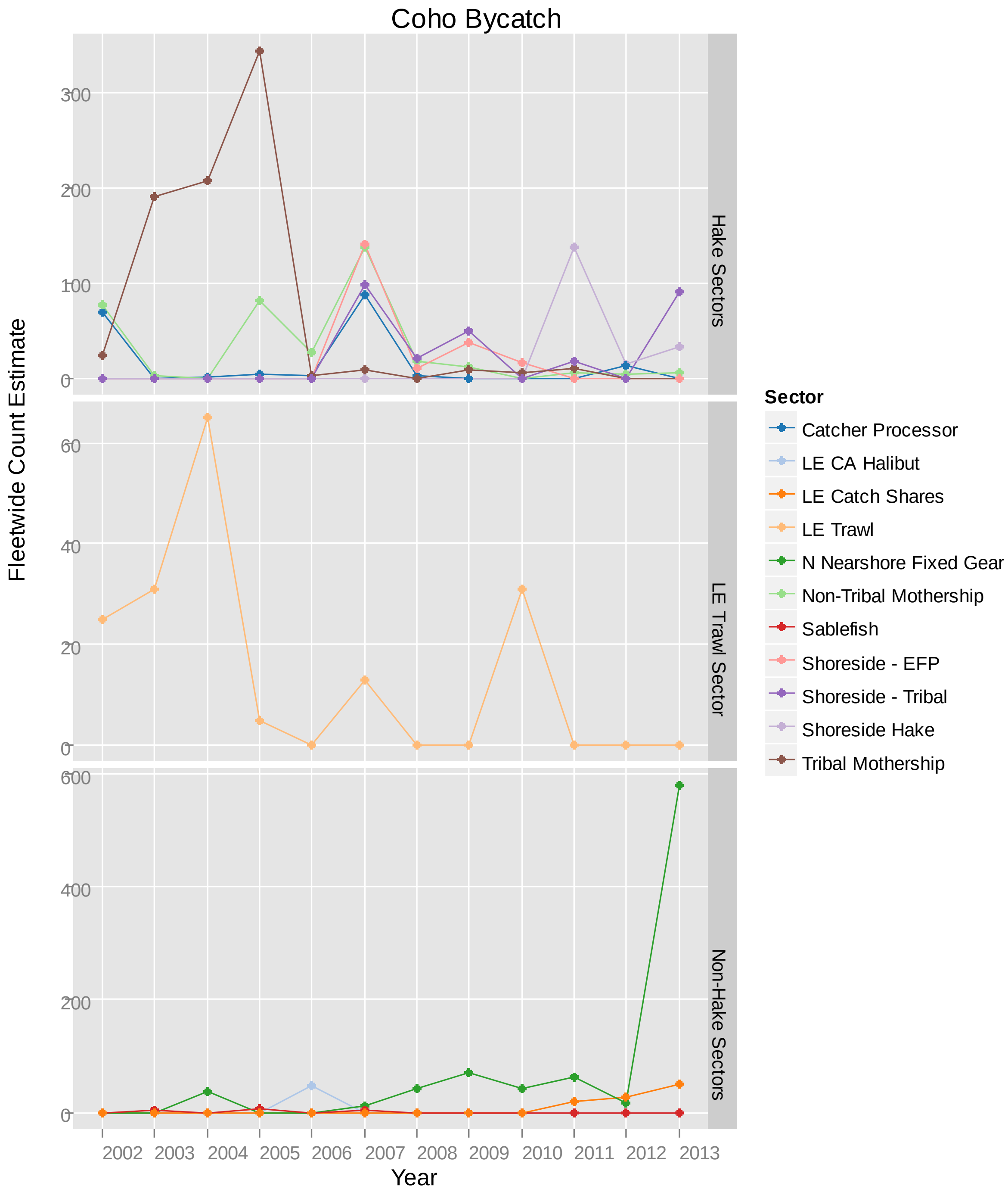

Figure 2. Coho bycatch in all observed fisheries.

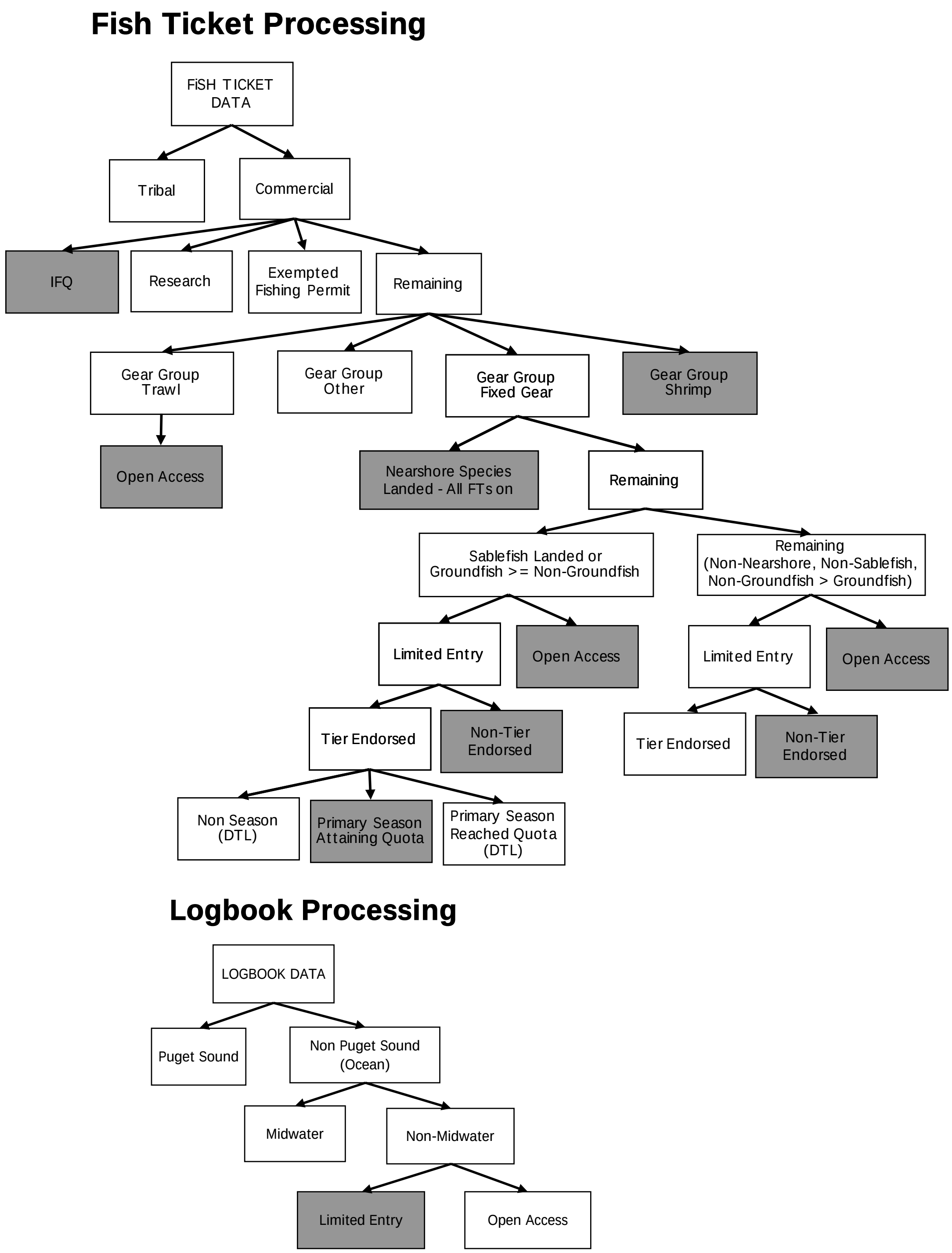

Figure 3. Fish ticket and logbook data processing for division into groundfish fishery sectors after retrieval of a full calendar year dataset from the Pacific Coast Fisheries Information Network (PacFIN) database. Grey highlight indicates sectors for which federal observer data is available.

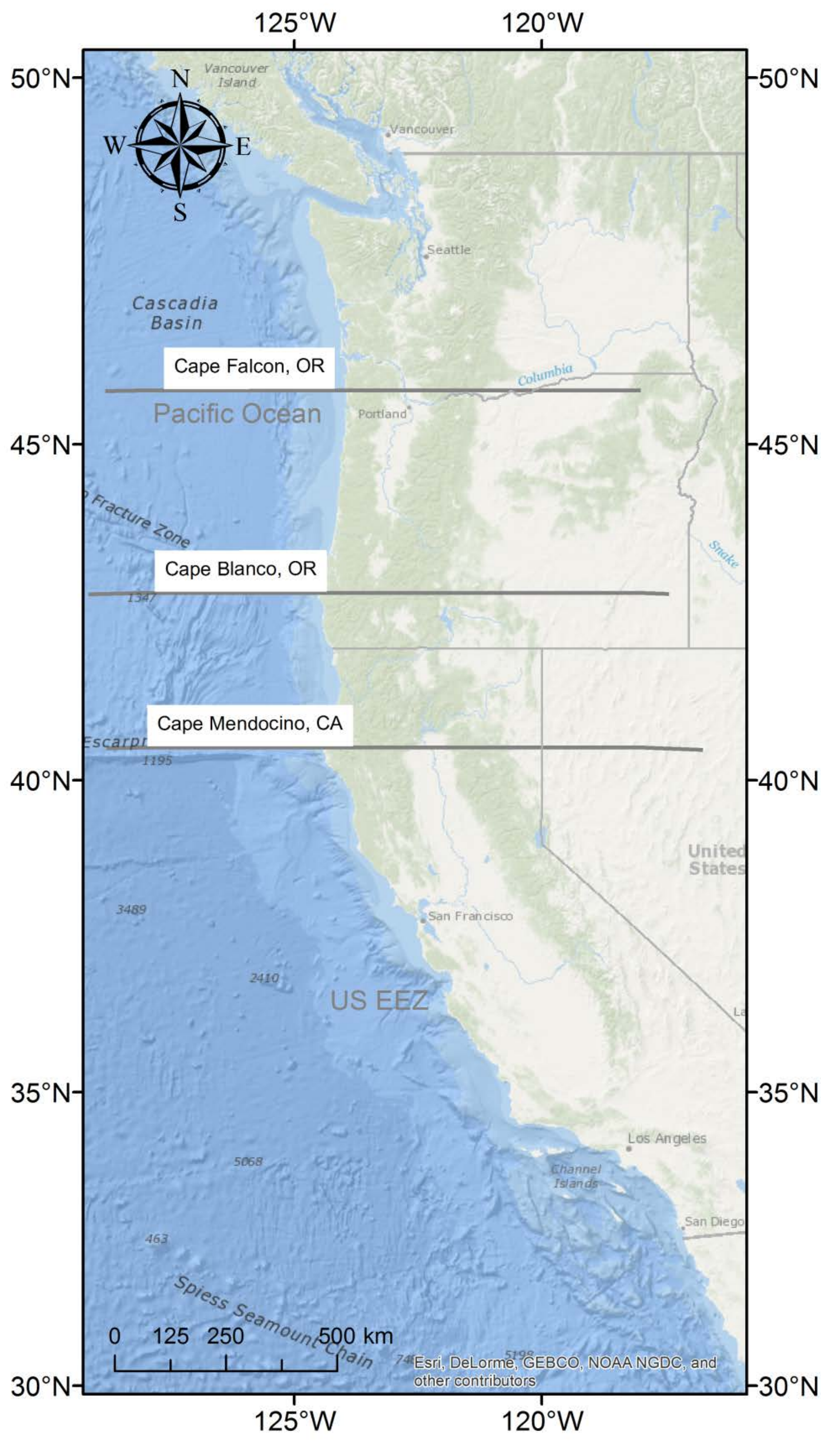

Figure 4. Geographic latitudinal regions and depths utilized in salmon bycatch estimation in the LE groundfish bottom trawl sector. Latitudinal regions are also used to summarize salmon bycatch estimates in the U.S. west coast groundfish fisheries.

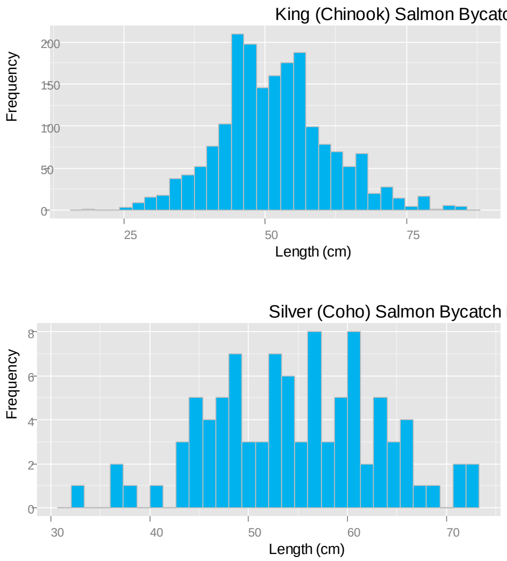

Figure 5. Length-frequency diagrams for Chinook salmon and coho salmon bycatch, across all fisheries observed by WCGOP in years 2002 to 2013.

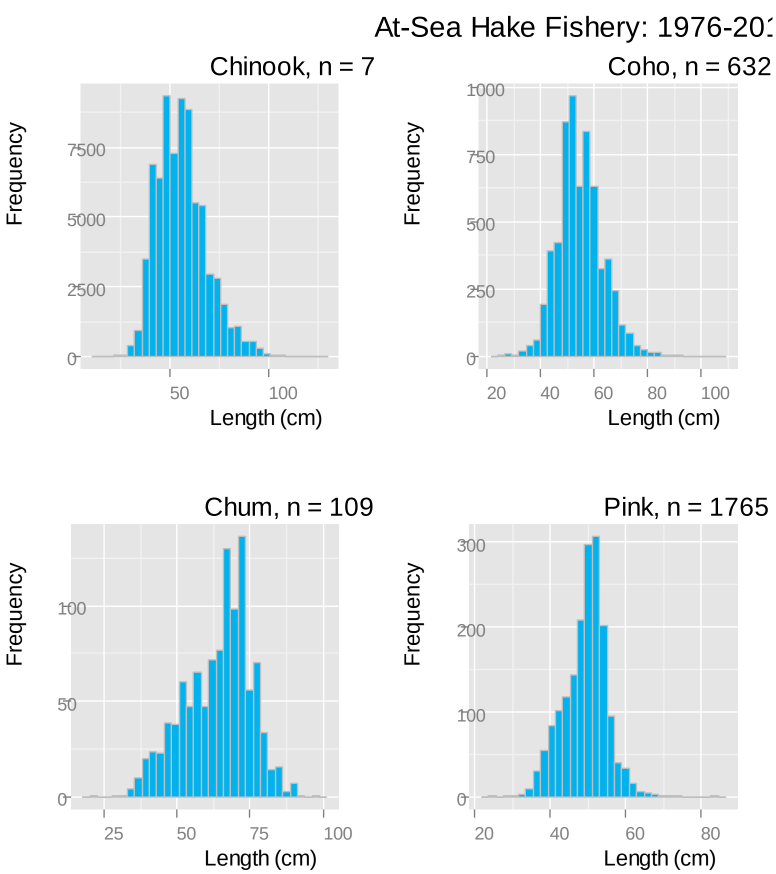

Figure 6. Length-frequency diagrams for Chinook, coho, chum, and pink salmon bycatch in all fisheries observed by the A-SHOP in years 1976 to 2013.

Tables

Table 1. Geographic latitudinal regions and depths utilized in salmon bycatch estimation in the U.S. west coast groundfish fisheries.

Management Area	**Latitudinal Description**
North of Cape Falcon, Oregon	North of 45.77°N
Cape Falcon, Oregon to Cape Blanco, Oregon	Between 42.75°N and 45.77°N
Cape Blanco, Oregon to Cape Mendocino, California	Between 40.16°N and 42.75°N
South of Cape Mendocino, California	Between 32.5°N and 40.16°N

Table 2. Observed vessels, trips, hauls, catch, and salmon and fleet landings, stratified by year, season, salmon management area, and depth interval for LE trawl fishery. Strata not listed were not observed; * represents strata containing fewer than 3 observed vessels; @ represents observed strata for which fewer than 3 vessels landed fish: this represented less than 0.25 percent of fishing effort in regards to yearly landings.

Year	Area	Season	Depth Interval (fm)	Observed Catch (mt)	Fleet Landings (mt)	Vessels	Trips	Hauls	Hauls that Encountered Salmon: Count	Hauls that Encountered Salmon: Percent
2002	North of Cape Falcon OR	Winter	0-125	223	965	17	52	258	56	22
			125-250	236	1006	13	35	151	24	16
			250+	170	927	16	36	126	3	2
		Summer	0-125	441	2544	20	136	821	50	6
			125-250	9	288	3	4	7	0	0
			250+	20	210	4	5	17	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	53	458	8	16	74	18	24
			125-250	70	774	14	32	83	19	23
			250+	145	1068	17	38	141	0	0
		Summer	0-125	121	980	11	48	252	5	2
			125-250	18	219	7	11	24	0	0
			250+	52	345	11	14	65	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	0-125	34	264	9	18	54	19	35
			125-250	32	438	12	18	41	19	46
			250+	198	1302	24	61	184	1	1
		Summer	0-125	66	751	11	38	143	14	10
			125-250	17	176	4	11	23	0	0
			250+	103	629	11	36	127	0	0
	South of Cape Mendocino CA	Winter	0-125	70	496	10	26	61	8	13
			125-250	82	584	15	34	87	2	2
			250+	141	1099	19	38	120	0	0
		Summer	0-125	17	269	4	9	20	2	10
			125-250	109	627	23	41	76	3	4
			250+	254	1587	27	60	208	0	0
2003	North of Cape Falcon OR	Winter	0-125	194	1257	11	34	201	33	16
			125-250	90	994	10	17	58	9	16
			250+	162	1074	15	24	108	0	0
		Summer	0-125	75	1394	7	19	135	23	17
			125-250	133	809	11	25	110	0	0
			250+	113	592	11	26	131	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	105	649	8	16	87	53	61
			125-250	162	832	19	44	131	17	13
			250+	199	856	25	47	176	1	1
		Summer	0-125	*	645	*	*	*	*	*
			125-250	77	628	12	19	69	0	0
			250+	99	712	14	21	83	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	0-125	36	188	8	15	39	16	41
			125-250	43	303	7	15	31	5	16
			250+	188	966	18	40	121	0	0
		Summer	0-125	23	240	5	11	28	5	18
			125-250	127	637	17	35	79	0	0
			250+	243	1389	23	59	189	0	0
	South of Cape Mendocino CA	Winter	0-125	*	211	*	*	*	*	*
			125-250	39	452	5	13	31	0	0
			250+	142	1183	16	31	103	0	0
		Summer	0-125	50	356	10	55	155	11	7
			125-250	50	352	12	25	38	1	3
			250+	217	1670	21	55	151	0	0
2004	North of Cape Falcon OR	Winter	0-125	153	324	8	55	268	44	16
			125-250	361	1501	17	47	199	20	10
			250+	401	1406	17	51	204	1	< 1
		Summer	0-125	432	2759	16	119	794	22	3
			125-250	154	924	11	18	73	1	1
			250+	83	254	10	16	76	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	13	15	3	8	31	4	13
			125-250	244	809	19	43	129	16	12
			250+	293	1170	22	44	146	1	1
		Summer	0-125	42	538	5	19	98	9	9
			125-250	221	1020	18	40	154	0	0
			250+	226	654	21	38	152	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	0-125	@	@	@	@	@	@	@
			125-250	112	278	8	23	58	14	24
			250+	233	639	11	34	108	1	1
		Summer	0-125	81	473	6	19	70	3	4
			125-250	100	437	12	20	43	0	0
			250+	166	761	13	31	100	0	0
	South of Cape Mendocino CA	Winter	0-125	9	75	4	14	39	0	0
			125-250	89	369	14	36	96	2	2
			250+	407	1052	20	62	229	0	0
		Summer	0-125	71	191	8	35	107	2	2
			125-250	109	604	13	29	85	0	0
			250+	309	1416	17	51	179	0	0

Table 2, continued.

Year	Area	Season	Depth Interval (fm)	Observed Catch (mt)	Fleet Landings (mt)	Vessels	Trips	Hauls	Hauls that Encountered Salmon: Count	Hauls that Encountered Salmon: Percent
2005	North of Cape Falcon OR	Winter	0-125	135	619	7	41	187	1	1
			125-250	276	1490	14	37	132	17	13
			250+	381	1361	16	42	170	0	0
		Summer	0-125	1061	4713	23	112	1148	0	0
			125-250	89	329	12	25	83	0	0
			250+	58	253	10	19	69	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	*	82	*	*	*	*	*
			125-250	278	947	18	46	148	11	7
			250+	237	971	20	42	122	0	0
		Summer	0-125	225	1241	11	41	267	0	0
			125-250	86	363	13	24	71	1	1
			250+	108	652	17	28	101	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	90	605	8	18	45	2	4
			250+	174	854	13	27	73	0	0
		Summer	0-125	86	565	6	18	83	2	2
			125-250	37	267	6	10	18	0	0
			250+	210	886	12	28	102	0	0
	South of Cape Mendocino CA	Winter	0-125	5	51	3	9	21	0	0
			125-250	111	392	11	26	76	0	0
			250+	218	962	13	35	120	0	0
		Summer	0-125	88	343	5	51	203	1	< 1
			125-250	53	317	9	19	40	0	0
			250+	195	1009	11	28	119	0	0
2006	North of Cape Falcon OR	Winter	0-125	60	232	6	28	147	2	1
			125-250	186	1170	11	28	102	2	2
			250+	214	1270	12	28	102	0	0
		Summer	0-125	665	4279	19	116	943	2	< 1
			125-250	106	544	10	19	54	0	0
			250+	67	321	9	13	64	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	*	7	*	*	*	*	*
			125-250	276	1065	16	48	180	1	1
			250+	191	789	16	37	91	0	0
		Summer	0-125	235	1063	14	41	282	0	0
			125-250	78	432	12	18	60	0	0
			250+	215	943	17	30	119	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	155	648	7	23	85	2	2
			250+	140	639	8	26	63	0	0
		Summer	0-125	75	650	3	12	71	0	0
			125-250	35	148	5	7	11	0	0
			250+	288	1153	11	35	134	0	0
	South of Cape Mendocino CA	Winter	0-125	*	47	*	*	*	*	*
			125-250	27	324	4	11	24	0	0
			250+	56	584	5	9	35	0	0
		Summer	0-125	63	259	5	48	175	0	0
			125-250	74	274	8	32	82	0	0
			250+	227	925	11	40	133	0	0
2007	North of Cape Falcon OR	Winter	0-125	10	93	3	5	33	0	0
			125-250	254	1673	13	31	116	6	5
			250+	228	1844	13	30	140	0	0
		Summer	0-125	253	1998	10	44	418	3	1
			125-250	222	1539	13	32	155	0	0
			250+	128	835	13	32	129	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	*	17	*	*	*	*	*
			125-250	190	1160	15	32	102	2	2
			250+	270	1486	18	39	145	1	1
		Summer	0-125	99	586	4	16	107	0	0
			125-250	224	1251	24	40	138	0	0
			250+	245	827	22	44	169	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	87	681	9	24	66	1	2
			250+	178	1368	7	20	72	0	0
		Summer	0-125	*	493	*	*	*	*	*
			125-250	172	843	12	28	60	1	2
			250+	289	1193	14	42	145	0	0
	South of Cape Mendocino CA	Winter	0-125	*	45	*	*	*	*	*
			125-250	92	467	5	23	68	0	0
			250+	150	400	5	21	75	0	0
		Summer	0-125	82	384	7	36	133	0	0
			125-250	103	516	9	30	75	0	0
			250+	109	718	11	33	83	0	0

Table 2, continued.

Year	Area	Season	Depth Interval (fm)	Observed Catch (mt)	Fleet Landings (mt)	Vessels	Trips	Hauls	Hauls that Encountered Salmon: Count	Hauls that Encountered Salmon: Percent
2008	North of Cape Falcon OR	Winter	125-250	317	2065	12	38	150	6	4
			250+	453	2636	13	41	210	0	0
		Summer	0-125	242	1132	8	30	328	0	0
			125-250	504	2109	21	47	224	0	0
			250+	386	1607	21	54	298	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	@	@	@	@	@	@	@
			125-250	271	1417	17	44	153	9	6
			250+	327	1885	17	44	158	0	0
		Summer	0-125	39	352	6	18	112	0	0
			125-250	485	1623	28	81	347	0	0
			250+	319	1400	30	69	238	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	0-125	*	47	*	*	*	*	*
			125-250	164	922	10	37	99	9	9
			250+	307	1744	12	53	156	0	0
		Summer	125-250	260	758	17	37	85	0	0
			250+	338	1255	17	41	150	0	0
	South of Cape Mendocino CA	Winter	0-125	*	96	*	*	*	*	*
			125-250	35	502	5	16	39	0	0
			250+	92	523	8	22	63	0	0
		Summer	0-125	106	334	11	46	207	1	< 1
			125-250	78	495	11	22	55	0	0
			250+	155	895	9	22	82	0	0
2009	North of Cape Falcon OR	Winter	0-125	41	149	6	11	77	6	8
			125-250	576	2852	18	57	215	2	1
			250+	616	2885	21	69	312	0	0
		Summer	0-125	517	1911	10	53	663	0	0
			125-250	316	2028	13	41	139	0	0
			250+	282	1262	13	41	235	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	*	17	*	*	*	*	*
			125-250	380	1391	41	93	256	7	3
			250+	784	2627	39	117	476	0	0
		Summer	0-125	193	834	10	41	313	0	0
			125-250	336	1175	21	58	254	0	0
			250+	408	1373	24	71	297	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	94	623	11	28	58	4	7
			250+	392	1503	16	57	215	1	< 1
		Summer	0-125	*	139	*	*	*	*	*
			125-250	126	863	11	32	75	0	0
			250+	354	1710	16	48	181	0	0
	South of Cape Mendocino CA	Winter	0-125	6	73	4	5	16	1	6
			125-250	65	494	7	18	63	0	0
			250+	155	635	10	29	114	0	0
		Summer	0-125	79	189	9	38	156	9	6
			125-250	142	475	8	43	105	0	0
			250+	172	816	8	40	120	0	0
2010	North of Cape Falcon OR	Winter	125-250	270	1985	12	27	78	0	0
			250+	398	2637	12	36	196	0	0
		Summer	0-125	232	1302	8	24	242	0	0
			125-250	421	2171	11	34	151	0	0
			250+	344	1239	14	42	267	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	125-250	138	1263	15	33	82	3	4
			250+	339	2165	18	42	217	1	< 1
		Summer	0-125	88	345	5	26	170	0	0
			125-250	258	1062	22	46	153	0	0
			250+	375	1504	27	64	314	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	*	379	*	*	*	*	*
			250+	138	1372	7	18	72	0	0
		Summer	0-125	*	13	*	*	*	*	*
			125-250	200	828	17	40	64	0	0
			250+	433	1428	20	58	225	0	0
	South of Cape Mendocino CA	Winter	0-125	28	99	3	15	65	0	0
			125-250	*	213	*	*	*	*	*
			250+	41	611	4	11	34	0	0
		Summer	0-125	32	245	6	17	62	0	0
			125-250	52	322	8	24	60	0	0
			250+	191	966	8	31	120	0	0

Table 3. Salmon bycatch count for LE trawl fishery. Unobserved strata and those without salmon bycatch are not shown. * represents strata containing fewer than 3 observed vessels; ! represents strata where bootstrapping was not possible due to fewer than 3 observed vessels in potential boostrapping dataset. Bootstrapped estimates of the bycatch ratio and 95% confidence intervals around the ratio SE are italicized. Note that for strata with a small number of salmon encounters can show bycatch ratio values equivalent to bycatch ratio SE values.

Year	Area	Season	Depth Interval (fm)	Observed Groundfish Catch (mt)	Fleet Groundfish Landings (mt)	Chinook Observed Bycatch (count)	Chinook Observed Bycatch Ratio	Chinook Observed Bycatch Ratio SE	Chinook Bycatch Estimate (count)	Chum Observed Bycatch (count)	Chum Observed Bycatch Ratio	Chum Observed Bycatch Ratio SE	Chum Bycatch Estimate (count)	Coho Observed Bycatch (count)	Coho Observed Bycatch Ratio	Coho Observed Bycatch Ratio SE	Coho Bycatch Estimate (count)	Pink Observed Bycatch (count)	Pink Observed Bycatch Ratio	Pink Observed Bycatch Ratio SE	Pink Bycatch Estimate (count)	Unspecified Observed Bycatch (count)	Unspecified Observed Bycatch Ratio	Unspecified Observed Bycatch Ratio SE	Unspecified Bycatch Estimate (count)
2002	North of Cape Falcon OR	Winter	0-125	223	965	143	0.6397	0.1203	618	0	0	0	0	1	0.004485	0.004485	4	0	0	0	0	0	0	0	0
			125-250	236	1006	74	0.3135	0.1143	315	0	0	0	0	0	0	0	0	0	0	0	0	1	0.004237	0.004237	4
			250+	170	927	5	0.02934	0.01948	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	441	2544	116	0.2629	0.05169	669	1	0.002266	0.002266	6	2	0.004533	0.004533	12	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	53	458	141	2.671	1.219	1224	0	0	0	0	1	0.01893	0.01893	9	0	0	0	0	0	0	0	0
			125-250	70	774	544	7.809	4.923	6041	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	121	980	7	0.05784	0.02977	57	1	0.008263	0.008263	8	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	0-125	34	264	183	5.408	2.749	1427	0	0	0	0	0	0	0	0	0	0	0	0	1	0.02955	0.02955	8
			125-250	32	438	194	6.066	3.599	2659	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			250+	198	1302	6	0.03031	0.03031	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	66	751	106	1.614	0.7106	1212	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	South of Cape Mendocino CA	Winter	0-125	70	496	21	0.3015	0.1403	149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	82	584	2	0.02451	0.01766	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	17	269	3	0.1784	0.1337	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	109	627	6	0.05503	0.03905	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	North of Cape Falcon OR	Winter	0-125	194	1257	98	0.5055	0.1194	636	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	90	994	29	0.3217	0.144	320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	75	1394	121	1.612	0.7132	2247	1	0.01332	0.01332	19	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	105	649	1234	11.72	4.394	7609	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	162	832	569	3.502	1.693	2912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			250+	199	856	8	0.04029	0.04029	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	*	645	*	*0.1524*	*0.152 - 0.1529*	98	*	*0.01627*	*0.01625 - 0.01629*	10	*	*0.007981*	*0.007941 - 0.008021*	5	0	0	0	0	*	*0.004882*	*0.004858 - 0.004907*	3
	Cape Blanco OR to Cape Mendocino CA	Winter	0-125	36	188	146	4.059	1.535	761	0	0	0	0	1	0.02779	0.02779	5	0	0	0	0	0	0	0	0
			125-250	43	303	184	4.272	2.725	1294	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	23	240	23	0.9999	0.6133	240	0	0	0	0	2	0.08694	0.08694	21	0	0	0	0	0	0	0	0
	South of Cape Mendocino CA	Winter	0-125	*	211	*	*0.2216*	*0.2214 - 0.2219*	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	50	356	20	0.3996	0.1668	142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	50	352	0	0	0	0	1	0.02009	0.02009	7	0	0	0	0	0	0	0	0	0	0	0	0
2004	North of Cape Falcon OR	Winter	0-125	153	324	146	0.958	0.2831	310	0	0	0	0	0	0	0	0	0	0	0	0	2	0.01309	0.01309	4
			125-250	361	1501	36	0.09976	0.02843	150	1	0.002771	0.002771	4	1	0.002771	0.002771	4	0	0	0	0	0	0	0	0
			250+	401	1406	2	0.004992	0.004992	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	432	2759	33	0.07663	0.02107	211	0	0	0	0	1	0.002314	0.002314	6	0	0	0	0	1	0.002314	0.002314	6
			125-250	154	924	1	0.006492	0.006492	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	13	15	7	0.559	0.3137	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	244	809	94	0.386	0.1368	312	0	0	0	0	4	0.01643	0.01298	13	0	0	0	0	0	0	0	0
			250+	293	1170	1	0.003418	0.003418	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	42	538	36	0.8635	0.6779	465	0	0	0	0	3	0.07844	0.05697	42	0	0	0	0	2	0.04797	0.04797	26
	Cape Blanco OR to Cape Mendocino CA	Winter	0-125	112	278	80	0.717	0.2855	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	*	6	*	*2.738*	*2.727 - 2.748*	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			250+	233	639	1	0.004297	0.004297	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	81	473	3	0.03695	0.02125	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	South of Cape Mendocino CA	Winter	125-250	89	369	2	0.02246	0.01587	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	71	191	4	0.05668	0.03997	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3, continued.

Year	Area	Season	Depth Interval (fm)	Observed Groundfish Catch (mt)	Fleet Groundfish Landings (mt)	Chinook Observed Bycatch (count)	Chinook Observed Bycatch Ratio	Chinook Observed Bycatch Ratio SE	Chinook Bycatch Estimate (count)	Chum Observed Bycatch (count)	Chum Observed Bycatch Ratio	Chum Observed Bycatch Ratio SE	Chum Bycatch Estimate (count)	Coho Observed Bycatch (count)	Coho Observed Bycatch Ratio	Coho Observed Bycatch Ratio SE	Coho Bycatch Estimate (count)	Pink Observed Bycatch (count)	Pink Observed Bycatch Ratio	Pink Observed Bycatch Ratio SE	Pink Bycatch Estimate (count)	Unspecified Observed Bycatch (count)	Unspecified Observed Bycatch Ratio	Unspecified Observed Bycatch Ratio SE	Unspecified Bycatch Estimate (count)
2005	North of Cape Falcon OR	Winter	0-125	135	619	1	0.007433	0.007433	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	276	1490	108	0.3918	0.1523	584	0	0	0	0	1	0.003628	0.003628	5	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	*	82	*	*0.1251*	*0.1249 - 0.1253*	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	278	947	28	0.1006	0.03973	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	125-250	86	363	3	0.03468	0.03468	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	90	605	14	0.1562	0.111	94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	86	565	2	0.02318	0.01636	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	South of Cape Mendocino CA	Summer	0-125	88	343	1	0.0114	0.0114	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	North of Cape Falcon OR	Winter	0-125	60	232	2	0.03319	0.02348	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	186	1170	5	0.02919	0.02211	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	665	4279	2	0.003009	0.002128	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	276	1065	1	0.003622	0.003622	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	*	7	*	*0.08653*	*0.08647 - 0.08658*	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	155	648	2	0.01288	0.009084	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	North of Cape Falcon OR	Winter	125-250	254	1673	12	0.04732	0.02731	79	0	0	0	0	2	0.007887	0.005576	13	0	0	0	0	0	0	0	0
		Summer	0-125	253	1998	6	0.02368	0.01476	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	125-250	190	1160	8	0.04208	0.02969	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			250+	270	1486	1	0.003699	0.003699	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	87	681	1	0.01147	0.01147	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	125-250	172	843	1	0.005799	0.005799	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	North of Cape Falcon OR	Winter	125-250	317	2065	11	0.03471	0.01638	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	125-250	271	1417	24	0.08847	0.03777	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	0-125	!	47	!	!	!	!	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	164	922	20	0.1222	0.05322	113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	South of Cape Mendocino CA	Winter	0-125	*	99	*	*0.01*	*0.009906 - 0.01009*	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	106	334	4	0.0379	0.0379	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	North of Cape Falcon OR	Winter	0-125	41	149	39	0.9479	0.5364	142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	576	2852	2	0.00347	0.002452	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	!	17	!	!	!	!	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	380	1391	14	0.03687	0.01703	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	94	623	5	0.05292	0.02768	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			250+	392	1503	2	0.005102	0.005102	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	South of Cape Mendocino CA	Winter	0-125	6	73	1	0.1652	0.1652	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	79	189	18	0.2278	0.1135	43	0	0	0	0	0	0	0	0	1	0.01266	0.01266	2	0	0	0	0
2010	Cape Falcon OR to Cape Blanco OR	Winter	125-250	138	1263	4	0.02901	0.01767	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			250+	339	2165	0	0	0	0	0	0	0	0	4	0.01182	0.01182	26	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	*	379	*	*0.04262*	*0.04256 - 0.04269*	16	0	0	0	0	*	*0.01285*	*0.01281 - 0.01288*	5	0	0	0	0	0	0	0	0

Table 4. Salmon bycatch weight for LE trawl fishery. Unobserved strata and those without salmon bycatch are not shown. * represents strata containing fewer than 3 observed vessels; ! represents strata where bootstrapping was not possible due to fewer than 3 observed vessels in potential boostrapping dataset. Bootstrapped estimates of the bycatch ratio and 95% confidence intervals around the ratio SE are italicized. Note that for strata with a small number of salmon encounters can show bycatch ratio values equivalent to bycatch ratio SE values.

						Chinook				Chum				Coho				Pink				Unspecified			
						Observed				Observed				Observed				Observed				Observed			
Year	Area	Season	Depth Interval (fm)	Observed Groundfish Catch (mt)	Fleet Groundfish Landings (mt)	Bycatch (mt)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (mt)	Bycatch (mt)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (mt)	Bycatch (mt)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (mt)	Bycatch (mt)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (mt)	Bycatch (mt)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (mt)
2002	North of Cape Falcon OR	Winter	0-125	223	965	0.3	0.001269	0.0002341	1	0	0	0	0	0.002	0.000009297	0.000009297	0.009	0	0	0	0	0	0	0	0
			125-250	236	1006	0.1	0.0005839	0.0001918	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0.001	0.000005765	0.000005765	0.006
			250+	170	927	0.006	0.00003752	0.00002523	0.03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	441	2544	0.3	0.000635	0.0001144	2	0.004	0.00000843	0.00000843	0.02	0.0004	9.253E-07	9.253E-07	0.002	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	53	458	0.3	0.005207	0.002382	2	0	0	0	0	0.0006	0.00001116	0.00001116	0.005	0	0	0	0	0	0	0	0
			125-250	70	774	0.9	0.01249	0.00761	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	121	980	0.02	0.0001271	0.00006953	0.1	0.004	0.00003486	0.00003486	0.03	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	0-125	34	264	0.3	0.009053	0.004365	2	0	0	0	0	0	0	0	0	0	0	0	0	0.003	0.00008579	0.00008579	0.02
			125-250	32	438	0.3	0.009154	0.004829	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			250+	198	1302	0.01	0.00005494	0.00005494	0.07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	66	751	0.2	0.002462	0.000954	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	South of Cape Mendocino CA	Winter	0-125	70	496	0.07	0.0009928	0.0004379	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	82	584	0.006	0.00006903	0.00005077	0.04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	17	269	0.003	0.0001888	0.0001432	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	109	627	0.01	0.00008945	0.00006309	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	North of Cape Falcon OR	Winter	0-125	194	1257	0.2	0.001176	0.0003035	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	90	994	0.09	0.0009757	0.0004468	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	75	1394	0.2	0.002527	0.001094	4	0.003	0.00003462	0.00003462	0.05	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	105	649	2	0.02037	0.007278	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	162	832	1	0.006357	0.003241	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			250+	199	856	0.02	0.00008476	0.00008476	0.07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	*	645	*	*0.0003091*	*0.0003083 - 0.00031*	0.2	*	*0.00006863*	*6.854e-05 - 6.872e-05*	0.04	*	*0.00002954*	*2.939e-05 - 2.968e-05*	0.02	0	0	0	0	*	*0.00001329*	*1.322e-05 - 1.335e-05*	0.009
	Cape Blanco OR to Cape Mendocino CA	Winter	0-125	36	188	0.3	0.007613	0.003012	1	0	0	0	0	0.002	0.00006492	0.00006492	0.01	0	0	0	0	0	0	0	0
			125-250	43	303	0.3	0.006818	0.004182	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	23	240	0.03	0.001322	0.0007243	0.3	0	0	0	0	0.003	0.0001479	0.0001479	0.04	0	0	0	0	0	0	0	0
	South of Cape Mendocino CA	Winter	0-125	*	211	*	*0.0007445*	*0.0007438 - 0.0007452*	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	50	356	0.04	0.0008007	0.0002921	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	50	352	0	0	0	0	0.004	0.00007382	0.00007382	0.03	0	0	0	0	0	0	0	0	0	0	0	0
2004	North of Cape Falcon OR	Winter	0-125	153	324	0.2	0.001497	0.0003573	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0.002	0.0000127	0.0000127	0.004
			125-250	361	1501	0.09	0.0002602	0.00008487	0.4	0.002	0.000006536	0.000006536	0.01	0.001	0.000003771	0.000003771	0.006	0	0	0	0	0	0	0	0
			250+	401	1406	0.003	0.000007133	0.000007133	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	432	2759	0.1	0.0002405	0.0000717	0.7	0	0	0	0	0.003	0.000006509	0.000006509	0.02	0	0	0	0	0.004	0.000009564	0.000009564	0.03
			125-250	154	924	0.0008	0.000005301	0.000005301	0.005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	13	15	0.006	0.0004905	0.000277	0.007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			125-250	244	809	0.2	0.0007544	0.0002499	0.6	0	0	0	0	0.006	0.00002317	0.00001874	0.02	0	0	0	0	0	0	0	0
			250+	293	1170	0.001	0.000004496	0.000004496	0.005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	42	538	0.07	0.001653	0.001162	0.9	0	0	0	0	0.01	0.0002903	0.0002072	0.2	0	0	0	0	0.005	0.0001306	0.0001306	0.07
	Cape Blanco OR to Cape Mendocino CA	Winter	0-125	*	6	*	*0.005102*	*0.005081 - 0.005123*	0.03	0	0	0	0	*	*0.00002922*	*2.892e-05 - 2.952e-05*	0.0002	0	0	0	0	0	0	0	0
			125-250	112	278	0.2	0.001486	0.0005704	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			250+	233	639	0.005	0.00002261	0.00002261	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	81	473	0.007	0.0000838	0.00005891	0.04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	South of Cape Mendocino CA	Winter	125-250	89	369	0.007	0.00008253	0.00005831	0.03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	71	191	0.01	0.0001903	0.0001395	0.04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 4, continued.

Year	Area	Season	Depth Interval (fm)	Observed Groundfish Catch (mt)	Fleet Groundfish Landings (mt)	Chinook Observed Bycatch (mt)	Chinook Observed Bycatch Ratio	Chinook Observed Bycatch Ratio SE	Chinook Bycatch Estimate (mt)	Chum Observed Bycatch (mt)	Chum Observed Bycatch Ratio	Chum Observed Bycatch Ratio SE	Chum Bycatch Estimate (mt)	Coho Observed Bycatch (mt)	Coho Observed Bycatch Ratio	Coho Observed Bycatch Ratio SE	Coho Bycatch Estimate (mt)	Pink Observed Bycatch (mt)	Pink Observed Bycatch Ratio	Pink Observed Bycatch Ratio SE	Pink Bycatch Estimate (mt)	Unspecified Observed Bycatch (mt)	Unspecified Observed Bycatch Ratio	Unspecified Observed Bycatch Ratio SE	Unspecified Bycatch Estimate (mt)
2005	North of Cape Falcon OR	Winter	0-125	135	619	0.0007	0.000005395	0.000005395	0.003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Winter	125-250	276	1490	0.2	0.0007242	0.000271	1	0	0	0	0	0.001	0.000004361	0.000004361	0.006	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	*	82	*	*0.0002713*	*0.0002709 - 0.0002718*	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Winter	125-250	278	947	0.06	0.0002235	0.00009147	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	125-250	86	363	0.007	0.00008128	0.00008128	0.03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	90	605	0.04	0.0004074	0.0002934	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	86	565	0.005	0.00005993	0.00004296	0.03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	South of Cape Mendocino CA	Summer	0-125	88	343	0.001	0.00001576	0.00001576	0.005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	North of Cape Falcon OR	Winter	0-125	60	232	0.003	0.00005043	0.00003579	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Winter	125-250	186	1170	0.006	0.00003144	0.00002277	0.04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	665	4279	0.003	0.0000043	0.00000315	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	125-250	*	7	*	*0.0002487*	*0.0002483 - 0.0002491*	0.002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	276	1065	0.004	0.00001528	0.00001528	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	North of Cape Falcon OR	Winter	125-250	155	648	0.004	0.00002279	0.00001607	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	254	1673	0.02	0.00007746	0.00004288	0.1	0	0	0	0	0.002	0.000009481	0.000006713	0.02	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	125-250	253	1998	0.01	0.00004864	0.00002918	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Winter	250+	190	1160	0.02	0.00008434	0.00005992	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	270	1486	0.004	0.00001376	0.00001376	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	125-250	87	681	0.0009	0.000009884	0.000009884	0.007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	North of Cape Falcon OR	Winter	125-250	172	843	0.002	0.00001157	0.00001157	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	317	2065	0.02	0.00006776	0.00003334	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Winter	125-250	*	3	*	*0.0002268*	*0.0002262 - 0.0002274*	0.0006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	0-125	271	1417	0.05	0.0001882	0.00008127	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Winter	125-250	164	922	0.04	0.0002418	0.00009653	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	South of Cape Mendocino CA	Summer	0-125	*	99	*	*0.00003429*	*3.397e-05 - 3.462e-05*	0.003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	North of Cape Falcon OR	Winter	0-125	106	334	0.007	0.00006326	0.00006326	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Winter	125-250	41	149	0.02	0.0005413	0.0002672	0.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	576	2852	0.004	0.000006453	0.000004694	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Winter	125-250	380	1391	0.04	0.0000986	0.00004509	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	94	623	0.01	0.0001023	0.00005311	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Winter	250+	392	1503	0.003	0.000007174	0.000007174	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	South of Cape Mendocino CA	Winter	0-125	6	73	0.003	0.0005665	0.0005665	0.04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	0-125	79	189	0.04	0.0005081	0.0002278	0.1	0	0	0	0	0	0	0	0	0.0009	1.2E-05	1.2E-05	0.002	0	0	0	0
2010	Cape Falcon OR to Cape Blanco OR	Winter	125-250	138	1263	0.01	0.00006991	0.00004686	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Winter	250+	339	2165	0	0	0	0	0	0	0	0	0.01	0.00003082	0.00003082	0.07	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	*	379	*	*0.00009488*	*9.473e-05 - 9.504e-05*	0.04	0	0	0	0	*	*0.00001049*	*1.046e-05 - 1.052e-05*	0.004	0	0	0	0	0	0	0	0

Table 5. Observed vessels, trips, hauls, catch, and salmon and fleet landings, stratified by year and season for LE CA halibut fishery. Note that all fishing in this fishery occurred south of Cape Mendocino. Strata not listed were not observed. To preserve confidentiality: 2010 data are reported in Tables 11 and 12, combined with OA CA halibut; 2011 and 2013 data are reported in Table 21, combined with IFQ Bottom Trawl; 2012 data cannot be reported.

Year	Season	Observed California Halibut Catch (mt)	Fleet California Halibut Landings (mt)	Vessels	Trips	Hauls	Hauls that Encountered Salmon	
							Count	Percent
2002	All Year	4	105	7	19	52	8	15
2003	Winter	13	62	6	33	107	8	7
	Summer	6	44	8	40	99	9	9
2004	Winter	15	80	3	21	94	25	27
	Summer	17	56	6	25	76	4	5
2005	Winter	11	131	6	28	100	16	16
	Summer	20	57	5	46	133	9	7
2006	Winter	11	81	7	44	143	6	4
	Summer	3	39	5	34	81	2	2
2007	Winter	3	27	3	13	29	4	14
	Summer	2	12	4	26	51	2	4
2008	Winter	10	34	4	35	110	12	11
	Summer	< 1	2	3	5	8	0	0
2009	Summer	3	7	3	12	29	0	0

Table 6. Salmon bycatch count for LE CA halibut fishery. Unobserved strata and those without salmon bycatch are not shown. Note that all fishing in this fishery occurred south of Cape Mendocino. Note that for strata with a small number of salmon encounters can show bycatch ratio values equivalent to bycatch ratio SE values. To preserve confidentiality: 2010 data are reported in Tables 11 and 12, combined with OA CA halibut; 2011 and 2013 data are reported in Table 21, combined with IFQ Bottom Trawl; 2012 data cannot be reported.

				Chinook				Coho				Unspecified			
				Observed				Observed				Observed			
Year	Season	Observed California Halibut Catch (mt)	Fleet California Halibut Landings (mt)	Bycatch (count)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (count)	Bycatch (count)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (count)	Bycatch (count)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (count)
2002	All Year	4	105	13	3.621	1.47	381	0	0	0	0	5	1.393	1.393	147
2003	Winter	13	62	9	0.6987	0.2544	43	0	0	0	0	0	0	0	0
	Summer	6	44	11	1.767	0.632	77	0	0	0	0	0	0	0	0
2004	Winter	15	80	88	5.991	2.013	479	0	0	0	0	0	0	0	0
	Summer	17	56	4	0.2381	0.1181	13	0	0	0	0	0	0	0	0
2005	Winter	11	131	31	2.888	0.7882	380	0	0	0	0	0	0	0	0
	Summer	20	57	15	0.7583	0.2896	44	0	0	0	0	0	0	0	0
2006	Winter	11	81	13	1.174	0.6301	95	0	0	0	0	0	0	0	0
	Summer	3	39	1	0.3112	0.3112	12	4	1.245	1.245	48	0	0	0	0
2007	Winter	3	27	11	3.663	2.257	100	0	0	0	0	0	0	0	0
	Summer	2	12	5	2.045	1.685	24	0	0	0	0	0	0	0	0
2008	Winter	10	36	21	2.209	0.755	75	0	0	0	0	0	0	0	0

Table 7. Salmon bycatch weight for LE CA halibut fishery. Unobserved strata and those without salmon bycatch are not shown. Note that all fishing in this fishery occurred south of Cape Mendocino. To preserve confidentiality: 2010 data are reported in Tables 11 and 12, combined with OA CA halibut; 2011 and 2013 data are reported in Table 21, combined with IFQ Bottom Trawl; 2012 data cannot be reported.

				Chinook				Coho				Unspecified			
				Observed				Observed				Observed			
Year	Season	Observed California Halibut Catch (mt)	Fleet California Halibut Landings (mt)	Bycatch (mt)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (mt)	Bycatch (mt)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (mt)	Bycatch (mt)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (mt)
2002	Winter	4	105	0.01	0.003475	0.001474	0.4	0	0	0	0	0.002	0.000682	0.000682	0.07
2003	Winter	6	44	0.01	0.001716	0.000658	0.07	0	0	0	0	0	0	0	0
	Summer	13	62	0.01	0.000789	0.000321	0.05	0	0	0	0	0	0	0	0
2004	Winter	17	56	0.02	0.001407	0.000753	0.08	0	0	0	0	0	0	0	0
	Summer	15	80	0.1	0.008563	0.002286	0.7	0	0	0	0	0	0	0	0
2005	Winter	20	57	0.03	0.001674	0.000686	0.1	0	0	0	0	0	0	0	0
	Summer	11	131	0.06	0.005302	0.001462	0.7	0	0	0	0	0	0	0	0
2006	Winter	3	39	0.004	0.001129	0.001129	0.04	0.02	0.004952	0.004952	0.2	0	0	0	0
	Summer	11	81	0.02	0.001636	0.000874	0.1	0	0	0	0	0	0	0	0
2007	Winter	2	12	0.03	0.01258	0.01232	0.1	0	0	0	0	0	0	0	0
	Summer	3	27	0.02	0.006964	0.004237	0.2	0	0	0	0	0	0	0	0
2008	Winter	10	36	0.05	0.00496	0.001723	0.2	0	0	0	0	0	0	0	0

Table 8. Observed vessels, trips, hauls, catch, and salmon and fleet landings, stratified by year and season for OA CA halibut fishery. Note that all fishing in this fishery occurred south of Cape Mendocino. Strata not listed were not observed; * represents strata containing fewer than 3 observed vessels.

							Hauls that Encountered	
Year	Season	Observed California Halibut Catch (mt)	Fleet California Halibut Landings (mt)	Vessels	Trips	Hauls	Count	Percent
2003	Winter	*	18	*	*	*	*	*
	Summer	2	7	3	15	103	0	0
2004	Winter	1	30	3	18	67	0	0
	Summer	*	41	*	*	*	*	*
2005	Winter	2	24	4	31	117	0	0
	Summer	*	40	*	*	*	*	*
2007	Winter	1	8	4	18	73	0	0
	Summer	2	31	4	30	153	0	0
2008	Winter	1	21	3	18	68	0	0
	Summer	2	30	4	31	129	0	0
2009	Winter	*	37	*	*	*	*	*
	Summer	*	45	*	*	*	*	*
2011	Winter	11	50	4	22	83	5	6
	Summer	2	30	9	26	121	0	0
2012	Summer	4	29	7	27	77	0	0
2013	Winter	*	29	*	*	*	*	*
	Summer	2	39	4	19	51	0	0

Table 9. Salmon bycatch count and weight for OA CA halibut fishery. Unobserved strata and those without salmon bycatch are not shown. Note that all fishing in this fishery occurred south of Cape Mendocino in the winter. Bootstrapped estimates of the bycatch ratio and 95% confidence intervals around the ratio SE are italicized.

			Chinook							
			Observed				Observed			
Year	Observed California Halibut Catch (mt)	Fleet California Halibut Landings	Bycatch (count)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (count)	Bycatch (mt)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (mt)
2011	11	50	7	0.6415	0.3279	32	0.003	0.000311	0.0001409	0.02
2013	*	29	*	0.8319	0.8312 - 0.8326	25	*	0.000393	0.0003924 - 0.000393	0.01

Table 10. Observed vessels, trips, hauls, catch, and salmon and fleet landings, stratified by season for LE and OA CA halibut fishery (grouped in 2010 due to fewer than 3 observed vessels in strata). Note that all fishing in this fishery occurred south of Cape Mendocino.

Season	Observed California Halibut Catch (mt)	Fleet California Halibut Landings (mt)	Vessels	Trips	Hauls	Hauls that Encountered Salmon: Count	Hauls that Encountered Salmon: Percent
Winter	7	61	4	22	86	2	2
Summer	2	63	4	21	66	0	0

Table 11. Salmon bycatch count and weight for LE and OA CA halibut fishery in 2010. Only strata with observed salmon bycatch are shown. Note that all fishing in this fishery occurred south of Cape Mendocino.

			Chinook							
			Observed				Observed			
Season	Observed California Halibut Catch (mt)	Fleet California Halibut Landings (mt)	Bycatch (count)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (count)	Bycatch (mt)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (mt)
Winter	7	61	2	0.2873	0.2038	17	0.002	0.000225	0.000185	0.01

Table 12. Observed vessels, trips, hauls, catch, and salmon and fleet landings, stratified by year, season, and area for nearshore fixed gear fishery north of the management line at 40.16°N. Strata not listed were not observed.

Year	Area	Season	Observed Nearshore Species Catch (mt)	Fleet Nearshore Species Landings (mt)	Vessels	Trips	Hauls	Hauls that Encountered Salmon	
								Count	Percent
2003	Cape Blanco OR to Cape Mendocino CA	Winter	< 1	29	3	5	8	0	0
		Summer	3	119	5	19	45	1	2
2004	Cape Falcon OR to Cape Blanco OR	Summer	8	106	22	79	163	3	2
	Cape Blanco OR to Cape Mendocino CA	Winter	5	36	6	36	58	1	2
		Summer	10	123	23	105	136	1	1
2005	Cape Falcon OR to Cape Blanco OR	Winter	2	38	8	24	33	0	0
		Summer	5	77	24	57	62	1	2
	Cape Blanco OR to Cape Mendocino CA	Winter	2	44	8	23	27	1	4
		Summer	10	125	27	95	123	0	0
2006	Cape Falcon OR to Cape Blanco OR	Winter	1	12	8	17	23	0	0
		Summer	11	97	25	108	179	1	1
	Cape Blanco OR to Cape Mendocino CA	Winter	2	21	12	21	25	0	0
		Summer	11	125	37	133	192	1	1
2007	Cape Falcon OR to Cape Blanco OR	Winter	1	17	7	14	15	0	0
		Summer	10	108	17	93	151	1	1
	Cape Blanco OR to Cape Mendocino CA	Winter	4	40	12	37	41	0	0
		Summer	11	128	19	91	133	0	0
2008	Cape Falcon OR to Cape Blanco OR	Winter	3	30	13	29	38	0	0
		Summer	7	104	20	69	80	2	2
	Cape Blanco OR to Cape Mendocino CA	Winter	4	56	13	37	41	0	0
		Summer	6	125	16	65	75	0	0
2009	Cape Falcon OR to Cape Blanco OR	Winter	2	46	11	20	25	0	0
		Summer	10	116	20	87	147	6	4
	Cape Blanco OR to Cape Mendocino CA	Winter	4	40	14	44	50	1	2
		Summer	4	124	16	39	40	0	0
2010	Cape Falcon OR to Cape Blanco OR	Winter	2	35	13	29	41	0	0
		Summer	6	96	23	71	85	3	4
	Cape Blanco OR to Cape Mendocino CA	Winter	1	16	10	13	15	0	0
		Summer	8	85	27	86	105	2	2
2011	Cape Falcon OR to Cape Blanco OR	Winter	3	37	15	31	40	0	0
		Summer	8	108	26	105	125	3	2
	Cape Blanco OR to Cape Mendocino CA	Winter	2	15	13	29	35	0	0
		Summer	9	70	27	89	115	2	2
2012	Cape Falcon OR to Cape Blanco OR	Winter	3	33	22	41	53	2	4
		Summer	13	120	28	134	163	3	2
	Cape Blanco OR to Cape Mendocino CA	Winter	2	11	9	21	23	2	9
		Summer	9	64	20	70	97	2	2
2013	Cape Falcon OR to Cape Blanco OR	Winter	5	45	19	60	69	2	3
		Summer	6	107	26	68	92	5	5
	Cape Blanco OR to Cape Mendocino CA	Winter	4	22	17	47	51	5	10
		Summer	8	71	24	68	88	1	1

Table 13. Salmon bycatch count for nearshore fixed gear fishery north of the management line at 40.16°N. Unobserved strata and those without salmon bycatch are not shown. Note that for strata with a small number of salmon encounters can show bycatch ratio values equivalent to bycatch ratio SE values.

					Chinook				Coho				Unspecified			
Year	Area	Season	Observed Nearshore Species Catch (mt)	Fleet Nearshore Species Landings (mt)	Observed Bycatch (count)	Observed Bycatch Ratio	Observed Bycatch Ratio SE	Bycatch Estimate (count)	Observed Bycatch (count)	Observed Bycatch Ratio	Observed Bycatch Ratio SE	Bycatch Estimate (count)	Observed Bycatch (count)	Observed Bycatch Ratio	Observed Bycatch Ratio SE	Bycatch Estimate (count)
2003	Cape Blanco OR to Cape Mendocino CA	Summer	3	119	1	0.3468	0.3468	41	0	0	0	0	0	0	0	0
2004	Cape Falcon OR to Cape Blanco OR	Summer	8	106	2	0.2465	0.2465	26	2	0.2465	0.1747	26	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	5	36	1	0.1903	0.1903	7	0	0	0	0	0	0	0	0
		Summer	10	123	0	0	0	0	1	0.09933	0.09933	12	0	0	0	0
2005	Cape Falcon OR to Cape Blanco OR	Summer	5	77	1	0.186	0.186	14	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	2	44	1	0.4108	0.4108	18	0	0	0	0	0	0	0	0
2006	Cape Falcon OR to Cape Blanco OR	Summer	11	97	1	0.09226	0.09226	9	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Summer	11	125	1	0.08697	0.08697	11	0	0	0	0	0	0	0	0
2007	Cape Falcon OR to Cape Blanco OR	Summer	10	108	0	0	0	0	1	0.1051	0.1051	11	0	0	0	0
2008	Cape Falcon OR to Cape Blanco OR	Summer	7	104	0	0	0	0	3	0.4085	0.3035	42	0	0	0	0
2009	Cape Blanco OR to Cape Mendocino CA	Winter	4	116	1	0.1015	0.1015	12	6	0.609	0.2867	71	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Summer	10	40	1	0.2599	0.2599	10	0	0	0	0	0	0	0	0
2010	Cape Falcon OR to Cape Blanco OR	Summer	6	96	1	0.1681	0.1681	16	2	0.3363	0.3363	32	1	0.1681	0.1681	16
	Cape Blanco OR to Cape Mendocino CA	Summer	8	85	0	0	0	0	1	0.1209	0.1209	10	1	0.1209	0.1209	10
2011	Cape Falcon OR to Cape Blanco OR	Summer	8	108	0	0	0	0	4	0.5153	0.3147	56	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Summer	9	70	1	0.11	0.11	8	1	0.11	0.11	8	0	0	0	0
2012	Cape Falcon OR to Cape Blanco OR	Winter	3	33	2	0.7197	0.5066	24	0	0	0	0	0	0	0	0
		Summer	13	120	2	0.1586	0.1119	19	1	0.07928	0.07928	9	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	2	11	1	0.626	0.626	7	1	0.626	0.626	7	0	0	0	0
		Summer	9	64	2	0.2105	0.1487	14	0	0	0	0	0	0	0	0
2013	Cape Falcon OR to Cape Blanco OR	Winter	5	45	3	0.6489	0.4825	29	0	0	0	0	0	0	0	0
		Summer	6	107	18	3.143	2.634	337	31	5.414	5.241	581	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	4	22	5	1.345	0.5922	29	0	0	0	0	0	0	0	0
		Summer	8	71	1	0.13	0.13	9	0	0	0	0	0	0	0	0

Table 14. Salmon bycatch weight for nearshore fixed gear fishery north of the management line at 40.16°N. Unobserved strata and those without salmon bycatch are not shown. Note that for strata with a small number of salmon encounters can show bycatch ratio values equivalent to bycatch ratio SE values.

					Chinook				Coho				Unspecified			
					Observed				Observed				Observed			
Year	Area	Season	Observed Nearshore Species Catch (mt)	Fleet Nearshore Species Landings (mt)	Bycatch (count)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (count)	Bycatch (count)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (count)	Bycatch (count)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (count)
2003	Cape Blanco OR to Cape Mendocino CA	Summer	3	119	0.006	0.001966	0.001966	0.2	0	0	0	0	0	0	0	0
2004	Cape Falcon OR to Cape Blanco OR	Summer	8	106	0.004	0.000475	0.000475	0.05	0.009	0.001062	0.000778	0.1	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	5	36	0.002	0.000345	0.000345	0.01	0	0	0	0	0	0	0	0
		Summer	10	123	0	0	0	0	0.005	0.000451	0.000451	0.06	0	0	0	0
2005	Cape Falcon OR to Cape Blanco OR	Summer	5	77	0.005	0.001013	0.001013	0.08	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	2	44	0.0002	9.32E-05	9.32E-05	0.004	0	0	0	0	0	0	0	0
2006	Cape Falcon OR to Cape Blanco OR	Summer	11	97	0.02	0.001465	0.001465	0.1	0	0	0	0	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Summer	11	125	0.001	9.86E-05	9.86E-05	0.01	0	0	0	0	0	0	0	0
2007	Cape Falcon OR to Cape Blanco OR	Summer	10	108	0	0	0	0	0.001	0.000107	0.000107	0.01	0	0	0	0
2008	Cape Falcon OR to Cape Blanco OR	Summer	7	104	0	0	0	0	0.01	0.001729	0.001364	0.2	0	0	0	0
2009	Cape Blanco OR to Cape Mendocino CA	Winter	10	116	0.004	0.000368	0.000368	0.04	0.02	0.001681	0.000851	0.2	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Summer	4	40	0.004	0.00112	0.00112	0.05	0	0	0	0	0	0	0	0
2010	Cape Falcon OR to Cape Blanco OR	Summer	6	96	0.009	0.001525	0.001525	0.1	0.01	0.001678	0.001678	0.2	0.005	0.000763	0.000763	0.07
	Cape Blanco OR to Cape Mendocino CA	Summer	8	85	0	0	0	0	0.005	0.000631	0.000631	0.05	0.009	0.001097	0.001097	0.09
2011	Cape Falcon OR to Cape Blanco OR	Summer	8	108	0	0	0	0	0.01	0.001636	0.001063	0.2	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Summer	9	70	0.006	0.000674	0.000674	0.05	0.005	0.000549	0.000549	0.04	0	0	0	0
2012	Cape Falcon OR to Cape Blanco OR	Winter	3	33	0.005	0.001632	0.001149	0.05	0	0	0	0	0	0	0	0
		Summer	13	120	0.01	0.001079	0.000803	0.1	0.005	0.00036	0.00036	0.04	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	2	11	0.007	0.00426	0.00426	0.05	0.003	0.001704	0.001704	0.02	0	0	0	0
		Summer	9	64	0.01	0.001361	0.000973	0.09	0	0	0	0	0	0	0	0
2013	Cape Falcon OR to Cape Blanco OR	Winter	5	45	0.02	0.005102	0.003809	0.2	0	0	0	0	0	0	0	0
		Summer	6	107	0.1	0.01721	0.01457	2	0.1	0.01814	0.01759	2	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	4	22	0.02	0.004245	0.002145	0.09	0	0	0	0	0	0	0	0
		Summer	8	71	0.009	0.00118	0.00118	0.08	0	0	0	0	0	0	0	0

Table 15. Observed vessels, trips, hauls, catch, and salmon and fleet landings, stratified by year, season, and salmon management area for OR Pink Shrimp fishery. Strata not listed were not observed; * represents strata containing fewer than 3 observed vessels. @ represents strata for which fewer than 3 vessels landed fish: this represented less than 1 percent of fishing effort in regards to yearly landings.

Year	Area	Season	Observed Pink Shrimp Catch (mt)	Fleet Pink Shrimp Landings (mt)	Vessels	Trips	Hauls	Hauls that Encountered Salmon Count	Hauls that Encountered Salmon Percent
2004	North of Cape Falcon OR	Summer	142	1573	11	24	230	0	0
	Cape Falcon OR to Cape Blanco OR	Summer	285	2405	18	40	504	0	0
2005	North of Cape Falcon OR	Winter	10	154	3	3	15	0	0
		Summer	95	1733	8	9	115	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	102	637	6	10	99	0	0
		Summer	192	4320	11	21	241	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	*	157	*	*	*	*	*
		Summer	*	157	*	*	*	*	*
2007	North of Cape Falcon OR	Winter	*	85	*	*	*	*	*
		Summer	47	1527	7	11	88	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	66	601	5	10	70	0	0
		Summer	464	6680	22	46	645	0	0
	Cape Blanco OR to Cape Mendocino CA	Summer	45	236	3	5	45	0	0
2008	North of Cape Falcon OR	Winter	*	196	*	*	*	*	*
		Summer	209	3113	10	18	283	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	125	508	6	7	104	0	0
		Summer	267	7140	17	27	324	0	0
	Cape Blanco OR to Cape Mendocino CA	Summer	65	620	5	5	49	0	0
2009	North of Cape Falcon OR	Winter	*	54	*	*	*	*	*
		Summer	184	2044	11	15	183	0	0
	Cape Falcon OR to Cape Blanco OR	Summer	366	7431	25	32	339	0	0
	Cape Blanco OR to Cape Mendocino CA	Summer	194	483	11	13	80	0	0
2010	North of Cape Falcon OR	Winter	30	342	3	6	40	0	0
		Summer	192	3424	9	19	213	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	103	1008	7	9	85	0	0
		Summer	888	8525	27	59	652	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	@	@	@	@	@	@	@
		Summer	465	881	16	24	186	0	0
2011	North of Cape Falcon OR	Winter	*	162	*	*	*	*	*
		Summer	526	4394	11	29	443	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	77	1582	3	5	46	0	0
		Summer	1340	14693	30	76	892	0	0
	Cape Blanco OR to Cape Mendocino CA	Summer	1042	963	21	50	436	0	0
2012	North of Cape Falcon OR	Summer	467	3749	14	33	501	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	74	1519	4	5	55	0	0
		Summer	991	15113	34	81	842	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	*	118	*	*	*	*	*
		Summer	1456	1552	29	68	635	1	0.16
2013	North of Cape Falcon OR	Winter	*	318	*	*	*	*	*
		Summer	398	2989	11	22	277	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	146	1242	6	8	86	0	0
		Summer	940	14981	32	58	633	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	*	145	*	*	*	*	*
		Summer	787	1864	21	34	325	0	0

Table 16. Salmon bycatch count for OR Pink Shrimp fishery. Salmon bycatch was observed only in 2012, between Cape Blanco OR and Cape Mendocino CA. Note that for strata with a small number of salmon encounters can show bycatch ratio values equivalent to bycatch ratio SE values.

			Chinook							
			Observed				Observed			
Season	Observed Pink Shrimp Catch (mt)	Fleet Pink Shrimp Landings (mt)	Bycatch (count)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (count)	Bycatch (mt)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (mt)
Summer	1456	1552	2	0.001374	0.001374	2	0.001	7.63E-07	7.63E-07	0.001

Table 17. Observed vessels, trips, hauls, catch, and salmon and fleet landings, stratified by year, season, and area for Sablefish fishery. Strata not listed were not observed; * represents strata containing fewer than 3 observed vessels. @ represents strata for which fewer than 3 vessels landed fish: this represented at most 4 percent of fishing effort in regards to yearly landings.

							Hauls that Encountered Salmon	
Year	Area	Observed Sablefish Catch (mt)	Fleet Sablefish Landings (mt)	Vessels	Trips	Hauls	Count	Percent
2002	North of Cape Falcon OR	103	547	9	24	224	0	0
	Cape Falcon OR to Cape Blanco OR	71	381	12	32	114	0	0
	South of Cape Blanco OR	17	215	7	14	53	0	0
2003	North of Cape Falcon OR	158	750	9	28	231	1	0
	Cape Falcon OR to Cape Blanco OR	41	580	3	8	70	0	0
	South of Cape Blanco OR	24	303	3	12	48	0	0
2004	North of Cape Falcon OR	95	905	9	19	198	0	0
	Cape Falcon OR to Cape Blanco OR	64	721	4	16	81	0	0
	South of Cape Blanco OR	20	299	5	11	41	0	0
2005	North of Cape Falcon OR	254	894	11	34	408	0	0
	Cape Falcon OR to Cape Blanco OR	123	704	11	33	142	1	1
	South of Cape Blanco OR	105	277	10	38	113	0	0
2006	North of Cape Falcon OR	178	990	13	47	361	0	0
	Cape Falcon OR to Cape Blanco OR	95	617	5	13	81	0	0
	South of Cape Blanco OR	23	343	3	8	27	0	0
2007	North of Cape Falcon OR	163	694	11	38	397	1	0
	Cape Falcon OR to Cape Blanco OR	106	545	8	18	78	0	0
	South of Cape Blanco OR	30	262	6	19	42	0	0
2008	North of Cape Falcon OR	117	683	9	34	281	0	0
	Cape Falcon OR to Cape Blanco OR	168	578	9	35	207	0	0
	South of Cape Blanco OR	46	260	5	13	51	0	0
2009	North of Cape Falcon OR	44	791	5	14	180	0	0
	Cape Falcon OR to Cape Blanco OR	36	762	4	9	74	0	0
	South of Cape Blanco OR	18	377	4	24	33	0	0
2010	North of Cape Falcon OR	149	681	7	41	396	0	0
	Cape Falcon OR to Cape Blanco OR	156	764	9	61	273	0	0
	South of Cape Blanco OR	35	354	11	46	87	0	0
2011	North of Cape Falcon OR	99	519	9	31	375	0	0
	Cape Falcon OR to Cape Blanco OR	70	598	10	30	161	0	0
	South of Cape Blanco OR	72	402	11	44	137	0	0
2012	North of Cape Falcon OR	64	422	7	21	177	0	0
	Cape Falcon OR to Cape Blanco OR	97	503	7	43	231	0	0
	South of Cape Blanco OR	66	428	5	31	124	0	0
2013	North of Cape Falcon OR	68	349	6	12	155	0	0
	Cape Falcon OR to Cape Blanco OR	14	382	6	9	48	0	0
	South of Cape Blanco OR	84	288	11	37	148	0	0

Table 18. Salmon bycatch count and count for sablefish fishery. Unobserved strata and those without salmon bycatch are not shown. Note that for strata with a small number of salmon encounters can show bycatch ratio values equivalent to bycatch ratio SE values.

					Coho							
					Observed				Observed			
Year	Area	Season	Observed Sablefish Catch (mt)	Fleet Sablefish Landings (mt)	Bycatch (count)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (count)	Bycatch (mt)	Bycatch Ratio	Bycatch Ratio SE	Bycatch Estimate (mt)
2003	North of Cape Falcon OR	Summer	158	750	1	0.006317	0.006317	5	0.004	2.35E-05	2.35E-05	0.02
2005	Cape Falcon OR to Cape Blanco OR	Summer	123	704	1	0.008112	0.008112	6	0.004	3.11E-05	3.11E-05	0.02
2007	North of Cape Falcon OR	Summer	163	694	1	0.00615	0.00615	4	0.003	1.56E-05	1.56E-05	0.01

Table 19. Observed vessels, trips, hauls, catch, and salmon and fleet landings, stratified by year, season, and salmon management area for Catch Shares Non-Hake Trawl, including bottom and mid-water trawl and LE California halibut. Strata not listed were not observed.

Year	Area	Season	Depth Interval (fm)	Fleet Groundfish Landings (mt)	Vessels	Trips	Hauls	Hauls that Encountered Salmon: Count	Hauls that Encountered Salmon: Percent
2011	North of Cape Falcon OR	Winter	0-125	364	6	27	222	2	1
			125-250	1104	18	131	400	3	1
			250+	1614	19	150	807	0	0
		Summer	0-125	1871	17	125	1505	9	1
			125-250	1294	16	94	467	1	0
			250+	702	17	99	480	1	0
	Cape Falcon OR to Cape Blanco OR	Winter	125-250	899	29	108	350	12	3
			250+	1618	31	163	726	2	0
		Summer	0-125	157	8	47	315	0	0
			125-250	540	17	74	269	0	0
			250+	673	17	84	383	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	287	12	45	97	8	8
			250+	1218	19	118	507	0	0
		Summer	0-250	658	16	94	237	0	0
			250+	1321	14	121	460	0	0
	South of Cape Mendocino CA	Winter	0-125	28	4	9	27	0	0
			125-250	162	8	36	105	0	0
			250+	289	8	50	187	0	0
		Summer	0-125	387	9	136	531	3	1
			125-250	319	12	80	185	0	0
			250+	948	13	127	520	0	0
2012	North of Cape Falcon OR	Winter	0-125	213	8	19	139	1	1
			125-250	1362	18	117	490	16	3
			250+	1321	20	129	621	1	0
		Summer	0-125	2861	15	157	1914	6	0
			125-250	926	14	85	374	3	1
			250+	397	13	67	250	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-250	1054	32	143	405	20	5
			250+	1652	30	164	742	2	0
		Summer	0-125	138	8	42	274	0	0
			125-250	477	16	51	205	0	0
			250+	704	20	75	378	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	0-250	220	18	42	82	6	7
			250+	1201	19	104	418	0	0
		Summer	0-125	52	4	11	57	0	0
			125-250	365	12	60	144	0	0
			250+	1189	13	101	441	0	0
	South of Cape Mendocino CA	Winter	0-125	41	3	19	75	1	1
			125-250	218	11	53	143	0	0
			250+	592	11	68	327	0	0
		Summer	0-125	273	8	81	402	0	0
			125-250	273	9	72	197	0	0
			250+	942	9	108	498	0	0
2013	North of Cape Falcon OR	Winter	0-125	324	12	31	227	9	4
			125-250	1851	17	132	810	10	1
			250+	1394	17	145	734	1	0
		Summer	0-125	2519	12	182	1785	17	1
			125-250	719	12	80	346	0	0
			250+	422	10	75	262	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-125	7	5	5	11	0	0
			125-250	1591	29	181	626	11	2
			250+	1839	29	183	912	3	0
		Summer	0-125	170	9	61	241	1	0
			125-250	367	14	48	177	0	0
			250+	574	17	69	308	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	354	14	62	121	17	14
			250+	1321	22	126	527	0	0
		Summer	0-125	228	4	35	158	6	4
			125-250	342	13	51	131	0	0
			250+	1415	14	102	468	0	0
	South of Cape Mendocino CA	Winter	0-125	105	7	27	166	3	2
			125-250	212	10	64	135	0	0
			250+	575	11	83	332	0	0
		Summer	0-125	501	9	125	543	1	0
			125-250	226	9	81	194	0	0
			250+	886	12	123	519	0	0

Table 20. Salmon bycatch count and weight for Catch Shares Non-Hake Trawl, including bottom and midwater trawl (2011) and LE California halibut (2011, 2013). Unobserved strata and those without salmon bycatch are not shown. Due to 100% coverage, only small amounts of estimation were required to calculate fleetwide bycatch. Note that a small amount of shoreside discard is shown in Table 22 and is included in the annual summary tables but not shown here.

Year	Area	Season	Depth Interval (fm)	Fleet Groundfish Retained (mt)	Count					Weight (mt)				
					Chinook	Coho	Pink	Sockeye	Unspecified	Chinook	Coho	Pink	Sockeye	Unspecified
2011	North of Cape Falcon OR	Winter	0-125	364	2	0	0	0	0	0.008	0	0	0	0
			125-250	1104	3	0	0	0	0	0.006	0	0	0	0
		Summer	0-125	1871	39	0	0	0	0	0.06	0	0	0	0
			125-250	1294	1	0	0	0	0	0.001	0	0	0	0
			250+	702	0	0	0	1	0	0	0	0	0.001	0
	Cape Falcon OR to Cape Blanco OR	Winter	125-250	899	114	18	0	0	0	0.2	0.03	0	0	0
			250+	1618	2	0	0	0	0	0.003	0	0	0	0
		Summer	125-250	540	1	0	0	0	0	0.002	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	287	8	2	0	0	0	0.01	0.005	0	0	0
	South of Cape Mendocino CA	Summer	0-125	387	4	0	0	0	0	0.01	0	0	0	0
2012	North of Cape Falcon OR	Winter	0-125	246	1	0	0	0	0	0.001	0	0	0	0
			125-250	1362	26	4	0	0	0	0.07	0.008	0	0	0
			250+	1321	1	0	0	0	0	0.003	0	0	0	0
		Summer	0-125	3025	7	1	0	0	0	0.02	0.002	0	0	0
			125-250	926	11	1	0	0	0	0.03	0.004	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	0-250	1054	37	9	2	0	0	0.07	0.02	0.002	0	0
			250+	1652	2	0	0	0	0	0.009	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	0-250	220	217	11	0	0	2	0.002	0	0	0	0.000
	South of Cape Mendocino CA	Winter	0-125	41	1	0	0	0	0	0.300	0.02	0	0	0
2013	North of Cape Falcon OR	Winter	0-125	352	35	0	0	0	0	0.05	0	0	0	0
			125-250	1876	12	3	0	0	0	0.02	0.005	0	0	0
			250+	1394	1	0	0	0	0	0.002	0	0	0	0
		Summer	0-125	2607	124	34	0	0	0	0.20	0.030	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	125-250	1591	24	0	0	0	0	0.06	0	0	0	0
			250+	1839	11	0	0	0	0	0.02	0	0	0	0
		Summer	0-125	170	1	0	0	0	0	0.002	0	0	0	0
	Cape Blanco OR to Cape Mendocino CA	Winter	125-250	354	94	3	0	0	0	0.2	0.01	0	0	0
		Summer	0-125	228	12	0	0	0	0	0.02	0	0	0	0
	South of Cape Mendocino CA	Winter	0-125	105	1	9	0	0	0	0.002	0.02	0	0	0
		Summer	0-125	501	6	0	0	0	0	0.007	0	0	0	0

Table 21. Salmon bycatch count and weight of shoreside discards by the Catch Shares Bottom Trawl IFQ Fishery. Strata without salmon bycatch are not shown.

Year	Area	Season	Groundfish Retained (mt)	Chinook	
				Count	Weight (mt)
2012	Cape Falcon OR to Cape Blanco OR	Winter	2706	1	0.002
2013	Cape Blanco OR to Cape Mendocino CA	Winter	1675	1	0.002

Table 22. Observed vessels, trips, hauls, catch, and salmon and fleet landings, stratified by year for Catch Shares Midwater Trawl. All fishing occurred north of Cape Blanco, OR. 2011 data is included with Catch Shares Bottom Trawl. No estimation was required due to 100% sampled hauls.

Year	Fleet Groundfish Landings (mt)	Vessels	Trips	Hauls	Hauls that Discarded Salmon At-Sea Count	Hauls that Discarded Salmon At-Sea Percent
2011	*	*	*	*	*	*
2012	198	4	9	30	3	10
2013	405	5	19	58	7	12

Table 23. Salmon bycatch count and weight of at-sea discards by the Catch Shares Non-Hake Midwater Trawl IFQ Fishery. 2011 data is included with Catch Shares Bottom Trawl to maintain confidentiality. Note that 8 Chinook salmon, (0.02 mt), in 2012 and 40 (0.15 mt) in 2013 were discarded shoreside by the non-hake midwater trawl sector; these numbers are included in the summary table but not shown here.

Year	Groundfish Retained (mt)	Chinook		Chum	
		Count	Weight (mt)	Count	Weight (mt)
2011	*	*	*	*	*
2012	198	4	0.009	0	0
2013	405	15	0.09	1	0.006

Table 24. Observed vessels, trips, hauls, catch, and salmon and fleet landings, stratified by year, season, and salmon management area for Catch Shares Shoreside Hake IFQ. Strata not listed were not observed.

Year	Area	Season	Fleet Pacific Whiting Landings (mt)	Vessels	Trips	Hauls	Hauls that Discarded Salmon At-Sea Count	Hauls that Discarded Salmon At-Sea Percent
2011	North of Cape Falcon OR	Winter	717	4	9	19	0	0
		Summer	62718	24	591	1138	2	0
	Cape Falcon OR to Cape Blanco OR	Winter	1292	3	12	25	0	0
		Summer	25427	21	305	517	6	1
2012	North of Cape Falcon OR	Winter	6126	13	59	135	3	2
		Summer	31636	21	333	797	3	0
	Cape Falcon OR to Cape Blanco OR	Winter	4234	14	53	72	1	1
		Summer	23222	20	291	558	1	0
2013	North of Cape Falcon OR	Winter	*	*	*	*	*	*
		Summer	20581	16	188	388	1	0
	Cape Falcon OR to Cape Blanco OR	Winter	1474	7	13	34	0	0
		Summer	73990	24	746	1261	5	0

Table 25. Salmon bycatch count for Catch Shares Shoreside Hake IFQ Fishery, including both at-sea and shoreside discard. Due to 100% coverage, only small amounts of estimation were required to calculate fleetwide bycatch.

Year	Area	Season	Fleet Pacific Whiting Landings	Chinook			Chum			Coho			Pink			Sockeye			Unspecified		
				At-Sea	Shoreside	Total	At-Sea	Shoreside	Total	At-Sea	Shoreside	Total	At-Sea	Shoreside	Total	At-Sea	Shoreside	Total	At-Sea	Shoreside	Total
2011	North of Cape Falcon OR	Winter	717	0	30	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	62718	0	3085	3085	0	41	41	0	110	110	3	6076	6079	0	2	2	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	1292	0	72	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	25427	19	521	540	0	1	1	0	27	27	0	34	34	0	0	0	0	0	0
2012	North of Cape Falcon OR	Winter	6126	2	1073	1075	0	0	0	0	6	6	0	0	0	0	0	0	10	0	10
		Summer	31636	4	504	508	0	3	3	0	8	8	0	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	4234	3	314	317	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	23222	0	421	421	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1
2013	North of Cape Falcon OR	Winter	*	0	59	59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	20581	11	452	463	0	7	7	0	31	31	0	2	2	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	1474	0	344	344	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	73990	13	379	392	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0

Table 26. Salmon bycatch weight for Catch Shares Shoreside Hake IFQ Fishery, including both at-sea and shoreside discard. Due to 100% coverage, only small amounts of estimation were required to calculate fleetwide bycatch.

Year	Area	Season	Fleet Pacific Whiting Landings	Chinook (mt)			Chum (mt)			Coho (mt)			Pink (mt)			Sockeye (mt)			Unspecified (mt)		
				At-Sea	Shoreside	Total	At-Sea	Shoreside	Total	At-Sea	Shoreside	Total	At-Sea	Shoreside	Total	At-Sea	Shoreside	Total	At-Sea	Shoreside	Total
2011	North of Cape Falcon OR	Winter	717	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	62718	0	10	10	0	0.2	0.2	0	0.3	0.3	0.006	10	10.006	0	0.003	0.003	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	1292	0	0.2	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	25427	0.08	2	2.08	0	0.003	0.003	0	0.09	0.09	0	0.06	0.06	0	0	0	0	0	0
2012	North of Cape Falcon OR	Winter	6126	0.006	3	3.006	0	0	0	0	0.01	0.01	0	0	0	0	0	0	0.04	0	0.04
		Summer	31636	0.02	2	2.02	0	0.01	0.01	0	0.02	0.02	0	0	0	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	4234	0.006	0.9	0.906	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	23222	0	2	2	0	0	0	0	0.005	0.005	0	0	0	0	0	0	0.005	0	0.005
2013	North of Cape Falcon OR	Winter	*	*	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	20581	0.04	2	2.04	0	0.03	0.03	0	0.1	0.1	0	0.005	0.005	0	0	0	0	0	0
	Cape Falcon OR to Cape Blanco OR	Winter	1474	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Summer	73990	0.04	1	1.04	0	0	0	0	0.005	0.005	0	0	0	0	0	0	0	0	0

Table 27. Observed vessels, hauls, and salmon and fleet landings, stratified by sector, year, and season for the At-Sea Hake fishery. Note that seasons for the At-Sea Hake fishery run from May 15 to June 30 (spring) and from July 1 to December 31 (fall).

Sector	Year	Season	Fleet Hake Landings (mt)	Vessels	Hauls	Hauls that Encountered Salmon: Count	Hauls that Encountered Salmon: Percent
Catcher Processor	2002	All Year	36333	5	559	98	18
	2003	Spring	14524	4	308	72	23
		Fall	26945	3	460	16	3
	2004	Spring	25300	6	611	96	16
		Fall	47559	5	890	16	2
	2005	Spring	38056	6	728	216	30
		Fall	40442	5	609	4	1
	2006	Spring	46665	9	937	22	2
		Fall	31581	6	560	0	0
	2007	Spring	42149	9	992	137	14
		Fall	30749	5	585	29	5
	2008	Spring	41769	8	784	53	7
		Fall	65985	6	1102	49	4
	2009	All Year	34591	5	868	9	1
	2010	All Year	54217	6	1068	74	7
	2011	Spring	26261	7	517	58	11
		Fall	45076	9	1032	272	26
	2012	Spring	20539	7	400	121	30
		Fall	34983	7	707	163	23
	2013	Spring	28184	8	520	46	9
		Fall	49821	7	939	157	17
Non-Tribal Mothership	2002	Spring	26503	11	574	118	21
	2003	Spring	25333	12	536	192	36
	2004	Spring	24010	10	571	79	14
	2005	Spring	37648	18	855	301	35
		Fall	10952	3	185	14	8
	2006	Spring	42850	18	999	145	15
		Fall	11289	6	284	12	4
	2007	All Year	47276	20	1147	147	13
	2008	Spring	32484	18	865	47	5
		Fall	25203	7	484	24	5
	2009	Spring	24066	19	600	74	12
	2010	Spring	33518	22	845	137	16
		Fall	2209	3	63	0	0
	2011	Spring	18463	9	492	77	16
		Fall	31508	10	756	123	16
	2012	Spring	7031	7	200	26	13
		Fall	31011	13	749	278	37
	2013	Spring	12938	11	376	29	8
		Fall	39410	14	880	168	19
Tribal Mothership	2002	Spring	3923	3	114	33	29
		Fall	17706	4	519	139	27
	2003	Spring	6276	4	182	129	71
		Fall	13155	4	358	251	70
	2004	Spring	6458	4	177	95	54
		Fall	17054	5	455	235	52
	2005	Spring	9288	3	258	165	64
		Fall	14274	4	375	194	52
	2006	Spring	2730	4	83	44	53
		Fall	2675	4	77	22	29
	2007	Fall	5129	5	156	73	47
	2008	Fall	14977	5	382	38	10
	2009	Fall	13469	5	404	87	22
	2010	Spring	88	3	4	3	75
		Fall	16118	6	512	148	29
	2011	Fall	6147	5	228	79	35
	2012	Fall	21	2	4	0	0

Table 28. Salmon bycatch count for the At-Sea Hake fishery. Note that seasons for the At-Sea Hake fishery run from May 15 to June 30 (spring) and from July 1 to December 31 (fall).

Sector	Year	Season	Fleet Hake Landings (mt)	Chinook	Chum	Coho	Pink	Sockeye	Unspecified
Catcher Processor	2002	All Year	36333	954	14	69	0	0	0
	2003	Spring	14524	508	8	0	0	0	0
		Fall	26945	62	0	0	13	0	0
	2004	Spring	25300	361	21	1	0	0	0
		Fall	47559	55	6	0	0	0	0
	2005	Spring	38056	1746	8	4	48	0	0
		Fall	40442	8	0	0	0	0	0
	2006	Spring	46665	112	8	2	0	0	0
	2007	Spring	42149	434	73	86	19	0	0
		Fall	30749	299	0	2	0	0	0
	2008	Spring	41769	81	39	3	0	2	2
		Fall	65985	412	4	0	0	0	16
	2009	All Year	34591	22	0	0	0	0	0
	2010	All Year	54217	257	4	0	0	2	0
	2011	Spring	26261	137	28	0	10	0	6
		Fall	45076	2556	6	0	0	0	0
	2012	Spring	20539	407	51	12	22	0	0
		Fall	34983	1521	0	1	0	0	0
	2013	Spring	28184	87	24	0	34	0	1
		Fall	49821	1671	2	0	0	0	0
Non-Tribal Mothership	2002	Spring	26503	709	10	77	0	0	3
	2003	Spring	25333	2047	3	3	4	0	186
	2004	Spring	24010	387	28	0	0	0	0
	2005	Spring	37648	2141	12	82	0	0	0
		Fall	10952	63	0	0	0	0	0
	2006	Spring	42850	997	79	26	0	0	0
		Fall	11289	83	0	0	0	0	0
	2007	All Year	47276	584	96	138	15	0	0
	2008	Spring	32484	123	17	3	0	0	0
		Fall	25203	102	0	15	0	0	0
	2009	Spring	24066	296	41	12	2	0	0
	2010	Spring	33518	457	6	0	0	0	2
	2011	Spring	18463	173	12	5	2	0	0
		Fall	31508	1123	0	0	0	0	0
	2012	Spring	7031	52	2	4	0	0	0
		Fall	31011	2229	0	0	0	0	0
	2013	Spring	12938	92	0	2	2	0	0
		Fall	39410	1889	0	4	1	0	0
Tribal Mothership	2002	Spring	3923	232	33	0	0	0	0
		Fall	17706	772	18	23	0	0	1
	2003	Spring	6276	1571	9	56	3	0	0
		Fall	13155	1833	0	135	3744	0	0
	2004	Spring	6458	661	11	0	0	0	0
		Fall	17054	3032	0	207	0	0	9
	2005	Spring	9288	1811	2	180	26	0	2
		Fall	14274	2093	0	164	357	0	6
	2006	Spring	2730	557	6	3	0	0	0
		Fall	2675	103	18	0	0	0	0
	2007	Fall	5129	710	0	9	0	0	0
	2008	Fall	14977	157	0	0	0	0	0
	2009	Fall	13469	824	11	8	0	0	0
	2010	Spring	88	8	0	0	0	0	0
		Fall	16118	642	1	5	0	0	0
	2011	Fall	6147	371	19	10	382	0	0

Table 29. Salmon bycatch weight for the At-Sea Hake fishery. Note that seasons for the At-Sea Hake fishery run from May 15 to June 30 (spring) and from July 1 to December 31 (fall).

Sector	Year	Season	Fleet Hake Landings (mt)	Chinook (mt)	Chum (mt)	Coho (mt)	Pink (mt)	Sockeye (mt)	Unspecified (mt)
Catcher Processor	2002	All Year	36333	3	0.07	0.2	0	0	0
	2003	Spring	14524	1	0.03	0	0	0	0
		Fall	26945	0.3	0	0	0.03	0	0
	2004	Spring	25300	2	0.07	0.002	0	0	0
		Fall	47559	0.3	0.02	0	0	0	0
	2005	Spring	38056	5	0.03	0.004	0.05	0	0
		Fall	40442	0.04	0	0	0	0	0
	2006	Spring	46665	0.6	0.04	0.009	0	0	0
	2007	Spring	42149	2	0.3	0.2	0.02	0	0
		Fall	30749	0.8	0	0.003	0	0	0
	2008	Spring	41769	0.4	0.1	0.005	0	0.004	0.0002
		Fall	65985	2	0.02	0	0	0	0.09
	2009	All Year	34591	0.1	0	0	0	0	0
	2010	All Year	54217	1	0.01	0	0	0.003	0
	2011	Spring	26261	0.6	0.06	0	0.02	0	0.01
		Fall	45076	7	0.02	0	0	0	0
	2012	Spring	20539	1	0.2	0.02	0.03	0	0
		Fall	34983	5	0	0.003	0	0	0
	2013	Spring	28184	0.4	0.1	0	0.04	0	0.0002
		Fall	49821	5	0.004	0	0	0	0
Non-Tribal Mothership	2002	Spring	26503	2	0.06	0.3	0	0	0.02
	2003	Spring	25333	6	0.01	0.007	0.003	0	0.4
	2004	Spring	24010	1	0.1	0	0	0	0
	2005	Spring	37648	6	0.04	0.2	0	0	0
		Fall	10952	0.4	0	0	0	0	0
	2006	Spring	42850	4	0.4	0.08	0	0	0
		Fall	11289	0.2	0	0	0	0	0
	2007	All Year	47276	2	0.3	0.3	0.02	0	0
	2008	Spring	32484	0.5	0.07	0.005	0	0	0
		Fall	25203	0.4	0	0.04	0	0	0
	2009	Spring	24066	1	0.2	0.02	0.002	0	0
	2010	Spring	33518	2	0.02	0	0	0	0.004
	2011	Spring	18463	0.9	0.05	0.007	0.003	0	0
		Fall	31508	3	0	0	0	0	0
	2012	Spring	7031	0.2	0.009	0.006	0	0	0
		Fall	31011	7	0	0	0	0	0
	2013	Spring	12938	0.4	0	0.005	0.003	0	0
		Fall	39410	5	0	0.02	0.001	0	0
Tribal Mothership	2002	Spring	3923	0.8	0.2	0	0	0	0
		Fall	17706	2	0.07	0.05	0	0	0.002
	2003	Spring	6276	3	0.03	0.09	0.005	0	0
		Fall	13155	6	0	0.3	6	0	0
	2004	Spring	6458	2	0.05	0	0	0	0
		Fall	17054	6	0	0.6	0	0	0.008
	2005	Spring	9288	4	0.009	0.3	0.03	0	0.002
		Fall	14274	5	0	0.3	0.5	0	0.01
	2006	Spring	2730	1	0.03	0.007	0	0	0
		Fall	2675	0.2	0.04	0	0	0	0
	2007	Fall	5129	1	0	0.03	0	0	0
	2008	Fall	14977	0.5	0	0	0	0	0
	2009	Fall	13469	1	0.05	0.02	0	0	0
	2010	Spring	88	0.02	0	0	0	0	0
		Fall	16118	2	0.003	0.01	0	0	0
	2011	Fall	6147	0.6	0.07	0.02	0.6	0	0

Table 30. Estimated bycatch count of salmon in all U.S. west coast fisheries observed by the West Coast Groundfish Observer Program (WCGOP) and the At-Sea Hake Observer Program (* = A-SHOP) from 2002-2013, as well as salmon bycatch in shoreside Pacific hake sectors (** = numbers from annual NWR reports). Dashes (--) signify years when the fishery/sector was not observed, or data were not available.

Species		Sector	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Chinook	Non-Hake Sectors	Limited Entry Trawl	14534	16340	1729	818	68	193	324	299	53	--	--	--
		Limited Entry California Halibut	381	120	492	424	107	124	75	0	--	--	--	--
		Open Access California Halibut	0	0	0	0	0	0	0	0	--	32	0	25
		Open Access and Limited Entry California Halibut	--	--	--	--	--	--	--	--	17	--	--	--
		Nearshore Fixed Gear in the North	--	41	33	32	20	0	0	22	16	8	64	404
		OR Pink Shrimp	--	--	0	0	--	0	0	0	0	0	2	0
		Catch Shares Non-Hake Bottom Trawl	--	--	--	--	--	--	--	--	--	175	304	323
		Catch Shares Non-Hake Midwater Trawl	--	--	--	--	--	--	--	--	--	*	12	55
	Hake Sectors	Catch Shares Shoreside	--	--	--	--	--	--	--	--	--	3727	2321	1258
		Catcher Processor *	954	570	416	1754	112	733	493	22	257	2693	1928	1758
		Non-Tribal Mothership *	709	2047	387	2204	1080	584	225	296	457	1296	2281	1981
		Tribal Mothership *	1004	3404	3693	3904	660	710	157	824	650	371	0	--
		Shoreside - EFP **	1062	425	4206	4018	839	2462	1962	279	2997	--	--	--
		Shoreside - Tribal **	0	9	50	76	1271	1690	539	1321	28	535	17	1025
Chum	Non-Hake Sectors	Limited Entry Trawl	14	36	4	0	0	0	0	0	0	--	--	--
		Catch Shares Non-Hake Midwater Trawl	--	--	--	--	--	--	--	--	--	*	0	1
	Hake Sectors	Catch Shares Shoreside	--	--	--	--	--	--	--	--	--	42	3	7
		Catcher Processor *	14	8	27	8	8	73	43	0	4	34	51	26
		Non-Tribal Mothership *	10	3	28	12	79	96	17	41	6	12	2	0
		Tribal Mothership *	51	9	11	2	24	0	0	11	1	19	0	--
		Shoreside - EFP **	--	--	--	--	--	113	8	2	8	--	--	--
		Shoreside - Tribal **	--	--	--	--	--	8	11	0	0	4	0	1
Coho	Non-Hake Sectors	Limited Entry Trawl	25	31	65	5	0	13	0	0	31	--	--	--
		Limited Entry California Halibut	0	0	0	0	48	0	0	0	--	--	--	--
		Nearshore Fixed Gear in the North	--	0	38	0	0	11	42	71	42	64	16	581
		Limited Entry Sablefish Primary	0	5	0	6	0	4	0	0	0	0	0	0
		Catch Shares Non-Hake Bottom Trawl	--	--	--	--	--	--	--	--	--	20	27	49
	Hake Sectors	Catch Shares Shoreside	--	--	--	--	--	--	--	--	--	137	15	33
		Catcher Processor *	69	0	1	4	2	88	3	0	0	0	13	0
		Non-Tribal Mothership *	77	3	0	82	26	138	18	12	0	5	4	6
		Tribal Mothership *	23	191	207	344	3	9	0	8	5	10	0	--
		Shoreside - EFP **	--	--	--	--	--	141	10	37	16	--	--	--
		Shoreside - Tribal **	--	--	--	--	--	98	21	49	0	17	0	91
Pink	Non-Hake Sectors	Limited Entry Trawl	0	0	0	0	0	0	0	2	0	--	--	--
		Catch Shares Non-Hake Bottom Trawl	--	--	--	--	--	--	--	--	--	0	2	0
	Hake Sectors	Catch Shares Shoreside	--	--	--	--	--	--	--	--	--	6113	0	2
		Catcher Processor *	0	13	0	48	0	19	0	0	0	10	22	34
		Non-Tribal Mothership *	0	4	0	0	0	15	0	2	0	2	0	3
		Tribal Mothership *	0	3747	0	383	0	0	0	0	0	382	0	--
		Shoreside - EFP **	--	--	--	--	--	47	7	26	0	--	--	--
		Shoreside - Tribal **	--	--	--	--	--	513	9	129	0	808	0	5
Sockeye	Non-Hake Sectors	Catch Shares Non-Hake Bottom Trawl	--	--	--	--	--	--	--	--	--	1	0	0
	Hake Sectors	Catch Shares Shoreside	--	--	--	--	--	--	--	--	--	2	0	0
		Catcher Processor *	0	0	0	0	0	0	2	0	2	0	0	0
		Shoreside - Tribal **	--	--	--	--	--	0	0	0	0	2	0	0
Unspecified	Non-Hake Sectors	Limited Entry Trawl	12	3	36	0	0	0	0	0	0	--	--	--
		Limited Entry California Halibut	147	0	0	0	0	0	0	0	0	--	--	--
		Nearshore Fixed Gear in the North	--	0	0	0	0	0	0	0	26	0	0	0
		Catch Shares Non-Hake Bottom Trawl	--	--	--	--	--	--	--	--	--	0	2	0
	Hake Sectors	Catch Shares Shoreside	--	--	--	--	--	--	--	--	--	0	11	0
		Catcher Processor *	0	0	0	0	0	0	18	0	0	6	0	1
		Non-Tribal Mothership *	3	186	0	0	0	0	0	0	2	0	0	0
		Tribal Mothership *	1	0	9	8	0	0	0	0	0	0	0	--
		Shoreside - EFP **	--	--	--	--	--	0	0	0	2	--	--	--

Table 31. Estimated bycatch weight (mt) of salmon in all U.S. west coast fisheries observed by the West Coast Groundfish Observer Program (WCGOP) and the At-Sea Hake Observer Program (* = A-SHOP) from 2002-2013, as well as salmon bycatch in shoreside Pacific hake sectors. Dashes (--) signify years when the fishery/sector was not observed, or data were not available.

Species		Sector	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Chinook	Non-Hake Sectors	Limited Entry Trawl	24	25	3.7	1.5	0.1	0.34	0.62	0.41	0.13	--	--	--
		Limited Entry California Halibut	0.4	0.12	0.78	0.8	0.14	0.3	0.2	0	--	--	--	--
		Open Access California Halibut	0	0	0	0	0	0	0	0	--	0.02	0	0.01
		Open Access and Limited Entry California Halibut	--	--	--	--	--	--	--	--	0.01	--	--	--
		Nearshore Fixed Gear in the North	--	0.2	0.06	0.084	0.11	0	0	0.09	0.1	0.05	0.29	2.4
		OR Pink Shrimp	0	0	0	0	0	0	0	0	0	0	0.001	0
		Catch Shares Non-Hake Bottom Trawl	--	--	--	--	--	--	--	--	--	0.3	0.5	0.6
		Catch Shares Non-Hake Midwater Trawl	--	--	--	--	--	--	--	--	--	*	0.03	0.2
	Hake Sectors	Catch Shares Shoreside	--	--	--	--	--	--	--	--	--	12	7.9	4
		Catcher Processor *	3	1.3	2.3	5	0.6	2.8	2.4	0.1	1	7.6	6	5.4
		Non-Tribal Mothership *	2	6	1	6.4	4.2	2	0.9	1	2	3.9	7.2	5.4
		Tribal Mothership *	2.8	9	8	9	1.2	1	0.5	1	2	0.6	0	0
Chum	Non-Hake Sectors	Limited Entry Trawl	0.05	0.12	0.01	0	0	0	0	0	0	--	--	--
		Catch Shares Non-Hake Midwater Trawl	--	--	--	--	--	--	--	--	--	*	0	0.006
	Hake Sectors	Catch Shares Shoreside	--	--	--	--	--	--	--	--	--	0.2	0.01	0.03
		Catcher Processor *	0.07	0.03	0.09	0.03	0.04	0.3	0.12	0	0.01	0.08	0.2	0.1
		Non-Tribal Mothership *	0.06	0.01	0.1	0.04	0.4	0.3	0.07	0.2	0.02	0.05	0.009	0
		Tribal Mothership *	0.27	0.03	0.05	0.009	0.07	0	0	0.05	0.003	0.07	0	0
Coho	Non-Hake Sectors	Limited Entry Trawl	0.016	0.07	0.25	0.006	0	0.02	0	0	0.074	--	--	--
		Limited Entry California Halibut	0	0	0	0	0.2	0	0	0	--	--	--	--
		Nearshore Fixed Gear in the North	--	0	0.16	0	0	0.01	0.2	0.2	0.25	0.24	0.06	2
		Limited Entry Sablefish Primary	0	0.02	0	0.02	0	0.01	0	0	0	0	0	0
		Catch Shares Non-Hake Bottom Trawl	--	--	--	--	--	--	--	--	--	0.03	0.05	0.06
	Hake Sectors	Catch Shares Shoreside	--	--	--	--	--	--	--	--	--	0.39	0.04	0.10
		Catcher Processor *	0.2	0	0.002	0.004	0.009	0.2	0.005	0	0	0	0.023	0
		Non-Tribal Mothership *	0.3	0.007	0	0.2	0.08	0.3	0.045	0.02	0	0.007	0.006	0.025
		Tribal Mothership *	0.05	0.39	0.6	0.6	0.007	0.03	0	0.02	0.01	0.02	0	--
Pink	Non-Hake Sectors	Limited Entry Trawl	0	0	0	0	0	0	0	0.002	0	--	--	--
		Catch Shares Non-Hake Bottom Trawl	--	--	--	--	--	--	--	--	--	0	0.002	0
	Hake Sectors	Catch Shares Shoreside	--	--	--	--	--	--	--	--	--	10	0	0.005
		Catcher Processor *	0	0.03	0	0.05	0	0.02	0	0	0	0.02	0.03	0.04
		Non-Tribal Mothership *	0	0.003	0	0	0	0.02	0	0.002	0	0.003	0	0.004
		Tribal Mothership *	0	6	0	0.53	0	0	0	0	0	0.6	0	0
Sockeye	Non-Hake Sectors	Catch Shares Non-Hake Bottom Trawl	--	--	--	--	--	--	--	--	--	0.0007	0	0
	Hake Sectors	Catch Shares Shoreside	--	--	--	--	--	--	--	--	--	0.003	0	0
		Catcher Processor *	0	0	0	0	0	0	0.004	0	0.003	0	0	0
Unspecified	Non-Hake Sectors	Limited Entry Trawl	0.026	0.009	0.1	0	0	0	0	0	0	--	--	--
		Limited Entry California Halibut	0.07	0	0	0	0	0	0	0	--	--	--	--
		Nearshore Fixed Gear in the North	--	0	0	0	0	0	0	0	0.16	0	0	0
		Catch Shares Non-Hake Bottom Trawl	--	--	--	--	--	--	--	--	--	0	0.002	0
	Hake Sectors	Catch Shares Shoreside	--	--	--	--	--	--	--	--	--	0	0.045	0
		Catcher Processor *	0	0	0	0	0	0	0.09	0	0	0.01	0	0.0002
		Non-Tribal Mothership *	0.02	0.4	0	0	0	0	0	0	0.004	0	0	0
		Tribal Mothership *	0.002	0	0.008	0.012	0	0	0	0	0	0	0	--

Table 32. Summary of biological data for at-sea salmon catch, separated by sector, collected by WCGOP observers from 2002 to 2013. All data was not available for every specimen. Due to 100% coverage in Catch Shares sectors, more biological data is typically collected.

				Sex		Length (cm)			Weight (kg)			Adipose Fin		Coded Wire Tags	Genetic Samples Taken
Species	Sector	Year	Count	Females	Males	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Checked	Clipped		
Chinook	Catch Shares Shoreside Hake	2011	11	6	3	42	65	78	5.0	21.4	39.0	11	9	0	6
		2012	8	2	6	49	61	77	7.3	13.7	25.1	8	6	1	4
		2013	27	8	3	42	62	74	4.7	16.6	28.8	27	16	1	5
	Catch Shares Non-Hake	2011	157	77	75	40	51	83	3.4	8.5	41.7	155	109	15	31
		2012	255	135	116	36	50	77	3.0	8.3	32.0	254	219	12	43
		2013	166	64	75	31	51	84	2.0	9.0	44.2	162	108	13	64
	Limited Entry Trawl	2002	1	1	0	57	57	57	10.1	10.1	10.1	0	0	0	1
		2003	8	4	4	41	48	54	3.9	6.8	10.1	0	0	0	6
		2004	353	179	161	18	53	84	1.8	10.1	43.2	0	0	10	37
		2005	157	69	68	25	50	71	1.3	9.8	24.7	0	0	5	41
		2006	23	5	12	32	50	80	2.4	8.8	20.5	2	1	1	13
		2007	40	13	26	33	51	68	3.1	9.2	22.3	40	32	7	19
		2008	75	40	34	36	53	69	2.4	9.6	25.5	72	59	2	31
		2009	74	32	39	28	45	77	1.4	8.1	29.6	57	35	1	27
		2010	6	0	4	27	50	64	1.5	9.4	14.3	5	4	0	6
	Nearshore Fixed Gear in the North	2004	2	0	0	55	57	59	8.8	9.1	9.4	0	0	0	0
		2006	1	0	0	46	46	46	5.5	5.5	5.5	0	0	0	0
		2011	1	0	0	74	74	74	29.8	29.8	29.8	0	0	0	0
		2012	3	0	0	57	69	79	11.0	24.6	36.4	0	0	0	0
		2013	1	0	0	33	33	33	2.2	2.2	2.2	0	0	0	0
	Open Access California Halibut	2011	6	2	3	31	35	38	1.1	2.2	3.6	6	5	0	4
		2013	5	1	3	28	31	34	1.3	2.3	3.0	5	2	1	4
	Oregon Pink Shrimp	2012	2	1	1	30	35	40	1.8	2.7	3.6	2	2	0	1
Chum	Catch Shares Non-Hake	2013	1	1	0	69	69	69	19.6	19.6	19.6	1	1	0	1
	Limited Entry Trawl	2003	1	0	0	61	61	61	12.6	12.6	12.6	0	0	0	1
		2004	1	0	1	57	57	57	11.5	11.5	11.5	0	0	0	1
Coho	Catch Shares Non-Hake	2011	18	8	10	49	59	65	4.5	8.0	18.7	17	16	0	1
		2012	26	17	8	41	51	71	4.6	8.3	19.2	25	18	0	11
		2013	17	10	6	37	53	65	4.7	10.1	17.4	16	12	2	7
	Limited Entry Trawl	2004	5	2	3	51	61	72	6.6	14.4	25.9	0	0	0	2
		2005	1	1	0	45	45	45	5.8	5.8	5.8	0	0	0	1
		2006	4	2	2	65	67	69	17.4	19.3	22.5	4	3	0	1
		2007	2	0	1	47	48	48	5.5	5.8	6.2	2	1	0	1
		2010	2	0	1	43	51	58	4.0	8.3	12.7	2	2	0	2
	Limited Entry Sablefish Primary	2005	1	1	0	66	66	66	18.6	18.6	18.6	0	0	0	0
		2007	1	1	0	63	63	63	12.3	12.3	12.3	1	0	0	1
	Nearshore Fixed Gear in the North	2004	2	0	0	53	58	63	15.4	18.7	22.0	0	0	0	0
		2007	1	0	0	38	38	38	5.0	5.0	5.0	1	1	0	0
		2009	1	0	0	32	32	32	2.2	2.2	2.2	0	0	0	0
		2012	1	0	0	71	71	71	22.0	22.0	22.0	0	0	0	0
Pink	Catch Shares Shoreside Hake IFQ	2011	3	0	0	49	53	57	7.7	7.7	7.7	0	0	0	0
	Catch Shares Non-Hake IFQ	2012	2	1	1	42	42	42	4.1	4.2	4.4	0	0	0	0
	Limited Entry Trawl	2009	1	0	0	41	41	41	4.5	4.5	4.5	1	1	0	1
Sockeye	Catch Shares Non-Hake IFQ	2011	1	0	0	37	37	37	3.1	3.1	3.1	1	1	0	1
Unspecified	Catch Shares Non-Hake IFQ	2012	2	0	0	47	49	50	--	--	--	2	2	0	1
	Limited Entry Trawl	2004	3	2	1	41	52	71	4.4	9.8	20.1	0	0	0	0

Table 33. Summary of biological data for salmon discarded shoreside with coded wire tags (CWTs) in the Shoreside Hake sector, collected by the Catch Monitor (CM) program 2008 to 2013. Additional data is collected by the CM program, but only data for salmon with CWTs are shown here. All salmon with CWTs are checked for adipose fin clips. From 2008 to 2010, this sector functioned under exempted fishing permits. All data was not available for every specimen, but 100% coverage of the catch typically leads to greater collection of biological data than in other fishery sectors.

			Sex		Length (cm)			Weight (kg)			Coded Wire	Adipose Fin
Species	Year	Count	Females	Males	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Tags	Clipped
Chinook	2008	195	111	80	29	50	90	3.6	22.8	131.2	84	179
	2009	44	22	20	5	60	98	1.4	19.2	70.5	23	26
	2010	324	160	149	26	59	93	2.4	36.0	140.9	190	221
	2011	240	112	123	35	58	98	2.2	14.4	81.6	138	167
	2012	132	64	66	39	61	85	4.4	16.1	41.9	83	88
	2013	62	36	21	42	65	102	4.4	18.4	55.1	48	46
Coho	2008	3	3	0	58	61	66	38.9	43.7	53.5	0	3
	2009	4	2	2	54	58	64	8.4	11.5	15.7	2	3
	2010	5	5	0	57	65	74	31.6	41.8	55.9	4	3
	2011	11	4	7	41	59	66	4.2	13.2	19.8	5	9
	2012	1	0	1	56	56	56	10.8	10.8	10.8	0	0

Table 34. Summary of biological data for salmon species, separated by sector, collected by ASHOP observers from 1976 to 2013. All data was not available for every specimen. 100% coverage of the catch typically leads to greater collection of biological data than in other fishery sectors.

				Sex		Length (cm)			Weight (kg)			Genetic Samples
Species	Sector	Year	Count	Females	Males	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Taken
Chinook	Historic	1976	470	121	175	36	64	108	--	--	--	--
		1977	296	133	153	37	60	108	--	--	--	--
		1978	607	203	356	39	61	104	--	--	--	--
		1979	1000	422	477	23	64	103	--	--	--	--
		1980	2379	965	1277	30	55	109	--	--	--	--
		1981	2155	981	1098	28	54	106	--	--	--	--
		1982	5328	2200	2827	15	58	112	--	--	--	--
		1983	1861	870	894	26	54	109	--	--	--	--
		1984	2162	1154	999	30	50	100	--	--	--	--
		1985	1183	572	563	22	60	105	--	--	--	--
		1986	21892	11124	10545	20	49	116	--	--	--	--
		1987	8273	3737	4430	20	57	114	--	--	--	--
		1988	7676	3765	3799	22	54	105	--	--	--	--
		1989	5179	2451	2687	25	56	111	--	--	--	--
		1990	2982	1460	1464	24	54	105	--	--	--	--
	At-Sea CP	1991	770	301	468	19	59	98	0.45	3.40	15.75	--
		1992	302	128	146	43	68	101	1	5.09	15.5	--
		1993	569	258	301	32	55	105	0.65	3.10	13	--
		1994	256	123	132	36	61	97	0.55	3.50	12.78	--
		1995	561	277	284	35	62	102	0.7	3.93	10.2	--
		1996	113	53	60	36	78	110	1.8	7.71	15	--
		1997	107	51	52	33	65	103	0.9	5.35	16.6	--
		1998	81	37	44	32	73	123	0.9	6.50	14.2	--
		1999	691	280	407	32	61	101	0.62	5.47	13.51	--
		2000	599	295	304	17	53	106	0.24	4.06	15.69	--
		2001	371	179	192	36	59	102	0.65	4.53	15.46	--
		2002	293	119	174	30	60	122	0.59	3.71	15.7	--
		2003	243	115	128	35	60	101	1.63	4.46	13.43	--
		2004	168	71	97	40	64	119	1	4.79	15.69	--
		2005	771	359	381	39	61	99	--	--	--	--
		2006	54	23	26	50	70	98	--	--	--	--
		2007	393	185	191	34	59	99	1.71	2.83	3.88	--
		2008	232	95	137	36	65	99	1.22	4.43	13.44	145
		2009	12	4	8	59	78	104	3.29	7.46	16.86	11
		2010	114	48	66	28	68	106	0.26	5.01	14.62	113
		2011	1239	562	676	32	58	97	0.44	2.86	13.69	1103
		2012	984	440	543	33	60	114	0.47	3.21	14.43	922
		2013	787	365	421	34	59	90	0.56	2.97	10.44	784
	At-Sea MS	1991	731	311	387	33	58	91	0.5	3.87	10.9	--
		1992	139	70	53	35	63	93	0.5	3.75	9.8	--
		1993	556	276	280	31	48	86	0.8	2.61	10.4	--
		1994	724	364	353	29	51	102	0.4	2.93	14.9	--
		1995	1144	568	574	24	56	95	0.6	3.83	12	--
		1996	269	121	109	32	61	105	0.6	6.80	14.2	--
		1997	88	43	43	36	65	98	0.8	5.55	15	--
		1998	97	43	54	38	71	98	0.8	4.99	11.3	--
		1999	115	46	68	32	64	104	0.76	4.52	12.4	--
		2000	821	414	407	16	53	104	0.43	3.44	15.95	--
		2001	302	165	137	34	54	95	0.47	2.47	10.99	--
		2002	335	134	201	40	60	98	1.67	4.35	12.18	--
		2003	687	328	359	37	58	98	0.7	3.04	6.1	--
		2004	155	70	85	39	59	94	1.12	3.25	8.78	--
		2005	994	444	540	37	60	102	2.46	4.87	9.56	--
		2006	388	208	164	17	62	106	9.43	9.43	9.43	--
		2007	260	150	109	35	56	99	2.18	4.92	7.65	--
		2008	96	53	42	40	65	98	0.82	4.16	11.44	81
		2009	145	80	65	33	60	97	0.44	3.66	12.73	143
		2010	217	105	112	30	63	113	0.38	3.86	15.85	212
		2011	552	247	304	32	61	98	0.59	3.54	12.65	531
		2012	1106	441	664	32	60	95	0.58	2.98	12.7	1093
		2013	764	349	414	36	60	98	0.5	3.13	14.17	758
	Tribal MS	1996	79	44	35	25	53	84	--	--	--	--
		1997	846	411	433	25	56	98	0.6	3.04	9.6	--
		1998	828	401	426	28	52	106	0.5	3.22	16.2	--
		1999	1264	537	727	27	54	116	1	3.47	6.4	--
		2000	279	154	125	36	52	96	0.68	2.56	14.61	--
		2001	376	179	197	27	59	91	0.37	2.70	11.69	--
		2002	314	136	178	35	59	99	--	--	--	--
		2003	1112	538	574	27	54	113	1.32	4.17	8.46	--
		2004	932	451	481	32	53	108	1.66	4.98	13.42	--
		2005	1074	577	497	17	54	102	--	--	--	--
		2006	225	120	105	36	53	89	--	--	--	--
		2007	206	97	109	30	48	77	--	--	--	--
		2008	54	24	30	29	58	80	0.25	3.12	7.4	45
		2009	256	127	129	24	51	81	0.15	1.72	7.43	249
		2010	354	155	199	37	59	93	0.32	2.92	13.88	351
		2011	206	111	95	22	48	94	0.12	1.69	13.26	203

Table 34, continued.

				Sex		Length (cm)			Weight (kg)			Genetic Samples
Species	Sector	Year	Count	Females	Males	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Taken
Chum	Historic	1978	4	0	4	57	65	75	--	--	--	--
		1979	13	6	6	48	60	71	--	--	--	--
		1980	1	1	0	66	66	66	--	--	--	--
		1981	8	5	3	47	66	77	--	--	--	--
		1982	46	21	25	45	70	79	--	--	--	--
		1983	17	6	10	33	55	81	--	--	--	--
		1984	195	109	86	37	54	78	--	--	--	--
		1985	48	22	26	21	62	85	--	--	--	--
		1986	260	154	99	33	64	92	--	--	--	--
		1987	17	8	9	51	71	90	--	--	--	--
		1988	49	24	24	30	69	90	--	--	--	--
		1989	5	3	2	40	50	58	--	--	--	--
		1990	13	10	3	51	72	81	--	--	--	--
	At-Sea CP	1991	3	2	1	54	62	73	5.6	5.60	5.6	--
		1992	21	9	11	62	71	81	3.3	5.08	7.8	--
		1993	5	3	2	36	44	65	--	--	--	--
		1994	4	3	1	71	74	75	4.5	5.13	5.5	--
		1995	11	7	4	36	47	74	0.55	2.01	5.6	--
		1996	12	10	2	65	73	79	3.4	5.02	7.2	--
		1997	4	2	2	40	52	70	0.8	1.78	3.6	--
		1998	2	0	2	63	70	76	3.8	3.80	3.8	--
		1999	17	8	9	41	71	85	3.34	4.79	9.11	--
		2000	2	2	0	63	80	97	3.26	3.26	3.26	--
		2001	20	10	10	48	64	78	2.73	3.75	6.76	--
		2002	7	6	1	56	71	89	2.29	5.33	10.81	--
		2003	4	1	2	60	65	69	2.24	3.57	4.54	--
		2004	13	3	10	53	66	74	1.96	3.57	4.74	--
		2005	5	1	3	44	63	69	--	--	--	--
		2006	4	2	2	53	71	82	--	--	--	--
		2007	44	11	31	39	66	79	--	--	--	--
		2008	12	6	6	52	62	73	--	--	--	--
		2010	2	1	1	58	61	63	--	--	--	--
		2011	17	7	10	33	59	76	--	--	--	--
		2012	21	9	12	63	70	79	--	--	--	--
		2013	10	5	5	49	68	80	--	--	--	--
	At-Sea MS	1991	2	0	2	72	76	79	--	--	--	--
		1992	3	3	0	70	73	76	3.4	4.50	5.5	--
		1993	1	1	0	73	73	73	4.8	4.80	4.8	--
		1994	2	2	0	79	81	82	6.4	6.40	6.4	--
		1995	39	25	14	31	56	77	2.4	4.05	6	--
		1996	16	13	3	65	72	80	3.4	5.19	7.2	--
		1997	7	4	2	59	64	68	2.6	2.93	3.5	--
		1999	7	5	2	41	65	78	0.72	3.81	5.8	--
		2000	2	2	0	63	66	69	3.37	3.95	4.52	--
		2001	3	1	2	65	70	78	5.16	5.16	5.16	--
		2002	4	3	1	75	79	82	4.6	6.11	7.61	--
		2003	1	0	1	69	69	69	--	--	--	--
		2004	11	5	6	56	67	73	2.22	3.61	4.66	--
		2005	5	1	4	62	67	70	--	--	--	--
		2006	28	14	14	56	74	85	--	--	--	--
		2007	45	18	26	47	65	82	6.72	6.72	6.72	--
		2008	10	7	3	64	68	73	--	--	--	--
		2009	4	2	2	66	70	73	--	--	--	--
		2010	2	1	1	60	60	60	--	--	--	--
		2011	5	1	4	67	69	72	--	--	--	--
	Tribal MS	1997	7	5	2	46	68	82	3.9	6.07	7.4	--
		1998	11	3	8	50	65	76	2.9	3.87	5.1	--
		1999	7	5	2	70	79	89	4.5	6.80	10.8	--
		2001	2	2	0	63	65	67	2.84	2.84	2.84	--
		2002	13	5	8	49	68	85	--	--	--	--
		2003	3	0	3	62	64	67	--	--	--	--
		2004	3	2	1	61	69	77	--	--	--	--
		2006	6	5	1	54	65	73	--	--	--	--
		2009	3	2	1	69	71	73	--	--	--	--
		2011	10	5	5	61	67	78	--	--	--	--

Table 34, continued.

Species	Sector	Year	Count	Sex		Length (cm)			Weight (kg)			Genetic Samples Taken
				Females	Males	Minimum	Mean	Maximum	Minimum	Mean	Maximum	
Coho	Historic	1976	11	5	3	59	64	70	--	--	--	--
		1977	49	17	31	44	59	86	--	--	--	--
		1978	27	8	14	44	59	85	--	--	--	--
		1979	39	12	26	39	61	88	--	--	--	--
		1980	38	17	14	47	58	73	--	--	--	--
		1981	17	8	9	47	60	74	--	--	--	--
		1982	122	45	43	33	59	105	--	--	--	--
		1983	349	146	170	34	54	100	--	--	--	--
		1984	1067	556	509	25	52	79	--	--	--	--
		1985	252	114	124	26	58	80	--	--	--	--
		1986	1793	877	909	33	55	83	--	--	--	--
		1987	656	314	334	26	55	80	--	--	--	--
		1988	1538	917	609	27	52	79	--	--	--	--
		1989	94	49	45	43	54	67	--	--	--	--
		1990	40	19	21	33	56	89	--	--	--	--
	At-Sea CP	1991	40	18	21	30	53	84	--	--	--	--
		1992	14	3	10	47	64	77	1.4	2.74	4.9	--
		1993	3	1	2	45	48	50	--	--	--	--
		1994	2	1	1	43	47	50	1.7	1.70	1.7	--
		1995	9	4	5	50	61	76	7.4	7.40	7.4	--
		1996	27	12	15	55	73	96	2	6.99	9.8	--
		1997	14	2	12	49	56	84	1.3	2.58	9.2	--
		1998	1	0	1	74	74	74	--	--	--	--
		1999	8	5	3	46	60	79	1.16	2.88	6.76	--
		2000	33	17	16	43	56	69	1.1	2.45	4.03	--
		2001	15	8	7	46	62	74	1.45	3.80	6.3	--
		2002	19	8	11	47	58	81	1.5	3.21	5.3	--
		2004	1	0	1	56	56	56	1.93	1.93	1.93	--
		2005	73	28	36	46	55	90	--	--	--	--
		2006	1	1	0	68	68	68	--	--	--	--
		2007	50	24	17	42	54	70	--	--	--	--
		2008	1	1	0	62	62	62	--	--	--	--
		2012	5	3	2	48	51	54	--	--	--	--
	At-Sea MS	1991	16	7	9	32	58	78	--	--	--	--
		1992	13	4	9	47	55	65	1.9	2.20	2.6	--
		1993	1	1	0	43	43	43	1	1.00	1	--
		1994	14	6	8	32	50	72	1.1	3.10	4.4	--
		1995	394	206	188	30	55	87	0.7	2.40	4.8	--
		1996	2	1	1	66	74	82	2.5	2.50	2.5	--
		1997	15	9	5	35	52	70	1.25	2.45	4	--
		1998	1	1	0	51	51	51	1.7	1.70	1.7	--
		1999	13	9	4	50	62	83	1.7	3.22	7.7	--
		2001	19	10	9	36	54	65	1.44	2.10	2.89	--
		2002	21	10	11	38	62	78	1.32	2.65	5.06	--
		2003	1	0	1	61	61	61	--	--	--	--
		2005	30	6	23	41	55	71	--	--	--	--
		2006	11	7	4	44	56	62	--	--	--	--
		2007	49	24	23	39	57	80	--	--	--	--
		2008	5	4	1	46	55	61	--	--	--	--
		2009	6	4	2	41	49	52	--	--	--	--
		2011	3	2	1	46	50	53	--	--	--	--
		2012	2	1	1	48	50	51	--	--	--	--
		2013	3	1	2	55	64	70	--	--	--	--
	Tribal MS	1997	115	61	54	33	50	72	0.85	1.45	2.4	--
		1998	58	38	20	33	57	85	1	1.76	2.4	--
		1999	4	2	1	45	53	67	1.05	2.08	3.8	--
		2000	3	0	3	51	56	62	2.11	2.66	3.2	--
		2001	4	2	2	65	68	72	3.64	4.20	5.25	--
		2002	11	6	5	25	52	65	--	--	--	--
		2003	55	22	33	45	53	71	2.09	2.35	2.6	--
		2004	51	25	26	44	59	68	2.15	3.00	3.61	--
		2005	90	36	54	43	54	70	--	--	--	--
		2006	2	1	1	55	56	57	--	--	--	--
		2007	3	1	2	56	62	67	--	--	--	--
		2009	2	0	2	40	59	77	--	--	--	--
		2010	2	0	2	59	60	60	--	--	--	--
		2011	7	1	6	55	57	59	--	--	--	--

Table 34, continued.

Species	Sector	Year	Count	Sex		Length (cm)			Weight (kg)			Genetic Samples Taken
				Females	Males	Minimum	Mean	Maximum	Minimum	Mean	Maximum	
Pink	Historic	1978	1	0	1	65	65	65	--	--	--	--
		1979	2	1	1	66	75	83	--	--	--	--
		1981	33	13	19	52	58	65	--	--	--	--
		1983	91	53	38	40	52	74	--	--	--	--
		1985	29	10	19	40	55	64	--	--	--	--
		1987	80	48	32	41	52	69	--	--	--	--
		1988	1	0	1	48	48	48	--	--	--	--
	At-Sea CP	1991	8	3	5	37	42	45	--	--	--	--
		1993	236	137	99	37	43	58	0.7	1.00	1.4	--
		1995	163	73	90	31	39	45	0.5	0.70	0.9	--
		1997	14	6	8	38	44	48	0.53	0.89	1.3	--
		1999	61	44	15	24	45	53	0.62	1.02	1.7	--
		2000	6	5	1	37	42	45	0.93	0.93	0.93	--
		2001	29	19	10	41	50	68	0.84	1.41	2.16	--
		2003	4	2	2	51	54	62	1.54	1.94	2.87	--
		2005	20	11	9	42	46	54	--	--	--	--
		2007	11	5	4	34	44	51	--	--	--	--
		2011	5	2	3	46	49	52	--	--	--	--
		2012	6	3	3	42	49	59	--	--	--	--
		2013	13	9	4	41	47	54	--	--	--	--
	At-Sea MS	1991	2	2	0	28	39	49	--	--	--	--
		1993	70	36	34	38	43	49	0.6	1.03	1.5	--
		1994	11	5	6	37	50	59	1.3	3.33	6.8	--
		1995	65	33	32	33	39	46	--	--	--	--
		1997	11	8	3	37	43	47	0.53	1.03	2	--
		1999	4	2	2	40	42	44	0.72	0.84	0.96	--
		2001	14	11	3	42	50	58	1.22	1.52	1.7	--
		2003	1	0	1	41	41	41	--	--	--	--
		2007	6	2	2	46	48	49	--	--	--	--
		2009	1	1	0	46	46	46	--	--	--	--
		2011	1	1	0	46	46	46	--	--	--	--
		2013	2	1	1	44	46	48	--	--	--	--
	Tribal MS	1997	185	90	95	35	50	59	1	1.31	1.85	--
		1999	37	14	23	40	50	56	1	1.59	2.1	--
		2003	939	438	501	36	52	62	1.51	1.88	2.56	--
		2005	130	66	64	43	51	63	--	--	--	--
		2011	143	79	64	43	52	60	--	--	--	--

Table 35. Summary of CWT data collected by ASHOP observers from 1981 to 2013. 100% coverage of trips from 2000 to present typically leads to greater collection of biological data than in other fishery sectors.

Year	Chinook	Coho
1981	61	1
1982	120	0
1983	29	2
1984	39	25
1985	30	4
1986	778	43
1987	383	18
1988	273	41
1989	193	1
1990	106	1
1991	27	0
1992	13	1
1993	14	0
1994	56	1
1995	116	0
1996	55	0
1997	55	3
1998	37	1
1999	108	2
2000	215	3
2001	129	0
2002	64	0
2003	309	5
2004	210	10
2005	301	28
2006	44	0
2007	64	7
2008	24	0
2009	39	3
2010	48	1
2011	172	1
2012	116	0
2013	64	0