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Estimated Discard and Catch of Groundfish Species in the 2015 US West Coast Fisheries

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Executive Summary

The primary objective of this report is to estimate fishing mortality of groundfish species in U.S. west coast fisheries during 2015 and evaluate mortality estimates relative to Annual Catch Limit (ACL), Acceptable Biological Catch (ABC), and Overfishing Limit (OFL) harvest management goals. These management goals are published in the federal groundfish regulations for selected groundfish species (50 CFR 660 Subpart C, 80 FR 212). Based on a recommendation from the Pacific Fishery Management Council's (PFMC) Scientific and Statistical Committee (SSC), we present groundfish mortality estimates by species, whenever possible (PFMC 2014). Our primary findings include:

- No groundfish species or complexes exceeded 2015 ACL, ABC, or OFL harvest goals.
- Estimated fishing mortality of four groundfish species/complexes were 90% or greater of their ACLs: black rockfish, south of 46°16' N. latitude; cnaray rockfish; minor nearshore rockfish, north of 40°10' N. latitude; petrale sole; and sablefish, north of 36° N. latitude.
- Of the eight PFMC-defined rebuilding or rebuilt groundfish species, bocaccio rockfish, canary rockfish, petrale sole, Pacific ocean perch, and yelloweye rockfish increased in ACL percentage from 2014 to 2015.
- Twenty-nine of the groundfish species or complexes (69%) had fishing mortality estimates which were less than 50% of 2015 ACL harvest goals.
- Fishing mortality estimates for all groundfish combined were lower in 2015 relative to 2014 in the IFQ bottom trawl, at-sea hake, shoreside tribal, and California recreational fisheries (Somers et al. 2015). The IFQ fixed gear, non-nearshore fixed gear, nearshore fixed gear, California halibut, pink shrimp, incidental, and Washington and Oregon recreational fisheries all showed an increase in overall groundfish mortality relative to 2014 levels. We did not compare the midwater fisheries due to changes in sector definitions from 2014 to 2015.

Summaries of 2015 catch from the following groundfish fishery sectors are included:

Commercial -

- Shore-based Individual Fishing Quota (IFQ) Program*****
  - Limited entry (LE) trawl permits – fishing bottom trawl gear
  - LE trawl permits – fishing fixed gear
  - LE trawl permits – fishing midwater trawl gear, landing 50% or more rockfish
  - LE trawl permits – fishing midwater trawl gear, landing 50% or more hake
  - LE trawl permits – fishing bottom trawl gear and using electronic monitoring (EM)
  - LE trawl permits – fishing fixed gear and using EM
  - LE trawl permits – fishing midwater trawl gear, landing 50% or more rockfish and using EM
  - LE trawl permits – fishing midwater trawl gear, landing 50% or more hake and using EM
- At-sea Hake Co-op Programs*****
  - Pacific hake catcher-processor (C/P)
  - Pacific hake mothership catcher- vessel
- Open access (OA) bottom trawl - targeting California halibut*****
- OA fixed gear nearshore (Oregon/California)*****
- Fixed gear LE sablefish primary season (tier endorsed)*****
- Fixed gear LE non-primary sablefish (non-endorsed and daily trip limit sectors)*****
- Fixed gear OA daily trip limit*****

Exempted fishing permit (EFP) (not including EM sectors listed above)*

Tribal –

Shoreside hake

At-sea hake

Non-commercial –

Recreational (Washington/Oregon/California)

Research

Other non-groundfish fisheries included with incidental catch of groundfish species:

Commercial -

OA pink shrimp trawl – Washington/Oregon/California*

OA bottom trawl

Other gear groups - not trawl, pink shrimp trawl, or fixed-gear

Fixed gear targeting non-groundfish

* indicates sectors that use federal observer data

Data Sources

Data sources used to estimate groundfish fishing mortality include landing receipts, onboard observer data, EM data, recreational catch, research catch, and discard mortality rates.

Fleet-wide landing receipts (a.k.a. fish tickets) are the cornerstone of retained catch information for all shoreside sectors of the commercial groundfish fishery on the US west coast. Fish tickets are trip-aggregated sales receipts issued to vessels by fish-buyers in each port for each delivery of fish. They are provided to fish-buyers by a state agency and must be returned to the agency for processing. Fish tickets are designed by the individual states. Washington, Oregon, and California each have a slightly different fish ticket format. Each state conducts species-composition sampling for numerous market categories reported on fish tickets. Market categories represent either a single species or a mixture of species. Fish ticket and species-composition data are submitted by state agencies to the Pacific Fisheries Information Network (PacFIN) regional database, which is maintained by the Pacific States Marine Fisheries Commission (PSMFC). 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. Landed weights from sampled market categories were distributed to individual species whenever possible.

Fish ticket landings data for the calendar year 2015 were retrieved from the PacFIN database (04-25-2016) and allocated to various sectors of the groundfish fishery as indicated in Figure 1. All additional data processing steps are described in the methods section below. Discard is defined in this report as only catch which is discarded at-sea. Discard at the dock is coded in PacFIN fish ticket landings data and is thus accounted for in landing weights in this report. Landing weights are presented in round weight (complete weight as caught, prior to any dressing), as any conversion factors (e.g. for at-sea processing) have already been applied by state agencies or in PacFIN.

Discard estimation focused on commercial groundfish fishery sectors with scientific at-sea observations of discards, conducted by the Fishery Observation Science Program, Fishery Resource Analysis and Monitoring Division (FRAM), Northwest Fishery Science Center (NWFSC). The West Coast Groundfish Observer Program (WCGOP) and the At-Sea Hake Observer Program (A-SHOP) observe distinct sectors of the groundfish fishery. The WCGOP observes a number of different sectors of the groundfish fishery, including IFQ shore-based sectors, limited entry and open access (OA) fixed gear, and state-permitted nearshore fixed gear sectors. The WCGOP also observes

several fisheries that incidentally catch groundfish, including the California halibut trawl and pink shrimp trawl fisheries. WCGOP data from each of these groundfish sectors and fisheries were used for the purposes of discard estimation. Mortality estimates were summarized from the A-SHOP data for the at-sea Pacific hake fishery, including: catcher-processor and mothership catcher-vessel. No tribal fishing in the at-sea hake fishery occurred in 2015.

The NWFSC WCGOP program was established in 2001 by NOAA Fisheries (National Marine Fisheries Services (NMFS) (66 FR 20609). All commercial vessels that land groundfish caught in the United States Exclusive Economic Zone (EEZ) from 3-200 miles offshore are required to carry an observer when notified to do so by NMFS or its designated agent. Subsequent state rule-making also requires vessels that fish for groundfish within 3 miles of shore or participate in other state-managed fisheries to carry federal observers when notified.

The WCGOP's goal is to improve total catch estimates by collecting information on west coast groundfish species discarded at-sea. Detailed information on data collection methods employed in each observed fishery can be found in WCGOP manuals (NWFSC 2015a, 2015b). Estimates of observer coverage, observed catch, and a summary of observed fishing depths for each sector can be found at:
http://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_products/sector_products.cfm

The sampling protocol employed by the WCGOP is primarily focused on the discarded portion of catch. To ensure that recorded weights for the retained portion of the observed catch are accurate, haul-level retained catch recorded by the WCGOP observers are reconciled with trip-level fish ticket records. The WCGOP data are linked to fish tickets by fish ticket identification numbers obtained by the observer and are adjusted so that the total trip pounds of retained catch in the WCGOP data equal the total trip pounds on the fish ticket(s). This adjustment is necessary because observer retained catch weight estimates in the trawl sectors often consists of the visual estimate used in the vessel's logbook, while the fish ticket weight is a physical measurement and is legally binding (for more details see: http://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_processing.cfm). Additional data processing steps are described in the methods section below.

The A-SHOP has conducted observations of the west coast at-sea hake (a.k.a. Pacific whiting, henceforth referred to as hake) fishery since 2001. Prior to 2001, observer coverage of the west coast at-sea hake fishery was conducted by the North Pacific Groundfish Observer Program. Current A-SHOP program information and documentation on data collection methods can be found in the observer manual (NWFSC 2015a). The at-sea hake fishery has mandatory observer coverage, with each vessel over 38 meters carrying two observers. Beginning in 2011, under IFQ/Co-op Program management, all catcher vessels that deliver catch to motherships are required to carry WCGOP observers.

At-sea discard of IFQ species was recorded by EM systems on those vessels fishing IFQ quota within the EM EFP in 2015. Estimates of discard weight by species or species grouping at the haul level were provided by the Pacific States Marine Fisheries Commission (PSMFC) and used in this report.

For all PacFIN, WCGOP, A-SHOP, and PSMFC data, we maintain confidentiality of persons and businesses, as required by the Magnuson-Stevens Fishery Conservation and Management Act (often referred as Magnuson-Stevens Acts or MSA), which is most recently reauthorized in 2007 (http://www.fisheries.noaa.gov/sfa/laws_policies/msa/documents/msa_amended_2007.pdf). NOAA Fisheries guidance recommends, and NWFSC Fisheries Observation Science Program follows, the "rule of three," which states that, "Information from at least three participants in the fishery must be aggregated/summarized at a temporal and spatial level to protect not only the identity of a person or a business, but also any business information."

Groundfish species catch from the recreational fisheries come directly from data provided by the Washington Department of Fish and Wildlife (WDFW), the Oregon Department of Fish and Wildlife (ODFW), and the California Department of Fish and Wildlife (CDFW). State agencies provide catch weight (discarded + retained) estimates with PFMC-approved mortality rates applied to account for discard mortality. WDFW include only surface-release mortality rates for released rockfish; ODFW and CDFW applied depth-dependent mortality rates (PFMC 2014).

Each year, a certain portion of the ACL for groundfish species is harvested through research activities. In 2015, research programs that caught groundfish included the NWFSC's groundfish bottom trawl survey, Pacific hake acoustic survey, and rockfish hook and line survey, the International Pacific Halibut Commission's (IPHC) longline survey, as well as other scientific research permits. Total groundfish research catch (discarded and retained) information was provided to NOAA's West Coast Regional Office (WCR). These data were then summarized by the WCR and included in this report. Catch varies by research permit, including but not limited to: catch from permits with only retained catch, tagging study catch where all fish were released alive, and combined discarded and retained catch. In this report, the WCR applied depth-dependent mortality rates to research catch of lingcod was applied where depth data was available (PFMC 2016).

In addition to these data sources, estimates of discard mortality rates were provided by the PFMC Groundfish Management Team (GMT) (PFMC 2014). The GMT is an advisory body to the PFMC that is comprised of representatives from federal, state, and tribal agencies and is involved in evaluating management performance and alternatives for groundfish fisheries between the U.S. borders with Canada and Mexico. For the purposes of this analysis, the GMT provided discard mortality rates, which estimate the survival of discarded catch, for big skate in trawl sectors only; for sablefish, longnose skate, and lingcod in trawl and fixed gear sectors; for spiny dogfish in hook and line fixed gear sectors only; and for some individual species and major species groups reported in the state-permitted fixed gear nearshore sector (for all discard mortality rates, see Tables A-3 and A-4 or PFMC 2016). Trawl mortality rates have only been generated for bottom trawl gears and therefore were only applied to discard estimates generated from bottom trawl gear. We assume 100% mortality for all species caught with midwater or pink shrimp trawl gear, because species-specific mortality rates have not been identified for these gear types. Changes to estimation, discard rates, and management are documented in Table A-5.

Methods

Discard Estimation Methods Overview

We used a deterministic approach to estimate discard mortality for all WCGOP observed sectors of the groundfish fishery. Observed discard rates for each species were expanded to the fleet-wide level to estimate total discard amount. Because of differences in data availability and management structure among sectors of the groundfish fishery, expansions were applied with minor differences between fishery sectors (see methods below).

The stratification scheme used in this analysis is inconsistent with the sampling design employed by the WCGOP. The overall WCGOP sampling design is based on a stratified multi-stage random sampling. This design-based framework distributes observational effort more evenly coast-wide than simple random sampling, and uses prior information (landings) to improve the efficiency of sampling allocation. Strata employed in this report provide mortality estimates that are relevant to the spatial and temporal structure of groundfish management. The validity of stratification in terms of isolating variance in discard has not been rigorously tested. Until more work can be completed to evaluate which strata (area/depth/season) are most appropriate for discard analyses, broader stratification is often warranted to ensure adequate sample size or to meet confidentiality mandates.

In addition to standard error, we have provided the coefficient of variation (CV) of discard ratio for each species (or species group), as another measurement of statistical uncertainty. We calculated the standard error (SE) of observed discard ratio for each fish species, as described in Pikitch et al. (1998). The standard error of discard ratio was then divided by the discard ratio itself to calculate the CV of the discard ratio. Within a given stratum, the CV of the discard ratio of a fish species is identical to the CV of the expanded discard estimate of the given species (Lee 2015). Thus, it can serve as a very informative statistic for discard estimates. Although the confidence intervals (CIs) for the estimated discards can be derived from SEs based on normality assumption, we do not provide these statistics in the current report, because preliminary analyses indicated that the upper bounds of CIs for some less commonly encountered species could be underestimated. This is an area of on-going research. In addition, the differences in the magnitude of discarded amounts among the species make the CVs, which are unitless, more useful for comparisons when the estimates of many species are presented in one table.

In all cases where an FMP groundfish species grouping, nearshore species grouping, or unsampled catch category was used to compute discard 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, various species of rockfish are often grouped, weighed, and recorded together on the fish ticket under a grouped species code (e.g., NUSP = Northern Unspecified Slope Rockfish). When using a single species in the denominator, (e.g., sablefish in the fixed gear fisheries), 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 (http://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_processing.cfm). A complete listing of groundfish species is defined in the Groundfish Fishery Management Plan (Table A-1 or http://www.pcouncil.org/wp-content/uploads/GF_FMP_Ch1-6_Sept-22-2010_Am23_AM16-5_NMFS_PFMC_FINAL.pdf).

As with all point estimates, mortality values presented in Tables 15 and 16 should be considered with caution. It should be noted that multiple sources of uncertainty were not accounted for in this analysis and might influence mortality estimates. Sources of uncertainty include, but are not limited to: species composition sampling of landed catch, observed retained weights, and discard mortality rates.

In all tables, (--) was used when there is no actual numeric value (i.e., the species was not caught). Values appear as 0.0 when a value exists but is smaller than the decimal places allotted. A value of NA represents that the calculation is not applicable for a particular species or stratum or that the calculation did not produce a result (e.g., very small values might result in NA from a standard error calculation). Grey shading indicates that values include estimates of both discard and retained catch.

IFQ Fishery Discard Estimation

The IFQ/Co-op managed groundfish catch share fishery operates with a variety of gear types and target strategies, which depend on where catch is delivered and processed.

Catch delivered to shore-based processors (IFQ):

- Bottom trawl: Bottom trawl nets were used to target a variety of groundfish species.
- Midwater non-hake trawl: Midwater trawl nets were used to target midwater non-hake species, such as widow and yellowtail rockfish.

- Pot: Pot gear was used to target groundfish species, primarily sablefish.
- Hook-and-line: Longlines were primarily used to target groundfish species, mainly sablefish.
- Shoreside hake trawl: Midwater trawl nets were used to target hake.

Catch processed at-sea (Co-op Program):

- Mothership catcher vessels: Midwater trawl nets were used to target hake. Catcher vessels deliver unsorted catch to a mothership. The catch was sorted and processed aboard the mothership.
- Catcher-processors: Midwater trawl nets were used to target hake. Catch was processed at-sea.

In 2011, the implementation of the IFQ management program resulted in changes to fishing regulations which, in turn, resulted in development of new methods for estimating fishing mortality under the IFQ fishery. For example, in the non-hake IFQ sectors:

- Vessels must carry NMFS observers *or* EM systems (if participating in the EM EFP) on all IFQ fishing trips
- If participating in the EM EFP and fishing bottom trawl or fixed gear, vessels must carry NMFS observers when notified to do so
- Observer sampling priorities were shifted to focus more on IFQ and rebuilding groundfish species.
- The use of multiple gear types (trawl or fixed gear) were allowed for fishing under a Federal groundfish trawl-endorsed permit, although only one gear type is allowed per trip.
- A limit of one IFQ reporting area could be fished per trip.
- Individual fishing quotas (IFQs) were established for a subset of groundfish managed under the Fishery Management Plan (FMP).

Shore-based IFQ Sectors

Fleet-wide discard estimates for the shore-based IFQ sectors were derived from WCGOP observer data and fish ticket landings data (Figure 1). Fish tickets associated with the IFQ fishery were defined by analysts through an extensive quality control and review process of all available data sources, including those utilized for in-season management. For a description of the IFQ fishery and observer data collection, see: http://www.nwfsc.noaa.gov/research/divisions/fram/observation/catchshares_how.cfm .

IFQ bottom trawl vessels can hold a California halibut bottom trawl permit and participate in the state-permitted California halibut fishery. Limited entry California halibut tows can occur on the same trip as tows targeting IFQ groundfish and were identified at the tow-level based on the use of bottom trawl gear and the following criteria: 1) the target was California halibut and more than 150 lbs. of California halibut was landed or 2) the 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 IFQ bottom trawl tows that met at least one of the above requirements were analyzed using methods for IFQ discard estimation to reflect the sampling protocol performed by observers on the boat. Tow targets are typically determined by the vessel captain. In 2015, however, no limited entry California halibut tows occurred.

100% Observed Shore-Based IFQ Sectors

Observer data from the IFQ fishery not participating in the EM EFP were stratified by sector, gear type, and management area to the finest possible level while maintaining confidentiality (>= 3 vessels) (Table 1). When sample size was adequate (10 hauls or more per strata) and data confidentiality could be met, we further stratified by season and depth. Records were separated into two groundfish management areas, north and south of 40° 10' N. latitude. Each management area was divided into three depth strata (0-125, 126-250, >250 fathoms). The depth strata used in the present analysis highlight the areas shoreward and seaward of RCA closures relevant in the fishery management framework and provide consistency when evaluating discard or bycatch over time, as depth-based spatial closures

change. The fishery was further stratified into two seasonal strata: winter (November-April) and summer (May-October), reflecting seasonal changes in RCA boundaries, fishing effort, and target species (e.g. winter petrale sole). Lastly, observations from tows made by IFQ vessels participating in the LE California halibut fishery were combined with all other observations of bottom trawl gear due to low sample size and confidentiality guidelines.

In 2011, an observer coverage rate of 100% of trips was mandated. However, on rare occasions (e.g., observer illness), tows or sets are unsampled. In some cases, tows or sets may have some portion of unsampled discarded catch recorded in very broad or mixed categories (Table A-2). We used ratio estimators to apportion any unsampled discard weight to specific species within each stratum, based on what was observed in the sampled catch in the stratum. Values used to calculate the expanded discard weight of groundfish species from each WCGOP unsampled catch category in the 2015 IFQ fishery are presented in Tables 2a and 2b. Discard ratios and expansion factors are presented by area, gear type, season and depth. Only strata with unsampled discard weight are shown.

To obtain the estimated discard weight of a species (W) when the entire haul or set was unsampled, the unsampled discard weight, summed within the stratum, was multiplied by the ratio of the discard weight of the species (summed across sampled hauls within a stratum) divided by the total discard weight of all species in all sampled hauls within a stratum:

$$W = \sum_{p} x_p \times \frac{\sum_f w_f}{\sum_f x_f}$$

where, for each stratum:
W = estimated unsampled discard weight of a given species in a stratum
p = unsampled haul
x = total weight of discarded catch of all species
f = sampled haul
w = sampled discard weight of a given species

In hauls with unsampled catch categories, unsampled discard weight was recorded as non-IFQ species (NIFQ) or IFQ species. Unsampled IFQ species weight could be further categorized into IFQ flatfish (IFQFF), IFQ rockfish (IFQRF), IFQ roundfish (IFQRD) and IFQ mixed species (IFQM) (Table A-2). IFQM included all 2015 IFQ managed species (see Tables A-1, A-2 or 78 FR 579 for a listing of IFQ species in 2015). NIFQ included all fish species encountered that were not designated as an IFQ species in 2015 management. Observers are instructed that IFQ hauls or sets in which they record unsampled categories cannot also contain sampled species that are within the unsampled category to avoid double counting. Rarely, observers are unable to sort discard by IFQ status, resulting in an unsampled discarded catch that contains both IFQ and non-IFQ species (ZMIS). Even less often, entire hauls, including species that would have normally been retained, are discarded at-sea either because of errors (e.g., net rips before landed) or operational considerations (e.g., deliberate release of catch from net before landing because of safety or other concerns). In these instances, the observer records a visual estimate as unsorted catch (UNST), included both discarded and retained species. Very infrequently, haul data fail quality control measures. In these cases, all observer recorded data for the entire trip was ignored and discards were estimated based on known retained values from fish tickets.

To obtain the estimated discard weight of a species (W) in strata that include unsampled categories, the unsampled discard weight, summed within the stratum, was multiplied by the ratio of the sampled discard weight of the species (summed within a stratum) divided by the sampled weight of all species that are included within an unsampled

category (NIFQ, IFQFF, IFQRF, IFQRD, IFQM, ZMIS) within a stratum. When entire hauls, including species that are typically retained, were unsampled (UNST), the same formula was applied, but included both discarded and retained weight for all species. Failed data (FAIL) occurs when errors occurred consistently throughout an observer's sampling of a haul or trip. It is estimated using the ratio of discarded to retained for each species, multiplied by the known retained weight from fish tickets to estimate the discarded catch at the trip level. Estimated discard weight of the species was calculated and summed across unsampled categories:

$$W = \sum_{y} \left(\sum_{p} x_{p,y} \times \frac{\sum_{f} w_{f,y}}{\sum_{f} x_{f,y}} \right)$$

where, for each stratum:
W = estimated unsampled discard weight of a given species within a stratum
y = unsampled catch category (either NIFQ, IFQFF, IFQRF, IFQRD, IFQM, ZMIS, UNST, or FAIL)
p = unsampled catch
x = catch weight
f = sampled catch
w = sampled discard weight of a given species

Expanded discard weights of a particular species obtained using the equations above for unsampled hauls or partially unsampled hauls (those containing both sampled and unsampled catch categories) were then added to the sampled discard weight of that species (from sampled catch) within each stratum to obtain the total species-specific discard weight per stratum (Tables 2a, 2b).

The 2015 midwater hake and rockfish fisheries which deliver to shore-based processors were observed by WCGOP under the IFQ fishery and discard was estimated in the same manner as described above. Prior to 2011, this fishery was conducted under an EFP. It continues to operate as a "maximum retention" fishery, where minor amounts of operational discard at-sea are permissible provided the observer accounts for the discard weight. Prior to 2015, this fishery was defined based on the species targeted by the captain and recorded in the logbook and observer notes and divided into the IFQ non-hake midwater trawl and the shoreside hake sector. With new regulations (50 CFR 660, 80 FR 239), this fishery is now defined and managed based on percentage of hake landings for each vessel per landing day, so that the fishery now consists of the shoreside midwater hake (landing >=50% hake) and the shoreside midwater rockfish sectors (landing < 50% hake).

Electronically Monitored Shore-Based IFQ Sectors

For those IFQ vessels participating in the IFQ EM EFP fishery, discard rules and observer requirements varied by gear. EM systems use video recordings to estimate weights of certain IFQ species (see Table 2d) that are allowed to be discarded at sea. In 2015, the first year of this EFP, both WCGOP and fishing crews worked to implement and improve procedures for sorting catch into (1) at-sea discard, (2) retained and expected to be landed for revenue, and (3) retained but expected to be discarded shoreside.

Vessels fishing using pot or bottom trawl gear followed guidelines for optimized retention and could discard small amounts; on those vessels, observer coverage was targeted at 25 to 30% of landings. For non-IFQ species, total at-sea discard estimates were calculated in the same manner described below for non-catch shares fisheries, but the discard rates were calculated from the 100% observed portion of the catch shares fleet. Specifically, a ratio estimator of observed discard rates from the non-EM fleet was applied to the total amount of groundfish retained by the EM fleet, with rates and total landings stratified by gear (pot or bottom trawl) and by area where possible while

maintaining confidentiality (Table 2c). Discard rates from the 100% observed fleet provided the best estimates of discard rates for two main reasons. First, the current EM fleet is relatively small compared to the 100% observed fleet, especially for vessels fishing using bottom trawl. Second, fishing crews and observers were initially unclear about how to sort and sample catch that was landed but expected to be 'discarded' shoreside. A small amount of double-counting could occur if observers in the 100% observed fishery already recorded some discard portions as at-sea discard of species, but then subsequently that portions were "discarded" shoreside and recorded as such in fish tickets in the EM fleet. Due to variation in sorting and recording requirements, there is no way to assess the magnitude of this overlap. For similar reasons, EM logbook data was used as the most accurate record of at-sea IFQ species discard (Table 2d). Throughout the season, confidence increased and sampling methods were refined, so that in 2016, observer data from the EM fleet itself will provide an increased level of detail in identified species and groupings and allow for the use of the same estimation methods across all species.

The midwater sectors required maximized retention, so no observer coverage was required on any trips where EM systems were in place (Table 2e). Instead, the small amount of at-sea discard of IFQ species recorded by EM logbooks was provided by PSMFC and included in the report.

As with all other sectors, fleetwide landing data for the EM sector was acquired from PacFIN fish tickets. Data from observer records and from the EM systems via PSMFC enabled the identification of all fish tickets associated with EM trips.

Mortality Summary for Shore-Based IFQ Sectors

Coast-wide landings, estimated discard weight from 100% observer coverage and EM data, and estimated fishing mortality in the 2015 shore-based non-hake IFQ sectors are reported in Table 3a. All mortality rates applied in these sectors are reported in Table A-3. We apply a 50% mortality rate to discarded sablefish and lingcod weight caught by IFQ bottom trawl and LE California halibut trawl sectors. These rates are assumptions made by the Groundfish Mortality Team (GMT) and carried over from management under the pre-IFQ LE groundfish bottom trawl sector (before 2011). We apply a 20% mortality rate to discarded sablefish caught by IFQ longline and pot gear. This rate is an assumption by the GMT, previously used in non-nearshore groundfish fixed gear sectors. We apply a 7% mortality rate to discarded lingcod caught by IFQ hook-and-line gear, previously used in nearshore groundfish fixed gear sectors. We also apply SSC recommended discard mortality rate assumptions (previously made for stock assessment purposes) for longnose skate (bottom trawl = 50%, fixed gear = 50%) and spiny dogfish (hook-and-line fixed gear = 50%) (PFMC 2012), as well as for big skate (bottom trawl= 50%) (PFMC 2015a, 2015b).

The total estimated weight, comprised of the sampled and expanded discard weight and the landed weight, is reported by species for the shoreside midwater hake sector in Table 3a and for the shoreside midwater rockfish sector in Table 3b. No discard mortality rates are applied for midwater trawl sectors.

At-Sea Hake Co-op Sectors

The midwater trawl fishery for hake is comprised of three at-sea processing fleets: catcher-processors, motherships with catcher vessels, and a tribal catcher vessel fleet delivering to motherships. The A-SHOP produces estimates of total catch (discarded and retained) in the at-sea hake fishery. Observers sample unsorted catch and provide a visual estimate of the proportion retained, at the species level. Discarded catch weight is calculated on a haul basis for the total weight of all species. The discard weight estimate, along with the proportion retained, form the basis for the two at-sea hake sectors summarized in Table 3b. In 2015, the tribal fleet did not make any at-sea landings; shore-based tribal landings are presented in Table 15. Coast-wide landings, sampled discard weight, estimated discard weight, and estimated fishing mortality in all 2015 hake IFQ/Co-op Program sectors (shore-based and at-sea) are reported in Table 3b.

California Halibut Bottom Trawl Fishery

For a description of the California halibut bottom trawl fishery, vessel selection, observer coverage, vessel waivers, and prior California halibut bottom trawl reports, see: http://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_products/halibut_trawl.cfm

Fleet-wide discard estimates in the California halibut bottom trawl fishery were derived from WCGOP observer data and fish ticket landings data. All California halibut vessels are permitted by the state of California. However, limited entry (LE) California halibut vessels also have a federal limited entry groundfish permit, whereas open access (OA) vessels do not. In 2015, no fishing effort occurred in the LE California halibut fishery. The WCGOP randomly samples the OA California halibut fishery following non-catch shares sampling priorities, protocols, and selection design.

Discard ratios for the OA California halibut fishery were calculated by dividing the observed discard weight of each species or complex by the observed retained weight of California halibut. The fleet-wide landed weight of California halibut was then used as a multiplier to expand observed discard ratios to the fleet-wide level (Table 4). Fleet-wide landings were compiled from OA trawl fish tickets (see Figure 1) for those vessels that had a state-issued California halibut bottom trawl permit.

The discard estimate for each species was computed based on the following equation:

$$D = \frac{\sum_t d_t}{\sum_t r_t} \times F$$

where:

D: discard estimate for a given species
t: observed tows
d: observed discard weight for a given species
r: observed retained weight of California halibut
F: weight of retained California halibut recorded on fish tickets for the fleet (expansion factor)

Table 4 presents estimated fishing mortalities of groundfish species caught in the 2015 OA California halibut trawl fishery. All mortality rates applied in this sector are reported in Table A-3. A 50% mortality rate was applied for discarded lingcod and sablefish, which are assumptions made by the GMT and carried over from management under the pre-IFQ LE groundfish bottom trawl sector (before 2011). We also applied an SSC recommended discard mortality rate assumption (previously made for stock assessment purposes) of 50% for longnose skate (PFMC 2012) and a 50% mortality rate to big skate discard in the California halibut fisheries (PFMC 2015a, 2015b).

Pink Shrimp Trawl Fishery

Fleet-wide discard estimates for the pink shrimp trawl fishery were derived from WCGOP observer data and fish ticket landings data (Figure 1). For a description of the pink shrimp trawl fishery, vessel selection, observer coverage, vessel waivers, and prior pink shrimp trawl reports, see: http://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_products/shrimp_trawl.cfm .

Discard ratios for each state pink shrimp fishery were calculated by dividing the observed discard weight of each species or complex by the observed retained weight of pink shrimp (Table 5). The fleet landed weight of pink

shrimp was used as a multiplier to expand observed discard ratios to the fleet. Table 5 presents landings, final discard estimates, and total fishing mortality in the 2015 individual state pink shrimp trawl fisheries.

The discard estimate for each species in each state was computed based on the same equation as described above for the OA California halibut fishery, but utilizing pink shrimp as the retained weight for both discard rates and expansion factors.

In reporting of data prior to 2011, pink shrimp fish tickets in the area north of 40°10' N. latitude were compiled for a single discard expansion factor, and south of 40°10' N. latitude landings were summarized as part of the remaining incidental fisheries. Previously, observer data from all state pink shrimp fleets in the north were combined to calculate discard rates. However, WCGOP coverage of the Washington pink shrimp fleet began in 2010 and coverage of all state fisheries from 2011 forward were sufficient to further stratify the analysis by state.

Non-Nearshore Fixed Gear Sector

Fleet-wide discard estimates for the LE and OA non-nearshore fixed gear sector of the groundfish fishery were derived from WCGOP observer data and fish ticket landings data. For a description of the fixed gear sectors, vessel selection, observer coverage, vessel waivers, and prior fixed gear sector reports, see: http://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_products/fixed_gear.cfm

Fish tickets for fixed gear that did not have recorded sablefish or nearshore species were included in the non-nearshore fixed gear sector only if groundfish landings were greater than non-groundfish landings based on a unique vessel and landing date (Figure 1). Fixed gear fish tickets where non-groundfish landings were greater than groundfish landings and sablefish or nearshore species were not recorded were summarized as incidental landings (Table 14). Fixed gear fish tickets with non-groundfish landings greater than groundfish landings but also containing sablefish or nearshore species were classified as non-nearshore fixed gear or nearshore fixed gear sector, respectively. The commercial fixed gear fish tickets with recorded nearshore species weight were not used in this portion of the analysis, regardless of whether they included recorded weights for sablefish. These fish tickets were instead included in the nearshore fixed gear groundfish sector (see next section). Fish tickets associated with the Pacific halibut directed commercial fishery were isolated and removed from our analyses based on landed catch of Pacific halibut recorded on the fish ticket on the day of the opening or within two subsequent days. Fish tickets generated from fixed gear fishing under the IFQ fishery were also excluded.

Fish tickets were partitioned into three commercial fixed gear subsectors: LE sablefish endorsed primary season, LE non-sablefish endorsed, and OA fixed gear groundfish. Commercial fixed gear fish tickets were first divided out by whether the vessel had a federal groundfish permit (LE) or no federal groundfish permit (OA). Open access fish tickets were placed in the OA fixed gear groundfish subsector. Next, LE fish tickets were separated based on whether the vessel's federal groundfish permit(s) had a sablefish endorsement with tier quota for the primary season or whether it was not endorsed (also referred to as '0' tier permits). Fish tickets for all LE vessels with tier sablefish endorsements operating during the sablefish primary season (April – October) and within their allotted tier quota were placed in the LE sablefish endorsed primary subsector. If LE sablefish-endorsed vessels fished outside of the primary season (November-March) or made trips within the season after they had reached their cumulative tier quota, the fish tickets were placed in the LE non-sablefish endorsed subsector. Fish tickets from non-sablefish endorsed LE vessels were also placed in this subsector.

Data used in these analyses were collected by WCGOP from the following fixed gear subsectors in order of priority: LE sablefish endorsed primary season fixed gear, LE '0' tier (non-endorsed), and OA fixed gear (non-nearshore). LE sablefish endorsed vessels that were fishing outside of the primary season or that had reached their cumulative tier

quota in the primary season were not observed. However, observed LE '0' tier discard rates were used to expand these landings, as these are the best available discard rates for these sectors.

Observer data were stratified by subsector, gear type, and area (where applicable) (Tables 6-8). Area strata (north and south of 36° N. latitude) are based on PFMC area management for sablefish trip limits. Gear type was defined as longline gear or pot/trap gear. If landings were made by a fixed gear subsector for which there were no or very few WCGOP observations, the most appropriate observed discard ratios were selected and applied to these landings based on similarities in the fishery management structure, fishing and discard behavior, and the gear fished. For example, the LE non-sablefish endorsed fixed gear subsector landed 3 mt of groundfish with pot gear in 2015 (Table 7). Given similarities in gear type and catch composition, OA fixed gear pot data were selected as the most appropriate source of information to compute a discard ratio, which was then multiplied by the LE non-sablefish endorsed fixed gear pot landings to generate estimated discard.

Explicit depth stratification of fixed gear fishing effort is not possible because there are no fleet-wide estimates of fishing depths. However, management restricted most fixed gear fishing to depths greater than 100 fathoms in the area north of 40° 10' N. latitude and to depths greater than 150 fathoms in the area south of 40° 10' N. latitude.

The number of observed vessels, trips, and sets are summarized for each subsector in Tables 6-8, along with sablefish and FMP groundfish fleet landings (excluding Pacific hake) used as a measure for expanding discard from observed trips to the entire fleet (expansion factor). Retained groundfish was used as the denominator rather than sablefish weight alone because some subsectors and, in general, fixed gear fisheries south of 36° N. latitude have a wider range of target species. A broader denominator was therefore necessary to effectively capture fishing effort in these calculations. Stratum estimated discard weight for all subsectors were then summed for each area and summed coast-wide.

Coast-wide landings, final discard estimates, and estimated fishing mortality are reported in Table 9 for 2015 LE and OA non-nearshore groundfish fixed gear. All mortality rates applied in this sector are reported in Table A-3. A 20% mortality rate is applied for discarded sablefish, as assumed by the GMT. We also applied SSC recommended discard mortality rate assumptions (previously made for stock assessment purposes) for longnose skate (50%) and spiny dogfish (50%) (PFMC 2012).

Nearshore Fixed Gear Sector

Fleet-wide discard estimates for the commercial nearshore fixed gear sector of the groundfish fishery were derived from WCGOP observer data, fish ticket landings data (Figure 1), and mortality rates provided by the GMT (Table A-4). For a description of the nearshore fixed gear sector, vessel selection, observer coverage, vessel waivers, and prior nearshore fixed gear sector reports, see:
http://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_products/nearshore_gear.cfm

The WCGOP selects commercial nearshore vessels in California and Oregon for observer coverage based on state-issued nearshore permits or licenses. Although California and Oregon nearshore fisheries are sampled separately for observer coverage, fleet-wide discard estimates are provided for the areas north and south of the groundfish management line at 40° 10' N. latitude, in accordance with 2015 federal groundfish management specifications.

For species without swim bladders, we applied a discard mortality rate of 7% for all species (Albin and Karpov 1996). Additional mortality rates provided by the GMT differ for some species according to depth. In December 2013, the GMT provided revised depth-specific discard survival assumptions for some nearshore species, which was updated in June 2016 (Table A-4). It was therefore necessary to generate discard estimates in each of the three depth

intervals employed by the GMT (0-10, 11-20, > 20 fathoms). The percentage of catch for each species or complex by depth was calculated based on summarized observer data from 2003-2015 (Table 10). Using data from all previously observed years ensures that data is comparable across years and that proportions are available for all species landed in a given year. Fleet landings of each nearshore species or complex in 2015 were then distributed among depth intervals using the percentages computed in the previous step. Finally, the total distributed landed weight of all nearshore groundfish species within each depth stratum was used to expand observed discard to the fleet-wide level (expansion factor).

Prior to the calculation of discard ratios in this sector, WCGOP observer data were stratified by area and depth (Table 11). Discard ratios were calculated by dividing the stratum discard weight of each species or complex by the retained weight of nearshore species. Observed discard ratios were multiplied by the allocated landed weight of all nearshore groundfish species within each depth stratum (Table 11). These fleet-wide level estimates of gross discard within each stratum were then multiplied by depth-specific discard mortality rates (provided by the GMT) to generate estimates of discard mortality in each stratum (Tables 12a, 12b). If provided, a species-specific discard mortality rate was applied in preference to a complex or group rate. Final discard estimates for each area were obtained by summing estimates of discard mortality across depth strata. Gross discard estimates, discard mortality rates, estimated discard mortality, and fishing mortality estimates in the 2015 nearshore fixed gear sectors north and south of 40° 10' N. latitude are reported in Tables 12a and 12b.

Estimated total fishing mortality in observed non-IFQ groundfish fisheries by sector is shown in Table 13.

Other Commercial Data Summaries

Landings of groundfish species from the WA tribal shore-based fisheries are summarized in Table 15. The WA tribal summary is based exclusively on fish ticket data. Discard estimates for WA tribal shore-based fisheries were not available. Tribal directed groundfish fisheries employ full retention requirements. In addition, both the Makah bottom trawl and midwater, targeting yellowtail, trawl sectors are monitored at a target tribal observation rate of 15%. In tribal management, discard mortality of fixed gear sablefish is accounted for by the PFMC reducing the tribal allocation. For more information on discard and retention in tribal sablefish fisheries and Makah trawl observations, see Appendix B of the 2011-2012 groundfish harvest specifications (PFMC and NMFS 2012).

Groundfish species catch from the recreational fisheries and research catch are also summarized in Table 15. Recreational fisheries are reported by state, and all gear groups are combined for both recreational and research data.

Landings of groundfish species from other non-groundfish fisheries operating under federal open access landing limits, which are mostly state-managed and incidentally caught groundfish and a small number of EFPs outside of the EM program, are also summarized in Table 15 as 'Incidental fisheries'. A more detailed breakdown of incidental landings by PacFIN gear group is provided in Table 14. Catch summaries of incidental fisheries are based exclusively on fish ticket data and therefore do not include any estimates of discards at-sea.

Bycatch estimation and summaries for several additional fish species observed by the WCGOP and A-SHOP are available in separate reports: Pacific halibut (Jannot et al. 2016), salmon species (Somers et al. 2015), green sturgeon (Lee et al. 2015) and Pacific eulachon (Gustafson et al. 2015). Observed catch of protected fish species for 2015 is available on the WCGOP website (https://www.nwfsc.noaa.gov/research/divisions/fram/observation/data_products/protected_species.cfm).

Cumulative Mortality Estimation Methods

We calculated the cumulative mortality for each species in a sector as the sum of the total discard mortality (with mortality rate applied) and retained weight (100% mortality). To calculate the cumulative mortality across all sectors, we summed the estimated discard mortality and retained weight from all observed sectors, the retained weight from unobserved incidental fisheries (as described above), and the mortality estimates (with mortality rates applied) from research and recreation catch.

Results

Fishing mortality estimates for all groundfish combined were lower in 2015 relative to 2014 in the IFQ bottom trawl, at-sea hake, shoreside tribal, and California recreational fisheries (Somers et al. 2015). The IFQ fixed gear, non-nearshore fixed gear, nearshore fixed gear, California halibut, pink shrimp, incidental, and Washington and Oregon recreational fisheries all showed an increase in total groundfish mortality relative to 2014 levels. We did not compare the midwater fisheries due to changes in sector definitions from 2014 to 2015.

The shore-based, non-hake IFQ bottom trawl fishery in 2015 showed the lowest numbers of vessels, trips, and tows since trawl rationalization in 2011 (Table 1; Somers et al. 2016). Only 0.2% of tows/sets in 2015 were unsampled by observers (e.g., rare occasions such as observer illness), although 100% of trips were observed (Table 1; Somers et al. 2016). The EM portion of the bottom trawl fleet comprised 5 vessels landing 3% of total groundfish by the fleet, and 33% of those groundfish landings were observed (Table 2c; Somers et al. 2016).

The midwater rockfish fishery, defined based on landing less than 50% hake by a pelagic trawl vessel on a given day, is very similar but not directly comparable to the IFQ non-hake midwater trawl fleet of 2011-2014. In general, the midwater rockfish fishery has increased annually since 2011 and the groundfish non-hake landings in that fleet in 2014 are half of the landings made by the midwater rockfish fishery in 2015 (Tables 2e and 3a; Somers et al. 2016). Specifically, the 100% observed portion of the fleet landed 100 mt of groundfish more than in 2014, and the EM portion of the fleet landed an additional 800 mt of groundfish (Somers et al. 2016).

The midwater hake fishery, defined based on landing 50 percent or more hake by a vessel on a given day, is somewhat comparable to the shoreside hake fleet of 2011-2014. Hake landings by the midwater hake fishery in 2015, however, were only 60% of those made by shoreside hake fleet in 2014 (Somers et al. 2016). 80% of the fleet used EM systems for monitoring, while the rest used 100% observer coverage (Tables 2e and 3b; Somers et al. 2016).

Half of groundfish landings made by pot gear in the IFQ sector came from boats using EM systems, while the other half had 100% observer coverage (Tables 2d, 3a; Somers et al. 2016). Groundfish landings by all pot gear in the IFQ sector increased in 2015, with the second-highest annual total since the beginning of the IFQ program in 2011 (Somers et al. 2016). Longline gear in the IFQ sector did not use any EM systems, but increased in landings for the first time since the implementation of the IFQ program (Somers et al. 2016). No hauls or landings in the IFQ fixed gear fleet observed at 100% were unsampled (Somers et al. 2016).

Landings in the at-sea hake fishery for the catcher processor and mothership sectors decreased by 66% and 45%, respectively, from 2014 to 2015 (Somers et al. 2016). With 100% observer coverage in the at-sea fleet, nearly all hauls were sampled for species composition: only 0.3% of catcher processor tows and 1% of mothership tows were not; in both sectors, 100% of catch was sampled (Somers et al. 2016).

Two elements which affect WCGOP fleet-wide discard estimates are the discard ratio and the expansion factor used to generate the fleet-wide estimates. Changes in expansion factors are tracked by reviewing the fleet-wide landing trends in each observed fishery. In state fisheries which are observed for incidental groundfish interactions, landings increased by 13% in the OA California halibut trawl fishery compared to 2014 (Table 4). Thus the expansion factor for discard estimation was higher in 2015 compared to 2014. Fleet-wide landings in the Washington pink shrimp fishery increased by more than a third in 2015 compared to 2014, while landings in the Oregon remained cosntant and California pink shrimp landings decreased by 10% (Table 5). Relative to 2014 landings, the longline sector of the limited entry non-nearshore fixed gear fishery increased by about 20% in 2015, while the pot portion of the sector remained nearly the same (Table 6). OA and LE, non-endorsed non-nearshore fixed gear landings continued to increase in all gears and area stratifications (Tables 7, 8a, 8b). Nearshore fixed gear landings increased by more than 20% from 2014 to 2015 coastwide, with a greater increase in California; this results in higher expansions factors for north and south of 40º10' N. latitude relative to 2014 (Table 11).

Fishing mortality estimates are evaluated in terms of 2015 ACL, ABC, and OFL harvest specifications from federal groundfish regulations (50 CFR 660 Subpart C, 80 FR 212). Of the eight PFMC-defined rebuilding or rebuilt groundfish species, five increased in ACL percentage from 2014 to 2015: Pacific ocean perch north of 40°10' N. latitude (2%), petrale sole (3%), bocaccio rockfish south of 40°10' N. latitude (5%), yelloweye rockfish (14%), and canary rockfish (54%) (Figure 2). The estimated fishing mortality of none of the groundfish species or complexes exceeded 2015 ACL, ABC, or OFL harvest goals (Table 16). Twenty-nine of the groundfish species or complexes (69%) had fishing mortality estimates which were less than 50% of 2015 ACL harvest goals (Table 16). The estimated fishing mortality of five groundfish species/complexes were 90% or greater of their ACLs: black rockfish, south of 46°16' N. latitude (91%); canary rockfish (92%); minor nearshore rockfish, north of 40°10' N. latitude (93%); petrale sole (95%); and sablefish, north of 36° N. latitude (98%).

In 2014, the estimated fishing mortality of California scorpionfish south of 34°27' N. latitude exceeded OFL harvest goals by 3%; in 2015, estimated fishing mortality was only 74% of the ACL goal (Table 16). This was primarily due to a decrease of 40 mt fishing mortality from 2014 to 2015 in the California recreational fishery (Table 15).

By estimated mortality weight sablefish north of 36° N. latitude (850 mt) and sablefish coastwide (773 mt) showed the greatest increases between 2014 and 2015. Sablefish mortality north of 36° N. latitude also increased from 2013 to 2014, and this trend likely reflects an increasing ACL. Pacific hake (109,260 mt) showed the greatest decrease, and this mortality comprised only 41% of the U.S. total allowable catch (TAC).

Relativized by 2014 catch, canary rockfish (146%) and Pacific cod (76%) showed the greatest proportional increases in estimated fishing mortality between 2014 and 2015, reflecting large increases in catch. In 2015, two groupings decreased to half or less of the total mortality estimated for 2014: splitnose rockfish south of 40°10' N. latitude and longspine thornyhead south of 34°27' N. latitude.

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Figures

Figure 1. PacFIN Fish Ticket Data Processing.

Fish ticket data processing for division into groundfish fishery sectors after retrieval of a full calendar year data set from the Pacific Coast Fisheries Information Network (PacFIN) database (query date 05-27-2015). Grey highlight indicates sectors for which federal observer data are available.

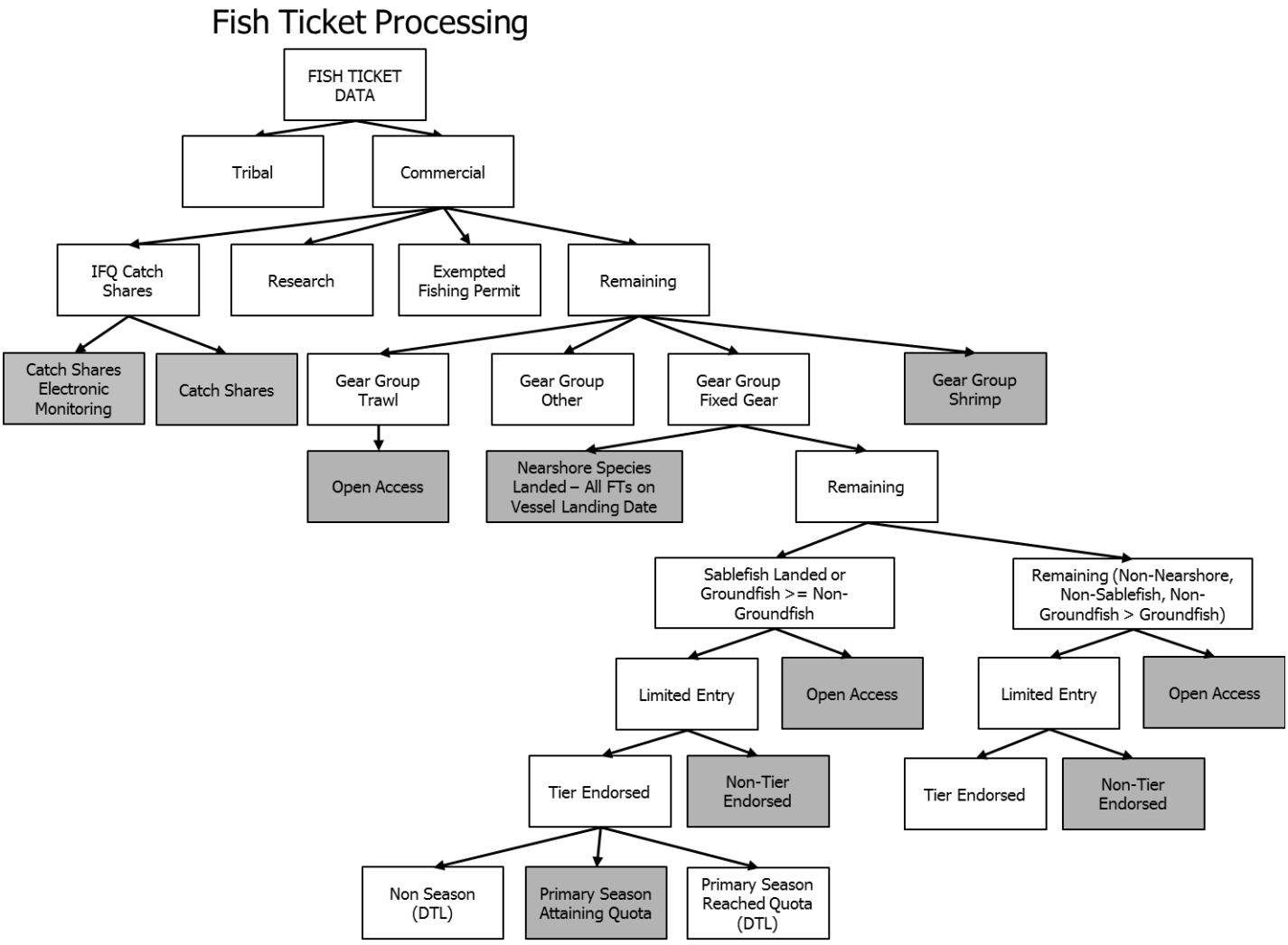
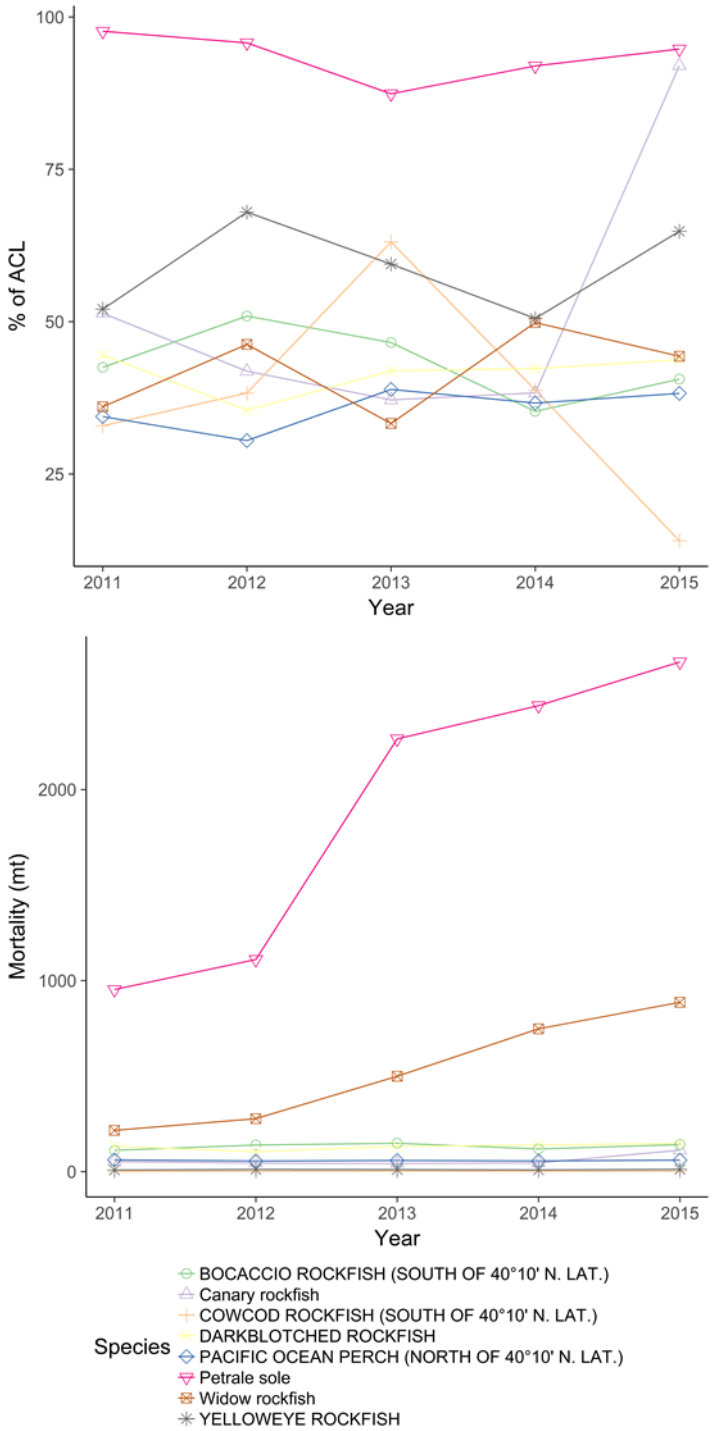


Figure 2. Mortality and ACL percentages 2011-2015 for rebuilding and rebuilt species.

Estimated mortality and percentage of ACL for the eight PFMC-defined rebuilding (in capitals) or rebuilt groundfish species. Bocaccio rockfish, canary rockfish, Pacific ocean perch, petrale sole, and yelloweye rockfish increased in ACL percentage from 2014 to 2015.



Tables

Note: In all tables, (--) was used when there is no actual numeric value (i.e. the species was neither caught nor discarded). Values appear as 0.0 when a value exists but is smaller than the decimal places allotted. A value of NA represents that the calculation is not applicable for a particular species or strata, or that the calculation did not produce a result (e.g. very small values might result in NA from a standard error calculation). Also note that all rebuilding species are capitalized.

Table 1. IFQ Fishery Data Stratification.

Number of vessels, trips and hauls from WCGOP observer data for the 2015 non-EM IFQ fishery by gear, latitudinal management area, season and depth (fm). Data are combined as needed to ensure confidentiality requirements and a reasonable number of observations. Winter season is January-April and November-December and summer season is May-October. This does NOT include observed EM Catch Shares trips, as those trips are observed following non-catch shares protocol. Note that "unsampled hauls" are only those with unsampled categories of "All discarded species", "All species", or "Failed data".

							No. of hauls with unsampled categories									
			Depth (fm)	No. of vessels	No. of trips	No. of sampled hauls	IFQ flatfish	IFQ rockfish	IFQ roundfish	IFQ mixed	Non-IFQ species	All discarded species	All species (incl. those typically retained)	Failed data	No. unsampled hauls	% of hauls sampled
Trawl - Bottom	North of 40°10' N	Winter	0-125	11	44	311	--	--	--	1	14	--	--	--	--	100.0%
			126-250	43	344	1287	--	--	--	5	36	--	3	--	3	99.8%
			> 250	42	337	1654	--	--	--	--	36	1	--	--	1	99.9%
		Summer	0-125	14	207	1978	--	--	--	17	48	5	--	--	5	99.7%
			126-250	23	109	404	--	--	--	--	10	1	--	--	1	99.8%
			> 250	25	113	475	--	--	--	--	12	--	--	--	--	100.0%
	South of 40°10' N	Winter	0-125	4	21	108	--	--	--	--	7	--	1	--	1	99.1%
			126-250	9	40	114	--	--	--	--	1	--	1	--	1	99.1%
			> 250	10	58	225	--	--	--	--	5	1	--	--	1	99.6%
		Summer	0-125	7	68	369	--	--	--	--	1	--	--	--	--	100.0%
			126-250	6	53	183	--	--	--	--	--	--	--	--	--	100.0%
			> 250	7	71	316	--	--	--	--	--	--	--	--	--	100.0%
Trawl - Midwater Hake	North of 40°10' N	Summer	0-125	5	50	94	--	--	--	--	2	--	--	--	--	100.0%
			126-250	5	93	188	--	--	--	--	1	--	--	--	--	100.0%
Trawl - Midwater Rockfish	North of 40°10' N	Winter	All depths	5	35	115	--	--	--	--	1	--	--	--	--	100.0%
		Summer	All depths	4	8	25	--	--	--	--	--	--	--	--	--	100.0%
Hook-and-Line	Coastwide	Annual	All depths	5	16	179	--	--	--	--	--	--	--	--	--	100.0%
Pot	North of 40°10' N	Annual	All depths	6	39	355	--	--	--	--	--	--	--	--	--	100.0%
	South of 40°10' N	Annual	All depths	3	18	219	--	--	--	--	--	--	--	--	--	100.0%

Table 2a. IFQ Discard Ratios, Bottom Trawl, North of 40°10' N.

Values used to calculate the expanded weight of groundfish species from each WCGOP unsampled catch category in the 2015 observed IFQ fishery using bottom trawl gear north of 40°10' N latitude. Expansion factors for each season and depth strata are shown in the top row. Discard ratios for each species are presented by season and depth strata in the rest of the table. Winter season is January-April and November-December and summer season is May-October. Only strata with unsampled discard weight are shown. Unsampled catch weight is assigned to the following categories: IFQ flatfish species (IFQFF), IFQ rockfish species (IFQRF) IFQ roundfish species (IFQRD), IFQ mixed species (IFQM), non-IFQ species (NIFQ), all discarded species (IFQ & non-IFQ), all species (IFQ & non-IFQ), and all failed data. See text for a list of species included in each unsampled category. Rebuilding species are capitalized.

	Bottom Trawl (North of 40°10' N Lat.)												
	IFQM			NIFQ						All Discarded Species			All Species
Area (40°10' N. Lat.)	North			North						North			North
Season	Summer	Winter		Summer			Winter			Summer		Winter	Winter
Depth (fm)	0-125	0-125	126-250	0-125	126-250	>250	0-125	126-250	>250	0-125	126-250	>250	126-250
Expansion Factor (mt)	3.5027	0.0113	0.6081	4.0041	0.5752	1.3653	0.3311	2.5914	1.3876	1.7127	0.6260	0.1588	2.3270
Groundfish species													
Arrowtooth Flounder	0.1500	0.0865	0.5423	--	--	--	--	--	--	0.0783	0.3704	0.2853	0.1384
Black rockfish (North of 46°16' N. lat.)	--	--	--	--	--	--	0.0082	--	--	--	--	--	0.0000
Canary Rockfish	0.0001	--	--	--	--	--	--	--	--	0.0001	--	0.0000	0.0000
DARKBLOTCHED ROCKFISH	0.0097	0.0061	0.0004	--	--	--	--	--	--	0.0051	0.0002	0.0001	0.0120
Dover Sole	0.0108	0.0101	0.0058	--	--	--	--	--	--	0.0056	0.0112	0.0036	0.3346
Ecosystem component species													
Alaska Skate	--	--	--	--	0.0004	--	--	--	--	--	0.0001	--	--
Aleutian Skate	--	--	--	--	0.0017	0.0029	--	0.0014	0.0024	--	0.0006	0.0014	0.0001
Big Skate	--	--	--	0.0825	0.0007	0.0008	0.0941	0.0002	0.0002	0.0394	0.0002	0.0001	0.0010
Black Skate	--	--	--	--	0.0013	0.0338	--	0.0020	0.0341	--	0.0004	0.0202	0.0001
California Skate	--	--	--	0.0008	--	0.0012	--	0.0001	0.0000	0.0004	--	0.0000	0.0000
Deepsea Skate	--	--	--	0.0001	0.0015	0.0023	--	0.0000	0.0013	0.0000	0.0005	0.0007	0.0000
Giant Grenadier	--	--	--	--	0.0024	0.1188	--	0.0015	0.0770	--	0.0008	0.0455	0.0001
Grenadier Unid	--	--	--	--	--	0.0032	--	0.0001	0.0019	--	--	0.0011	0.0003
Pacific Electric Ray	--	--	--	0.0032	0.0004	--	0.0027	0.0002	0.0003	0.0015	0.0001	0.0002	0.0000
Pacific Flatnose	--	--	--	--	7.95E-05	0.001306	--	7.88E-05	0.002087	--	2.59E-05	0.001234	0.0000
Pacific Grenadier	--	--	--	--	0.000158	0.044164	--	0.000399	0.051603	--	5.15E-05	0.0305	0.0000
Sandpaper Skate	--	--	--	0.0204	0.0835	0.0276	0.0231	0.0787	0.0360	0.0097	0.0272	0.0213	0.0029
Skate Unid	--	--	--	0.0008	0.0001	0.0009	--	0.0004	0.0000	0.0004	0.0000	0.0000	0.0033
Soupfin Shark	--	--	--	0.0016	--	--	0.0003	0.0019	0.0017	0.0008	--	0.0010	0.0001
Spotted Ratfish	--	--	--	0.1115	0.0941	0.0114	0.1236	0.0385	0.0139	0.0533	0.0306	0.0082	0.0014
Starry Skate	--	--	--	0.0000	0.0002	0.0000	0.0000	--	--	0.0000	0.0001	--	--
White Skate	--	--	--	--	--	--	--	--	0.0001	--	--	0.0000	--
English Sole	0.1341	0.1405	0.0000	--	--	--	--	--	--	0.0700	0.0003	0.0000	0.0032
Lingcod (North of 40°10' N. lat.)	0.0430	0.0569	0.0023	--	--	--	--	--	--	0.0224	0.0025	0.0000	0.0030
Longnose Skate	--	--	--	0.0613	0.2512	0.0712	0.0521	0.0899	0.0495	0.0293	0.0817	0.0293	0.0510
Longspine Thornyhead (North of 34°27' N. lat.)	--	--	0.0049	--	--	--	--	--	--	--	0.0006	0.0160	0.0028
Minor nearshore rockfish (North of 40°10' N. lat.)													
Blue Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	0.0000
Minor shelf rockfish (North of 40°10' N. lat.)													
Bocaccio Rockfish	--	--	0.0001	--	--	--	--	--	--	--	0.0002	--	0.0000
Chilipepper Rockfish	0.0012	0.0089	0.0001	--	--	--	--	--	--	0.0006	0.0000	--	0.0000
Cowcod Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	0.0000
Flag Rockfish	--	--	0.0000	--	--	--	--	--	--	--	--	--	0.0000
Greenspotted Rockfish	0.0000	--	0.0000	--	--	--	--	--	--	0.0000	--	--	0.0000
Greenstriped Rockfish	0.0058	0.0112	0.0000	--	--	--	--	--	--	0.0030	0.0000	--	0.0000
Redstripe Rockfish	0.0001	--	0.0000	--	--	--	--	--	--	0.0001	--	0.0000	0.0000
Rockfish Unid	0.0008	--	--	--	--	--	--	--	--	0.0004	--	--	0.0000
Rosethorn Rockfish	0.0000	--	0.0007	--	--	--	--	--	--	0.0000	0.0001	0.0000	0.0001
Shelf Rockfish Unid	--	--	--	--	--	--	--	--	--	--	--	--	0.0000
Silvergray Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	0.0000
Stripetail Rockfish	0.0182	0.0436	0.0017	--	--	--	--	--	--	0.0095	0.0009	--	0.0001

Table 2a (continued).

	IFQ - Bottom Trawl (North of 40˚10' N Lat.)												
	IFQM			NIFQ						All Discarded Species			All Species
Area (40°10' N. Lat.)	North			North						North			North
Season	Summer	Winter		Summer			Winter			Summer		Winter	Winter
Depth (fm)	0-125	0-125	126-250	0-125	126-250	>250	0-125	126-250	>250	0-125	126-250	>250	126-250
Expansion Factor (mt)	3.5027	0.0113	0.6081	4.0041	0.5752	1.3653	0.3311	2.5914	1.3876	1.7127	0.6260	0.1588	2.3270
Minor slope rockfish (North of 40°10' N. lat.)													
Aurora Rockfish	0.0001	--	0.0071	--	--	--	--	--	--	0.0000	0.0074	0.0015	0.0015
Bank Rockfish	--	--	--	--	--	--	--	--	--	--	--	0.0000	0.0001
Blackgill Rockfish	--	--	0.0000	--	--	--	--	--	--	--	--	0.0000	0.0004
Redbanded Rockfish	0.0000	0.0000	0.0005	--	--	--	--	--	--	0.0000	0.0004	0.0000	0.0004
Rockfish Unid	--	--	0.0003	--	--	--	--	--	--	--	--	--	0.0067
Rougheye/Blackspotted Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	0.0030
Rougheye Rockfish	--	0.0001	0.0000	--	--	--	--	--	--	--	--	0.0000	0.0000
Sharpchin Rockfish	0.0000	--	0.0001	--	--	--	--	--	--	0.0000	0.0000	--	0.0000
Shortraker Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	0.0010
Slope Rockfish Unid	--	--	--	--	--	--	--	--	--	--	--	--	0.0001
Splitnose Rockfish	0.0000	0.0000	0.0474	--	--	--	--	--	--	0.0000	0.0136	0.0013	0.0041
Yellowmouth Rockfish	0.0000	--	--	--	--	--	--	--	--	0.0000	--	--	0.0001
Mixed thornyheads													
Shortspine/Longspine Thornyhead	--	--	0.0001	--	--	--	--	--	--	--	--	0.0011	0.0004
Other flatfish													
Butter Sole	0.0003	0.0003	--	--	--	--	--	--	--	0.0002	--	--	--
Curlfin Turbot	0.0010	0.0017	--	--	--	--	--	--	--	0.0005	--	--	0.0000
Flatfish Unid	--	--	--	--	--	--	--	--	--	--	--	--	0.0000
Flathead Sole	0.0589	0.0210	0.0000	--	--	--	--	--	--	0.0307	--	--	0.0000
Pacific Sanddab	0.2675	0.3103	0.0000	--	--	--	--	--	--	0.1397	0.0000	0.0000	0.0000
Rex Sole	0.0793	0.0969	0.0041	--	--	--	--	--	--	0.0414	0.0078	0.0002	0.0224
Rock Sole	0.0001	0.0004	0.0000	--	--	--	--	--	--	0.0000	--	--	0.0000
Sanddab Unid	0.0001	--	--	--	--	--	--	--	--	0.0001	--	--	--
Sand Sole	0.0003	0.0004	--	--	--	--	--	--	--	0.0002	--	--	0.0000
Other groundfish													
Kelp Greenling (Oregon)	--	--	--	0.0000	--	--	--	--	--	0.0000	--	--	--
Kelp Greenling (Washington)	--	--	--	0.0002	--	--	0.0001	--	--	0.0001	--	--	--
Pacific Cod	0.0011	0.0010	0.0001	--	--	--	--	--	--	0.0005	0.0001	0.0001	0.0002
Pacific Hake	0.1312	0.1002	0.2097	--	--	--	--	--	--	0.0685	0.1995	0.0607	0.0115
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	0.0001	0.0001	0.0004	--	--	--	--	--	--	0.0000	0.0001	0.0000	0.0048
Petrale Sole	0.0170	0.0284	0.0027	--	--	--	--	--	--	0.0089	0.0006	0.0003	0.2783
Roundfish Unid	--	--	--	--	--	--	--	--	0.0000	--	--	0.0000	--
Sablefish (North of 36° N. lat.)	0.0061	0.0070	0.0053	--	--	--	--	--	--	0.0032	0.0005	0.0024	0.0477
Shortbelly Rockfish	--	--	--	0.0000	0.0000	--	0.0002	--	--	0.0000	0.0000	--	0.0000
Shortspine Thornyhead (North of 34°27' N. lat.)	0.0001	0.0001	0.0106	--	--	--	--	--	--	0.0001	0.0073	0.0045	0.0288
Spiny Dogfish Shark	--	--	--	0.1357	0.1949	0.0112	0.2371	0.5303	0.0542	0.0648	0.0634	0.0320	0.0193
Starry Flounder	0.0003	0.0004	0.0000	--	--	--	--	--	--	0.0002	--	--	0.0000
Widow Rockfish	--	--	0.0000	--	--	--	--	--	--	--	--	--	0.0001
YELLOWEYE ROCKFISH	0.0000	--	--	--	--	--	--	--	--	0.0000	--	--	0.0000
Yellowtail Rockfish (North of 40°10' N. lat.)	0.0000	--	--	--	--	--	--	--	--	0.0000	--	--	0.0001
Non-groundfish species													
Dungeness Crab	--	--	--	0.2141	0.0054	--	0.2219	0.0004	--	0.1023	0.0017	--	0.0000
Non-FMP flatfish													
Deepsea Sole	--	--	--	0.0000	0.0019	0.0259	--	0.0013	0.0154	0.0000	0.0006	0.0091	0.0000
Diamond Turbot	--	--	--	0.0000	--	--	--	--	--	0.0000	--	--	--
Slender Sole	--	--	--	0.0721	0.0018	0.0002	0.0264	0.0086	0.0016	0.0345	0.0006	0.0009	0.0003
Other nongroundfish													
Sculpin Unid	--	--	--	0.0018	0.0001	--	0.0013	0.0001	0.0000	0.0008	0.0000	0.0000	0.0000

Table 2b. IFQ Discard Ratios, Bottom Trawl, South of 40°10' N; Pot; Shoreside Hake.

Values used to calculate the expanded weight of groundfish species from each WCGOP unsampled catch category in 2015 observed IFQ fisheries: bottom trawl gear south of 40˚10' N latitude, midwater hake, and midwater rockfish. Expansion factors for each season and depth strata are shown in the top row. Discard ratios for each species are presented by season and depth strata in the rest of the table. Winter season is January-April and November-December and summer season is May-October. Only strata with unsampled discard weight are shown. Unsampled catch weight is assigned to the following categories: IFQ flatfish species (IFQFF), IFQ rockfish species (IFQRF) IFQ roundfish species (IFQRD), IFQ mixed species (IFQM), non-IFQ species (NIFQ), all discarded species (IFQ & non-IFQ), all species (IFQ & non-IFQ), and all failed data. See text for a list of species included in each unsampled category. Rebuilding species are capitalized.

	Bottom Trawl (South of 40˚10' N Lat.)							Midwater Hake		Midwater Rockfish
	NIFQ				All Discarded Species	All Species		NIFQ		NIFQ
Area (40°10' N. Lat.)	South				South	South		North		North
Season	Summer	Winter			Winter	Winter		Summer		Summer
Depth (fm)	0-125	0-125	126-250	>250	>250	0-125	126-250	0-125	126-250	All depths
Expansion Factor (mt)	0.0015	0.2249	0.0454	0.1686	0.0045	12.2471	0.4536	0.0032	0.1134	0.0454
Groundfish species										
Arrowtooth Flounder	--	--	--	--	0.0180	0.0111	0.0210	--	--	--
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	--	--	--	--	--	0.0279	0.0204	--	--	--
Cabezon (California)	--	0.0001	--	--	--	0.0000	--	--	--	--
Canary Rockfish	--	--	--	--	--	0.0027	0.0000	--	--	--
Chilipepper rockfish (South of 40°10' N. lat.)	--	--	--	--	0.0000	0.2841	0.0937	--	--	--
COWCOD ROCKFISH (South of 40°10' N. lat.)	--	--	--	--	--	0.0001	0.0007	--	--	--
DARKBLOTCHED ROCKFISH	--	--	--	--	--	0.0000	0.0068	--	--	--
Dover sole	--	--	--	--	0.2569	0.0031	0.0404	--	--	--
Ecosystem component species										
Aleutian Skate	--	--	--	0.0002	0.0001	--	--	--	--	--
Big Skate	0.0209	0.0114	0.0101	0.0002	0.0001	0.0101	0.0041	--	--	0.0004
Black Skate	0.0001	0.0005	0.0007	0.0402	0.0236	0.0001	0.0001	--	--	--
California Skate	0.0229	0.0045	--	0.0000	0.0000	0.0006	--	--	--	--
Deepsea Skate	--	--	--	0.0065	0.0038	--	--	--	--	--
Giant Grenadier	--	--	0.0001	0.0585	0.0343	--	0.0000	--	--	--
Grenadier Unid	--	--	--	0.0005	0.0003	--	0.0002	--	--	--
Pacific Electric Ray	0.0080	0.0043	0.0178	0.0001	0.0001	0.0004	0.0015	--	--	--
Pacific Flatnose	--	--	--	0.0006	0.0003	--	--	--	--	--
Pacific Grenadier	--	--	0.0003	0.0335	0.0197	--	0.0000	--	--	--
Sandpaper Skate	0.0069	0.0186	0.0431	0.0067	0.0039	0.0019	0.0039	--	--	--
Skate Unid	--	--	--	--	--	0.0181	0.0076	--	--	0.0008
Soupfin Shark	0.0013	--	0.0014	--	--	0.0010	0.0001	--	--	0.0005
Spotted Ratfish	0.2686	0.1119	0.2905	0.0138	0.0081	0.0120	0.0238	--	--	--
Starry Skate	0.0001	--	--	--	--	--	--	--	--	--

Table 2b (continued).

	Bottom Trawl (South of 40˚10' N Lat.)							Midwater Hake		Midwater Rockfish
	NIFQ				All Discarded Species	All Species		NIFQ		NIFQ
Area (40°10' N. Lat.)	South				South	South		North		North
Season	Summer	Winter			Winter	Winter		Summer		Summer
Depth (fm)	0-125	0-125	126-250	>250	>250	0-125	126-250	0-125	126-250	All depths
Expansion Factor (mt)	0.0015	0.2249	0.0454	0.1686	0.0045	12.2471	0.4536	0.0032	0.1134	0.0454
English sole	--	--	--	--	0.0002	0.1294	0.0251	--	--	--
Lingcod (South of 40°10' N. lat.)	--	--	--	--	0.0002	0.0165	0.0398	--	--	--
Longnose skate	0.2300	0.2918	0.2281	0.0792	0.0465	0.0793	0.0462	--	--	--
Longspine Thornyhead (North of 34°27' N. lat.)	--	--	--	--	0.0802	0.0001	0.0030	--	--	--
Minor nearshore rockfish (South of 40°10' N. lat.)										
Brown Rockfish	0.0000	--	--	--	--	--	--	--	--	--
Minor shelf rockfish (South of 40°10' N. lat.)										
Bronzespotted Rockfish	--	--	--	--	--	--	0.0000	--	--	--
Greenblotched Rockfish	--	--	--	--	--	--	0.0000	--	--	--
Greenspotted Rockfish	--	--	--	--	--	0.0002	0.0001	--	--	--
Greenstriped Rockfish	--	--	--	--	--	0.0012	0.0003	--	--	--
Halfbanded Rockfish	--	--	--	--	--	0.0000	--	--	--	--
Mexican Rockfish	--	--	--	--	--	--	0.0000	--	--	--
Pink Rockfish	--	--	--	--	--	--	0.0000	--	--	--
Pygmy Rockfish	--	--	--	--	--	--	0.0000	--	--	--
Rockfish Unid	--	--	--	--	--	0.0001	0.0000	--	--	--
Rosethorn Rockfish	--	--	--	--	--	--	0.0002	--	--	--
Shelf Rockfish Unid	--	--	--	--	--	--	0.0000	--	--	--
Stripetail Rockfish	--	--	--	--	0.0000	0.0064	0.0129	--	--	--
Vermilion Rockfish	--	--	--	--	--	0.0016	0.0003	--	--	--
Yellowtail Rockfish	--	--	--	--	--	0.0000	0.0001	--	--	--
Minor slope rockfish (South of 40°10' N. lat.)										
Aurora Rockfish	--	--	--	--	0.0033	0.0002	0.0018	--	--	--
Bank Rockfish	--	--	--	--	--	0.0000	0.0139	--	--	--
Blackgill Rockfish	--	--	--	--	0.0000	0.0014	0.0187	--	--	--
Pacific Ocean Perch	--	--	--	--	--	--	0.0000	--	--	--
Redbanded Rockfish	--	--	--	--	--	0.0000	0.0018	--	--	--
Rockfish Unid	--	--	--	--	--	--	0.0057	--	--	--
Rougheye/Blackspotted Rockfish	--	--	--	--	--	0.0001	0.0000	--	--	--
Sharpchin Rockfish	--	--	--	--	--	0.0000	--	--	--	--
Slope Rockfish Unid	--	--	--	--	--	--	0.0000	--	--	--

Table 2b (continued).

	Bottom Trawl (South of 40˚10' N Lat.)							Midwater Hake		Midwater Rockfish
	NIFQ				All Discarded Species	All Species		NIFQ		NIFQ
Area (40°10' N. Lat.)	South				South	South		North		North
Season	Summer	Winter			Winter	Winter		Summer		Summer
Depth (fm)	0-125	0-125	126-250	>250	>250	0-125	126-250	0-125	126-250	All depths
Expansion Factor (mt)	0.0015	0.2249	0.0454	0.1686	0.0045	12.2471	0.4536	0.0032	0.1134	0.0454
Mixed thornyheads										
Shortspine/Longspine Thornyhead	--	--	--	--	0.0024	--	--	--	--	--
Other flatfish										
Curlfin Turbot	--	--	--	--	--	0.0004	0.0001	--	--	--
Pacific Sanddab	--	--	--	--	--	0.0523	0.0006	--	--	--
Rex Sole	--	--	--	--	0.0003	0.0158	0.0157	--	--	--
Rock Sole	--	--	--	--	--	0.0000	0.0000	--	--	--
Pacific Hake	--	--	--	--	0.0471	0.0059	0.0660	--	--	--
Petrale Sole	--	--	--	--	0.0002	0.2366	0.3969	--	--	--
Sablefish (North of 36° N. lat.)	--	--	--	--	0.0010	0.0048	0.0350	--	--	--
Sablefish (South of 36° N. lat.)	--	--	--	--	0.0002	--	0.0011	--	--	--
Shortbelly Rockfish	0.1058	0.0525	0.0180	0.0000	0.0000	0.0053	0.0015	--	--	--
Shortspine Thornyhead (North of 34°27' N. lat.)	--	--	--	--	0.0030	0.0004	0.0044	--	--	--
Spiny Dogfish Shark	0.0236	0.3457	0.1257	0.0145	0.0085	0.0441	0.0103	0.0008	0.0021	0.0082
Splitnose rockfish (South of 40°10' N. lat.)	--	--	--	--	0.0004	0.0000	0.0519	--	--	--
Widow Rockfish	--	--	--	--	--	0.0027	0.0001	--	--	--
Nongroundfish species										
California Halibut	0.0001	--	--	--	--	0.0026	0.0002	--	--	--
Dungeness Crab	0.1424	0.0583	0.0009	0.0001	0.0001	0.0058	0.0001	--	--	--
Non-FMP flatfish										
Deepsea Sole	--	--	0.0002	0.0341	0.0200	--	0.0000	--	--	--
Hornyhead Turbot	0.0000	0.0000	--	--	--	0.0000	--	--	--	--
Slender Sole	0.0067	0.0078	0.0061	0.0000	0.0000	0.0013	0.0005	--	--	--
Other nongroundfish										
Sculpin Unid	0.0004	0.0004	0.0002	--	--	0.0000	0.0000	--	--	--

Table 2c. Non-IFQ species in EM Catch Shares

Observed discard ratios in the 100% observed catch shares fishery, estimated discard (mt), landings (mt), and fishing mortality estimates (mt) of non-IFQ species in the 2015 electronically monitored (EM) catch shares fishery. Ratios are computed as the observed discard weight divided by the observed weight of retained FMP-groundfish (adjusted to fish tickets) in the 100% observed catch shares fishery. Discard ratios were multiplied by landings of groundfish in the EM fleet to generate estimated discard. Rebuilding species are capitalized. Estimates for IFQ species come directly from the EM systems and are in Table 2d. Because discard ratios are calculated from 100% observer or EM coverage, CVs and SEs are too small to be quantified.

	Trawl - Coastwide				Pot - North				Pot - South			
Non-IFQ species in EM Catch Shares	EM vessels	EM trips	Expansion factor: Fleet landings of groundfish (mt)		EM vessels	EM trips	Expansion factor: Fleet landings of groundfish (mt)		EM vessels	EM trips	Expansion factor: Fleet landings of groundfish (mt)	
	5	23	404		3	32	185		5	26	154	
Weight (mt)	Discard Ratio	Discard	Landed	Estimate	Discard Ratio	Discard	Landed	Estimate	Discard Ratio	Discard	Landed	Estimate
Groundfish species												
Black rockfish (North of 46°16' N. lat.)	0.0000	0.01	--	0.01	--	--	--	--	--	--	--	--
Black rockfish (South of 46°16' N. lat.)	--	--	--	--	--	--	--	--	--	--	--	--
Cabezon (California)	0.0000	0.00	--	0.00	--	--	--	--	--	--	--	--
California scorpionfish (North of 34°27' N. lat.)	--	--	--	--	--	--	--	--	--	--	--	--
Ecosystem component species												
Alaska Skate	0.0000	0.00	--	0.00	--	--	--	--	--	--	--	--
Aleutian Skate	0.0001	0.03	--	0.03	--	--	--	--	--	--	--	--
Big Skate	0.0022	0.91	2.01	2.46	--	--	--	--	--	--	--	--
50% discard mortality (Trawl)‡		0.45										
Black Skate	0.0009	0.36	--	0.36	--	--	--	--	--	--	--	--
California Skate	0.0001	0.03	0.01	0.04	--	--	--	--	--	--	--	--
Deepsea Skate	0.0001	0.02	--	0.02	--	--	--	--	--	--	--	--
Giant Grenadier	0.0023	0.91	--	0.91	0.0002	0.03	--	0.03	0.0018	0.28	--	0.28
Grenadier Unid	0.0000	0.02	4.44	4.46	0.0002	0.04	--	0.04	0.0003	0.05	0.00	0.05
Pacific Electric Ray	0.0002	0.06	--	0.06	--	--	--	--	--	--	--	--
Pacific Flatnose	0.0000	0.02	--	0.02	0.0000	0.00	--	0.00	0.0006	0.09	--	0.09
Pacific Grenadier	0.0012	0.49	0.71	1.20	0.0014	0.26	--	0.26	0.0404	6.23	--	6.23
Sandpaper Skate	0.0024	0.97	0.04	1.02	--	--	--	--	--	--	--	--
Skate Unid	0.0000	0.01	0.26	0.28	--	--	--	--	--	--	--	--
Soupfin Shark	0.0001	0.03	0.02	0.06	--	--	--	--	--	--	--	--
Spotted Ratfish	0.0052	2.11	0.49	2.60	0.0000	0.00	--	0.00	--	--	--	--
Starry Skate	0.0000	0.00	--	0.00	--	--	--	--	--	--	--	--
White Skate	0.0000	0.00	--	0.00	--	--	--	--	--	--	--	--
Groundfish unid	0.0003	0.11	--	0.11	--	--	--	--	--	--	--	--
Longnose skate	0.0063	2.53	13.11	14.38	--	--	0.00	0.00	--	--	--	--
50% discard mortality (Trawl)‡		1.27										
50% discard mortality (Fixed Gear)‡												

‡Mortality rates provided by the Groundfish Management Team (GMT).

Table 2c (continued).

	Trawl - Coastwide				Pot - North				Pot - South			
Non-IFQ species in EM Catch Shares	EM vessels	EM trips	Expansion factor: Fleet landings of groundfish (mt)		EM vessels	EM trips	Expansion factor: Fleet landings of groundfish (mt)		EM vessels	EM trips	Expansion factor: Fleet landings of groundfish (mt)	
	5	23	404		3	32	185		5	26	154	
Weight (mt)	Discard Ratio	Discard	Landed	Estimate	Discard Ratio	Discard	Landed	Estimate	Discard Ratio	Discard	Landed	Estimate
Longspine Thornyhead (South of 34°27' N. lat.)	--	--	--	--	--	--	--	--	0.0000	0.01	--	0.01
Minor nearshore rockfish (North of 40°10' N. lat.)												
Blue Rockfish	--	--	--	--	--	--	--	--	--	--	--	--
Brown Rockfish	--	--	--	--	--	--	--	--	--	--	--	--
Quillback Rockfish	--	--	--	--	--	--	--	--	--	--	--	--
Brown Rockfish	0.0000	0.00	--	0.00	--	--	--	--	--	--	--	--
Olive Rockfish	--	--	--	--	--	--	--	--	--	--	--	--
Other groundfish												
Kelp Greenling (Oregon)	0.0000	0.00	--	0.00	--	--	--	--	--	--	--	--
Kelp Greenling (Washington)	0.0000	0.00	--	0.00	--	--	--	--	--	--	--	--
Leopard Shark	--	--	--	--	--	--	--	--	--	--	--	--
Roundfish unid	0.0000	0.00	--	0.00	--	--	--	--	--	--	--	--
Shortbelly rockfish	0.0003	0.11	0.01	0.12	--	--	--	--	--	--	--	--
Spiny dogfish	0.0113	4.59	0.85	5.44	0.0003	0.05	0.03	0.08	--	--	--	--
Non-groundfish species												
California halibut	0.0000	0.00	--	0.00	--	--	--	--	--	--	--	--
Dungeness crab	0.0059	2.39	--	2.39	0.0016	0.29	0.00	0.29	--	--	--	--
Non-FMP flatfish												
Deepsea Sole	0.0006	0.25	--	0.25	0.0000	0.00	0.00	0.00	0.0000	0.00	--	0.00
Diamond Turbot	0.0000	0.00	--	0.00	--	--	--	--	--	--	--	--
Hornyhead Turbot	0.0000	0.00	--	0.00	--	--	--	--	--	--	--	--
Slender Sole	0.0018	0.75	0.01	0.76	--	--	--	--	--	--	--	--

Table 2d. IFQ species in EM Catch Shares

Electronically monitored (EM) estimated discard (mt), landings (mt), and fishing mortality estimates (mt) of IFQ species in the 2015 electronically monitored (EM) catch shares bottom trawl and pot fisheries. Discard estimates come directly from the EM program. Rebuilding species are capitalized.

	Trawl - Coastwide			Pot - North			Pot - South		
IFQ species in EM Catch Shares	EM vessels	EM trips	Fleet landings of groundfish (mt)	EM vessels	EM trips	Fleet landings of groundfish (mt)	EM vessels	EM trips	Fleet landings of groundfish (mt)
	5	23	404	3	32	185	5	26	154
Weight (mt)	Discard	Landed	Estimate	Discard	Landed	Estimate	Discard	Landed	Estimate
Groundfish species									
Arrowtooth Flounder	0.12	6.00	6.12	0.08	0.03	0.11	--	0.01	0.01
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	0.00	3.32	3.32	--	--	--	--	--	--
Canary Rockfish	--	0.10	0.10	--	0.00	0.00	--	--	--
Chilipepper Rockfish (South of 40°10' N. lat.)	0.01	8.07	8.08	--	--	--	--	--	--
COWCOD ROCKFISH (South of 40°10' N. lat.)	--	0.05	0.05	--	--	--	--	--	--
DARKBLOTCHED ROCKFISH	--	0.02	0.02	0.00	0.01	0.01	0.00	--	0.00
Dover Sole	0.02	155.36	155.38	0.01	0.21	0.22	0.00	0.05	0.05
English Sole	1.15	1.64	2.79	--	--	--	--	--	--
Lingcod (North of 40°10' N. lat.)	--	0.11	0.11	0.27	4.72	4.98	--	--	--
50% discard mortality (Trawl)‡	--								
Lingcod (South of 40°10' N. lat.)	0.00	2.51	2.51	--	--	--	0.01	0.01	0.03
50% discard mortality (Trawl)‡	0.00								
Longspine Thornyhead (North of 34°27' N. lat.)	--	52.73	52.73	--	0.01	0.01	--	0.01	0.01
Minor shelf rockfish (North of 40°10' N. lat.)									
Greenstriped Rockfish	--	--	--	0.00	--	0.00	--	--	--
Rosethorn Rockfish	--	0.00	0.00	--	0.00	0.00	--	--	--
Shelf Rockfish Unid	--	--	--	--	0.00	0.00	--	--	--
Minor shelf rockfish (South of 40°10' N. lat.)									
Greenspotted Rockfish	--	0.05	0.05	--	--	--	--	--	--
Greenstriped Rockfish	--	0.05	0.05	--	--	--	--	--	--
Stripetail Rockfish	--	0.01	0.01	--	--	--	--	--	--
Vermilion Rockfish	--	0.00	0.00	--	--	--	--	--	--
Minor slope rockfish (North of 40°10' N. lat.)									
Aurora Rockfish	--	0.03	0.03	0.00	--	0.00	--	--	--
Bank Rockfish	--	0.00	0.00	--	--	--	--	--	--
Blackgill Rockfish	--	0.02	0.02	--	--	--	--	--	--
Redbanded Rockfish	--	0.01	0.01	0.01	0.19	0.20	--	--	--
Rougheye/Blackspotted Rockfish	--	--	--	--	0.12	0.12	--	--	--
Sharpchin Rockfish	--	0.00	0.00	--	--	--	--	--	--

‡Mortality rates provided by the Groundfish Management Team (GMT).

Table 2d (continued).

IFQ species in EM Catch Shares	Trawl - Coastwide			Pot - North			Pot - South		
	EM vessels	EM trips	Fleet landings of groundfish (mt)	EM vessels	EM trips	Fleet landings of groundfish (mt)	EM vessels	EM trips	Fleet landings of groundfish (mt)
	5	23	404	3	32	185	5	26	154
Weight (mt)	Discard	Landed	Estimate	Discard	Landed	Estimate	Discard	Landed	Estimate
Shortraker Rockfish	--	--	--	0.00	--	0.00	--	--	--
Splitnose Rockfish	--	0.03	0.03	--	--	--	--	--	--
Minor slope rockfish (South of 40°10' N. lat.)									
Aurora Rockfish	0.02	0.00	0.02	--	--	--	--	0.01	0.01
Bank Rockfish	--	0.01	0.01	--	--	--	--	--	--
Blackgill Rockfish	--	0.01	0.01	--	--	--	0.00	0.77	0.78
Redbanded Rockfish	--	0.02	0.02	--	--	--	--	0.00	0.00
Mixed thornyheads									
Shortspine/Longspine Thornyhead	0.02	--	0.02	0.00	--	0.00	0.00	--	0.00
Other flatfish									
Curlfin Turbot	0.01	0.11	0.12	--	--	--	--	--	--
Flatfish Unid	0.03	0.04	0.07	--	--	--	0.00	--	0.00
Pacific Sanddab	0.01	4.33	4.35	--	--	--	--	--	--
Rex Sole	0.01	2.49	2.49	--	0.00	0.00	--	0.00	0.00
Rock Sole	--	0.03	0.03	--	--	--	--	--	--
Other rockfish	0.02	--	0.02	0.00	--	0.00	0.00	--	0.00
Rockfish Unid									
Pacific hake	0.85	1.12	1.97	--	--	--	0.00	--	0.00
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	--	--	--	--	0.00	0.00	--	--	--
Petrale sole	0.01	58.50	58.51	--	--	--	--	0.01	0.01
Sablefish (North of 36° N. lat.)	0.10	58.61	58.66	7.07	179.58	181.00	0.46	82.49	82.59
50% discard mortality (Trawl)‡	0.05								
20% discard mortality (Fixed Gear)‡				1.41			0.09		
Sablefish (South of 36° N. lat.)	--	--	--	--	--	--	1.15	70.89	71.12
50% discard mortality (Trawl)‡									
20% discard mortality (Fixed Gear)‡							0.23		
Shortspine Thornyhead (North of 34°27' N. lat.)	0.00	26.85	26.85	0.02	0.07	0.09	0.01	0.14	0.16
Shortspine Thornyhead (South of 34°27' N. lat.)	--	--	--	--	--	--	0.05	--	0.05
Splitnose rockfish (South of 40°10' N. lat.)	--	1.13	1.13	--	--	--	--	--	--
Widow rockfish	--	0.24	0.24	--	--	--	--	--	--
YELLOWEYE ROCKFISH	--	0.00	0.00	--	0.01	0.01	--	--	--

Table 2e. Discard in EM Midwater trawl

Electronically monitored (EM) estimated discard (mt), landings (mt), and fishing mortality estimates (mt) of FMP groundfish species in the 2015 electronically monitored (EM) catch shares midwater fisheries. Discard estimates come directly from the EM program. Rebuilding species are capitalized.

	Midwater Rockfish Trawl			Midwater Hake Trawl		
EM Midwater	EM vessels	EM tows	Fleet landings of groundfish (mt)	EM vessels	EM tows	Fleet landings of hake (mt)
	8	87	794	17	1197	46,440
Weight (mt)	Discard	Landed	Estimate	Discard	Landed	Estimate
Groundfish species						
Arrowtooth flounder	--	0.01	0.01	--	6.29	6.29
Canary rockfish	--	25.34	25.34	--	2.89	2.89
DARKBLOTCHED ROCKFISH	--	0.01	0.01	--	27.99	27.99
Dover sole	--	--	--	--	0.28	0.28
Ecosystem component species						
Big Skate	--	0.01	0.01	--	0.12	0.12
Skate Unid	--	0.00	0.00	--	0.04	0.04
Soupfin Shark	--	--	--	--	0.08	0.08
Spotted Ratfish	--	0.00	0.00	--	0.02	0.02
English sole	--	0.01	0.01	--	0.37	0.37
Lingcod (North of 40°10' N. lat.)	--	0.36	0.36	--	2.31	2.31
Longnose skate	--	0.02	0.02	--	0.18	0.18
Longspine Thornyhead (North of 34°27' N. lat.)	--	--	--	--	0.01	0.01
Minor shelf rockfish (North of 40°10' N. lat.)						
Bocaccio Rockfish	--	0.01	0.01	--	0.15	0.15
Chilipepper Rockfish	--	0.21	0.21	--	0.30	0.30
Greenstriped Rockfish	--	--	--	--	0.01	0.01
Redstripe Rockfish	--	0.57	0.57	--	0.96	0.96
Rosethorn Rockfish	--	0.03	0.03	--	0.16	0.16
Shelf Rockfish Unid	--	--	--	--	0.00	0.00
Silvergray Rockfish	--	0.01	0.01	--	0.01	0.01
Stripetail Rockfish	--	--	--	--	0.04	0.04
Vermilion Rockfish	--	--	--	--	0.00	0.00

Table 2e (continued).

	Midwater Rockfish Trawl			Midwater Hake Trawl		
EM Midwater	EM vessels	EM tows	Fleet landings of groundfish (mt)	EM vessels	EM tows	Fleet landings of hake (mt)
	8	87	794	17	1197	46,440
Weight (mt)	Discard	Landed	Estimate	Discard	Landed	Estimate
Minor slope rockfish (North of 40°10' N. lat.)						
Aurora Rockfish	--	0.00	0.00	--	0.00	0.00
Bank Rockfish	--	0.00	0.00	--	0.09	0.09
Blackgill Rockfish	--	0.00	0.00	--	0.02	0.02
Rougheye/Blackspotted Rockfish	--	0.01	0.01	--	15.52	15.52
Sharpchin Rockfish	--	0.00	0.00	--	1.40	1.40
Shortraker Rockfish	--	--	--	--	0.17	0.17
Slope Rockfish Unid	--	0.01	0.01	--	8.71	8.71
Splitnose Rockfish	--	0.27	0.27	--	72.34	72.34
Yellowmouth Rockfish	--	0.00	0.00	--	0.82	0.82
Other flatfish						
Flatfish Unid	--	--	--	0.00	0.01	0.01
Flathead Sole	--	0.00	0.00	--	0.00	0.00
Pacific Sanddab	--	0.00	0.00	--	0.00	0.00
Rex Sole	--	0.00	0.00	--	5.86	5.86
Other groundfish						
Groundfish Unid	--	0.00	0.00	--	2.17	2.17
Other rockfish						
Rockfish Unid	--	--	--	0.00	--	0.00
Pacific cod	--	0.01	0.01	--	0.05	0.05
Pacific hake	--	38.64	38.64	0.01	46,439.83	46,439.84
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	--	0.01	0.01	--	18.26	18.26
Petrale sole	--	0.00	0.00	--	0.02	0.02
Sablefish (North of 36° N. lat.)	--	0.00	0.00	0.02	6.41	6.43
Shortbelly rockfish	--	0.00	0.00	--	0.71	0.71
Shortspine Thornyhead (North of 34°27' N. lat.)	--	0.00	0.00	--	19.41	19.41
Spiny dogfish	--	49.48	49.48	--	187.02	187.02
Widow rockfish	--	266.15	266.15	--	244.03	244.03
Yellowtail rockfish (North of 40°10' N. lat.)	--	451.95	451.95	--	90.26	90.26
Non-groundfish species						
Dungeness crab	--	--	--	--	0.01	0.01

Table 3a. Observed Sectors: Non-hake IFQ Fishing Mortality Estimates by Sector.

Non-hake IFQ sector totals, including the EM portion of the fleet. Landings (mt), estimated discard (mt), and fishing mortality estimate (mt) of groundfish species from non-hake IFQ fisheries in 2015. Discard ratios (Tables 2a, 2b) were multiplied by expansion factors to generate estimated discard and sampled discard was expanded to the haul level and summed by sector. Estimated total discard of non-IFQ species on observed EM trips were combined with total at-sea discard weight of IFQ species as recorded by EM systems. Finally, landings were summarized from PacFIN. We do not report CVs, because they are estimated to be zero in fisheries with 100% coverage.

	IFQ - Bottom Trawl			IFQ - Midwater Rockfish Trawl			IFQ - Hook-and-Line			IFQ - Pot		
Weight (mt)	Discard	Landed	Estimate	Discard	Landed	Estimate	Discard	Landed	Estimate	Discard	Landed	Estimate
Groundfish species												
Arrowtooth flounder	344.16	1,314.77	1,658.93	--	0.01	0.01	1.24	0.03	1.26	0.35	0.14	0.49
Black rockfish (North of 46°16' N. lat.)	0.47	0.47	0.94	--	0.01	0.01	--	--	--	--	--	--
Black rockfish (South of 46°16' N. lat.)	--	0.04	0.04	--	--	--	--	--	--	--	--	--
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	0.76	38.88	39.64	--	--	--	--	--	--	--	--	--
Cabezon (California)	0.00	--	0.00	--	--	--	--	--	--	--	--	--
California scorpionfish (North of 34°27' N. lat.)	--	0.00	0.00	--	--	--	--	--	--	--	--	--
Canary rockfish	0.08	13.51	13.58	--	27.46	27.46	0.00	0.05	0.05	--	0.00	0.00
Chilipepper rockfish (South of 40°10' N. lat.)	18.21	173.80	192.01	--	--	--	--	--	--	--	--	--
COWCOD ROCKFISH (South of 40°10' N. lat.)	0.00	0.39	0.39	--	--	--	--	--	--	--	--	--
DARKBLOTCHED ROCKFISH	4.09	87.28	91.37	--	0.01	0.01	--	0.03	0.03	0.00	0.05	0.05
Dover sole	39.76	6,185.89	6,225.65	--	--	--	0.02	0.23	0.26	0.22	0.40	0.62
Ecosystem component species												
Alaska Skate	0.02	--	0.02	--	--	--	--	--	--	--	--	--
Aleutian Skate	1.12	--	1.12	--	--	--	--	--	--	--	--	--
Big Skate	36.43	215.30	233.52	0.01	0.02	0.03	0.03	0.38	0.41	--	--	--
50% discard mortality (Trawl)‡	18.22											
Black Skate	14.36	--	14.36	--	--	--	0.22	--	0.22	--	--	--
California Skate	1.19	0.19	1.38	--	--	--	--	--	--	--	--	--
Deepsea Skate	0.88	--	0.88	--	--	--	--	--	--	--	--	--
Giant Grenadier	36.27	--	36.27	--	--	--	0.59	--	0.59	0.51	--	0.51
Grenadier Unid	0.73	13.12	13.86	--	--	--	0.75	--	0.75	0.18	0.00	0.18
Pacific Electric Ray	2.49	--	2.49	--	--	--	--	--	--	--	--	--
Pacific Flatnose	0.63	--	0.63	--	--	--	0.28	--	0.28	0.15	--	0.15
Pacific Grenadier	19.40	1.18	20.59	--	--	--	2.49	--	2.49	10.06	--	10.06
Sandpaper Skate	38.88	0.34	39.22	--	--	--	0.03	--	0.03	--	--	--
Skate Unid	0.75	77.07	77.82	0.01	0.01	0.02	--	--	--	--	--	--
Soupfin Shark	1.38	0.19	1.57	0.01	0.02	0.03	0.05	--	0.05	--	--	--
Spotted Ratfish	84.16	1.50	85.66	--	0.00	0.00	0.03	--	0.03	0.00	--	0.00
Starry Skate	0.02	--	0.02	--	--	--	--	--	--	--	--	--
White Skate	0.02	--	0.02	--	--	--	--	--	--	--	--	--
English sole	85.79	239.54	325.33	--	0.01	0.01	--	--	--	--	--	--
Groundfish unid	0.11	--	0.11	--	0.00	0.00	--	--	--	--	--	--
Lingcod (North of 40°10' N. lat.)	18.37	147.76	156.94	0.01	5.91	5.92	0.01	1.19	1.19	0.27	8.54	8.80
50% discard mortality (Trawl)‡	9.18											
7% discard mortality (Line)‡							0.00					
Lingcod (South of 40°10' N. lat.)	6.80	25.62	29.02	--	--	--	--	--	--	0.02	0.01	0.03
50% discard mortality (Trawl)‡	3.40											
7% discard mortality (Line)‡												
Longnose skate	102.07	721.71	772.74	--	0.03	0.03	0.70	3.89	4.24	--	0.00	0.00
50% discard mortality (Trawl)‡	51.04											
50% discard mortality (Fixed Gear)‡							0.35					

‡Discard mortality rates provided by the Groundfish Management Team (GMT).

Table 3a (continued).

	IFQ - Bottom Trawl			IFQ - Midwater Rockfish Trawl			IFQ - Hook-and-Line			IFQ - Pot		
Weight (mt)	Discard	Landed	Estimate	Discard	Landed	Estimate	Discard	Landed	Estimate	Discard	Landed	Estimate
Longspine Thornyhead (North of 34°27' N. lat.)	22.44	733.89	756.33	--	--	--	0.00	0.01	0.01	0.01	0.01	0.02
Longspine Thornyhead (South of 34°27' N. lat.)	--	--	--	--	--	--	--	0.00	0.00	0.01	0.00	0.01
Minor nearshore rockfish (North of 40°10' N. lat.)												
Blue Rockfish	0.00	0.00	0.00	--	--	--	--	--	--	--	--	--
Brown Rockfish	--	0.00	0.00	--	--	--	--	--	--	--	--	--
Quillback Rockfish	--	0.03	0.03	--	--	--	--	--	--	--	--	--
Minor nearshore rockfish (South of 40°10' N. lat.)												
Brown Rockfish	0.00	--	0.00	--	--	--	--	--	--	--	--	--
Olive Rockfish	--	0.00	0.00	--	--	--	--	--	--	--	--	--
Minor shelf rockfish (North of 40°10' N. lat.)												
Bocaccio Rockfish	0.04	1.22	1.26	--	0.06	0.06	--	--	--	--	--	--
Chilipepper Rockfish	0.68	2.74	3.42	--	0.85	0.85	--	--	--	--	--	--
Cowcod Rockfish	0.00	0.03	0.03	--	--	--	--	--	--	--	--	--
Flag Rockfish	0.00	--	0.00	--	--	--	--	--	--	--	--	--
Greenspotted Rockfish	0.00	0.03	0.03	--	--	--	--	--	--	--	--	--
Greenstriped Rockfish	2.46	8.01	10.47	--	--	--	0.00	0.00	0.00	0.00	0.01	0.01
Redstripe Rockfish	0.05	2.72	2.77	0.45	1.18	1.63	--	--	--	--	--	--
Rockfish Unid	0.30	--	0.30	--	--	--	--	--	--	--	--	--
Rosethorn Rockfish	0.14	0.77	0.90	--	0.03	0.03	0.00	0.02	0.02	0.00	0.00	0.01
Rosy Rockfish	--	--	--	--	--	--	--	--	--	--	--	--
Shelf Rockfish Unid	0.00	0.21	0.21	--	0.00	0.00	--	--	--	--	0.00	0.00
Silvergray Rockfish	0.00	0.15	0.15	--	0.02	0.02	--	--	--	--	--	--
Starry Rockfish	--	--	--	--	--	--	--	--	--	--	--	--
Stripetail Rockfish	8.29	0.19	8.48	--	0.00	0.00	--	--	--	--	--	--
Tiger Rockfish	--	0.00	0.00	--	--	--	--	--	--	--	--	--
Minor shelf rockfish (South of 40°10' N. lat.)												
Bronzespotted Rockfish	0.00	0.01	0.01	--	--	--	--	--	--	--	--	--
Greenblotched Rockfish	0.01	0.02	0.03	--	--	--	--	--	--	--	--	--
Greenspotted Rockfish	0.06	0.24	0.30	--	--	--	--	--	--	--	--	--
Greenstriped Rockfish	0.57	0.47	1.05	--	--	--	--	--	--	--	--	--
Halfbanded Rockfish	0.02	--	0.02	--	--	--	--	--	--	--	--	--
Mexican Rockfish	0.00	0.01	0.01	--	--	--	--	--	--	--	--	--
Pink Rockfish	0.00	0.03	0.03	--	--	--	--	--	--	--	--	--
Pygmy Rockfish	0.00	--	0.00	--	--	--	--	--	--	--	--	--
Redstripe Rockfish	--	--	--	--	--	--	--	--	--	--	--	--
Rockfish Unid	0.01	--	0.01	--	--	--	--	--	--	--	--	--
Rosethorn Rockfish	0.07	0.01	0.08	--	--	--	--	--	--	--	--	--
Shelf Rockfish Unid	0.00	0.00	0.00	--	--	--	--	--	--	--	--	--
Speckled Rockfish	--	0.00	0.00	--	--	--	--	--	--	--	--	--
Stripetail Rockfish	7.14	0.15	7.29	--	--	--	--	--	--	--	--	--
Vermilion Rockfish	0.02	0.41	0.43	--	--	--	--	--	--	--	--	--
Yellowtail Rockfish	0.00	0.11	0.11	--	--	--	--	--	--	--	--	--

Table 3a (continued).

	IFQ - Bottom Trawl			IFQ - Midwater Rockfish Trawl			IFQ - Hook-and-Line			IFQ - Pot		
Weight (mt)	Discard	Landed	Estimate	Discard	Landed	Estimate	Discard	Landed	Estimate	Discard	Landed	Estimate
Minor slope rockfish (North of 40°10' N. lat.)												
Aurora Rockfish	2.91	14.79	17.70	--	0.00	0.00	--	0.00	0.00	0.01	--	0.01
Bank Rockfish	0.00	0.83	0.83	--	0.00	0.00	--	--	--	--	--	--
Blackgill Rockfish	0.01	5.38	5.39	--	0.00	0.00	--	0.03	0.03	--	--	--
Redbanded Rockfish	0.14	3.90	4.04	--	--	--	0.01	0.43	0.45	0.02	0.70	0.72
Rockfish Unid	0.06	--	0.06	--	--	--	--	--	--	--	--	--
Rougheye/Blackspotted Rockfish	0.01	30.25	30.26	--	0.01	0.01	--	5.20	5.20	--	0.42	0.42
Rougheye Rockfish	0.00	--	0.00	--	--	--	--	--	--	0.01	--	0.01
Sharpchin Rockfish	0.02	0.77	0.78	--	0.00	0.00	--	--	--	0.00	0.01	0.01
Shortraker Rockfish	0.00	9.61	9.61	--	--	--	--	0.73	0.73	0.00	--	0.00
Shortraker/Rougheye Rockfish	--	--	--	--	--	--	0.25	--	0.25	--	--	--
Slope Rockfish Unid	0.00	1.16	1.16	--	0.01	0.01	--	--	--	--	--	--
Splitnose Rockfish	9.38	21.04	30.43	--	0.28	0.28	--	--	--	--	--	--
Yellowmouth Rockfish	0.00	0.55	0.55	--	0.00	0.00	0.00	--	0.00	--	--	--
Minor slope rockfish (South of 40°10' N. lat.)												
Aurora Rockfish	1.39	1.87	3.26	--	--	--	--	--	--	--	0.01	0.01
Bank Rockfish	0.09	45.46	45.55	--	--	--	--	--	--	--	--	--
Blackgill Rockfish	1.10	17.20	18.31	--	--	--	--	--	--	0.07	1.13	1.20
Pacific Ocean Perch	0.00	0.00	0.00	--	--	--	--	--	--	--	--	--
Redbanded Rockfish	0.05	0.74	0.78	--	--	--	--	--	--	0.00	0.00	0.00
Rockfish Unid	0.00	--	0.00	--	--	--	--	--	--	--	--	--
Rougheye/Blackspotted Rockfish	0.00	0.09	0.09	--	--	--	--	--	--	--	--	--
Sharpchin Rockfish	0.03	--	0.03	--	--	--	--	--	--	--	--	--
Shortraker Rockfish	--	--	--	--	--	--	--	--	--	--	--	--
Slope Rockfish Unid	0.00	0.00	0.00	--	--	--	--	--	--	--	--	--
Mixed thornyheads												
Shortspine/Longspine Thornyhead	0.76	--	0.76	--	--	--	--	0.00	0.00	0.00	--	0.00
Other flatfish												
Butter Sole	0.13	0.09	0.22	--	--	--	--	--	--	--	--	--
Curlfin Turbot	0.58	2.22	2.79	--	--	--	--	--	--	--	--	--
Flatfish Unid	0.03	0.08	0.11	--	--	--	--	--	--	0.00	--	0.00
Flathead Sole	22.98	14.54	37.52	--	0.00	0.00	--	--	--	--	--	--
Pacific Sanddab	120.76	155.35	276.11	--	0.01	0.01	--	--	--	--	--	--
Rex Sole	38.37	455.74	494.11	--	0.00	0.00	--	--	--	--	0.00	0.00
Rock Sole	0.04	0.95	0.99	--	--	--	--	--	--	--	--	--
Sanddab Unid	0.04	--	0.04	--	--	--	--	--	--	--	--	--
Sand Sole	0.12	13.60	13.72	--	--	--	--	--	--	--	--	--

Table 3a (continued).

	IFQ - Bottom Trawl			IFQ - Midwater Rockfish Trawl			IFQ - Hook-and-Line			IFQ - Pot		
Weight (mt)	Discard	Landed	Estimate	Discard	Landed	Estimate	Discard	Landed	Estimate	Discard	Landed	Estimate
Other groundfish												
Kelp Greenling	0.08	0.00	0.08	--	--	--	--	--	--	--	--	--
Leopard Shark	--	--	--	--	--	--	--	--	--	--	--	--
Other rockfish												
Rockfish Unid	0.02	0.12	0.14	--	--	--	--	--	--	0.00	--	0.00
Pacific cod	0.48	376.50	376.99	--	0.01	0.01	0.09	0.05	0.14	--	--	--
Pacific hake	222.31	56.03	278.35	3.20	53.79	56.99	0.00	--	0.00	0.00	0.00	0.01
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	0.12	29.33	29.45	--	0.02	0.02	--	--	--	0.00	0.01	0.01
Petrale sole	14.35	2,483.17	2,497.52	--	0.00	0.00	0.01	0.02	0.04	--	0.08	0.08
Roundfish unid	0.00	--	0.00	--	--	--	--	--	--	--	--	--
Sablefish (North of 36° N. lat.)	9.73	1,452.21	1,457.08	--	0.00	0.00	4.85	112.54	113.51	13.59	585.37	588.09
50% discard mortality (Trawl)‡	4.86											
20% discard mortality (Fixed Gear)‡							0.97			2.72		
Sablefish (South of 36° N. lat.)	1.54	5.04	5.81	--	--	--	0.25	7.97	8.02	2.44	147.12	147.61
50% discard mortality (Trawl)‡	0.77											
20% discard mortality (Fixed Gear)‡							0.05			0.49		
Shortbelly rockfish	4.43	0.06	4.49	--	0.01	0.01	--	--	--	--	--	--
Shortspine Thornyhead (North of 34°27' N. lat.)	6.30	691.41	697.71	--	0.00	0.00	0.23	4.55	4.78	0.10	0.45	0.55
Shortspine Thornyhead (South of 34°27' N. lat.)	--	--	--	--	--	--	0.01	0.42	0.43	0.10	0.14	0.24
Spiny dogfish	187.66	4.49	192.15	0.13	54.11	54.24	26.78	--	13.39	0.14	0.03	0.17
50% discard mortality (Line)‡							13.39					
Splitnose rockfish (South of 40°10' N. lat.)	22.12	6.69	28.81	--	--	--	--	--	--	--	--	--
Starry flounder	0.12	6.28	6.41	--	--	--	--	--	--	--	--	--
Widow rockfish	0.07	11.60	11.66	--	479.18	479.18	--	--	--	0.00	0.00	0.00
YELLOWEYE ROCKFISH	0.00	0.03	0.03	--	--	--	--	--	--	--	0.01	0.01
Yellowtail rockfish (North of 40°10' N. lat.)	0.01	125.05	125.06	0.12	1,193.71	1,193.84	0.00	0.05	0.05	--	--	--
Non-groundfish species												
California halibut	0.03	0.79	0.83	--	--	--	--	--	--	--	--	--
Dungeness crab	95.56	0.03	95.59	--	--	--	--	--	--	0.80	0.00	0.80
Non-FMP flatfish												
Deepsea Sole	9.84	0.00	9.84	--	--	--	--	--	--	0.00	0.00	0.00
Diamond Turbot	0.01	--	0.01	--	--	--	--	--	--	--	--	--
Hornyhead Turbot	0.00	--	0.00	--	--	--	--	--	--	--	--	--
Slender Sole	29.88	0.29	30.17	--	--	--	--	--	--	--	--	--
Other nongroundfish												
Sculpin Unid	0.74	--	0.74	--	--	--	--	--	--	--	--	--

Table 3b. Observed Sectors: Hake IFQ/Co-op Fishing Mortality Estimates by Sector.

Hake IFQ/Co-op sectors. Retained catch/landings (mt), discard (mt), and fishing mortality estimates (mt) of groundfish species from hake IFQ/Co-op sectors in 2015. In midwater hake, discard ratios (Table 2b) were multiplied by expansion factors to generate estimated discard, sampled discard was expanded to the haul level and summed by sector. At-sea discard recorded by EM is included in the discard estimate. Landings from the observed and EM fleet were summarized from PacFIN. At-sea hake Co-op Program data was summarized from the A-SHOP. We do not report CVs, because they are estimated to be zero in fisheries with 100% coverage. Rebuilding species are capitalized.

	IFQ - Midwater Hake			At-sea Catcher-Processors			At-sea Mothership Catcher Vessels		
Weight (mt)	Discard	Landed	Estimate	Discard	Retained	Estimate	Discard	Retained	Estimate
Groundfish species									
Arrowtooth flounder	--	6.71	6.71	6.59	58.94	65.53	0.41	0.44	0.85
Canary rockfish	--	3.78	3.78	0.02	0.05	0.07	0.04	0.10	0.14
DARKBLOTCHED ROCKFISH	--	31.43	31.43	1.21	4.36	5.57	0.55	1.83	2.38
Dover sole	--	0.31	0.31	0.09	0.69	0.79	0.02	0.01	0.04
Ecosystem component species									
Aleutian Skate	--	--	--	--	--	--	0.00	--	0.00
Big Skate	--	0.15	0.15	0.04	0.06	0.10	0.13	0.01	0.14
Grenadier Unid	--	--	--	0.03	0.14	0.17	--	0.00	0.00
Sandpaper Skate	--	--	--	0.00	0.02	0.02	0.00	--	0.00
Skate Unid	--	0.05	0.05	--	--	--	--	--	--
Soupfin Shark	--	0.08	0.08	--	--	--	0.14	0.05	0.19
Spotted Ratfish	--	0.02	0.02	--	--	--	--	--	--
English sole	--	0.38	0.38	0.00	0.00	0.00	--	--	--
Lingcod (North of 40°10' N. lat.)	--	2.90	2.90	--	0.00	0.00	0.11	0.74	0.85
Longnose skate	--	0.23	0.23	0.12	0.06	0.19	0.21	0.06	0.28
Longspine Thornyhead (North of 34°27' N. lat.)	--	0.01	0.01	--	0.02	0.02	--	--	--
Minor shelf rockfish (North of 40°10' N. lat.)									
Bocaccio Rockfish	--	0.32	0.32	--	--	--	0.04	0.05	0.08
Chilipepper Rockfish	--	0.56	0.56	--	0.00	0.00	--	--	--
Greenstriped Rockfish	--	0.01	0.01	--	--	--	--	--	--
Redstripe Rockfish	--	1.50	1.50	0.00	0.01	0.01	0.29	0.02	0.32
Rockfish Unid	--	--	--	--	--	--	--	--	--
Rosethorn Rockfish	--	0.18	0.18	--	0.00	0.00	--	--	--
Shelf Rockfish Unid	--	0.00	0.00	--	--	--	--	--	--
Silvergray Rockfish	--	0.02	0.02	0.00	0.31	0.31	0.02	0.01	0.03
Stripetail Rockfish	--	0.08	0.08	--	--	--	0.02	--	0.02
Vermilion Rockfish	--	0.00	0.00	--	--	--	--	--	--
Minor slope rockfish (North of 40°10' N. lat.)									
Aurora Rockfish	--	0.00	0.00	0.00	0.02	0.02	--	--	--
Bank Rockfish	--	0.10	0.10	0.01	0.04	0.05	0.02	--	0.02
Blackgill Rockfish	--	0.03	0.03	--	0.03	0.03	--	--	--
Redbanded Rockfish	--	--	--	--	0.00	0.00	--	--	--
Rockfish Unid	--	--	--	--	0.00	0.00	--	--	--
Rougheye/Blackspotted Rockfish	--	19.26	19.26	--	--	--	--	--	--
Rougheye Rockfish	--	--	--	7.69	7.32	15.01	2.33	4.46	6.79
Sharpchin Rockfish	--	2.08	2.08	0.00	0.00	0.00	0.00	--	0.00
Shortraker Rockfish	--	0.24	0.24	0.02	0.00	0.02	0.01	--	0.01
Slope Rockfish Unid	--	10.02	10.02	--	--	--	--	--	--
Splitnose Rockfish	--	85.85	85.85	2.48	8.68	11.16	2.14	1.20	3.34
Yellowmouth Rockfish	--	0.88	0.88	0.00	--	0.00	0.00	--	0.00
Mixed thornyheads									
Shortspine/Longspine Thornyhead	--	--	--	--	0.00	0.00	--	--	--
Other flatfish									
Flatfish Unid	0.00	0.01	0.01	0.00	--	0.00	--	--	--
Flathead Sole	--	0.00	0.00	--	--	--	--	--	--
Pacific Sanddab	--	0.01	0.01	--	0.00	0.00	0.00	--	0.00
Rex Sole	--	6.25	6.25	0.74	5.13	5.87	0.18	0.16	0.35
Rock Sole	--	0.00	0.00	--	--	--	--	--	--
Other groundfish									
Groundfish Unid	--	2.51	2.51	--	--	--	--	--	--
Other rockfish									
Rockfish Unid	0.00	--	0.00	--	--	--	--	--	--
Other roundfish									
Roundfish Unid	--	--	--	0.02	0.06	0.09	--	0.01	0.01
Pacific cod	--	0.05	0.05	--	0.00	0.00	--	--	--
Pacific hake	0.01	57,901.26	57901.27	48.38	68,435.23	68,483.61	119.66	27,544.49	27,664.15
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	--	20.10	20.10	0.69	6.29	6.97	0.67	1.06	1.73
Petrale sole	--	0.02	0.02	--	--	--	--	--	--
Sablefish (North of 36° N. lat.)	0.02	6.92	6.95	0.11	9.57	9.69	0.09	1.83	1.92
Shortbelly rockfish	--	0.73	0.73	0.01	0.02	0.02	0.01	0.00	0.01
Shortspine Thornyhead (North of 34°27' N. lat.)	--	22.59	22.59	0.75	8.05	8.79	1.50	0.23	1.73
Spiny dogfish	0.00	190.19	190.19	85.97	8.34	94.30	2.86	0.14	3.01
Widow rockfish	--	323.20	323.20	15.70	1.76	17.46	8.39	8.82	17.20
Yellowtail rockfish (North of 40°10' N. lat.)	--	129.95	129.95	0.22	0.29	0.51	45.00	40.88	85.88
Non-groundfish species									
Dungeness crab	--	0.01	0.01	--	--	--	--	--	--
Non-FMP flatfish									
Slender Sole	--	--	--	--	--	--	0.00	0.00	0.00

Table 4. OA California Halibut Trawl.

Observed discard ratios, standard error, coefficient of variation, estimated discard (mt), landings (mt), and fishing mortality estimates (mt) of groundfish species from federal open access participants in the state-licensed California halibut fishery in 2015 (only occurs south of 40°10' N latitude). Ratios are computed as the observed discard weight divided by the observed weight of retained California halibut (adjusted to fish tickets). Discard ratios were multiplied by fleet landings of California halibut to generate estimated discard.

Open Access California Halibut Fishery South of 40°10' N Lat.	Observed vessels		Observed trips	Observed tows	Expansion factor: Fleet landings of California halibut (mt)	
	8		100	339	92	
Weight (mt)	Discard Ratio	SE	CV	Discard	Landed	Total Estimate
Groundfish species						
Cabezon (California)	0.0000	0.0000	0.0568	0.00	--	0.00
California scorpionfish (South of 34°27' N. lat.)	0.0000	0.0000	0.1473	0.00	--	0.00
Canary rockfish	0.0001	0.0000	0.0568	0.01	--	0.01
Ecosystem component species						
Big Skate	0.3197	0.0483	0.1509	29.43	--	14.72
50% discard mortality (Trawl)‡				14.72		
California Skate	0.1555	0.0205	0.1319	14.31	--	14.31
Pacific Electric Ray	0.0126	0.0019	0.1485	1.16	--	1.16
Skate Unid	0.0027	0.0004	0.1583	0.25	0.08	0.33
Soupfin Shark	--	--	--	--	0.14	0.14
Spotted Ratfish	0.0000	0.0000	0.0568	0.00	--	0.00
Starry Skate	0.0010	0.0004	0.4039	0.09	--	0.09
English sole	0.0194	0.0031	0.1610	1.79	0.04	1.82
Lingcod (South of 40°10' N. lat.)	0.0007	0.0002	0.2610	0.06	0.26	0.29
50% discard mortality (Trawl)‡				0.03		
Longnose skate	0.0007	0.0000	0.0568	0.06	0.02	0.05
50% discard mortality (Trawl)‡				0.03		
Minor nearshore rockfish (South of 40°10' N. lat.)						
Brown Rockfish	0.0007	0.0003	0.4553	0.06	0.00	0.06
Minor shelf rockfish (South of 40°10' N. lat.)						
Vermilion Rockfish	0.0000	0.0000	0.2484	0.00	--	0.00
Other flatfish						
Curlfin Turbot	0.0509	0.0112	0.2195	4.68	2.39	7.07
Flatfish Unid	0.0004	0.0003	0.6152	0.04	0.76	0.80
Pacific Sanddab	0.0167	0.0036	0.2158	1.54	0.01	1.55
Rex Sole	0.0000	0.0000	0.6262	0.00	--	0.00
Rock Sole	0.0113	0.0050	0.4468	1.04	0.09	1.13
Sand Sole	0.0302	0.0073	0.2418	2.78	5.37	8.14
Other groundfish						
Leopard Shark	0.0308	0.0062	0.2011	2.83	0.17	3.00
Petrale sole	0.0009	0.0003	0.2783	0.09	1.16	1.25
Spiny dogfish	0.0257	0.0057	0.2231	2.36	--	2.36
Starry flounder	0.0123	0.0035	0.2816	1.13	5.96	7.09
Non-groundfish species						
California halibut	0.1226	0.0126	0.1029	11.28	92.05	103.33
Dungeness crab	1.4393	0.1256	0.0872	132.49	--	132.49
Non-FMP flatfish						
Diamond Turbot	0.0036	0.0010	0.2683	0.33	--	0.33
Hornyhead Turbot	0.0022	0.0008	0.3602	0.20	0.43	0.63
Longfin Sanddab	0.0000	0.0000	0.2484	0.00	--	0.00
Speckled Sanddab	0.0001	0.0000	0.1562	0.01	--	0.01
Other nongroundfish						
Brown Irish Lord Sculpin	0.0000	0.0000	0.0568	0.00	--	0.00
Sculpin Unid	0.0023	0.0008	0.3395	0.21	--	0.21

‡Mortality rates provided by the Groundfish Management Team (GMT).

Table 5. Pink Shrimp Trawl.

Observed discard ratios, standard error, estimated discard (mt), landings (mt), and fishing mortality estimates (mt) of groundfish species from 2015 state pink shrimp fisheries. Ratios are computed as the observed discard weight divided by the observed weight of retained pink shrimp (adjusted to fish tickets). Discard ratios were multiplied by state fleet landings of pink shrimp to generate estimated discard. Rebuilding species are capitalized.

	Washington						Oregon						California					
Pink Shrimp Trawl Fishery	Observed vessels		Observed trips	Observed tows	Expansion factor: Fleet landings of pink shrimp (mt)		Observed vessels		Observed trips	Observed tows	Expansion factor: Fleet landings of pink shrimp (mt)		Observed vessels		Observed trips	Observed tows	Expansion factor: Fleet landings of pink shrimp (mt)	
	24		100	1459	18,814		41		129	1990	24,226		9		23	335	3,453	
Weight (mt)	Discard Ratio	SE	CV	Discard	Landed	Estimate	Discard Ratio	SE	CV	Discard	Landed	Estimate	Discard Ratio	SE	CV	Discard	Landed	Estimate
Groundfish species																		
Arrowtooth flounder	0.0002	0.0000	0.0692	2.97	--	2.97	0.0005	0.0000	0.0700	11.44	--	11.44	0.0004	0.0001	0.1528	1.43	--	1.43
Black rockfish (South of 46°16' N. lat.)	--	--	--	--	--	--	0.0000	0.0000	0.0218	0.05	--	0.05	--	--	--	--	--	--
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.04	0.04
California scorpionfish (South of 34°27' N. lat.)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.11	0.11
Canary rockfish	0.0000	0.0000	0.0226	0.80	--	0.80	0.0000	0.0000	0.5732	0.46	--	0.46	--	--	--	--	--	--
DARKBLOTCHED ROCKFISH	0.0001	0.0000	0.0671	2.00	--	2.00	0.0001	0.0000	0.0935	3.03	--	3.03	0.0001	0.0000	0.2493	0.21	--	0.21
Dover sole	0.0001	0.0000	0.1601	1.40	--	1.40	0.0001	0.0000	0.0902	2.05	--	2.05	0.0000	0.0000	0.2878	0.14	0.30	0.44
Ecosystem component species																		
Aleutian Skate	0.0000	0.0000	0.5192	0.00	--	0.00	--	--	--	--	--	--	--	--	--	--	--	--
Big Skate	--	--	--	--	--	--	0.0000	0.0000	0.8033	0.73	--	0.73	0.0000	0.0000	0.8244	0.05	--	0.05
Pacific Electric Ray	--	--	--	--	--	--	0.0000	0.0000	0.0218	0.00	--	0.00	--	--	--	--	--	--
Sandpaper Skate	0.0000	0.0000	0.1935	0.00	--	0.00	0.0000	0.0000	0.1144	0.00	--	0.00	--	--	--	--	--	--
Skate Unid	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.41	3.41
Spotted Ratfish	0.0000	0.0000	0.1973	0.02	--	0.02	0.0000	0.0000	0.3304	0.31	--	0.31	--	--	--	--	--	--
English sole	0.0000	0.0000	0.1881	0.12	--	0.12	0.0000	0.0000	0.1716	0.84	--	0.84	0.0000	0.0000	0.1629	0.00	0.97	0.97
Lingcod (North of 40°10' N. lat.)	0.0000	0.0000	0.3423	0.20	--	0.20	0.0000	0.0000	0.1578	0.26	--	0.26	0.0000	0.0000	0.6534	0.01	--	0.01
Lingcod (South of 40°10' N. lat.)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.01	0.01
Longnose skate	0.0000	0.0000	0.4416	0.62	--	0.62	0.0000	0.0000	0.2663	0.42	--	0.42	0.0000	0.0000	0.2545	0.08	--	0.08
Minor nearshore rockfish (South of 40°10' N. lat.)																		
Brown Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Copper Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.03	0.03
Minor shelf rockfish (North of 40°10' N. lat.)																		
Bocaccio Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.0218	0.01	--	0.01	--	--	--	--	--	--
Chilipepper Rockfish	0.0000	0.0000	0.0226	0.00	--	0.00	0.0000	0.0000	0.2358	1.03	--	1.03	0.0001	0.0001	0.4970	0.49	--	0.49
Cowcod Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.0218	0.00	--	0.00	0.0000	0.0000	0.1899	0.00	--	0.00
Flag Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.0218	0.00	--	0.00	--	--	--	--	--	--
Greenspotted Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.1696	0.00	--	0.00	--	--	--	--	--	--
Greenstriped Rockfish	0.0001	0.0000	0.0671	0.97	--	0.97	0.0000	0.0000	0.0702	0.66	--	0.66	0.0000	0.0000	0.2512	0.09	--	0.09
Halfbanded Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.2907	0.01	--	0.01	0.0000	0.0000	0.3494	0.00	--	0.00
Puget Sound Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.4643	0.00	--	0.00	--	--	--	--	--	--
Pygmy Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.0218	0.00	--	0.00	--	--	--	--	--	--
Rockfish Unid	0.0000	0.0000	0.4479	0.28	--	0.28	0.0000	0.0000	0.3604	0.96	--	0.96	0.0000	0.0000	0.6786	0.03	--	0.03
Rosethorn Rockfish	0.0000	0.0000	0.4941	0.00	--	0.00	0.0000	0.0000	0.1873	0.01	--	0.01	--	--	--	--	--	--
Squarespot Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.6801	0.01	--	0.01	--	--	--	--	--	--
Stripetail Rockfish	0.0000	0.0000	0.3926	0.01	--	0.01	0.0000	0.0000	0.1709	0.61	--	0.61	0.0001	0.0000	0.2240	0.23	--	0.23
Tiger Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.0313	0.00	--	0.00	--	--	--	--	--	--
Minor shelf rockfish (South of 40°10' N. lat.)																		
Flag Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Shelf Rockfish Unid	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.01	0.01
Vermilion Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.03	0.03

Table 5 (continued).

Pink Shrimp Trawl Fishery	Washington						Oregon						California					
	Observed vessels		Observed trips	Observed tows	Expansion factor: Fleet landings of pink shrimp (mt)		Observed vessels		Observed trips	Observed tows	Expansion factor: Fleet landings of pink shrimp (mt)		Observed vessels		Observed trips	Observed tows	Expansion factor: Fleet landings of pink shrimp (mt)	
	24		100	1459	18,814		41		129	1990	24,226		9		23	335	3,453	
Weight (mt)	Discard Ratio	SE	CV	Discard	Landed	Estimate	Discard Ratio	SE	CV	Discard	Landed	Estimate	Discard Ratio	SE	CV	Discard	Landed	Estimate
Minor slope rockfish (North of 40°10' N. lat.)																		
Aurora Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.0218	0.00	--	0.00	--	--	--	--	--	--
Blackgill Rockfish	0.0000	0.0000	0.0226	0.00	--	0.00	--	--	--	--	--	--	--	--	--	--	--	--
Redbanded Rockfish	0.0000	0.0000	0.1898	0.00	--	0.00	0.0000	0.0000	0.1317	0.05	--	0.05	--	--	--	--	--	--
Rougheye Rockfish	0.0000	0.0000	0.1675	0.01	--	0.01	0.0000	0.0000	0.3139	0.02	--	0.02	--	--	--	--	--	--
Sharpchin Rockfish	0.0000	0.0000	0.2415	0.01	--	0.01	0.0000	0.0000	0.1921	0.03	--	0.03	--	--	--	--	--	--
Shortraker Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.0218	0.00	--	0.00	--	--	--	--	--	--
Shortraker/Rougheye Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.0218	0.04	--	0.04	--	--	--	--	--	--
Splitnose Rockfish	0.0000	0.0000	0.1973	0.01	--	0.01	0.0000	0.0000	0.3267	0.02	--	0.02	--	--	--	--	--	--
Yellowmouth Rockfish	0.0000	0.0000	0.3800	0.01	--	0.01	--	--	--	--	--	--	--	--	--	--	--	--
Minor slope rockfish (South of 40°10' N. lat.)																		
Slope Rockfish Unid	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.01	0.01
Other flatfish																		
Butter Sole	--	--	--	--	--	--	0.0000	0.0000	0.0449	0.01	--	0.01	--	--	--	--	--	--
Curlfin Turbot	--	--	--	--	--	--	0.0000	0.0000	0.3645	0.02	--	0.02	--	--	--	--	0.00	0.00
Flatfish Unid	0.0001	0.0000	0.2330	1.06	--	1.06	0.0001	0.0000	0.3208	1.82	--	1.82	0.0000	0.0000	0.7238	0.06	19.16	19.21
Flathead Sole	0.0002	0.0000	0.0609	4.64	--	4.64	0.0001	0.0000	0.0883	3.47	--	3.47	0.0000	0.0000	0.2024	0.03	--	0.03
Pacific Sanddab	0.0003	0.0000	0.1033	5.37	--	5.37	0.0002	0.0000	0.0837	5.28	0.00	5.28	0.0001	0.0000	0.2062	0.35	--	0.35
Rex Sole	0.0006	0.0000	0.0650	11.57	--	11.57	0.0012	0.0001	0.0656	28.63	--	28.63	0.0006	0.0001	0.1360	1.94	1.09	3.03
Rock Sole	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.33	0.33
Sanddab Unid	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.29	0.29
Pacific cod	0.0000	0.0000	0.3084	0.04	--	0.04	--	--	--	--	--	--	--	--	--	--	--	--
Pacific hake	0.0213	0.0012	0.0554	401.01	--	401.01	0.0301	0.0014	0.0451	730.31	--	730.31	0.0075	0.0015	0.2035	25.82	0.00	25.83
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	0.0000	0.0000	0.2173	0.08	--	0.08	0.0000	0.0000	0.1573	0.21	--	0.21	0.0000	0.0000	0.1821	0.00	--	0.00
Petrale sole	0.0000	0.0000	0.1435	0.40	--	0.40	0.0001	0.0000	0.1108	1.88	--	1.88	0.0000	0.0000	0.2909	0.04	0.57	0.61
Sablefish (North of 36° N. lat.)	0.0000	0.0000	0.2294	0.02	--	0.02	0.0000	0.0000	0.2179	0.05	41.25	41.30	0.0000	0.0000	0.0598	0.00	--	0.00
Sablefish (South of 36° N. lat.)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.18	0.18
Shortbelly rockfish	0.0000	0.0000	0.2593	0.18	--	0.18	0.0000	0.0000	0.1245	0.49	--	0.49	0.0001	0.0000	0.2758	0.26	--	0.26
Shortspine Thornyhead (North of 34°27' N. lat.)	--	--	--	--	--	--	0.0000	0.0000	0.2842	0.03	--	0.03	--	--	--	--	--	--
Spiny dogfish	0.0000	0.0000	0.3331	0.01	--	0.01	0.0000	0.0000	0.1238	0.09	--	0.09	0.0002	0.0001	0.5565	0.81	--	0.81
Yellowtail rockfish (North of 40°10' N. lat.)	0.0000	0.0000	0.0226	0.00	--	0.00	0.0000	0.0000	0.7671	0.37	--	0.37	0.0000	0.0000	0.5450	0.01	--	0.01
Non-groundfish species																		
California halibut	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14.00	14.00
Dungeness crab	--	--	--	--	--	--	0.0000	0.0000	0.5056	0.04	--	0.04	--	--	--	--	--	--
Non-FMP flatfish																		
Hornyhead Turbot	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.01	0.01
Slender Sole	0.0021	0.0002	0.0722	40.17	--	40.17	0.0031	0.0002	0.0541	74.22	--	74.22	0.0017	0.0003	0.1648	6.01	--	6.01
Other nongroundfish																		
Sculpin Unid	0.0000	0.0000	0.0226	0.00	--	0.00	0.0000	0.0000	0.1440	0.04	--	0.04	0.0000	0.0000	0.3875	0.10	--	0.10

Table 6. LE Sablefish Primary Fixed Gear.

Observed discard ratios, standard error, estimated discard (mt), landings (mt), and fishing mortality estimates (mt) from the LE sablefish endorsed primary season (tier endorsed) fixed gear fleet in 2015. Ratios are computed as the observed discard weight divided by the observed weight of retained sablefish (adjusted to fish tickets). Discard ratios were multiplied by fleet landings of sablefish to generate discard estimates for each gear type; combined with other fixed gear sectors in Table 9. Rebuilding species are capitalized.

Limited Entry Sablefish Endorsed Primary Season	Longline						Pot					
	Observed vessels		Observed trips	Observed sets	Expansion factor: Fleet landings of sablefish (mt)		Observed vessels		Observed trips	Observed sets	Expansion factor: Fleet landings of sablefish (mt)	
	26		97	632	912		9		35	299	358	
Weight (mt)	Discard Ratio	SE	CV	Discard	Landed	Estimate	Discard Ratio	SE	CV	Discard	Landed	Estimate
Groundfish species												
Arrowtooth flounder	0.0215	0.0034	0.1586	19.62	0.52	20.15	0.0012	0.0003	0.2198	0.43	--	0.43
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	--	--	--	--	0.01	0.01	--	--	--	--	--	--
Canary rockfish	0.0021	0.0010	0.4860	1.89	0.25	2.14	--	--	--	--	--	--
Chilipepper rockfish (South of 40°10' N. lat.)	0.0002	0.0001	0.5369	0.15	0.20	0.34	--	--	--	--	--	--
DARKBLOTCHED ROCKFISH	0.0003	0.0001	0.3319	0.24	1.51	1.76	0.0000	0.0000	0.4097	0.01	0.10	0.10
Dover sole	0.0009	0.0001	0.1635	0.78	1.68	2.46	0.0017	0.0004	0.2136	0.62	0.07	0.69
Ecosystem component species												
Aleutian Skate	0.0000	0.0000	0.0349	0.02	--	0.02	--	--	--	--	--	--
Big Skate	0.0003	0.0002	0.5154	0.28	2.76	3.03	--	--	--	--	--	--
Black Skate	0.0003	0.0001	0.2458	0.23	--	0.23	--	--	--	--	--	--
Giant Grenadier	0.0014	0.0008	0.6204	1.25	--	1.25	0.0004	0.0001	0.2691	0.13	--	0.13
Grenadier Unid	0.0004	0.0003	0.7262	0.32	8.84	9.16	0.0017	0.0004	0.2321	0.59	--	0.59
Pacific Flatnose	0.0000	0.0000	0.6288	0.04	--	0.04	0.0001	0.0000	0.2127	0.03	--	0.03
Pacific Grenadier	0.0006	0.0002	0.3032	0.52	--	0.52	0.0016	0.0004	0.2225	0.59	--	0.59
Sandpaper Skate	0.0017	0.0002	0.0988	1.53	--	1.53	0.0000	0.0000	0.1154	0.00	--	0.00
Skate Unid	0.0003	0.0002	0.7268	0.31	1.61	1.91	--	--	--	--	--	--
Spotted Ratfish	0.0015	0.0002	0.1230	1.40	--	1.40	--	--	--	--	--	--
English sole	0.0000	0.0000	0.0349	0.00	--	0.00	--	--	--	--	--	--
Lingcod (North of 40°10' N. lat.)	0.0015	0.0004	0.3057	1.34	7.45	7.54	0.0062	0.0010	0.1642	2.23	3.62	5.85
7% discard mortality (Line)‡				0.09								
Lingcod (South of 40°10' N. lat.)	--	--	--	--	0.68	0.68	--	--	--	--	0.32	0.32
7% discard mortality (Line)‡												
Longnose skate	0.0353	0.0033	0.0927	32.15	19.98	36.05	--	--	--	--	0.13	0.13
50% discard mortality (Fixed Gear)‡				16.08								
Longspine Thornyhead (North of 34°27' N. lat.)	0.0000	0.0000	0.5964	0.01	0.52	0.53	0.0000	0.0000	0.1417	0.01	0.00	0.01
Longspine Thornyhead (South of 34°27' N. lat.)	--	--	--	--	0.02	0.02	--	--	--	--	--	--
Minor shelf rockfish (North of 40°10' N. lat.)												
Bocaccio Rockfish	0.0000	0.0000	0.5236	0.02	--	0.02	--	--	--	--	--	--
Chilipepper Rockfish	--	--	--	--	0.00	0.00	--	--	--	--	--	--
Greenblotched Rockfish	0.0000	0.0000	0.3929	0.04	--	0.04	--	--	--	--	--	--
Greenspotted Rockfish	--	--	--	--	0.00	0.00	--	--	--	--	--	--
Greenstriped Rockfish	0.0002	0.0001	0.2684	0.22	0.12	0.34	--	--	--	--	0.00	0.00
Redstripe Rockfish	0.0000	0.0000	0.8678	0.00	0.00	0.00	--	--	--	--	--	--
Rockfish Unid	--	--	--	--	--	--	--	--	--	--	--	--
Rosethorn Rockfish	0.0003	0.0001	0.1572	0.30	0.36	0.65	0.0000	0.0000	0.5064	0.00	0.00	0.00
Rosy Rockfish	0.0000	0.0000	0.0349	0.00	--	0.00	--	--	--	--	--	--
Shelf Rockfish Unid	--	--	--	--	0.14	0.14	--	--	--	--	--	--
Silvergray Rockfish	0.0000	0.0000	0.4211	0.03	0.02	0.05	--	--	--	--	--	--
Minor shelf rockfish (South of 40°10' N. lat.)												
Flag Rockfish	--	--	--	--	0.24	0.24	--	--	--	--	--	--
Redstripe Rockfish	--	--	--	--	--	--	--	--	--	--	--	--
Rosethorn Rockfish	0.0000	0.0000	0.9371	0.00	0.04	0.04	--	--	--	--	--	--
Shelf Rockfish Unid	--	--	--	--	--	--	--	--	--	--	--	--
Swordspine Rockfish	--	--	--	--	0.04	0.04	--	--	--	--	--	--

‡Mortality rates provided by the Groundfish Management Team (GMT).

Table 6 (continued).

Limited Entry Sablefish Endorsed Primary Season	Longline						Pot					
	Observed vessels		Observed trips	Observed sets	Expansion factor: Fleet landings of sablefish (mt)		Observed vessels		Observed trips	Observed sets	Expansion factor: Fleet landings of sablefish (mt)	
	26		97	632	912		9		35	299	358	
Weight (mt)	Discard Ratio	SE	CV	Discard	Landed	Estimate	Discard Ratio	SE	CV	Discard	Landed	Estimate
Minor slope rockfish (North of 40°10' N. lat.)												
Aurora Rockfish	0.0000	0.0000	0.3082	0.04	0.01	0.05	--	--	--	--	0.00	0.00
Bank Rockfish	0.0000	0.0000	0.8678	0.01	0.01	0.01	--	--	--	--	--	--
Blackgill Rockfish	0.0003	0.0003	0.8124	0.28	0.27	0.56	0.0000	0.0000	0.5725	0.01	0.01	0.01
Blackspotted Rockfish	--	--	--	--	0.64	0.64	--	--	--	--	--	--
Redbanded Rockfish	0.0043	0.0006	0.1488	3.93	9.38	13.31	0.0003	0.0001	0.1747	0.12	0.14	0.26
Rockfish Unid	0.0000	0.0000	0.4744	0.00	--	0.00	--	--	--	--	--	--
Rougheye/Blackspotted Rockfish	--	--	--	--	18.75	18.75	--	--	--	--	0.17	0.17
Rougheye Rockfish	0.0144	0.0021	0.1461	13.09	0.00	13.09	0.0000	0.0000	0.5709	0.02	0.00	0.02
Sharpchin Rockfish	0.0000	0.0000	0.3474	0.01	0.00	0.02	0.0000	0.0000	0.7112	0.00	0.00	0.00
Shortraker Rockfish	0.0012	0.0003	0.2406	1.10	1.66	2.76	--	--	--	--	0.02	0.02
Shortraker/Rougheye Rockfish	0.0033	0.0008	0.2433	2.98	--	2.98	--	--	--	--	--	--
Slope Rockfish Unid	--	--	--	--	0.98	0.98	--	--	--	--	0.22	0.22
Splitnose Rockfish	0.0000	0.0000	0.6153	0.02	0.00	0.03	--	--	--	--	--	--
Yellowmouth Rockfish	0.0001	0.0000	0.4758	0.08	0.26	0.34	--	--	--	--	--	--
Minor slope rockfish (South of 40°10' N. lat.)												
Aurora Rockfish	0.0000	0.0000	0.9749	0.00	0.18	0.18	--	--	--	--	--	--
Bank Rockfish	--	--	--	--	0.18	0.18	--	--	--	--	--	--
Blackgill Rockfish	0.0014	0.0007	0.4618	1.30	4.19	5.49	--	--	--	--	0.09	0.09
Blackspotted Rockfish	--	--	--	--	0.22	0.22	--	--	--	--	--	--
Redbanded Rockfish	0.0000	0.0000	0.9775	0.01	2.00	2.01	--	--	--	--	--	--
Rougheye/Blackspotted Rockfish	--	--	--	--	0.06	0.06	--	--	--	--	--	--
Rougheye Rockfish	0.0001	0.0001	0.9503	0.08	0.00	0.08	--	--	--	--	--	--
Slope Rockfish Unid	--	--	--	--	0.06	0.06	--	--	--	--	--	--
Mixed thornyheads												
Shortspine/Longspine Thornyhead	--	--	--	--	0.35	0.35	--	--	--	--	--	--
Other flatfish												
Flathead Sole	0.0000	0.0000	0.0349	0.00	--	0.00	--	--	--	--	--	--
Pacific cod	0.0015	0.0003	0.2241	1.34	3.24	4.58	--	--	--	--	--	--
Pacific hake	0.0000	0.0000	0.2972	0.04	0.00	0.04	--	--	--	--	--	--
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	0.0001	0.0000	0.3218	0.12	0.05	0.17	--	--	--	--	0.00	0.00
Petrale sole	0.0002	0.0001	0.3155	0.21	1.02	1.23	--	--	--	--	0.01	0.01
Sablefish (North of 36° N. lat.)	0.2105	0.0152	0.0722	191.95	896.33	934.72	0.3566	0.0387	0.1086	127.71	357.92	383.47
20% discard mortality (Fixed Gear)‡				38.39						25.54		
Sablefish (South of 36° N. lat.)	--	--	--	--	15.55	15.55	--	--	--	--	0.21	0.21
20% discard mortality (Fixed Gear)‡												
Shortspine Thornyhead (North of 34°27' N. lat.)	0.0029	0.0007	0.2231	2.68	14.65	17.33	0.0001	0.0000	0.2381	0.02	0.10	0.13
Shortspine Thornyhead (South of 34°27' N. lat.)	--	--	--	--	1.35	1.35	--	--	--	--	--	--
Spiny dogfish	0.1390	0.0214	0.1542	126.74	0.60	63.97	0.0007	0.0001	0.1064	0.26	--	0.26
50% discard mortality (Line)‡				63.37								
Widow rockfish	0.0001	0.0001	0.4728	0.13	0.05	0.18	--	--	--	--	--	--
YELLOWEYE ROCKFISH	0.0006	0.0003	0.4028	0.57	--	0.57	0.0000	0.0000	0.0391	0.01	--	0.01
Yellowtail rockfish (North of 40°10' N. lat.)	0.0008	0.0002	0.2838	0.75	0.41	1.16	--	--	--	--	--	--
Non-groundfish species												
Dungeness crab	0.0000	0.0000	0.1612	0.01	--	0.01	0.0036	0.0006	0.1619	1.31	--	1.31
Non-FMP flatfish												
Deepsea Sole	--	--	--	--	--	--	0.0000	0.0000	0.4553	0.01	--	0.01
Slender Sole	--	--	--	--	--	--	0.0000	0.0000	0.0391	0.00	--	0.00
Other nongroundfish												
Sculpin Unid	0.0000	0.0000	0.0731	0.00	--	0.00	0.0000	0.0000	0.0391	0.00	--	0.00

Table 7. LE Non-Primary Fixed Gear.

Observed discard ratios, standard error, estimated discard (mt), landings (mt), and fishing mortality estimates (mt) from the LE non-endorsed fixed gear fleet in 2015. Ratios are computed as the observed discard weight divided by the observed weight of retained sablefish (north of 36° N lat.) or FMP groundfish (south of 36° N lat. and pot gear) (adjusted to fish tickets). The observed OA discard ratios were used for pot gear, as no pot was observed in this sector. Pot landings in this sector only occurred north of 36° N lat. Discard ratios were multiplied by fleet landings of sablefish or FMP groundfish to generate discard estimates for each gear type; combined with fixed gear sectors in Table 9. Rebuilding species are capitalized.

Limited Entry Non-Endorsed Fixed Gear	Longline - North of 36° N lat.						Longline - South of 36° N lat.						Pot - North of 36° N lat.					
	Observed vessels		Observed trips	Observed sets	Expansion factor: Fleet landings of sablefish (mt)		Observed vessels		Observed trips	Observed sets	Expansion factor: Fleet landings of groundfish (mt)		OA Observed (see Table 8b)			Expansion factor: Fleet landings of groundfish (mt)		
	6		14	17	141		15		51	127	510					3		
Weight (mt)	Discard Ratio	SE	CV	Discard	Landed	Estimate	Discard Ratio	SE	CV	Discard	Landed	Estimate	Discard Ratio	SE	CV	Discard	Landed	Estimate
Groundfish species																		
Arrowtooth flounder	0.0017	0.0009	0.5176	0.24	0.08	0.32	--	--	--	--	--	--	0.0012	0.0002	0.1977	0.00	--	0.00
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	--	--	--	--	0.19	0.19	--	--	--	--	2.92	2.92	--	--	--	--	--	--
California scorpionfish (South of 34°27' N. lat.)	--	--	--	--	--	--	0.0001	0.0001	0.7183	0.05	--	0.05	--	--	--	--	--	--
Canary rockfish	--	--	--	--	0.01	0.01	0.0000	0.0000	0.1279	0.02	--	0.02	--	--	--	--	--	--
Chilipepper rockfish (South of 40°10' N. lat.)	--	--	--	--	0.30	0.30	--	--	--	--	0.04	0.04	--	--	--	--	--	--
DARKBLOTCHED ROCKFISH	0.0012	0.0011	0.8735	0.18	1.10	1.27	--	--	--	--	--	--	0.0001	0.0000	0.2558	0.00	--	0.00
Dover sole	0.0013	0.0007	0.5615	0.18	0.18	0.37	0.0012	0.0003	0.2354	0.59	0.79	1.39	0.0007	0.0002	0.3390	0.00	--	0.00
Ecosystem component species																		
Big Skate	--	--	--	--	0.01	0.01	--	--	--	--	0.00	0.00	--	--	--	--	--	--
Black Skate	--	--	--	--	--	--	0.0155	0.0026	0.1674	7.89	--	7.89	--	--	--	--	--	--
California Skate	--	--	--	--	--	--	--	--	--	--	0.02	0.02	--	--	--	--	--	--
Deepsea Skate	--	--	--	--	--	--	0.0004	0.0001	0.3954	0.19	--	0.19	--	--	--	--	--	--
Giant Grenadier	--	--	--	--	--	--	0.0080	0.0013	0.1641	4.05	--	4.05	--	--	--	--	--	--
Grenadier Unid	--	--	--	--	15.68	15.68	0.0006	0.0004	0.6440	0.30	8.72	9.03	--	--	--	--	0.08	0.08
Pacific Flatnose	0.0254	0.0132	0.5192	3.59	--	3.59	0.00	0.00	0.3807	0.7755	--	0.78	--	--	--	--	--	--
Pacific Grenadier	0.0441	0.0117	0.2657	6.22	--	6.22	0.1174	0.0535	0.4559	59.8189	--	59.82	--	--	--	--	--	--
Sandpaper Skate	--	--	--	--	--	--	0.00	0.00	0.1279	0.0094	--	0.01	--	--	--	--	--	--
Skate Unid	0.0038	0.0010	0.2677	0.54	0.31	0.85	--	--	--	--	0.14	0.14	--	--	--	--	--	--
Soupfin Shark	--	--	--	--	--	--	0.0229	0.0029	0.1279	11.67	0.03	11.70	--	--	--	--	--	--
Spotted Ratfish	0.0063	0.0028	0.4376	0.90	--	0.90	0.0008	0.0002	0.2936	0.39	0.01	0.39	0.0000	0.0000	0.1138	0.00	--	0.00
Lingcod (North of 40°10' N. lat.)	--	--	--	--	1.44	1.44	--	--	--	--	--	--	--	--	--	--	0.03	0.03
7% discard mortality (Line)‡																		
Lingcod (South of 40°10' N. lat.)	0.0005	0.0001	0.2677	0.08	0.10	0.11	--	--	--	--	0.33	0.33	0.0013	0.0005	0.4374	0.00	--	0.00
7% discard mortality (Line)‡				0.01														
Longnose skate	0.0906	0.0633	0.6991	12.80	2.25	8.65	0.0137	0.0041	0.2959	6.9813	0.91	4.40	--	--	--	--	--	--
50% discard mortality (Fixed Gear)‡				6.40						3.49								
Longspine Thornyhead (North of 34°27' N. lat.)	--	--	--	--	0.32	0.32	0.01	0.00	0.2141	4.0234	1.28	5.31	--	--	--	--	0.00	0.00
Longspine Thornyhead (South of 34°27' N. lat.)	--	--	--	--	--	--	0.00	0.00	0.2321	0.7007	6.45	7.15	--	--	--	--	--	--
Minor nearshore rockfish (South of 40°10' N. lat.)																		
Copper Rockfish	--	--	--	--	--	--	0.00	0.00	0.1279	0.0263	--	0.03	--	--	--	--	--	--
Treefish Rockfish	--	--	--	--	--	--	0.00	0.00	0.1279	0.0075	--	0.01	--	--	--	--	--	--
Minor shelf rockfish (North of 40°10' N. lat.)																		
Chilipepper Rockfish	--	--	--	--	0.00	0.00	--	--	--	--	--	--	--	--	--	--	--	--
Greenstriped Rockfish	--	--	--	--	0.03	0.03	--	--	--	--	--	--	--	--	--	--	--	--
Rosethorn Rockfish	--	--	--	--	0.00	0.00	--	--	--	--	--	--	0.0000	0.0000	0.1138	0.0001	--	0.00
Shelf Rockfish Unid	--	--	--	--	0.01	0.01	--	--	--	--	--	--	--	--	--	--	--	--
Silvergray Rockfish	--	--	--	--	0.00	0.00	--	--	--	--	--	--	--	--	--	--	--	--
Minor shelf rockfish (South of 40°10' N. lat.)																		
Flag Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.2071	0.02	0.02	0.05	--	--	--	--	--	--
Greenblotched Rockfish	--	--	--	--	--	--	--	--	--	--	0.01	0.01	--	--	--	--	--	--
Greenspotted Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.1279	0.00	0.19	0.19	--	--	--	--	--	--
Greenstriped Rockfish	--	--	--	--	--	--	--	--	--	--	0.03	0.03	--	--	--	--	--	--
Halfbanded Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.1279	0.02	--	0.02	--	--	--	--	--	--
Honeycomb Rockfish	--	--	--	--	--	--	0.0001	0.0000	0.6592	0.04	0.00	0.04	--	--	--	--	--	--
Mexican Rockfish	--	--	--	--	--	--	--	--	--	--	0.01	0.01	--	--	--	--	--	--
Rosethorn Rockfish	--	--	--	--	0.00	0.00	--	--	--	--	--	--	--	--	--	--	--	--
Rosy Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.1279	0.00	0.03	0.04	--	--	--	--	--	--
Speckled Rockfish	--	--	--	--	--	--	--	--	--	--	0.05	0.05	--	--	--	--	--	--
Squarespot Rockfish	--	--	--	--	--	--	--	--	--	--	0.04	0.04	--	--	--	--	--	--
Starry Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.1279	0.01	0.66	0.67	--	--	--	--	--	--
Vermilion Rockfish	--	--	--	--	--	--	0.0000	0.0000	0.1279	0.00	6.64	6.64	--	--	--	--	--	--
Yellowtail Rockfish	--	--	--	--	--	--	--	--	--	--	0.02	0.02	--	--	--	--	--	--

‡Mortality rates provided by the Groundfish Management Team (GMT).

Table 7 (continued).

Limited Entry Non-Endorsed Fixed Gear	Longline - North of 36° N lat.						Longline - South of 36° N lat.						Pot - North of 36° N lat.					
	Observed vessels		Observed trips	Observed sets	Expansion factor: Fleet landings of sablefish (mt)		Observed vessels		Observed trips	Observed sets	Expansion factor: Fleet landings of groundfish (mt)		OA Observed (see Table 8b)			Expansion factor: Fleet landings of groundfish (mt)		
	6		14	17	141		15		51	127	510					3		
Weight (mt)	Discard Ratio	SE	CV	Discard	Landed	Estimate	Discard Ratio	SE	CV	Discard	Landed	Estimate	Discard Ratio	SE	CV	Discard	Landed	Estimate
Minor slope rockfish (North of 40°10' N. lat.)																		
Aurora Rockfish	--	--	--	--	0.01	0.01	--	--	--	--	--	--	--	--	--	--	--	--
Bank Rockfish	--	--	--	--	0.00	0.00	--	--	--	--	--	--	--	--	--	--	--	--
Blackgill Rockfish	--	--	--	--	0.85	0.85	--	--	--	--	--	--	--	--	--	--	--	--
Blackspotted Rockfish	--	--	--	--	0.14	0.14	--	--	--	--	--	--	--	--	--	--	--	--
Redbanded Rockfish	--	--	--	--	6.33	6.33	--	--	--	--	--	--	0.0000	0.0000	0.8345	0.00	--	0.00
Rougheye/Blackspotted Rockfish	--	--	--	--	4.10	4.10	--	--	--	--	--	--	--	--	--	--	--	--
Sharpchin Rockfish	--	--	--	--	0.00	0.00	--	--	--	--	--	--	--	--	--	--	--	--
Shortraker Rockfish	--	--	--	--	0.20	0.20	--	--	--	--	--	--	--	--	--	--	--	--
Slope Rockfish Unid	--	--	--	--	0.98	0.98	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Splitnose Rockfish	--	--	--	--	0.00	0.00	--	--	--	--	--	--	--	--	--	--	--	--
Yellowmouth Rockfish	--	--	--	--	0.05	0.05	--	--	--	--	--	--	--	--	--	--	--	--
Minor slope rockfish (South of 40°10' N. lat.)																		
Aurora Rockfish	--	--	--	--	0.02	0.02	0.0000	0.0000	0.9685	0.01	1.03	1.05	--	--	--	--	--	--
Bank Rockfish	--	--	--	--	0.09	0.09	--	--	--	--	0.4548	0.45	--	--	--	--	--	--
Blackgill Rockfish	0.0012	0.0006	0.5228	0.16	1.73	1.90	0.0009	0.0006	0.6000	0.48	10.62	11.10	--	--	--	--	--	--
Pacific Ocean Perch	--	--	--	--	--	--	--	--	--	--	0.00	0.00	--	--	--	--	--	--
Redbanded Rockfish	0.0002	0.0002	0.8735	0.03	0.06	0.09	--	--	--	--	--	--	0.0001	0.0001	0.3615	0.00	--	0.00
Rockfish Unid	--	--	--	--	--	--	--	--	--	--	--	--	0.0000	0.0000	0.2195	0.00	--	0.00
Slope Rockfish Unid	--	--	--	--	0.17	0.17	--	--	--	--	--	--	--	--	--	--	--	--
Mixed thornyheads																		
Shortspine/Longspine Thornyhead	--	--	--	--	0.05	0.05	--	--	--	--	2.68	2.68	--	--	--	--	--	--
Other flatfish																		
Flatfish Unid	--	--	--	--	--	--	--	--	--	--	0.02	0.02	--	--	--	--	--	--
Pacific Sanddab	--	--	--	--	--	--	0.0000	0.0000	0.1279	0.02	1.8339	1.85	--	--	--	--	--	--
Sanddab Unid	--	--	--	--	--	--	--	--	--	--	0.25	0.25	--	--	--	--	--	--
Other groundfish																		
Leopard Shark	--	--	--	--	--	--	--	--	--	--	0.01	0.0150	--	--	--	--	--	--
Other rockfish																		
Rockfish Unid	--	--	--	--	--	--	--	--	--	--	1.01	1.0124	--	--	--	--	--	--
Pacific cod	--	--	--	--	0.07	0.07	--	--	--	--	--	--	--	--	--	--	--	--
Pacific hake	--	--	--	--	0.02	0.02	0.0003	0.0001	0.3175	0.17	0.04	0.21	--	--	--	--	--	--
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	--	--	--	--	0.01	0.01	--	--	--	--	--	--	--	--	--	--	--	--
Petrale sole	0.0013	0.0004	0.2677	0.1855	0.06	0.25	0.0000	0.0000	0.7183	0.02	0.04	0.06	0.0001	0.0001	0.7277	0.00	--	0.00
Sablefish (North of 36° N. lat.)	0.2242	0.0715	0.3187	31.68	141.27	147.61	--	--	--	--	--	--	0.2588	0.0753	0.2911	0.79	2.92	3.08
20% discard mortality (Fixed Gear)‡				6.34												0.16		
Sablefish (South of 36° N. lat.)	--	--	--	--	--	--	0.0736	0.0200	0.2715	37.49	379.84	387.34	0.0024	0.0006	0.2376	0.01	--	0.00
20% discard mortality (Fixed Gear)‡										7.50						0.00		
Shortspine Thornyhead (North of 34°27' N. lat.)	0.0007	0.0005	0.8121	0.0943	7.70	7.80	0.0004	0.0002	0.4769	0.1784	18.46	18.64	0.0002	0.0001	0.4290	0.00	0.00	0.00
Shortspine Thornyhead (South of 34°27' N. lat.)	--	--	--	--	--	--	0.0068	0.0011	0.1688	3.4489	63.78	67.2299	0.0000	0.0000	0.8345	0.00	--	0.00
Spiny dogfish	0.0326	0.0241	0.7403	4.60	14.69	16.99	0.0002	0.0000	0.2325	0.09	0.10	0.15	0.0004	0.0000	0.1138	0.00	--	0.00
50% discard mortality (Line)‡				2.30						0.05						0.00		
Splitnose rockfish (South of 40°10' N. lat.)	--	--	--	--	--	--	--	--	--	--	0.13	0.13	--	--	--	--	--	--
Widow rockfish	--	--	--	--	0.01	0.01	--	--	--	--	--	--	--	--	--	--	--	--
Yellowtail rockfish (North of 40°10' N. lat.)	--	--	--	--	1.71	1.71	--	--	--	--	--	--	--	--	--	--	--	--
Non-groundfish species																		
California halibut	--	--	--	--	--	--	--	--	--	--	0.02	0.02	--	--	--	--	--	--
Dungeness crab	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.05	0.05
Non-FMP flatfish																		
Deepsea Sole	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 8a. OA Fixed Gear, Longline.

Observed discard ratios, standard error, estimated discard (mt), landings (mt), and fishing mortality estimates (mt) from the OA fixed gear longline fleet in 2015. Ratios are computed as the observed discard weight divided by the observed weight of retained sablefish or FMP groundfish (adjusted to fish tickets). Discard ratios were multiplied by fleet landings of sablefish or FMP groundfish to generate discard estimates; combined with fixed gear sectors in Table 9. Rebuilding species are capitalized.

Open Access Fixed Gear	Longline - Coastwide			North of 36° N lat. Expansion factor: Fleet landings of groundfish (mt)			South of 36° N lat. Expansion factor: Fleet landings of groundfish (mt)		
	Observed vessels	Observed trips	Observed sets						
	20	38	54	319			61		
Weight (mt)	Discard Ratio	SE	CV	Discard	Landed	Estimate	Discard	Landed	Estimate
Groundfish species									
Arrowtooth flounder	0.0017	0.0006	0.3300	0.56	0.13	0.69	0.11	--	0.11
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	--	--	--	--	1.04	1.04	--	1.73	1.73
Canary rockfish	0.0029	0.0014	0.4722	0.92	0.05	0.97	0.18	--	0.18
Chilipepper rockfish (South of 40°10' N. lat.)	--	--	--	--	0.31	0.31	--	0.15	0.15
DARKBLOTCHED ROCKFISH	0.0001	0.0001	0.5304	0.04	0.44	0.49	0.01	--	0.01
Dover sole	0.0014	0.0004	0.3043	0.44	0.07	0.51	0.08	--	0.08
Ecosystem component species									
Big Skate	0.0017	0.0002	0.1170	0.54	1.17	1.71	0.10	--	0.10
Black Skate	0.0059	0.00164	0.2786	1.88	--	1.88	0.36	--	0.36
California Skate	0.0001	0.0000	0.1170	0.02	--	0.02	0.00	--	0.00
Giant Grenadier	0.0032	0.0011	0.3490	1.03	--	1.03	0.20	--	0.20
Grenadier Unid	0.0004	0.0003	0.7172	0.13	22.29	22.42	0.03	--	0.03
Pacific Flatnose	0.0066	0.0033	0.5037	2.12	--	2.12	0.41	--	0.41
Pacific Grenadier	0.2267	0.1157	0.5103	72.36	--	72.36	13.92	--	13.92
Sandpaper Skate	0.0005	0.0001	0.2565	0.16	--	0.16	0.03	--	0.03
Skate Unid	--	--	--	--	0.29	0.29	--	0.07	0.07
Soupfin Shark	--	--	--	--	0.04	0.04	--	0.06	0.06
Spotted Ratfish	0.0044	0.0012	0.2604	1.42	--	1.42	0.27	--	0.27
Lingcod (North of 40°10' N. lat.)	0.0010	0.0005	0.5234	0.32	36.73	36.75	--	--	--
7% discard mortality (Line)‡				0.02					
Lingcod (South of 40°10' N. lat.)	0.0002	0.00017	0.8374	0.06	32.47	32.47	0.01	9.97	9.98
7% discard mortality (Line)‡				0.00			0.00		
Longnose skate	0.0203	0.0063	0.3100	6.48	1.32	4.56	1.25	--	0.62
50% discard mortality (Fixed Gear)‡				3.24			0.62		
Longspine Thornyhead (North of 34°27' N. lat.)	0.0010	0.0005	0.4816	0.32	--	0.32	0.06	--	0.06
Longspine Thornyhead (South of 34°27' N. lat.)	--	--	--	--	--	--	--	0.45	0.45
Minor nearshore rockfish (South of 40°10' N. lat.)									
Olive Rockfish	0.0001	0.0000	0.1170	0.02	--	0.02	0.00	--	0.00
Minor shelf rockfish (North of 40°10' N. lat.)									
Bocaccio Rockfish	--	--	--	--	0.03	0.03	--	--	--
Chilipepper Rockfish	--	--	--	--	0.00	0.00	--	--	--
Greenspotted Rockfish	--	--	--	--	0.00	0.00	--	--	--
Greenstriped Rockfish	0.0000	0.0000	0.5870	0.02	0.01	0.03	--	--	--
Rosethorn Rockfish	0.0001	0.0001	0.7308	0.02	0.09	0.12	--	--	--
Shelf Rockfish Unid	--	--	--	--	0.04	0.04	--	--	--
Vermilion Rockfish	--	--	--	--	0.10	0.10	--	--	--
Minor shelf rockfish (South of 40°10' N. lat.)									
Flag Rockfish	--	--	--	--	--	--	--	0.15	0.15
Greenblotched Rockfish	--	--	--	--	--	--	--	0.05	0.05
Greenspotted Rockfish	--	--	--	--	0.01	0.01	--	0.75	0.75
Greenstriped Rockfish	--	--	--	--	--	--	--	0.02	0.02
Honeycomb Rockfish	--	--	--	--	--	--	--	0.00	0.00
Mexican Rockfish	--	--	--	--	--	--	--	0.00	0.00
Rosy Rockfish	--	--	--	--	--	--	--	0.01	0.01
Shelf Rockfish Unid	--	--	--	--	0.24	0.24	--	0.93	0.93
Speckled Rockfish	--	--	--	--	0.00	0.00	--	0.11	0.11
Squarespot Rockfish	--	--	--	--	--	--	--	0.02	0.02
Starry Rockfish	--	--	--	--	--	--	--	0.21	0.21
Vermilion Rockfish	--	--	--	--	3.83	3.83	--	11.24	11.24
Yellowtail Rockfish	--	--	--	--	1.56	1.56	--	0.67	0.67

‡Mortality rates provided by the Groundfish Management Team (GMT).

Table 8a (continued).

Open Access Fixed Gear	Longline - Coastwide			North of 36° N lat. Expansion factor: Fleet landings of groundfish (mt)			South of 36° N lat. Expansion factor: Fleet landings of groundfish (mt)		
	Observed vessels	Observed trips	Observed sets						
	20	38	54	319			61		
Weight (mt)	Discard Ratio	SE	CV	Discard	Landed	Estimate	Discard	Landed	Estimate
Minor slope rockfish (North of 40°10' N. lat.)									
Aurora Rockfish	--	--	--	--	0.01	0.01	--	--	--
Blackgill Rockfish	--	--	--	--	0.63	0.63	--	--	--
Blackspotted Rockfish	--	--	--	--	0.08	0.08	--	--	--
Redbanded Rockfish	0.0008	0.0003	0.3731	0.24	2.43	2.67	--	--	--
Rockfish Unid	0.0001	0.0000	0.1170	0.03	--	0.03	--	--	--
Rougheye/Blackspotted Rockfish	--	--	--	--	1.24	1.24	--	--	--
Rougheye Rockfish	0.0008	0.0007	0.9135	0.24	0.00	0.24	--	--	--
Sharpchin Rockfish	--	--	--	--	0.00	0.00	--	--	--
Shortraker Rockfish	--	--	--	--	0.08	0.08	--	--	--
Slope Rockfish Unid	--	--	--	--	0.02	0.02	--	--	--
Splitnose Rockfish	0.0000	0.0000	0.7308	0.01	0.01	0.02	--	--	--
Yellowmouth Rockfish	--	--	--	--	0.00	0.00	--	--	--
Minor slope rockfish (South of 40°10' N. lat.)									
Aurora Rockfish	--	--	--	--	0.01	0.01	--	0.00	0.00
Bank Rockfish	--	--	--	--	0.03	0.03	--	0.04	0.04
Blackgill Rockfish	--	--	--	--	1.82	1.82	--	0.59	0.59
Blackspotted Rockfish	--	--	--	--	0.00	0.00	--	--	--
Redbanded Rockfish	--	--	--	--	0.09	0.09	--	0.00	0.00
Rougheye/Blackspotted Rockfish	--	--	--	--	0.00	0.00	--	--	--
Slope Rockfish Unid	--	--	--	--	0.15	0.15	--	0.03	0.03
Mixed thornyheads									
Shortspine/Longspine Thornyhead	--	--	--	--	--	--	--	0.00	0.00
Other flatfish									
Flatfish Unid	--	--	--	--	--	--	--	0.00	0.00
Pacific Sanddab	--	--	--	--	--	--	--	0.85	0.85
Rock Sole	--	--	--	--	--	--	--	0.01	0.01
Sand Sole	--	--	--	--	0.00	0.00	--	0.00	0.00
Sanddab Unid	--	--	--	--	4.12	4.12	--	0.51	0.51
Other groundfish									
Leopard Shark	--	--	--	--	1.28	1.28	--	0.96	0.96
Other rockfish	--	--	--	--	0.32	0.32	--	0.06	0.06
Rockfish Unid									
Pacific cod	--	--	--	--	0.50	0.50	--	--	--
Pacific hake	0.0000	0.0000	0.3391	0.01	--	0.01	0.00	--	0.00
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	0.0000	0.0000	0.1170	0.01	0.01	0.02	0.00	--	0.00
Petrale sole	0.0001	0.0000	0.1170	0.04	0.32	0.36	0.01	0.01	0.02
Sablefish (North of 36° N. lat.)	0.1709	0.0425	0.2489	54.53	203.02	213.92	--	--	--
20% discard mortality (Fixed Gear)‡				10.91					
Sablefish (South of 36° N. lat.)	0.0017	0.0006	0.3750	--	--	--	0.10	24.12	24.14
20% discard mortality (Fixed Gear)‡							0.02		
Shortspine Thornyhead (North of 34°27' N. lat.)	0.0090	0.0030	0.3350	2.88	0.13	3.01	0.55	--	0.55
Shortspine Thornyhead (South of 34°27' N. lat.)	0.0022	0.0011	0.5141	--	--	--	0.13	7.45	7.59
Spiny dogfish	0.0439	0.0197	0.4481	14.01	0.15	7.15	2.69	--	1.35
50% discard mortality (Line)‡				7.00			1.35		
Splitnose rockfish (South of 40°10' N. lat.)	--	--	--	--	--	--	--	0.00	0.00
Starry flounder	--	--	--	--	0.12	0.12	--	--	--
Widow rockfish	--	--	--	--	0.18	0.18	--	0.15	0.15
YELLOWEYE ROCKFISH	0.0005	0.0001	0.2991	0.15	--	0.15	0.03	--	0.03
Yellowtail rockfish (North of 40°10' N. lat.)	--	--	--	--	0.11	0.11	--	--	--
Non-groundfish species									
California halibut	--	--	--	--	0.89	0.89	--	0.17	0.17
Other nongroundfish									
Sculpin Unid	0.0000	0.0000	0.1170	0.00	--	0.00	0.00	--	0.00

Table 8b. OA Fixed Gear, Pot.

Observed discard ratios, standard error, estimated discard (mt), landings (mt), and fishing mortality estimates (mt) from the OA fixed gear pot fleet in 2015. Ratios are computed as the observed discard weight divided by the observed weight of retained sablefish or FMP groundfish (adjusted to fish tickets). Discard ratios were multiplied by fleet landings of sablefish or FMP groundfish to generate discard estimates; combined with fixed gear sectors in Table 9. Rebuilding species are capitalized.

Open Access Fixed Gear	Pot - Coastwide			North of 36° N lat. Expansion factor: Fleet landings of groundfish (mt)			South of 36° N lat. Expansion factor: Fleet landings of groundfish (mt)		
	Observed vessels	Observed trips	Observed sets						
	17	49	64	238			9		
Weight (mt)	Discard Ratio	CV	SE	Discard	Landed	Estimate	Discard	Landed	Estimate
Groundfish species									
Arrowtooth flounder	0.0012	0.0002	0.1977	0.30	0.00	0.30	0.01	--	0.01
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	--	--	--	--	--	--	--	0.01	0.01
Canary rockfish	--	--	--	--	0.01	0.01	--	--	--
DARKBLOTCHED ROCKFISH	0.0001	0.0000	0.2558	0.03	--	0.03	0.00	--	0.00
Dover sole	0.0007	0.0002	0.3390	0.15	0.23	0.39	0.01	--	0.01
Ecosystem component species									
Skate Unid	--	--	--	--	0.01	0.01	--	--	--
Spotted Ratfish	0.0000	0.0000	0.1138	0.01	--	0.01	0.00	--	0.00
Lingcod (North of 40°10' N. lat.)	--	--	--	--	1.16	1.16	--	--	--
Lingcod (South of 40°10' N. lat.)	0.0013	0.0005	0.4374	0.30	0.48	0.78	0.01	--	0.01
Longnose skate	--	--	--	--	0.02	0.02	--	--	--
50% discard mortality (Fixed Gear)‡									
Minor shelf rockfish (North of 40°10' N. lat.)									
Rosethorn Rockfish	0.0000	0.0000	0.1138	0.01	--	0.01	--	--	--
Vermilion Rockfish	--	--	--	--	0.00	0.00	--	--	--
Minor shelf rockfish (South of 40°10' N. lat.)									
Rosy Rockfish	--	--	--	--	--	--	--	0.00	0.00
Shelf Rockfish Unid	--	--	--	--	0.00	0.00	--	--	--
Vermilion Rockfish	--	--	--	--	0.00	0.00	--	0.01	0.01
Yellowtail Rockfish	--	--	--	--	--	--	--	0.00	0.00
Minor slope rockfish (North of 40°10' N. lat.)									
Blackgill Rockfish	--	--	--	--	0.01	0.01	--	--	--
Redbanded Rockfish	0.0000	0.0000	0.8345	0.01	0.03	0.04	--	--	--
Rougheye/Blackspotted Rockfish	--	--	--	--	0.01	0.01	--	--	--
Sharpchin Rockfish	--	--	--	--	0.00	0.00	--	--	--
Slope Rockfish Unid	--	--	--	--	0.34	0.34	--	--	--
Minor slope rockfish (South of 40°10' N. lat.)									
Aurora Rockfish	--	--	--	--	--	--	--	0.00	0.00
Blackgill Rockfish	--	--	--	--	0.02	0.02	--	0.32	0.32
Redbanded Rockfish	0.0001	0.0001	0.3615	0.03	--	0.03	0.00	--	0.00
Rockfish Unid	0.0000	0.0000	0.2195	0.01	--	0.01	0.00	--	0.00
Slope Rockfish Unid	--	--	--	--	0.00	0.00	--	--	--
Mixed thornyheads									
Shortspine/Longspine Thornyhead	--	--	--	--	--	--	--	0.01	0.01
Other flatfish									
Sanddab Unid	--	--	--	--	0.02	0.02	--	--	--
Pacific cod	--	--	--	--	0.01	0.01	--	--	--
Petrale sole	0.0001	0.0001	0.7277	0.02	0.04	0.07	0.00	--	0.00
Sablefish (North of 36° N. lat.)	0.2588	0.0753	0.2911	61.47	224.00	236.30	--	--	--
20% discard mortality (Fixed Gear)‡				12.29					
Sablefish (South of 36° N. lat.)	0.0024	0.0006	0.2376	--	--	--	0.02	8.65	8.65
20% discard mortality (Fixed Gear)‡							0.00		
Shortspine Thornyhead (North of 34°27' N. lat.)	0.0002	0.0001	0.4290	0.04	--	0.04	0.00	0.01	0.02
Shortspine Thornyhead (South of 34°27' N. lat.)	0.0000	0.0000	0.8345	--	--	--	0.00	--	0.00
Spiny dogfish	0.0004	0.0000	0.1138	0.10	--	0.10	0.00	--	0.00
Splitnose rockfish (South of 40°10' N. lat.)	--	--	--	--	--	--	--	0.0045	0.00
Starry flounder	--	--	--	--	11.14	11.14	--	--	--
Non-groundfish species									
Dungeness crab	--	--	--	--	0.70	0.70	--	--	--

‡Mortality rates provided by the Groundfish Management Team (GMT).

Table 9. LE and OA Fixed Gear Summary.

Estimated discard (mt), landings (mt), and fishing mortality estimate (mt) of groundfish species in the LE and OA non-nearshore fixed gear sectors in 2015. Discard ratios were multiplied by fleet landings of sablefish or FMP groundfish to generate estimated discard (Tables 6-8: LE sablefish endorsed primary season, LE non-endorsed, OA). Rebuilding species are capitalized.

	Limited Entry - Coastwide				Open Access - Coastwide				
Weight (mt)	Longline Discard	Pot Discard	Landed	LE Total	Longline Discard	Pot Discard	Landed	OA Total	**LE & OA Coastwide**
Groundfish species									
Arrowtooth flounder	19.86	0.43	0.60	20.90	0.66	0.31	0.14	1.11	22.01
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	--	--	3.12	3.12	--	--	2.78	2.78	5.90
California scorpionfish (South of 34°27' N. lat.)	0.05	--	--	0.05	--	--	--	--	0.05
Canary rockfish	1.90	--	0.26	2.17	1.10	--	0.06	1.16	3.33
Chilipepper rockfish (South of 40°10' N. lat.)	0.15	--	0.54	0.68	--	--	0.47	0.47	1.15
DARKBLOTCHED ROCKFISH	0.42	0.01	2.71	3.13	0.05	0.03	0.44	0.53	3.66
Dover sole	1.56	0.62	2.73	4.91	0.52	0.16	0.30	0.98	5.89
Ecosystem component species									
Aleutian Skate	0.02	--	--	0.02	--	--	--	--	0.02
Big Skate	0.28	--	2.77	3.05	0.64	--	1.17	1.81	4.86
Black Skate	8.12	--	--	8.12	2.24	--	--	2.24	10.36
California Skate	--	--	0.02	0.02	0.02	--	--	0.02	0.04
Deepsea Skate	0.19	--	--	0.19	--	--	--	--	0.19
Giant Grenadier	5.30	0.13	--	5.44	1.22	--		1.22	6.66
Grenadier Unid	0.63	0.59	33.32	34.54	0.16	--	22.29	22.45	56.99
Pacific Flatnose	4.40	0.03	--	4.43	2.53	--	--	2.53	6.96
Pacific Grenadier	66.57	0.59	--	67.15	86.28	--	--	86.28	153.43
Sandpaper Skate	1.54	0.00	--	1.54	0.19	--	--	0.19	1.73
Skate Unid	0.84	--	2.06	2.91	--	--	0.37	0.37	3.27
Soupfin Shark	11.67	--	0.03	11.70	--	--	0.10	0.10	11.80
Spotted Ratfish	2.68	0.00	0.01	2.68	1.69	0.01	--	1.70	4.38
English sole	0.00	--	--	0.00	--	--	--	--	0.00
Lingcod (North of 40°10' N. lat.)	1.34	2.23	12.54	14.86	0.32	--	37.88	37.91	52.77
7% discard mortality (Line)‡	0.09				0.02				
Lingcod (South of 40°10' N. lat.)	0.08	0.00	1.44	1.45	0.08	0.31	42.92	43.24	44.69
7% discard mortality (Line)‡	0.01				0.01				
Longnose skate	51.93	--	23.27	49.24	7.72		1.34	5.20	54.44
50% discard mortality (Fixed Gear)‡	25.97				3.86				
Longspine Thornyhead (North of 34°27' N. lat.)	4.03	0.01	2.12	6.17	0.39	--	--	0.39	6.55
Longspine Thornyhead (South of 34°27' N. lat.)	0.70	--	6.47	7.17	--	--	0.45	0.45	7.62
Minor nearshore rockfish (South of 40°10' N. lat.)									
Copper Rockfish	0.03	--	--	0.03	--	--	--	--	0.03
Olive Rockfish	--	--	--	--	0.02	--	--	0.02	0.02
Treefish Rockfish	0.01	--	--	0.01	--	--	--	--	0.01
Minor shelf rockfish (North of 40°10' N. lat.)									
Bocaccio Rockfish	0.02	--	--	0.02	--	--	0.03	0.03	0.06
Chilipepper Rockfish	--	--	0.01	0.01	--	--	0.00	0.00	0.01
Greenblotched Rockfish	0.04	--	--	0.04	--	--	--	--	0.04
Greenspotted Rockfish	--	--	0.00	0.00	--	--	0.00	0.00	0.00
Greenstriped Rockfish	0.22	--	0.15	0.37	0.02	--	0.01	0.03	0.40
Redstripe Rockfish	0.00	--	0.00	0.00	--	--	--	--	0.00
Rosethorn Rockfish	0.30	0.00	0.36	0.66	0.02	0.01	0.09	0.13	0.78
Rosy Rockfish	0.00	--	--	0.00	--	--	--	--	0.00
Shelf Rockfish Unid	--	--	0.15	0.15	--	--	0.04	0.04	0.19
Silvergray Rockfish	0.03	--	0.02	0.05	--	--	--	--	0.05
Vermilion Rockfish	--	--	--	--	--	--	0.10	0.10	0.10
Minor shelf rockfish (South of 40°10' N. lat.)									
Flag Rockfish	0.02	--	0.26	0.29	--	--	0.15	0.15	0.44
Greenblotched Rockfish	--	--	0.01	0.01	--	--	0.05	0.05	0.06
Greenspotted Rockfish	0.00	--	0.19	0.19	--	--	0.75	0.75	0.95
Greenstriped Rockfish	--	--	0.03	0.03	--	--	0.02	0.02	0.05
Halfbanded Rockfish	0.02	--		0.02	--	--	--	--	0.02
Honeycomb Rockfish	0.04	--	0.00	0.04	--	--	0.00	0.00	0.04
Mexican Rockfish	--	--	0.01	0.01	--	--	0.00	0.00	0.02
Redstripe Rockfish	--	--			--	--	--	--	
Rosethorn Rockfish	0.00	--	0.04	0.04	--	--	--	--	0.04
Rosy Rockfish	0.00	--	0.03	0.04	--	--	0.01	0.01	0.05
Shelf Rockfish Unid	--	--			--	--	1.18	1.18	1.18
Speckled Rockfish	--	--	0.05	0.05	--	--	0.11	0.11	0.16
Squarespot Rockfish	--	--	0.04	0.04	--	--	0.02	0.02	0.06
Starry Rockfish	0.01	--	0.66	0.67	--	--	0.21	0.21	0.88
Swordspine Rockfish	--	--	0.04	0.04	--	--	--	--	0.04
Vermilion Rockfish	0.00	--	6.64	6.64	--	--	15.08	15.08	21.72
Yellowtail Rockfish	--	--	0.02	0.02	--	--	2.24	2.24	2.25

‡Mortality rates provided by the Groundfish Management Team (GMT).

Table 9 (continued).

	Limited Entry - Coastwide				Open Access - Coastwide				
Weight (mt)	Longline Discard	Pot Discard	Landed	LE Total	Longline Discard	Pot Discard	Landed	OA Total	**LE & OA Coastwide**
Minor slope rockfish (North of 40°10' N. lat.)									
Aurora Rockfish	0.04	--	0.02	0.06	--	--	0.01	0.01	0.07
Bank Rockfish	0.01	--	0.01	0.01	--	--	--	--	0.01
Blackgill Rockfish	0.28	0.01	1.13	1.42	--	--	0.64	0.64	2.05
Blackspotted Rockfish	--	--	0.79	0.79	--	--	0.08	0.08	0.87
Redbanded Rockfish	3.93	0.12	15.85	19.90	0.24	0.01	2.46	2.71	22.61
Rockfish Unid	0.00	--	--	0.00	0.03	--	--	0.03	0.04
Rougheye/Blackspotted Rockfish	--	--	23.02	23.02	--	--	1.25	1.25	24.27
Rougheye Rockfish	13.09	0.02	--	13.11	0.24	--	--	0.24	13.35
Sharpchin Rockfish	0.01	0.00	0.01	0.02	--	--	0.00	0.00	0.03
Shortraker Rockfish	1.10	--	1.88	2.97	--	--	0.08	0.08	3.05
Shortraker/Rougheye Rockfish	2.98	--	--	2.98	--	--	--	--	2.98
Slope Rockfish Unid	--	--	2.18	2.18	--	--	0.37	0.37	2.55
Splitnose Rockfish	0.02	--	0.01	0.03	0.01	--	0.01	0.02	0.05
Yellowmouth Rockfish	0.08	--	0.31	0.39	--	--	0.00	0.00	0.39
Minor slope rockfish (South of 40°10' N. lat.)									
Aurora Rockfish	0.01	--	1.24	1.25	--	--	0.02	0.02	1.26
Bank Rockfish	--	--	0.73	0.73	--	--	0.07	0.07	0.79
Blackgill Rockfish	1.95	--	16.63	18.58	--	--	2.75	2.75	21.33
Blackspotted Rockfish	--	--	0.22	0.22	--	--	0.00	0.00	0.22
Pacific Ocean Perch	--	--	0.00	0.00	--	--	--	--	0.00
Redbanded Rockfish	0.04	0.00	2.06	2.10	--	0.04	0.09	0.13	2.23
Rockfish Unid	--	0.00	--	0.00	--	0.01	--	0.01	0.01
Rougheye/Blackspotted Rockfish	--	--	0.06	0.06	--	--	0.00	0.00	0.06
Rougheye Rockfish	0.08	--	--	0.08	--	--	--	--	0.08
Slope Rockfish Unid	--	--	0.23	0.23	--	--	0.18	0.18	0.41
Mixed thornyheads									
Shortspine/Longspine Thornyhead	--	--	3.07	3.07	--	--	0.01	0.01	3.08
Other flatfish									
Flatfish Unid	--	--	0.02	0.02	--	--	0.00	0.00	0.02
Flathead Sole	0.00	--		0.00	--	--	--	--	0.00
Pacific Sanddab	0.02	--	1.83	1.85	--	--	0.85	0.85	2.70
Rock Sole	--	--	--	--	--	--	0.01	0.01	0.01
Sanddab Unid	--	--	0.25	0.25	--	--	4.64	4.64	4.89
Sand Sole	--	--	--	--	--	--	0.00	0.00	0.00
Other groundfish									
Leopard Shark	--	--	0.01	0.01	--	--	2.24	2.24	2.26
Other rockfish									
Rockfish Unid	--	--	1.01	1.01	--	--	0.39	0.39	1.40
Pacific cod	1.34	--	3.31	4.65	--	--	0.51	0.51	5.16
Pacific hake	0.21	--	0.06	0.27	0.01	--	--	0.01	0.28
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	0.12	--	0.06	0.18	0.01	--	0.01	0.02	0.20
Petrale sole	0.42	0.00	1.13	1.55	0.04	0.02	0.38	0.45	2.00
Sablefish (North of 36° N. lat.)	223.63	128.50	1,398.45	1,468.87	54.53	61.47	427.02	450.22	1,919.09
20% discard mortality (Fixed Gear)‡	44.73	25.70			10.91	12.29			
Sablefish (South of 36° N. lat.)	37.49	0.01	395.61	403.11	0.10	0.02	32.77	32.80	435.90
20% discard mortality (Fixed Gear)‡	7.50	0.00			0.02	0.00			
Shortspine Thornyhead (North of 34°27' N. lat.)	2.95	0.02	40.92	43.89	3.44	0.04	0.14	3.62	47.51
Shortspine Thornyhead (South of 34°27' N. lat.)	3.45	0.00	65.13	68.58	0.13	0.00	7.45	7.59	76.17
Spiny dogfish	131.43	0.26	15.40	81.37	16.70	0.10	0.15	8.60	89.97
50% discard mortality (Line)‡	65.72				8.35				
Splitnose rockfish (South of 40°10' N. lat.)	--	--	0.13	0.13	--	--	0.00	0.00	0.13
Starry flounder	--	--	--	--	--	--	11.25	11.25	11.25
Widow rockfish	0.13	--	0.06	0.19	--	--	0.34	0.34	0.52
YELLOWEYE ROCKFISH	0.57	0.01	--	0.58	0.18	--	--	0.18	0.76
Yellowtail rockfish (North of 40°10' N. lat.)	0.75	--	2.12	2.87	--	--	0.11	0.11	2.98
Non-groundfish species									
California halibut	--	--	0.02	0.02	--	--	1.05	1.05	1.08
Dungeness crab	0.01	1.31	0.05	1.36	--	--	0.70	0.70	2.06
Non-FMP flatfish									
Deepsea Sole	--	0.01	--	0.01	--	--	--	--	0.01
Slender Sole	--	0.00	--	0.00	--	--	--	--	0.00
Other nongroundfish									
Sculpin Unid	0.00	0.00	--	0.00	0.00	--	--	0.00	0.01

Table 10. Nearshore Fixed Gear: Partition Landings by Depth.

Commercial landings of nearshore species (mt) in Oregon and California during 2015, partitioned by depth interval and groundfish management area based on observed catch from 2003 to 2015. Data from both states were combined. The California state-permit framework, which groups nearshore rockfish into either shallow or deeper nearshore rockfish, is represented in the area south of 40°10' N latitude. Rebuilding species are capitalized.

	2003-2015 Total observed landings (mt)	2003-2015 Percentage of observed catch by depth (fathoms)			2015 Fleet landings (mt)	2015 Fleet landings (mt) reallocated by depth (fathoms)		
		0 - 10	11 - 20	> 20		0 - 10	11 - 20	> 20
NORTH of 40° 10' N Lat.								
Nearshore Species - Commercial								
Black rockfish (South of 46°16' N. lat.)	174.00	45.1%	53.0%	1.9%	216.37	97.51	114.75	4.11
Cabezon (California)	2.49	40.2%	52.8%	7.0%	1.16	0.47	0.61	0.08
Cabezon (Oregon)	24.62	33.0%	64.5%	2.4%	16.36	5.40	10.56	0.40
California scorpionfish (North of 34°27' N. lat.)	0.00	100.0%	--	--	--	--	--	--
Lingcod (North of 40°10' N. lat.)	37.77	30.0%	62.0%	8.0%	73.86	22.13	45.83	5.90
Minor nearshore rockfish (North of 40°10' N. lat.)								
Black and Yellow Rockfish	0.06	34.6%	65.4%	0.0%	0.04	0.01	0.02	--
Blue Rockfish	17.22	21.6%	70.3%	8.1%	4.45	0.96	3.12	0.36
Brown Rockfish	0.29	10.1%	31.5%	58.5%	0.11	0.01	0.03	0.06
China Rockfish	6.90	30.6%	64.2%	5.2%	4.11	1.26	2.64	0.21
Copper Rockfish	1.54	13.2%	70.8%	16.1%	0.80	0.11	0.57	0.13
Gopher Rockfish	0.06	41.3%	54.7%	4.0%	0.03	0.01	0.01	0.00
Grass Rockfish	0.42	98.2%	1.2%	0.6%	0.26	0.25	0.00	0.00
Nearshore Rockfish Unid	2.21	28.1%	65.5%	6.4%	--	--	--	--
Olive Rockfish	0.08	6.1%	82.3%	11.5%	0.03	0.00	0.02	0.00
Quillback Rockfish	2.56	8.6%	62.8%	28.6%	1.57	0.14	0.98	0.45
Other groundfish								
Kelp Greenling (California)	0.73	33.4%	65.6%	1.0%	0.55	0.19	0.36	0.01
Kelp Greenling (Oregon)	16.22	48.2%	50.3%	1.5%	12.92	6.22	6.50	0.20
Other nongroundfish								
Brown Irish Lord Sculpin	0.00	100.0%	0.0%	0.0%	--	--	--	--
Buffalo Sculpin	0.02	95.2%	4.8%	0.0%	--	--	--	--
Greenling Unid	0.08	86.5%	13.5%	--	--	--	--	--
Red Irish Lord Sculpin	0.02	42.7%	57.3%	0.0%	--	--	--	--
Other rockfish								
Rockfish Unid	0.06	--	48.0%	52.0%	--	--	--	--
SOUTH of 40° 10' N Lat.								
Nearshore Species - Commercial								
Black rockfish (South of 46°16' N. lat.)	1.97	49.8%	46.7%	3.6%	5.47	2.72	2.55	0.19
Cabezon (California)	7.04	88.0%	10.6%	1.4%	33.71	29.66	3.58	0.47
California scorpionfish (South of 34°27' N. lat.)	0.56	2.9%	1.1%	96.0%	2.21	0.06	0.02	2.12
Deeper nearshore rockfish								
Blue Rockfish	1.32	38.8%	49.6%	11.6%	6.96	2.70	3.45	0.81
Brown Rockfish	11.69	24.2%	64.3%	11.6%	24.95	6.04	16.03	2.88
Calico Rockfish	--	--	--	--	0.01	--	--	--
Copper Rockfish	0.81	13.3%	55.8%	30.9%	8.50	1.13	4.74	2.63
Nearshore Rockfish Unid	0.41	32.6%	32.1%	35.3%	0.20	0.07	0.06	0.07
Olive Rockfish	0.53	17.7%	58.8%	23.5%	1.01	0.18	0.59	0.24
Quillback Rockfish	0.15	0.0%	42.9%	57.1%	0.23	--	0.10	0.13
Rockfish Unid	0.02	--	--	100.0%	--	--	--	--
Treefish Rockfish	0.29	38.3%	54.7%	7.0%	2.64	1.01	1.44	0.18
Lingcod (South of 40°10' N. lat.)	8.67	34.1%	55.7%	10.2%	35.52	12.11	19.78	3.62
Other groundfish								
Kelp Greenling (California)	1.24	52.9%	44.7%	2.4%	5.56	2.94	2.49	0.14
Other nongroundfish								
California Sheephead	17.24	65.7%	31.9%	2.4%	34.33	22.54	10.96	0.83
Other rockfish								
Rockfish Unid	0.13	25.5%	44.0%	30.5%	0.16	0.04	0.07	0.05
Shallow nearshore rockfish								
Black and Yellow Rockfish	2.05	88.5%	9.1%	2.4%	14.75	13.06	1.34	0.35
China Rockfish	0.66	28.8%	49.4%	21.9%	1.39	0.40	0.69	0.30
Gopher Rockfish	6.35	48.3%	43.4%	8.3%	28.19	13.61	12.24	2.34
Grass Rockfish	1.00	94.5%	5.0%	0.5%	13.45	12.72	0.67	0.07
Kelp Rockfish	0.18	64.4%	34.7%	0.8%	0.94	0.61	0.33	0.01
Nearshore Rockfish Unid	0.26	62.0%	29.3%	8.7%	0.00	0.00	0.00	0.00

Table 11. Nearshore Fixed Gear: Discard Ratios.

Observed discard ratios with standard error and nearshore species fleet landings (mt) from the commercial nearshore fixed gear fishery in 2015 by groundfish management area and depth (fathoms). Data from both Oregon and California were combined. The California state-permit framework is represented in the area south of 40°10' N latitude. Rebuilding species are capitalized.

	North of 40°10' N Lat.									South of 40°10' N Lat.								
	0 - 10 fm			11 - 20 fm			> 20 fm			0 - 10 fm			11 - 20 fm			> 20 fm		
Nearshore Fixed Gear Fishery	Vessels	Trips	Sets	Vessels	Trips	Sets	Vessels	Trips	Sets	Vessels	Trips	Sets	Vessels	Trips	Sets	Vessels	Trips	Sets
Observed	45	103	114	48	165	199	8	11	11	22	54	69	26	80	105	5	13	16
Expansion factor:	135			186			12			122			81			17		
Fleet landings of nearshore species (mt)	Discard Ratio	SE	CV	Discard Ratio	SE	CV	Discard Ratio	SE	CV	Discard Ratio	SE	CV	Discard Ratio	SE	CV	Discard Ratio	SE	CV
Groundfish species																		
Black rockfish (South of 46°16' N. lat.)	0.0239	0.0040	0.1695	0.0154	0.0024	0.1563	0.0245	0.0155	0.6326	0.0225	0.0073	0.3221	0.0143	0.0051	0.3589	--	--	--
Cabezon (California)	--	--	--	0.0034	0.0017	0.5108	--	--	--	0.0311	0.0116	0.3728	0.0121	0.0034	0.2833	0.0176	0.0056	0.3174
Cabezon (Oregon)	0.0136	0.0033	0.2412	0.0026	0.0006	0.2360	0.0032	0.0032	0.9818	--	--	--	--	--	--	--	--	--
California scorpionfish (North of 34°27' N. lat.)	--	--	--	--	--	--	--	--	--	0.0001	0.0000	0.1295	--	--	--	--	--	--
California scorpionfish (South of 34°27' N. lat.)	--	--	--	--	--	--	--	--	--	0.0001	0.0001	0.7278	--	--	--	--	--	--
Canary rockfish	0.0033	0.0011	0.3362	0.0112	0.0020	0.1830	0.0401	0.0156	0.3894	0.0007	0.0002	0.3644	0.1141	0.0191	0.1674	0.1073	0.0370	0.3452
Deeper nearshore rockfish																		
Blue Rockfish	--	--	--	--	--	--	--	--	--	0.0240	0.0057	0.2366	0.0275	0.0079	0.2864	0.0024	0.0014	0.5899
Brown Rockfish	--	--	--	--	--	--	--	--	--	0.0057	0.0017	0.3029	0.0153	0.0031	0.2016	0.0029	0.0015	0.5017
Calico Rockfish	--	--	--	--	--	--	--	--	--	0.0002	0.0000	0.2645	0.0007	0.0002	0.2526	0.0001	0.0000	0.2100
Copper Rockfish	--	--	--	--	--	--	--	--	--	0.0027	0.0010	0.3579	0.0025	0.0007	0.2927	0.0061	0.0036	0.5810
Olive Rockfish	--	--	--	--	--	--	--	--	--	0.0019	0.0005	0.2641	0.0037	0.0012	0.3332	0.0014	0.0007	0.4787
Treefish Rockfish	--	--	--	--	--	--	--	--	--	0.0044	0.0013	0.2823	0.0040	0.0013	0.3242	0.0060	0.0022	0.3620
Ecosystem component species																		
California Skate	--	--	--	--	--	--	--	--	--	0.0005	0.0001	0.1295	0.0028	0.0005	0.1848	--	--	--
Soupfin Shark	--	--	--	--	--	--	0.0080	0.0018	0.2189	--	--	--	--	--	--	--	--	--
Starry Skate	--	--	--	--	--	--	--	--	--	--	--	--	0.0009	0.0003	0.3769	--	--	--
Lingcod (North of 40°10' N. lat.)	0.1119	0.0288	0.2574	0.1376	0.0257	0.1870	0.0656	0.0305	0.4650	--	--	--	--	--	--	--	--	--
Lingcod (South of 40°10' N. lat.)	--	--	--	--	--	--	--	--	--	0.0680	0.0187	0.2745	0.2117	0.0342	0.1616	0.0992	0.0312	0.3146
Longnose skate	--	--	--	0.0007	0.0000	0.0584	--	--	--	--	--	--	--	--	--	--	--	--
Minor nearshore rockfish (North of 40°10' N. lat.)																		
Blue Rockfish	0.0107	0.0020	0.1822	0.0494	0.0134	0.2720	0.0152	0.0061	0.3998	--	--	--	--	--	--	--	--	--
China Rockfish	0.0008	0.0004	0.5608	0.0022	0.0004	0.1963	0.0077	0.0057	0.7364	--	--	--	--	--	--	--	--	--
Copper Rockfish	0.0000	0.0000	0.7335	0.0002	0.0002	0.9853	--	--	--	--	--	--	--	--	--	--	--	--
Grass Rockfish	0.0002	0.0001	0.6548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Quillback Rockfish	0.0000	0.0000	0.8265	0.0005	0.0002	0.2985	0.0050	0.0026	0.5205	--	--	--	--	--	--	--	--	--
Minor shelf rockfish (North of 40°10' N. lat.)																		
Rosy Rockfish	--	--	--	0.0001	0.0001	0.4224	0.0021	0.0005	0.2189	--	--	--	--	--	--	--	--	--
Tiger Rockfish	--	--	--	0.0001	0.0001	0.5642	0.0034	0.0020	0.5805	--	--	--	--	--	--	--	--	--
Vermilion Rockfish	0.0008	0.0006	0.7865	0.0007	0.0004	0.4954	--	--	--	--	--	--	--	--	--	--	--	--

Table 11 (continued).

	North of 40°10' N Lat.									South of 40°10' N Lat.								
	0 - 10 fm			11 - 20 fm			> 20 fm			0 - 10 fm			11 - 20 fm			> 20 fm		
Nearshore Fixed Gear Fishery	Vessels	Trips	Sets	Vessels	Trips	Sets	Vessels	Trips	Sets	Vessels	Trips	Sets	Vessels	Trips	Sets	Vessels	Trips	Sets
Observed	45	103	114	48	165	199	8	11	11	22	54	69	26	80	105	5	13	16
Expansion factor:	135			186			12			122			81			17		
Fleet landings of nearshore species (mt)	Discard Ratio	SE	CV	Discard Ratio	SE	CV	Discard Ratio	SE	CV	Discard Ratio	SE	CV	Discard Ratio	SE	CV	Discard Ratio	SE	CV
Minor shelf rockfish (South of 40°10' N. lat.)																		
Halfbanded Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0001	0.0000	0.21
Rosethorn Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	0.0001	0.0000	0.0980	0.0002	0.0000	0.2100
Rosy Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	0.0002	0.0001	0.4599	0.0004	0.0004	0.9767
Squarespot Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0020	0.0004	0.2100
Starry Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	0.0001	0.0001	0.8768	--	--	--
Vermilion Rockfish	--	--	--	--	--	--	--	--	--	0.0002	0.0001	0.6907	0.0013	0.0005	0.4068	0.0010	0.0007	0.6973
Yellowtail Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	0.0025	0.0007	0.2885	--	--	--
Other flatfish																		
Butter Sole	--	--	--	0.0000	0.0000	0.0584	--	--	--	--	--	--	--	--	--	--	--	--
Pacific Sanddab	--	--	--	0.0000	0.0000	0.2341	--	--	--	--	--	--	0.0001	0.0000	0.2135	--	--	--
Rock Sole	--	--	--	0.0001	0.0000	0.2842	0.0009	0.0002	0.2189	--	--	--	0.0002	0.0002	0.7203	--	--	--
Sand Sole	0.0000	0.0000	0.0772	0.0000	0.0000	0.0916	--	--	--	--	--	--	--	--	--	--	--	--
Other groundfish																		
Kelp Greenling (California)	0.0012	0.0009	0.7457	0.0005	0.0001	0.2655	--	--	--	0.0010	0.0004	0.4460	0.0068	0.0015	0.2162	0.0008	0.0007	0.7808
Kelp Greenling (Oregon)	0.0029	0.0009	0.3114	0.0035	0.0006	0.1860	0.0020	0.0019	0.9455	--	--	--	--	--	--	--	--	--
Petrale sole	--	--	--	--	--	--	--	--	--	--	--	--	0.0002	0.0001	0.3401	--	--	--
Shallow nearshore rockfish																		
Black and Yellow Rockfish	--	--	--	--	--	--	--	--	--	0.0040	0.0010	0.2583	0.0009	0.0003	0.3474	--	--	--
China Rockfish	--	--	--	--	--	--	--	--	--	0.0015	0.0004	0.2954	0.0042	0.0010	0.2263	0.0124	0.0045	0.3629
Gopher Rockfish	--	--	--	--	--	--	--	--	--	0.0139	0.0032	0.2323	0.0250	0.0054	0.2175	0.0165	0.0054	0.3252
Grass Rockfish	--	--	--	--	--	--	--	--	--	0.0006	0.0003	0.5670	0.0002	0.0001	0.5184	--	--	--
Kelp Rockfish	--	--	--	--	--	--	--	--	--	0.0014	0.0006	0.4334	0.0003	0.0002	0.6369	0.0004	0.0001	0.2100
Spiny dogfish	--	--	--	--	--	--	--	--	--	--	--	--	0.0056	0.0012	0.2196	0.0056	0.0012	0.2100
Widow rockfish	--	--	--	0.0001	0.0001	0.6971	--	--	--	--	--	--	--	--	--	--	--	--
YELLOWEYE ROCKFISH	0.0007	0.0003	0.4799	0.0124	0.0023	0.1852	0.0649	0.0325	0.5000	--	--	--	0.0004	0.0000	0.0980	--	--	--
Yellowtail rockfish (North of 40°10' N. lat.)	0.0030	0.0012	0.4127	0.0087	0.0021	0.2443	0.0131	0.0108	0.8241	--	--	--	--	--	--	--	--	--
Non-groundfish species																		
Dungeness crab	0.0006	0.0001	0.2261	0.0000	0.0000	0.0584	--	--	--	--	--	--	0.0018	0.0004	0.2344	--	--	--
Other nongroundfish																		
Brown Irish Lord Sculpin	--	--	--	--	--	--	0.0006	0.0001	0.2189	--	--	--	0.0006	0.0002	0.2525	--	--	--
Buffalo Sculpin	0.0007	0.0001	0.2030	0.0009	0.0003	0.3119	--	--	--	0.0009	0.0002	0.2545	0.0060	0.0016	0.2714	--	--	--
California Sheephead	--	--	--	--	--	--	--	--	--	0.2489	0.0717	0.2880	0.0686	0.0123	0.1795	0.2089	0.0867	0.4151
Red Irish Lord Sculpin	0.0010	0.0003	0.3170	0.0009	0.0001	0.1576	--	--	--	--	--	--	--	--	--	--	--	--
Sculpin Unid	0.0007	0.0004	0.5163	0.0002	0.0000	0.2419	0.0006	0.0001	0.2189	0.0011	0.0008	0.7278	0.0010	0.0004	0.3860	--	--	--

[1] Some listed species are under state nearshore fixed gear management, but not included in the groundfish FMP.

Table 12a. Nearshore Fixed Gear: Fishing Mortality Estimates, North of 40°10' N latitude.

Gross estimated discard (mt), discard mortality rates, estimated discard mortality (mt), fleet landings (mt), and fishing mortality estimates (mt) for the 2015 commercial nearshore fixed gear fishery north of 40°10' N latitude. Rebuilding species are capitalized.

Nearshore Fixed Gear Fishery North of 40°10' N lat.	Gross estimated discard (mt) by depth (fm)			Applied discard mortality rate ‡ by depth (fm)			Estimated discard mortality (mt) by depth (fm)			Estimated discard mortality (mt)	Fleet Landings (mt)	Estimated fishing mortality (mt)
	0-10	11-20	> 20	0-10	11-20	> 20	0-10	11-20	> 20			
Groundfish species												
Arrowtooth flounder	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Black rockfish (South of 46°16' N. lat.)	3.22	2.87	0.29	23%	42%	90%	0.74	1.21	0.26	2.21	216.37	218.58
Cabezon (California)	--	0.62	--	--	7%	--	--	0.04	--	0.04	1.16	1.20
Cabezon (Oregon)	1.83	0.48	0.04	7%	7%	7%	0.13	0.03	0.00	0.16	16.36	16.53
Canary rockfish	0.45	2.08	0.47	32%	54%	100%	0.14	1.12	0.47	1.74	0.00	1.74
DARKBLOTCHED ROCKFISH	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Dover sole	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Ecosystem component species												
Big Skate	--	--	--	--	--	--	--	--	--	--	0.02	0.02
Soupfin Shark	--	--	0.09	--	--	100%	--	--	0.09	0.09	--	0.09
Lingcod (North of 40°10' N. lat.)	15.07	25.60	0.77	7%	7%	7%	1.05	1.79	0.05	2.90	73.86	76.76
Longnose skate	--	0.13	--	--	7%	--	--	0.01	--	0.01	0.08	0.09
Minor nearshore rockfish (North of 40°10' N. lat.)												
Black and Yellow Rockfish	--	--	--	--	--	--	--	--	--	--	0.04	0.04
Blue Rockfish	1.45	9.20	0.18	29%	49%	100%	0.42	4.51	0.18	5.11	4.45	9.55
Brown Rockfish	--	--	--	--	--	--	--	--	--	--	0.11	0.11
China Rockfish	0.10	0.40	0.09	24%	48%	100%	0.03	0.19	0.09	0.31	4.11	4.42
Copper Rockfish	0.01	0.03	--	24%	48%	--	0.00	0.01	--	0.02	0.80	0.82
Gopher Rockfish	--	--	--	--	--	--	--	--	--	--	0.03	0.03
Grass Rockfish	0.03	--	--	24%	--	--	0.01	--	--	0.01	0.26	0.26
Olive Rockfish	--	--	--	--	--	--	--	--	--	--	0.03	0.03
Quillback Rockfish	0.01	0.10	0.06	24%	48%	100%	0.00	0.05	0.06	0.11	1.57	1.68
Minor shelf rockfish (North of 40°10' N. lat.)												
Rosethorn Rockfish	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Rosy Rockfish	--	0.02	0.02	--	100%	100%	--	0.02	0.02	0.05	--	0.05
Shelf Rockfish Unid	--	--	--	--	--	--	--	--	--	--	0.03	0.03
Swordspine Rockfish	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Tiger Rockfish	--	0.02	0.04	--	50%	100%	--	0.01	0.04	0.05	0.30	0.35
Vermilion Rockfish	0.11	0.13	--	10%	55%	--	0.01	0.07	--	0.08	2.48	2.56
Minor slope rockfish (North of 40°10' N. lat.)												
Blackgill Rockfish	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Blackspotted Rockfish	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Redbanded Rockfish	--	--	--	--	--	--	--	--	--	--	0.04	0.04
Rougheye/Blackspotted Rockfish	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Slope Rockfish Unid	--	--	--	--	--	--	--	--	--	--	0.06	0.06
Other flatfish												
Butter Sole	--	0.00	--	--	7%	--	--	0.00	--	0.00	--	0.00
Pacific Sanddab	--	0.00	--	--	7%	--	--	0.00	--	0.00	--	0.00
Rock Sole	--	0.02	0.01	--	7%	7%	--	0.00	0.00	0.00	--	0.00
Sand Sole	0.00	0.00	--	7%	7%	--	0.00	0.00	--	0.00	--	0.00
Other groundfish												
Kelp Greenling (California)	0.16	0.09	--	7%	7%	--	0.01	0.01	--	0.02	0.55	0.57
Kelp Greenling (Oregon)	0.39	0.64	0.02	7%	7%	7%	0.03	0.05	0.00	0.07	12.92	13.00
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Petrale sole	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Sablefish (North of 36° N. lat.)	--	--	--	--	--	--	--	--	--	--	1.09	1.09
Spiny dogfish	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Starry flounder	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Widow rockfish	--	0.02	--	--	54%	--	--	0.01	--	0.01	0.08	0.09
YELLOWEYE ROCKFISH	0.09	2.31	0.76	32%	56%	100%	0.03	1.30	0.76	2.09	--	2.09
Yellowtail rockfish (North of 40°10' N. lat.)	0.40	1.62	0.15	10%	30%	75%	0.04	0.49	0.12	0.64	1.51	2.15
Non-groundfish species												
Dungeness crab	0.08	0.01	--	100%	100%	--	0.08	0.01	--	0.09	1.30	1.39
Other nongroundfish												
Brown Irish Lord Sculpin	--	--	0.01	--	--	100%	--	--	0.01	0.01	--	0.01
Buffalo Sculpin	0.09	0.16	--	100%	100%	--	0.09	0.16	--	0.25	--	0.25
Pacific Halibut	--	1.13	0.04	--	100%	100%	--	1.13	0.04	1.16	--	1.16
Red Irish Lord Sculpin	0.13	0.17	--	100%	100%	--	0.13	0.17	--	0.30	--	0.30
Sculpin Unid	0.10	0.03	0.01	100%	100%	100%	0.10	0.03	0.01	0.13	0.05	0.19

‡Discard mortality rates provided by the Groundfish Management Team (GMT). A mortality rate is applied to each gross estimated discard weight by depth.

Table 12b. Nearshore Fixed Gear: Fishing Mortality Estimates, South of 40°10' N latitude.

Gross estimated discard (mt), discard mortality rates (provided by the Groundfish Management Team), estimated discard mortality (mt), fleet landings (mt), and fishing mortality estimates (mt) for the 2015 commercial nearshore fixed gear fishery south of 40°10' N latitude. The California state-permit framework is also represented. Rebuilding species are capitalized.

Nearshore Fixed Gear Fishery South of 40°10' N lat	Gross estimated discard (mt) by depth (fm)			Discard mortality rate ‡ by depth (fm)			Estimated discard mortality (mt) by depth (fm)			Estimated discard mortality (mt)	Fleet Landings (mt)	Estimated fishing mortality (mt)
	0-10	11-20	> 20	0-10	11-20	> 20	0-10	11-20	> 20			
Groundfish species												
Black rockfish (South of 46°16' N. lat.)	2.74	1.16	--	23%	42%	--	0.63	0.49	--	1.12	5.47	6.59
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	--	--	--	--	--	--	--	--	--	--	1.73	1.73
Cabezon (California)	3.78	0.98	0.31	7%	7%	7%	0.26	0.07	0.02	0.35	33.71	34.07
California scorpionfish (North of 34°27' N. lat.)	0.02	--	--	100%	--	--	0.02	--	--	0.02	--	0.02
California scorpionfish (South of 34°27' N. lat.)	0.01	--	--	7%	--	--	0.00	--	--	0.00	2.21	2.21
Canary rockfish	0.08	9.26	1.87	32%	54%	100%	0.03	5.00	1.87	6.90	--	6.90
Chilipepper rockfish (South of 40°10' N. lat.)	--	--	--	--	--	--	--	--	--	--	0.15	0.15
DARKBLOTCHED ROCKFISH	--	--	--	--	--	--	--	--	--	--	0.02	0.02
Deeper nearshore rockfish												
Blue Rockfish	2.92	2.23	0.04	29%	49%	100%	0.85	1.09	0.04	1.98	6.96	8.94
Brown Rockfish	0.69	1.24	0.05	23%	48%	100%	0.16	0.60	0.05	0.81	24.95	25.76
Calico Rockfish	0.02	0.06	0.00	23%	48%	100%	0.00	0.03	0.00	0.03	0.01	0.05
Copper Rockfish	0.33	0.20	0.11	23%	48%	100%	0.07	0.10	0.11	0.28	8.50	8.78
Nearshore Rockfish Unid	--	--	--	--	--	--	--	--	--	--	0.20	0.20
Olive Rockfish	0.24	0.30	0.02	23%	48%	100%	0.05	0.14	0.02	0.22	1.01	1.23
Quillback Rockfish	--	--	--	--	--	--	--	--	--	--	0.23	0.23
Treefish Rockfish	0.54	0.32	0.10	23%	48%	100%	0.12	0.16	0.10	0.38	2.64	3.02
Dover sole	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Ecosystem component species												
California Skate	0.07	0.22	--	7%	7%	--	0.00	0.02	--	0.02	0.01	0.03
Grenadier Unid	--	--	--	--	--	--	--	--	--	--	0.12	0.12
Skate Unid	--	--	--	--	--	--	--	--	--	--	0.11	0.11
Soupfin Shark	--	--	--	--	--	--	--	--	--	--	1.55	1.55
Spotted Ratfish	--	--	--	--	--	--	--	--	--	--	0.02	0.02
Starry Skate	--	0.07	--	--	7%	--	--	0.00	--	0.00	--	0.00
Lingcod (South of 40°10' N. lat.)	8.27	17.18	1.73	7%	7%	7%	0.58	1.20	0.12	1.90	35.52	37.42
Longnose skate	--	--	--	--	--	--	--	--	--	--	0.06	0.06
Longspine Thornyhead (North of 34°27' N. lat.)	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Longspine Thornyhead (South of 34°27' N. lat.)	--	--	--	--	--	--	--	--	--	--	0.13	0.13
Minor shelf rockfish (South of 40°10' N. lat.)												
Flag Rockfish	--	--	--	--	--	--	--	--	--	--	0.19	0.19
Greenblotched Rockfish	--	--	--	--	--	--	--	--	--	--	0.01	0.01
Greenspotted Rockfish	--	--	--	--	--	--	--	--	--	--	0.30	0.30
Greenstriped Rockfish	--	--	--	--	--	--	--	--	--	--	0.02	0.02
Halfbanded Rockfish	--	--	0.00	--	--	100%	--	--	0.00	0.00	--	0.00
Honeycomb Rockfish	--	--	--	--	--	--	--	--	--	--	0.01	0.01
Rosethorn Rockfish	--	0.01	0.00	--	100%	100%	--	0.01	0.00	0.01	0.05	0.06
Rosy Rockfish	--	0.02	0.01	--	100%	100%	--	0.02	0.01	0.03	0.17	0.19
Shelf Rockfish Unid	--	--	--	--	--	--	--	--	--	--	0.96	0.96
Speckled Rockfish	--	--	--	--	--	--	--	--	--	--	0.37	0.37
Squarespot Rockfish	--	--	0.04	--	--	100%	--	--	0.04	0.04	0.00	0.04
Starry Rockfish	--	0.01	--	--	100%	--	--	0.01	--	0.01	0.73	0.74
Vermilion Rockfish	0.02	0.11	0.02	10%	55%	100%	0.00	0.06	0.02	0.08	14.91	14.98
Yellowtail Rockfish	--	0.21	--	--	30%	--	--	0.06	--	0.06	0.84	0.91
Minor slope rockfish (South of 40°10' N. lat.)												
Aurora Rockfish	--	--	--	--	--	--	--	--	--	--	0.01	0.01
Bank Rockfish	--	--	--	--	--	--	--	--	--	--	0.14	0.14
Blackgill Rockfish	--	--	--	--	--	--	--	--	--	--	0.88	0.88
Blackspotted Rockfish	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Pacific Ocean Perch	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Redbanded Rockfish	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Slope Rockfish Unid	--	--	--	--	--	--	--	--	--	--	0.05	0.05
Mixed thornyheads												
Shortspine/Longspine Thornyhead	--	--	--	--	--	--	--	--	--	--	0.12	0.12

‡Discard mortality rates provided by the Groundfish Management Team (GMT). Each mortality rate is applied to each gross estimated discard weight by depth.

Table 12b (continued).

Nearshore Fixed Gear Fishery South of 40°10' N lat	Gross estimated discard (mt) by depth (fm)			Discard mortality rate ‡ by depth (fm)			Estimated discard mortality (mt) by depth (fm)			Estimated discard mortality (mt)	Fleet Landings (mt)	Estimated fishing mortality (mt)
	0-10	11-20	> 20	0-10	11-20	> 20	0-10	11-20	> 20			
Other flatfish												
Flatfish Unid	--	--	--	--	--	--	--	--	--	--	0.02	0.02
Pacific Sanddab	--	0.01	--	--	7%	--	--	0.00	--	0.00	1.97	1.97
Rock Sole	--	0.02	--	--	7%	--	--	0.00	--	0.00	0.05	0.05
Sanddab Unid	--	--	--	--	--	--	--	--	--	--	0.04	0.04
Sand Sole	--	--	--	--	--	--	--	--	--	--	0.03	0.03
Other groundfish												
Kelp Greenling (California)	0.12	0.55	0.01	7%	7%	7%	0.01	0.04	0.00	0.05	5.56	5.61
Leopard Shark	--	--	--	--	--	--	--	--	--	--	0.52	0.52
Other rockfish												
Rockfish Unid	--	--	--	--	--	--	--	--	--	--	0.16	0.16
Petrale sole	--	0.02	--	--	7%	--	--	0.00	--	0.00	0.00	0.00
Sablefish (South of 36° N. lat.)	--	--	--	--	--	--	--	--	--	--	7.34	7.34
Shallow nearshore rockfish												
Black and Yellow Rockfish	0.49	0.07	--	25%	49%	--	0.12	0.04	--	0.16	14.75	14.91
China Rockfish	0.18	0.34	0.22	25%	49%	100%	0.05	0.17	0.22	0.43	1.39	1.82
Gopher Rockfish	1.69	2.03	0.29	25%	49%	100%	0.42	0.99	0.29	1.70	28.19	29.90
Grass Rockfish	0.07	0.01	--	25%	49%	--	0.02	0.01	--	0.03	13.45	13.48
Kelp Rockfish	0.17	0.02	0.01	25%	49%	100%	0.04	0.01	0.01	0.06	0.94	1.01
Nearshore Rockfish Unid	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Shortspine Thornyhead (North of 34°27' N. lat.)	--	--	--	--	--	--	--	--	--	--	0.05	0.05
Shortspine Thornyhead (South of 34°27' N. lat.)	--	--	--	--	--	--	--	--	--	--	1.32	1.32
Spiny dogfish	--	0.45	0.10	--	7%	7%	--	0.03	0.01	0.04	0.11	0.15
Splitnose rockfish (South of 40°10' N. lat.)	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Starry flounder	--	--	--	--	--	--	--	--	--	--	0.15	0.15
Widow rockfish	--	--	--	--	--	--	--	--	--	--	0.08	0.08
YELLOWEYE ROCKFISH	--	0.03	--	--	56%	--	--	0.02	--	0.02	--	0.02
Non-groundfish species												
California halibut	--	--	--	--	--	--	--	--	--	--	0.66	0.66
Dungeness crab	--	0.15	--	--	100%	--	--	0.15	--	0.15	1.74	1.89
Non-FMP flatfish												
Speckled Sanddab	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Other nongroundfish												
Brown Irish Lord Sculpin	--	0.05	--	--	100%	--	--	0.05	--	0.05	--	0.05
Buffalo Sculpin	0.11	0.49	--	100%	100%	--	0.11	0.49	--	0.60	--	0.60
California Sheephead	30.26	5.57	3.65	100%	100%	100%	30.26	5.57	3.65	39.48	34.33	73.81
Sculpin Unid	0.13	0.08	--	100%	100%	--	0.13	0.08	--	0.21	--	0.21

[1] Some listed species are under state nearshore fixed gear management, but not included in the groundfish FMP.

Table 13. Observed Sectors: Non-IFQ Fishing Mortality Estimates by Sector.

Estimated discard (mt), landings (mt), and estimated total fishing mortality (mt) of west coast groundfish species in non-IFQ 2015 fisheries/groundfish sectors observed by the WCGOP. Rebuilding species are capitalized.

	Open Access CA halibut			Pink shrimp			Non-nearshore fixed gear				Nearshore fixed gear		
Weight (mt)	Discard	Landed	Estimate	Discard	Landed	Estimate	Longline Discard	Pot Discard	Landed	Estimate	Discard	Landed	Estimate
Groundfish species													
Arrowtooth flounder	--	--	--	15.83	--	15.83	20.53	0.74	0.74	22.01	--	0.00	0.00
Black rockfish (South of 46°16' N. lat.)	--	--	--	0.05	--	0.05	--	--	--	--	3.32	221.84	225.17
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	--	--	--	--	0.04	0.04	--	--	5.90	5.90	--	1.73	1.73
Cabezon (California)	0.00	--	0.00	--	--	--	--	--	--	--	0.40	34.87	35.27
Cabezon (Oregon)	--	--	--	--	--	--	--	--	--	--	0.16	16.36	16.53
California scorpionfish (North of 34°27' N. lat.)	--	--	--	--	--	--	--	--	--	--	0.02	--	0.02
California scorpionfish (South of 34°27' N. lat.)	0.00	--	0.00	--	0.11	0.11	0.05	--	--	0.05	0.00	2.21	2.21
Canary rockfish	0.01	--	0.01	1.26	--	1.26	3.00	--	0.32	3.33	8.63	0.00	8.63
Chilipepper rockfish (South of 40°10' N. lat.)	--	--	--	--	--	--	0.15	--	1.01	1.15	--	0.15	0.15
DARKBLOTCHED ROCKFISH	--	--	--	5.23	--	5.23	0.47	0.04	3.15	3.66	--	0.02	0.02
Dover sole	--	--	--	3.59	0.30	3.89	2.08	0.78	3.03	5.89	--	0.00	0.00
Ecosystem component species													
Aleutian Skate	--	--	--	0.00	--	0.00	0.02	--	--	0.02	--	--	--
Big Skate	29.43	--	29.43	0.78	--	0.78	0.92	--	3.94	4.86	--	0.02	0.02
Black Skate	--	--	--	--	--	--	10.36	--	--	10.36	--	--	--
California Skate	14.31	--	14.31	--	--	--	0.02	--	0.02	0.04	0.02	0.01	0.03
Deepsea Skate	--	--	--	--	--	--	0.19	--	--	0.19	--	--	--
Giant Grenadier	--	--	--	--	--	--	6.53	0.13	--	6.66	--	--	--
Grenadier Unid	--	--	--	--	--	--	0.78	0.59	55.62	56.99	--	0.12	0.12
Pacific Flatnose	--	--	--	--	--	--	6.93	0.03	--	6.96	--	--	--
Pacific Grenadier	--	--	--	--	--	--	152.85	0.59	--	153.43	--	--	--
Sandpaper Skate	--	--	--	0.00	--	0.00	1.73	0.00	--	1.73	--	--	--
Skate Unid	0.25	0.08	0.33	--	3.41	3.41	0.84	--	2.43	3.27	--	0.11	0.11
Soupfin Shark	--	0.14	0.14	--	--	--	11.67	--	0.14	11.80	0.09	1.55	1.65
Spotted Ratfish	0.00	--	0.00	0.33	--	0.33	4.37	0.01	0.01	4.38	--	0.02	0.02
Starry Skate	0.09	--	0.09	--	--	--	--	--	--	--	0.00	--	0.00
English sole	1.79	0.04	1.82	0.97	0.97	1.93	0.00	--	--	0.00	--	--	--
Lingcod (North of 40°10' N. lat.)	--	--	--	0.47	--	0.47	1.66	2.23	50.42	54.31	2.90	73.86	76.76
Lingcod (South of 40°10' N. lat.)	0.06	0.26	0.32	--	0.01	0.01	0.15	0.31	44.36	44.83	1.90	35.52	37.42
Longnose skate	0.06	0.02	0.08	1.11	--	1.11	59.65	--	24.62	84.27	0.01	0.14	0.15
Longspine Thornyhead (North of 34°27' N. lat.)	--	--	--	--	--	--	4.42	0.01	2.12	6.55	--	0.00	0.00
Longspine Thornyhead (South of 34°27' N. lat.)	--	--	--	--	--	--	0.70	--	6.91	7.62	--	0.13	0.13
Minor nearshore rockfish (North of 40°10' N. lat.)													
Black and Yellow Rockfish	--	--	--	--	--	--	--	--	--	--	--	0.04	0.04
Blue Rockfish	--	--	--	--	--	--	--	--	--	--	5.11	4.45	9.55
Brown Rockfish	--	--	--	--	--	--	--	--	--	--	--	0.11	0.11
China Rockfish	--	--	--	--	--	--	--	--	--	--	0.31	4.11	4.42
Copper Rockfish	--	--	--	--	--	--	--	--	--	--	0.02	0.80	0.82
Gopher Rockfish	--	--	--	--	--	--	--	--	--	--	--	0.03	0.03
Grass Rockfish	--	--	--	--	--	--	--	--	--	--	0.01	0.26	0.26
Olive Rockfish	--	--	--	--	--	--	--	--	--	--	--	0.03	0.03
Quillback Rockfish	--	--	--	--	--	--	--	--	--	--	0.11	1.57	1.68
Minor nearshore rockfish (South of 40°10' N. lat.)													
Black and Yellow Rockfish	--	--	--	--	--	--	--	--	--	--	0.16	14.75	14.91
Blue Rockfish	--	--	--	--	--	--	--	--	--	--	1.98	6.96	8.94
Brown Rockfish	0.06	0.00	0.06	--	0.00	0.00	--	--	--	--	0.81	24.95	25.76
Calico Rockfish	--	--	--	--	--	--	--	--	--	--	0.03	0.01	0.05
China Rockfish	--	--	--	--	--	--	--	--	--	--	0.43	1.39	1.82
Copper Rockfish	--	--	--	--	0.03	0.03	0.03	--	--	0.03	0.28	8.50	8.78
Gopher Rockfish	--	--	--	--	--	--	--	--	--	--	1.70	28.19	29.90
Grass Rockfish	--	--	--	--	--	--	--	--	--	--	0.03	13.45	13.48
Kelp Rockfish	--	--	--	--	--	--	--	--	--	--	0.06	0.94	1.01
Nearshore Rockfish Unid	--	--	--	--	--	--	--	--	--	--	--	0.20	0.20
Olive Rockfish	--	--	--	--	--	--	0.02	--	--	0.02	0.22	1.01	1.23
Quillback Rockfish	--	--	--	--	--	--	--	--	--	--	--	0.23	0.23
Treefish Rockfish	--	--	--	--	--	--	0.01	--	--	0.01	0.38	2.64	3.02

‡Discard mortality rates provided by the Groundfish Management Team (GMT).

Table 13 (continued).

	Open Access CA halibut			Pink shrimp			Non-nearshore fixed gear				Nearshore fixed gear		
Weight (mt)	Discard	Landed	Estimate	Discard	Landed	Estimate	Longline Discard	Pot Discard	Landed	Estimate	Discard	Landed	Estimate
Minor shelf rockfish (North of 40°10' N. lat.)													
Bocaccio Rockfish	--	--	--	0.01	--	0.01	0.02	--	0.03	0.06	--	--	--
Chilipepper Rockfish	--	--	--	1.52	--	1.52	--	--	0.01	0.01	--	--	--
Cowcod Rockfish	--	--	--	0.00	--	0.00	--	--	--	--	--	--	--
Flag Rockfish	--	--	--	0.00	--	0.00	--	--	--	--	--	--	--
Greenblotched Rockfish	--	--	--	--	--	--	0.04	--	--	0.04	--	--	--
Greenspotted Rockfish	--	--	--	0.00	--	0.00	--	--	0.00	0.00	--	--	--
Greenstriped Rockfish	--	--	--	1.72	--	1.72	0.24	--	0.17	0.40	--	--	--
Halfbanded Rockfish	--	--	--	0.01	--	0.01	--	--	--	--	--	--	--
Puget Sound Rockfish	--	--	--	0.00	--	0.00	--	--	--	--	--	--	--
Pygmy Rockfish	--	--	--	0.00	--	0.00	--	--	--	--	--	--	--
Redstripe Rockfish	--	--	--	--	--	--	0.00	--	0.00	0.00	--	--	--
Rockfish Unid	--	--	--	1.27	--	1.27	--	--	--	--	--	--	--
Rosethorn Rockfish	--	--	--	0.01	--	0.01	0.32	0.01	0.45	0.78	--	0.00	0.00
Rosy Rockfish	--	--	--	--	--	--	0.00	--	--	0.00	0.05	--	0.05
Shelf Rockfish Unid	--	--	--	--	--	--	--	--	0.19	0.19	--	0.03	0.03
Silvergray Rockfish	--	--	--	--	--	--	0.03	--	0.02	0.05	--	--	--
Squarespot Rockfish	--	--	--	0.01	--	0.01	--	--	--	--	--	--	--
Stripetail Rockfish	--	--	--	0.85	--	0.85	--	--	--	--	--	--	--
Swordspine Rockfish	--	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Tiger Rockfish	--	--	--	0.00	--	0.00	--	--	--	--	0.05	0.30	0.35
Vermilion Rockfish	--	--	--	--	--	--	--	--	0.10	0.10	0.08	2.48	2.56
Minor shelf rockfish (South of 40°10' N. lat.)													
Flag Rockfish	--	--	--	--	0.00	0.00	0.02	--	0.41	0.44	--	0.19	0.19
Greenblotched Rockfish	--	--	--	--	--	--	--	--	0.06	0.06	--	0.01	0.01
Greenspotted Rockfish	--	--	--	--	--	--	0.00	--	0.94	0.95	--	0.30	0.30
Greenstriped Rockfish	--	--	--	--	--	--	--	--	0.05	0.05	--	0.02	0.02
Halfbanded Rockfish	--	--	--	--	--	--	0.02	--	--	0.02	0.00	--	0.00
Honeycomb Rockfish	--	--	--	--	--	--	0.04	--	0.00	0.04	--	0.01	0.01
Mexican Rockfish	--	--	--	--	--	--	--	--	0.02	0.02	--	--	--
Redstripe Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	--
Rosethorn Rockfish	--	--	--	--	--	--	0.00	--	0.04	0.04	0.01	0.05	0.06
Rosy Rockfish	--	--	--	--	--	--	0.00	--	0.04	0.05	0.03	0.17	0.19
Shelf Rockfish Unid	--	--	--	--	0.01	0.01	--	--	1.18	1.18	--	0.96	0.96
Speckled Rockfish	--	--	--	--	--	--	--	--	0.16	0.16	--	0.37	0.37
Squarespot Rockfish	--	--	--	--	--	--	--	--	0.06	0.06	0.04	0.00	0.04
Starry Rockfish	--	--	--	--	--	--	0.01	--	0.87	0.88	0.01	0.73	0.74
Swordspine Rockfish	--	--	--	--	--	--	--	--	0.04	0.04	--	--	--
Vermilion Rockfish	0.00	--	0.00	--	0.03	0.03	0.00	--	21.72	21.72	0.08	14.91	14.98
Yellowtail Rockfish	--	--	--	--	--	--	--	--	2.25	2.25	0.06	0.84	0.91
Minor slope rockfish (North of 40°10' N. lat.)													
Aurora Rockfish	--	--	--	0.00	--	0.00	0.04	--	0.03	0.07	--	--	--
Bank Rockfish	--	--	--	--	--	--	0.01	--	0.01	0.01	--	--	--
Blackgill Rockfish	--	--	--	0.00	--	0.00	0.28	0.01	1.76	2.05	--	0.00	0.00
Blackspotted Rockfish	--	--	--	--	--	--	--	--	0.87	0.87	--	0.00	0.00
Redbanded Rockfish	--	--	--	0.05	--	0.05	4.17	0.13	18.31	22.61	--	0.04	0.04
Rockfish Unid	--	--	--	--	--	--	0.04	--	--	0.04	--	--	--
Rougheye/Blackspotted Rockfish	--	--	--	--	--	--	--	--	24.27	24.27	--	0.00	0.00
Rougheye Rockfish	--	--	--	0.03	--	0.03	13.33	0.02	--	13.35	--	--	--
Sharpchin Rockfish	--	--	--	0.04	--	0.04	0.01	0.00	0.01	0.03	--	--	--
Shortraker Rockfish	--	--	--	0.00	--	0.00	1.10	--	1.95	3.05	--	--	--
Shortraker/Rougheye Rockfish	--	--	--	0.04	--	0.04	2.98	--	--	2.98	--	--	--
Slope Rockfish Unid	--	--	--	--	--	--	--	--	2.55	2.55	--	0.06	0.06
Splitnose Rockfish	--	--	--	0.03	--	0.03	0.03	--	0.01	0.05	--	--	--
Yellowmouth Rockfish	--	--	--	0.01	--	0.01	0.08	--	0.31	0.39	--	--	--
Minor slope rockfish (South of 40°10' N. lat.)													
Aurora Rockfish	--	--	--	--	--	--	0.01	--	1.25	1.26	--	0.01	0.01
Bank Rockfish	--	--	--	--	--	--	--	--	0.79	0.79	--	0.14	0.14
Blackgill Rockfish	--	--	--	--	--	--	1.95	--	19.38	21.33	--	0.88	0.88
Blackspotted Rockfish	--	--	--	--	--	--	--	--	0.22	0.22	--	0.00	0.00
Pacific Ocean Perch	--	--	--	--	--	--	--	--	0.00	0.00	--	0.00	0.00
Redbanded Rockfish	--	--	--	--	--	--	0.04	0.04	2.15	2.23	--	0.00	0.00
Rockfish Unid	--	--	--	--	--	--	--	0.01	--	0.01	--	--	--
Rougheye/Blackspotted Rockfish	--	--	--	--	--	--	--	--	0.06	0.06	--	--	--
Rougheye Rockfish	--	--	--	--	--	--	0.08	--	--	0.08	--	--	--
Slope Rockfish Unid	--	--	--	--	0.01	0.01	--	--	0.41	0.41	--	0.05	0.05
Mixed thornyheads													
Shortspine/Longspine Thornyhead	--	--	--	--	--	--	--	--	3.08	3.08	--	0.12	0.12

Table 13 (continued).

	Open Access CA halibut			Pink shrimp			Non-nearshore fixed gear				Nearshore fixed gear		
Weight (mt)	Discard	Landed	Estimate	Discard	Landed	Estimate	Longline Discard	Pot Discard	Landed	Estimate	Discard	Landed	Estimate
Other flatfish													
Butter Sole	--	--	--	0.01	--	0.01	--	--	--	--	0.00	--	0.00
Curlfin Turbot	4.68	2.39	7.07	0.02	0.00	0.02	--	--	--	--	--	--	--
Flatfish Unid	0.04	0.76	0.80	2.94	19.16	22.09	--	--	0.02	0.02	--	0.02	0.02
Flathead Sole	--	--	--	8.13	--	8.13	0.00	--	--	0.00	--	--	--
Pacific Sanddab	1.54	0.01	1.55	10.99	0.00	10.99	0.02	--	2.68	2.70	0.00	1.97	1.97
Rex Sole	0.00	--	0.00	42.14	1.09	43.23	--	--	--	--	--	--	--
Rock Sole	1.04	0.09	1.13	--	0.33	0.33	--	--	0.01	0.01	0.00	0.05	0.05
Sanddab Unid	--	--	--	--	0.29	0.29	--	--	4.89	4.89	--	0.04	0.04
Sand Sole	2.78	5.37	8.14	--	--	--	--	--	0.00	0.00	0.00	0.03	0.03
Other groundfish													
Kelp Greenling (California)	--	--	--	--	--	--	--	--	--	--	0.06	6.12	6.18
Kelp Greenling (Oregon)	--	--	--	--	--	--	--	--	--	--	0.07	12.92	13.00
Leopard Shark	2.83	0.17	3.00	--	--	--	--	--	2.26	2.26	--	0.52	0.52
Other rockfish													
Rockfish Unid	--	--	--	--	--	--	--	--	1.40	1.40	--	0.16	0.16
Pacific cod	--	--	--	0.04	--	0.04	1.34	--	3.82	5.16	--	--	--
Pacific hake	--	--	--	1,157.15	0.00	1,157.15	0.22	--	0.06	0.28	--	--	--
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	--	--	--	0.29	--	0.29	0.13	--	0.07	0.20	--	0.00	0.00
Petrale sole	0.09	1.16	1.25	2.31	0.57	2.88	0.47	0.02	1.51	2.00	0.00	0.00	0.00
Sablefish (North of 36° N. lat.)	--	--	--	0.08	41.25	41.33	278.16	189.97	1,825.47	2,293.60	--	1.09	1.09
Sablefish (South of 36° N. lat.)	--	--	--	--	0.18	0.18	37.60	0.03	428.38	466.00	--	7.34	7.34
Shortbelly rockfish	--	--	--	0.93	--	0.93	--	--	--	--	--	--	--
Shortspine Thornyhead (North of 34°27' N. lat.)	--	--	--	0.03	--	0.03	6.39	0.06	41.06	47.51	--	0.05	0.05
Shortspine Thornyhead (South of 34°27' N. lat.)	--	--	--	--	--	--	3.58	0.00	72.59	76.17	--	1.32	1.32
Spiny dogfish	2.36	--	2.36	0.90	--	0.90	148.13	0.36	15.55	164.04	0.04	0.11	0.15
Splitnose rockfish (South of 40°10' N. lat.)	--	--	--	--	--	--	--	--	0.13	0.13	--	0.00	0.00
Starry flounder	1.13	5.96	7.09	--	--	--	--	--	11.25	11.25	--	0.15	0.15
Widow rockfish	--	--	--	--	--	--	0.13	--	0.40	0.52	0.01	0.17	0.18
YELLOWEYE ROCKFISH	--	--	--	--	--	--	0.75	0.01	--	0.76	2.11	--	2.11
Yellowtail rockfish (North of 40°10' N. lat.)	--	--	--	0.39	--	0.39	0.75	--	2.23	2.98	0.64	1.51	2.15
Non-groundfish species													
California halibut	11.28	92.05	103.33	--	14.00	14.00	--	--	1.08	1.08	--	0.66	0.66
Dungeness crab	132.49	--	132.49	0.04	--	0.04	0.01	1.31	0.74	2.06	0.24	3.04	3.28
Non-FMP flatfish													
Deepsea Sole	--	--	--	--	--	--	--	0.01	--	0.01	--	--	--
Diamond Turbot	0.33	--	0.33	--	--	--	--	--	--	--	--	--	--
Hornyhead Turbot	0.20	0.43	0.63	--	0.01	0.01	--	--	--	--	--	--	--
Longfin Sanddab	0.00	--	0.00	--	--	--	--	--	--	--	--	--	--
Slender Sole	--	--	--	120.40	--	120.40	--	0.00	--	0.00	--	--	--
Speckled Sanddab	0.01	--	0.01	--	--	--	--	--	--	--	--	0.00	0.00
Other nongroundfish													
Brown Irish Lord Sculpin	0.00	--	0.00	--	--	--	--	--	--	--	0.06	--	0.06
Buffalo Sculpin	--	--	--	--	--	--	--	--	--	--	0.85	--	0.85
California Sheephead	--	--	--	--	--	--	--	--	--	--	39.48	34.33	73.81
Pacific Electric Ray	1.16	--	1.16	0.00	--	0.00	--	--	--	--	--	--	--
Red Irish Lord Sculpin	--	--	--	--	--	--	--	--	--	--	0.30	--	0.30
Sculpin Unid	0.21	--	0.21	0.13	--	0.13	0.01	0.00	--	0.01	0.35	0.05	0.40

Table 14. Incidental Landings.

Incidental landings (mt) of groundfish from shoreside commercial fisheries by gear group in 2015. Gear groups are as follows: HKL (hook-and-lines), MSC (miscellaneous), NET (nets), POT (pots), TLS (troll), TWL (trawl), TWS (shrimp trawls). To maintain confidentiality, non-EM exempted fishing permits are incorporated in the table below. Rebuilding species are capitalized.

	Shoreside Commercial Landings (mt) By Gear Group						Incidental fisheries estimate
	HKL	MSC	NET	POT	TLS	TWL	
Groundfish species							
Arrowtooth flounder	0.20	--	--	--	--	--	0.20
Black rockfish (South of 46°16' N. lat.)	0.12	0.77	--	--	0.46	--	1.35
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	0.15	--	0.01	0.03	0.05	--	0.24
Cabezon (California)	--	0.00	0.01	--	0.00	--	0.02
California scorpionfish (South of 34°27' N. lat.)	--	--	0.03	--	--	--	0.03
Canary rockfish	0.04	--	--	--	0.00	0.01	0.05
Chilipepper rockfish (South of 40°10' N. lat.)	0.00	--	0.01	--	0.01	--	0.01
DARKBLOTCHED ROCKFISH	0.01	--	0.00	--	0.01	0.00	0.03
Dover sole	0.05	--	--	--	--	0.66	0.71
Ecosystem component species							
Big Skate	0.04	--	--	--	--	--	0.04
Skate Unid	0.85	--	0.50	--	0.01	0.10	1.46
Soupfin Shark	0.05	--	0.81	--	--	--	0.86
Spotted Ratfish	--	--	0.01	--	--	--	0.01
English sole	--	--	--	--	--	0.23	0.23
Lingcod (North of 40°10' N. lat.)	1.59	0.06	--	0.10	5.51	--	7.26
Lingcod (South of 40°10' N. lat.)	1.91	0.09	0.01	0.09	5.64	0.01	7.76
Longnose skate	3.08	--	--	--	0.63	0.17	3.88
Longspine Thornyhead (North of 34°27' N. lat.)	--	--	--	--	--	0.16	0.16
Longspine Thornyhead (South of 34°27' N. lat.)	0.02	--	--	--	--	--	0.02
Minor nearshore rockfish (North of 40°10' N. lat.)							
Blue Rockfish	0.00	--	--	--	--	--	0.00
Minor nearshore rockfish (South of 40°10' N. lat.)							
Black and Yellow Rockfish	0.01	0.00	0.00	--	0.01	--	0.03
Blue Rockfish	--	--	0.13	--	0.11	--	0.23
Brown Rockfish	--	0.01	0.03	--	0.10	0.04	0.18
China Rockfish	--	0.00	--	--	0.00	--	0.00
Copper Rockfish	--	--	0.00	--	0.00	0.06	0.07
Gopher Rockfish	--	0.00	0.00	--	0.08	--	0.08
Grass Rockfish	--	0.01	0.01	--	0.00	--	0.01
Kelp Rockfish	--	--	0.00	--	--	--	0.00
Nearshore Rockfish Unid	--	0.00	--	--	0.02	--	0.02
Olive Rockfish	--	--	--	--	0.04	--	0.04
Treefish Rockfish	--	--	--	--	0.00	--	0.00
Minor shelf rockfish (North of 40°10' N. lat.)							
Chilipepper Rockfish	0.00	--	--	--	--	--	0.00
Greenspotted Rockfish	0.00	--	--	--	--	--	0.00
Greenstriped Rockfish	0.06	--	--	--	--	--	0.06
Rosethorn Rockfish	0.06	--	--	--	--	--	0.06
Shelf Rockfish Unid	0.00	--	--	--	0.03	0.00	0.03
Silvergray Rockfish	0.02	--	--	--	--	--	0.02
Vermilion Rockfish	0.00	--	--	--	--	--	0.00
Minor shelf rockfish (South of 40°10' N. lat.)							
Flag Rockfish	0.00	--	--	0.00	--	--	0.00
Greenblotched Rockfish	0.00	--	--	--	--	--	0.00
Greenspotted Rockfish	0.03	--	--	0.00	0.01	--	0.05
Greenstriped Rockfish	0.00	--	--	--	--	--	0.00
Rosy Rockfish	0.00	--	--	--	--	--	0.00
Shelf Rockfish Unid	0.05	--	--	--	0.01	--	0.07
Speckled Rockfish	0.01	--	--	0.01	--	--	0.02
Squarespot Rockfish	0.01	--	0.00	--	--	--	0.01
Starry Rockfish	0.03	--	--	0.00	0.00	--	0.03
Vermilion Rockfish	0.75	--	0.01	0.10	1.05	0.04	1.95
Yellowtail Rockfish	0.23	0.00	0.04	0.07	0.57	--	0.90

Table 14 (continued).

	Shoreside Commercial Landings (mt) By Gear Group						Incidental fisheries estimate
	HKL	MSC	NET	POT	TLS	TWL	
Minor slope rockfish (North of 40°10' N. lat.)							
Aurora Rockfish	0.00	--	--	--	--	0.00	0.00
Blackgill Rockfish	0.00	--	--	--	--	0.00	0.00
Blackspotted Rockfish	0.01	--	--	--	--	--	0.01
Redbanded Rockfish	0.26	--	--	--	--	0.00	0.26
Rougheye/Blackspotted Rockfish	0.32	--	--	--	--	0.00	0.32
Sharpchin Rockfish	0.00	--	--	--	--	--	0.00
Shortraker Rockfish	0.05	--	--	--	--	--	0.05
Slope Rockfish Unid	0.04	--	--	--	0.14	--	0.18
Splitnose Rockfish	0.00	--	--	--	--	0.00	0.00
Minor slope rockfish (South of 40°10' N. lat.)							
Aurora Rockfish	--	--	0.00	--	--	--	0.00
Bank Rockfish	--	--	4.89	--	--	--	4.89
Blackgill Rockfish	0.14	--	0.39	--	--	--	0.54
Redbanded Rockfish	--	--	0.00	--	--	--	0.00
Slope Rockfish Unid	0.02	--	--	--	0.00	--	0.02
Other flatfish							
Curlfin Turbot	--	--	--	--	--	0.17	0.17
Flatfish Unid	0.01	--	0.02	--	--	0.11	0.13
Pacific Sanddab	0.06	--	--	--	--	0.02	0.07
Rex Sole	--	--	--	--	--	0.13	0.13
Sanddab Unid	0.09	--	0.02	--	0.49	--	0.60
Sand Sole	--	--	--	--	--	0.19	0.19
Other groundfish							
Kelp Greenling (California)	--	--	--	--	0.00	--	0.00
Leopard Shark	0.38	--	0.78	--	--	--	1.16
Other rockfish							
Rockfish Unid	0.00	0.01	--	--	0.08	--	0.09
Pacific cod	0.12	--	--	--	0.01	--	0.13
Pacific hake	--	--	--	--	--	0.01	0.01
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	0.01	--	--	--	--	--	0.01
Petrale sole	0.76	--	0.02	--	--	0.31	1.09
Sablefish (North of 36° N. lat.)	28.92	--	0.68	0.01	3.75	0.28	33.63
Sablefish (South of 36° N. lat.)	0.47	--	0.11	--	--	--	0.59
Shortspine Thornyhead (North of 34°27' N. lat.)	0.05	--	0.02	--	0.03	0.13	0.23
Shortspine Thornyhead (South of 34°27' N. lat.)	0.24	--	0.00	--	--	--	0.24
Spiny dogfish	0.16	0.58	--	--	--	--	0.74
Splitnose rockfish (South of 40°10' N. lat.)	0.01	--	0.10	--	--	--	0.11
Starry flounder	0.19	--	--	--	--	0.48	0.66
Widow rockfish	0.06	0.00	--	0.00	0.10	--	0.16
YELLOWEYE ROCKFISH	--	--	--	--	--	0.00	0.00
Yellowtail rockfish (North of 40°10' N. lat.)	0.13	--	--	--	3.95	--	4.08
Non-groundfish species							
California halibut	55.69	0.24	20.96	0.10	1.49	0.57	79.05
Dungeness crab	0.02	19.90	0.11	4,395.10	0.39	--	4,415.52
Non-FMP flatfish							
Hornyhead Turbot	0.02	--	--	--	--	0.04	0.07
Other nongroundfish							
California Sheephead	--	0.10	0.01	--	--	--	0.11
Sculpin Unid	--	--	--	--	--	0.07	0.07

Table 15. Fishing Mortality Estimates by Sector.

Estimated fishing mortality (mt) of west coast groundfish species and a subset of non-groundfish bycatch species in 2015 by sector or fishery. Rebuilding species are capitalized.

	Commercial fisheries																
	IFQ/Co-op Management												Recreational fishing mortality				
Weight (mt)	Non-tribal at-sea hake	Non-tribal midwater hake	Non-tribal midwater rockfish	Non-hake IFQ trawl	Non-hake IFQ fixed gear	Non-nearshore fixed gear	Nearshore fixed gear	OA CA halibut	Pink shrimp	Incidental fisheries	WA tribal shoreside	WA tribal at-sea	WA	OR	CA	Research	Estimated fishing mortality
Groundfish species																	
Arrowtooth flounder	66.39	6.71	0.01	1,658.93	1.75	22.01	0.00	--	15.83	0.20	0.00	--	--	0.05	--	7.81	1,779.69
Black rockfish (North of 46°16' N. lat.)	--	--	0.01	0.94	--	--	--	--	--	--	0.01	--	305.20	--	--	--	306.16
Black rockfish (South of 46°16' N. lat.)	--	--	--	0.04	--	--	225.17	--	0.05	1.35	--	--	--	454.63	227.09	0.01	908.34
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	--	--	--	39.64	--	5.90	1.73	--	0.04	0.24	--	--	--	--	90.46	3.61	141.61
Cabezon (California)	--	--	--	0.00	--	--	35.27	0.00	--	0.02	--	--	--	--	54.91	--	90.20
Cabezon (Oregon)	--	--	--	--	--	--	16.53	--	--	--	--	--	--	10.88	--	--	27.41
California scorpionfish (North of 34°27' N. lat.)	--	--	--	0.00	--	--	0.02	--	--	--	--	--	--	--	--	--	0.02
California scorpionfish (South of 34°27' N. lat.)	--	--	--	--	--	0.05	2.21	0.00	0.11	0.03	--	--	--	--	81.42	0.05	83.88
Canary rockfish	0.21	3.78	27.46	13.58	0.06	3.33	8.63	0.01	1.26	0.05	5.94	--	1.78	13.90	26.88	5.41	112.18
Chilipepper rockfish (South of 40°10' N. lat.)	--	--	--	192.01	--	1.15	0.15	--	--	0.01	--	--	--	--	5.90	4.49	203.71
COWCOD ROCKFISH (South of 40°10' N. lat.)	--	--	--	0.39	--	--	--	--	--	--	--	--	--	--	0.47	0.54	1.40
DARKBLOTCHED ROCKFISH	7.95	31.43	0.01	91.37	0.09	3.66	0.02	--	5.23	0.03	0.05	--	--	--	--	8.01	147.85
Dover sole	0.82	0.31	--	6,225.65	0.88	5.89	0.00	--	3.89	0.71	68.56	--	--	--	--	47.34	6,354.06
Ecosystem component species																	
Alaska Skate	--	--	--	0.02	--	--	--	--	--	--	--	--	--	--	--	--	0.02
Aleutian Skate	0.00	--	--	1.12	--	0.02	--	--	0.00	--	--	--	--	--	--	0.01	1.15
Big Skate	0.24	0.15	0.03	233.51	0.41	4.86	0.02	14.72	0.78	0.04	--	--	--	--	--	3.75	258.51
Black Skate	--	--	--	14.36	0.22	10.36	--	--	--	--	--	--	--	--	--	--	24.95
California Skate	--	--	--	1.38	--	0.04	0.03	14.31	--	--	--	--	--	--	--	0.38	16.14
Deepsea Skate	--	--	--	0.88	--	0.19	--	--	--	--	--	--	--	--	--	0.06	1.13
Giant Grenadier	--	--	--	36.26	1.10	6.66	--	--	--	--	--	--	--	--	--	--	44.03
Grenadier Unid	0.17	--	--	13.86	0.92	56.99	0.12	--	--	--	--	--	--	--	--	0.05	72.11
Pacific Flatnose	--	--	--	0.63	0.43	6.96	--	--	--	--	--	--	--	--	--	0.28	8.31
Pacific Grenadier	--	--	--	20.59	12.55	153.43	--	--	--	--	--	--	--	--	--	5.67	192.26
Sandpaper Skate	0.02	--	--	39.22	0.03	1.73	--	--	0.00	--	--	--	--	--	--	0.86	41.86
Skate Unid	--	0.05	0.02	77.82	--	3.27	0.11	0.33	3.41	1.46	135.82	--	--	--	--	--	222.30
Soupfin Shark	0.19	0.08	0.03	1.57	0.05	11.80	1.65	0.14	--	0.86	--	--	--	--	--	3.81	20.18
Spotted Ratfish	--	0.02	0.00	85.65	0.03	4.38	0.02	0.00	0.33	0.01	--	--	--	--	--	4.31	94.76
Starry Skate	--	--	--	0.02	--	--	0.00	0.09	--	--	--	--	--	--	--	0.04	0.16
White Skate	--	--	--	0.02	--	--	--	--	--	--	--	--	--	--	--	--	0.02

Note: A value is (--) when the species was neither caught nor discarded (no value). Values appear as 0.00 when a value is smaller than two decimal places.

Table 15 (continued).

	Commercial fisheries																
	IFQ/Co-op Management																
Weight (mt)	Non-tribal at-sea hake	Non-tribal midwater hake	Non-tribal midwater rockfish	Non-hake IFQ trawl	Non-hake IFQ fixed gear	Non-nearshore fixed gear	Nearshore fixed gear	OA CA halibut	Pink shrimp	Incidental fisheries	WA tribal shoreside	WA tribal at-sea	Recreational fishing mortality WA	OR	CA	Research	Estimated fishing mortality
English sole	0.00	0.38	0.01	325.33	--	0.00	--	1.82	1.93	0.23	55.48	--	--	--	--	4.18	389.37
Groundfish unid	--	2.51	0.00	0.11	--	--	--	--	--	--	--	--	--	--	--	--	2.62
Lingcod (North of 40°10' N. lat.)	0.85	2.90	5.92	156.94	9.99	52.77	76.76	--	0.47	7.26	31.58	--	95.13	207.88	110.21	6.01	764.68
Lingcod (South of 40°10' N. lat.)	--	--	--	29.02	0.03	44.69	37.42	0.29	0.01	7.76	--	--	--	--	602.87	1.00	723.13
Longnose skate	0.46	0.23	0.03	772.74	4.25	54.44	0.15	0.05	1.11	3.88	3.43	--	--	--	--	9.54	850.32
Longspine Thornyhead (North of 34°27' N. lat.)	0.02	0.01	--	756.33	0.03	6.55	0.00	--	--	0.16	0.03	--	--	--	--	14.18	777.31
Longspine Thornyhead (South of 34°27' N. lat.)	--	--	--	--	0.01	7.62	0.13	--	--	0.02	--	--	--	--	--	0.75	8.52
Minor nearshore rockfish (North of 40°10' N. lat.)																	
Black and Yellow Rockfish	--	--	--	--	--	--	0.04	--	--	--	--	--	--	--	0.04	--	0.08
Blue Rockfish	--	--	--	0.00	--	--	9.55	--	--	0.00	--	--	1.13	26.81	3.93	0.01	41.65
Brown Rockfish	--	--	--	0.00	--	--	0.11	--	--	--	--	--	--	0.10	0.99	--	1.20
China Rockfish	--	--	--	--	--	--	4.42	--	--	--	--	--	1.60	0.32	0.78	--	7.09
Copper Rockfish	--	--	--	--	--	--	0.82	--	--	--	--	--	0.93	2.02	2.47	--	6.24
Gopher Rockfish	--	--	--	--	--	--	0.03	--	--	--	--	--	--	--	0.04	--	0.07
Grass Rockfish	--	--	--	--	--	--	0.26	--	--	--	--	--	--	1.35	0.28	--	1.89
Nearshore Rockfish Unid	--	--	--	--	--	--	--	--	--	--	0.00	--	--	0.03	--	--	0.03
Olive Rockfish	--	--	--	--	--	--	0.03	--	--	--	--	--	--	0.02	0.39	--	0.44
Quillback Rockfish	--	--	--	0.03	--	--	1.68	--	--	--	--	--	1.12	0.12	2.61	0.08	5.61
Minor nearshore rockfish (South of 40°10' N. lat.)																	
Black and Yellow Rockfish	--	--	--	--	--	--	14.91	--	--	0.03	--	--	--	--	8.78	--	23.73
Blue Rockfish	--	--	--	--	--	--	8.94	--	--	0.23	--	--	--	--	172.42	0.03	181.86
Brown Rockfish	--	--	--	0.00	--	--	25.76	0.06	0.00	0.18	--	--	--	--	93.18	0.02	119.32
Calico Rockfish	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	0.39	0.00	0.44
China Rockfish	--	--	--	--	--	--	1.82	--	--	0.00	--	--	--	--	12.53	--	14.27
Copper Rockfish	--	--	--	--	--	0.03	8.78	--	0.03	0.07	--	--	--	--	138.13	0.25	147.25
Gopher Rockfish	--	--	--	--	--	--	29.90	--	--	0.08	--	--	--	--	54.16	--	84.22
Grass Rockfish	--	--	--	--	--	--	13.48	--	--	0.01	--	--	--	--	7.26	--	20.75
Kelp Rockfish	--	--	--	--	--	--	1.01	--	--	0.00	--	--	--	--	11.98	--	12.99
Nearshore Rockfish Unid	--	--	--	--	--	--	--	--	--	0.02	--	--	--	--	--	--	0.02
Olive Rockfish	--	--	--	0.00	--	0.02	1.23	--	--	0.04	--	--	--	--	50.86	0.06	52.24
Quillback Rockfish	--	--	--	--	--	--	0.23	--	--	--	--	--	--	--	4.96	--	5.19
Treefish Rockfish	--	--	--	--	--	0.01	3.02	--	--	0.00	--	--	--	--	10.20	0.00	13.21

Table 15 (continued).

	Commercial fisheries																
	IFQ/Co-op Management																
Weight (mt)	Non-tribal at-sea hake	Non-tribal midwater hake	Non-tribal midwater rockfish	Non-hake IFQ trawl	Non-hake IFQ fixed gear	Non-nearshore fixed gear	Nearshore fixed gear	OA CA halibut	Pink shrimp	Incidental fisheries	WA tribal shoreside	WA tribal at-sea	Recreational fishing mortality WA	OR	CA	Research	Estimated fishing mortality
Minor shelf rockfish (North of 40°10' N. lat.)																	
Bocaccio Rockfish	0.08	0.32	0.06	1.26	--	0.06	--	--	0.01	--	--	--	0.56	0.11	--	0.02	2.47
Chilipepper Rockfish	0.00	0.56	0.85	3.42	--	0.01	--	--	1.52	0.00	--	--	--	--	--	0.28	6.64
Cowcod Rockfish	--	--	--	0.03	--	--	--	--	0.00	--	--	--	--	--	0.01	--	0.05
Flag Rockfish	--	--	--	0.00	--	--	--	--	0.00	--	--	--	--	--	--	--	0.00
Greenblotched Rockfish	--	--	--	--	--	0.04	--	--	--	--	--	--	--	--	--	--	0.04
Greenspotted Rockfish	--	--	--	0.03	--	0.00	--	--	0.00	0.00	--	--	--	0.02	--	0.09	0.15
Greenstriped Rockfish	--	0.01	--	10.47	0.01	0.40	--	--	1.72	0.06	0.06	--	--	0.01	--	1.57	14.31
Halfbanded Rockfish	--	--	--	--	--	--	--	--	0.01	--	--	--	--	--	--	0.00	0.01
Puget Sound Rockfish	--	--	--	--	--	--	--	--	0.00	--	--	--	--	--	--	--	0.00
Pygmy Rockfish	--	--	--	--	--	--	--	--	0.00	--	--	--	--	--	--	0.01	0.01
Redstripe Rockfish	0.33	1.50	1.63	2.77	--	0.00	--	--	--	--	0.00	--	--	--	--	0.16	6.40
Rockfish Unid	--	--	--	0.30	--	--	--	--	1.27	--	--	--	--	--	--	0.01	1.58
Rosethorn Rockfish	0.00	0.18	0.03	0.90	0.03	0.78	0.00	--	0.01	0.06	1.44	--	--	0.01	--	0.36	3.80
Rosy Rockfish	--	--	--	--	--	0.00	0.05	--	--	--	--	--	--	--	--	--	0.05
Shelf Rockfish Unid	--	0.00	0.00	0.21	0.00	0.19	0.03	--	--	0.03	7.74	--	--	--	--	--	8.20
Silvergray Rockfish	0.35	0.02	0.02	0.15	--	0.05	--	--	--	0.02	0.02	--	--	0.03	--	0.38	1.04
Squarespot Rockfish	--	--	--	--	--	--	--	--	0.01	--	--	--	--	--	--	--	0.01
Starry Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Stripetail Rockfish	0.02	0.08	0.00	8.48	--	--	--	--	0.85	--	--	--	--	--	--	1.98	11.42
Swordspine Rockfish	--	--	--	--	--	--	0.00	--	--	--	--	--	--	--	--	--	0.00
Tiger Rockfish	--	--	--	0.00	--	--	0.35	--	0.00	--	--	--	0.19	0.48	0.09	0.01	1.11
Vermilion Rockfish	--	0.00	--	--	--	0.10	2.56	--	--	0.00	--	--	0.88	4.38	5.00	--	12.93
Minor shelf rockfish (South of 40°10' N. lat.)																	
Bronzespotted Rockfish	--	--	--	0.01	--	--	--	--	--	--	--	--	--	--	--	0.01	0.01
Flag Rockfish	--	--	--	--	--	0.44	0.19	--	0.00	0.00	--	--	--	--	10.14	0.02	10.79
Greenblotched Rockfish	--	--	--	0.03	--	0.06	0.01	--	--	0.00	--	--	--	--	0.36	0.10	0.57
Greenspotted Rockfish	--	--	--	0.30	--	0.95	0.30	--	--	0.05	--	--	--	--	8.35	0.39	10.34
Greenstriped Rockfish	--	--	--	1.05	--	0.05	0.02	--	--	0.00	--	--	--	--	0.54	0.32	1.98
Halfbanded Rockfish	--	--	--	0.02	--	0.02	0.00	--	--	--	--	--	--	--	0.77	0.73	1.55
Honeycomb Rockfish	--	--	--	--	--	0.04	0.01	--	--	--	--	--	--	--	4.09	0.00	4.14
Mexican Rockfish	--	--	--	0.01	--	0.02	--	--	--	--	--	--	--	--	--	0.01	0.04
Pink Rockfish	--	--	--	0.03	--	--	--	--	--	--	--	--	--	--	--	0.02	0.05
Pinkrose Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Pygmy Rockfish	--	--	--	0.00	--	--	--	--	--	--	--	--	--	--	--	--	0.00

Table 15 (continued).

	Commercial fisheries																
	IFQ/Co-op Management																
Weight (mt)	Non-tribal at-sea hake	Non-tribal midwater hake	Non-tribal midwater rockfish	Non-hake IFQ trawl	Non-hake IFQ fixed gear	Non-nearshore fixed gear	Nearshore fixed gear	OA CA halibut	Pink shrimp	Incidental fisheries	WA tribal shoreside	WA tribal at-sea	Recreational fishing mortality WA	OR	CA	Research	Estimated fishing mortality
Redstripe Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.00	0.00
Rockfish Unid	--	--	--	0.01	--	--	--	--	--	--	--	--	--	--	--	--	0.01
Rosethorn Rockfish	--	--	--	0.08	--	0.04	0.06	--	--	--	--	--	--	--	--	0.01	0.19
Rosy Rockfish	--	--	--	--	--	0.05	0.19	--	--	0.00	--	--	--	--	6.88	0.02	7.14
Shelf Rockfish Unid	--	--	--	0.00	--	1.18	0.96	--	0.01	0.07	--	--	--	--	--	--	2.21
Speckled Rockfish	--	--	--	0.00	--	0.16	0.37	--	--	0.02	--	--	--	--	26.70	0.41	27.66
Squarespot Rockfish	--	--	--	--	--	0.06	0.04	--	--	0.01	--	--	--	--	20.90	0.05	21.04
Starry Rockfish	--	--	--	--	--	0.88	0.74	--	--	0.03	--	--	--	--	19.43	0.13	21.21
Stripetail Rockfish	--	--	--	7.29	--	--	--	--	--	--	--	--	--	--	--	1.46	8.76
Swordspine Rockfish	--	--	--	--	--	0.04	--	--	--	--	--	--	--	--	--	0.06	0.10
Tiger Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.05	--	0.05
Vermilion Rockfish	--	--	--	0.43	--	21.72	14.98	0.00	0.03	1.95	--	--	--	--	291.50	3.54	334.14
Yellowtail Rockfish	--	--	--	0.11	--	2.25	0.91	--	--	0.90	--	--	--	--	95.72	1.02	100.93
Minor slope rockfish (North of 40°10' N. lat.)																	
Aurora Rockfish	0.02	0.00	0.00	17.70	0.02	0.07	--	--	0.00	0.00	0.02	--	--	--	--	0.19	18.01
Bank Rockfish	0.07	0.10	0.00	0.83	--	0.01	--	--	--	--	--	--	--	--	--	0.00	1.01
Blackgill Rockfish	0.03	0.03	0.00	5.39	0.03	2.05	0.00	--	0.00	0.00	0.05	--	--	--	--	0.00	7.59
Blackspotted Rockfish	--	--	--	--	--	0.87	0.00	--	--	0.01	0.37	--	--	--	--	0.01	1.26
Redbanded Rockfish	0.00	--	--	4.04	1.17	22.61	0.04	--	0.05	0.26	15.82	--	--	--	--	0.21	44.22
Rockfish Unid	0.00	--	--	0.06	--	0.04	--	--	--	--	--	--	--	--	--	--	0.10
Rougheye/Blackspotted Rockfish	--	19.26	0.01	30.26	5.62	24.27	0.00	--	--	0.32	9.87	--	--	--	--	--	89.61
Rougheye Rockfish	21.80	-	-	0.00	0.01	13.35	--	-	0.03	--	--	--	--	--	--	0.59	35.78
Sharpchin Rockfish	0.00	2.08	0.00	0.78	0.01	0.03	--	--	0.04	0.00	0.08	--	--	--	--	2.40	5.44
Shortraker Rockfish	0.03	0.24	--	9.61	0.74	3.05	--	--	0.00	0.05	0.66	--	--	--	--	0.54	14.91
Shortraker/Rougheye Rockfish	--	--	--	--	0.25	2.98	--	--	0.04	--	--	--	--	--	--	1.25	4.52
Slope Rockfish Unid	--	10.02	0.01	1.16	--	2.55	0.06	--	--	0.18	--	--	--	--	--	--	13.98
Splitnose Rockfish	14.50	85.85	0.28	30.43	--	0.05	--	--	0.03	0.00	0.00	--	--	--	--	1.06	132.19
Yellowmouth Rockfish	0.01	0.88	0.00	0.55	0.00	0.39	--	--	0.01	--	0.62	--	--	--	--	0.00	2.46
Minor slope rockfish (South of 40°10' N. lat.)																	
Aurora Rockfish	--	--	--	3.26	0.01	1.26	0.01	--	--	0.00	--	--	--	--	--	0.52	5.06
Bank Rockfish	--	--	--	45.55	--	0.79	0.14	--	--	4.89	--	--	--	--	2.69	0.53	54.60
Blackgill Rockfish	--	--	--	18.31	1.20	21.33	0.88	--	--	0.54	--	--	--	--	--	0.56	42.81
Blackspotted Rockfish	--	--	--	--	--	0.22	0.00	--	--	--	--	--	--	--	--	--	0.22
Pacific Ocean Perch	--	--	--	0.00	--	0.00	0.00	--	--	--	--	--	--	--	--	0.01	0.02
Redbanded Rockfish	--	--	--	0.78	0.00	2.23	0.00	--	--	0.00	--	--	--	--	--	0.01	3.02
Rockfish Unid	--	--	--	0.00	--	0.01	--	--	--	--	--	--	--	--	--	--	0.01
Rougheye/Blackspotted Rockfish	--	--	--	0.09	--	0.06	--	--	--	--	--	--	--	--	--	--	0.15
Rougheye Rockfish	--	--	--	--	--	0.08	--	-	-	--	--	--	--	--	--	0.03	0.11
Sharpchin Rockfish	--	--	--	0.03	--	--	--	--	--	--	--	--	--	--	--	0.02	0.06
Slope Rockfish Unid	--	--	--	0.00	--	0.41	0.05	--	0.01	0.02	--	--	--	--	--	--	0.49
Yellowmouth Rockfish	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.00	0.00

Table 15 (continued).

	Commercial fisheries																
	IFQ/Co-op Management																
Weight (mt)	Non-tribal at-sea hake	Non-tribal midwater hake	Non-tribal midwater rockfish	Non-hake IFQ trawl	Non-hake IFQ fixed gear	Non-nearshore fixed gear	Nearshore fixed gear	OA CA halibut	Pink shrimp	Incidental fisheries	WA tribal shoreside	WA tribal at-sea	Recreational fishing mortality WA	Recreational fishing mortality OR	Recreational fishing mortality CA	Research	Estimated fishing mortality
Mixed thornyheads																	
Shortspine/Longspine Thornyhead	0.00	--	--	0.76	0.01	3.08	0.12	--	--	--	--	--	--	--	--	0.04	4.00
Other flatfish																	
Butter Sole	--	--	--	0.22	--	--	0.00	--	0.01	--	--	--	--	0.08	--	0.01	0.32
Curlfin Turbot	--	--	--	2.79	--	--	--	7.07	0.02	0.17	--	--	--	--	--	0.18	10.24
Flatfish Unid	0.00	0.01	--	0.11	0.00	0.02	0.02	0.80	22.09	0.13	15.26	--	12.18	0.06	--	0.16	50.84
Flathead Sole	--	0.00	0.00	37.52	--	0.00	--	--	8.13	--	--	--	--	--	--	0.57	46.23
Pacific Sanddab	0.00	0.01	0.01	276.11	--	2.70	1.97	1.55	10.99	0.07	--	--	--	0.17	32.94	9.22	335.74
Rex Sole	6.22	6.25	0.00	494.11	0.00	--	--	0.00	43.23	0.13	60.34	--	--	--	--	13.05	623.34
Rock Sole	--	0.00	--	0.99	--	0.01	0.05	1.13	0.33	--	9.10	--	--	0.02	0.74	0.14	12.51
Sand Sole	--	--	--	13.72	--	0.00	0.03	8.14	--	0.19	0.17	--	--	0.54	0.15	0.03	22.98
Sanddab Unid	--	--	--	0.04	--	4.89	0.04	--	0.29	0.60	1.64	--	--	--	--	0.27	7.77
Other groundfish																	
Cabezon (Washington)	--	--	--	--	--	--	--	--	--	--	--	--	4.30	--	--	--	4.30
Kelp Greenling (California)	--	--	--	--	--	--	6.18	--	--	0.00	--	--	--	--	17.57	0.02	23.77
Kelp Greenling (Oregon)	--	--	--	0.00	--	--	13.00	--	--	--	--	--	--	18.66	--	--	31.66
Kelp Greenling (Washington)	--	--	--	0.08	--	--	--	--	--	--	--	--	1.37	--	--	0.01	1.45
Leopard Shark	--	--	--	--	--	2.26	0.52	3.00	--	1.16	--	--	--	0.01	15.19	--	22.13
Other rockfish																	
Rockfish Unid	--	0.00	--	0.14	0.00	1.40	0.16	--	--	0.09	--	--	0.24	0.06	--	0.00	2.09
Pacific cod	0.00	0.05	0.01	376.99	0.14	5.16	--	--	0.04	0.13	391.90	--	0.95	--	--	0.56	775.93
Pacific hake	96,147.76	57,945.01	56.99	278.35	0.01	0.28	--	--	1,157.15	0.01	0.00	--	--	0.03	--	274.28	155,859.86
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	8.71	20.10	0.02	29.45	0.01	0.20	0.00	--	0.29	0.01	0.02	--	--	--	--	1.59	60.40
Petrale sole	--	0.02	0.00	2,497.52	0.12	2.00	0.00	1.25	2.88	1.09	155.29	--	--	1.08	0.79	6.03	2,668.06
Roundfish unid	0.09	--	--	0.00	--	--	--	--	--	--	--	--	--	--	--	--	0.09
Sablefish (North of 36° N. lat.)	11.61	6.95	0.00	1,457.08	701.60	1,919.09	1.09	--	41.33	33.63	478.59	--	--	1.61	--	30.68	4,683.26
Sablefish (South of 36° N. lat.)	--	--	--	5.81	155.62	435.90	7.34	--	0.18	0.59	--	--	--	--	--	1.00	606.44
Shortbelly rockfish	0.03	0.73	0.01	4.49	--	--	--	--	0.93	--	--	--	--	--	--	3.09	9.28
Shortspine thornyhead (North of 34°27' N. lat.)	10.53	22.59	0.00	697.71	5.33	47.51	0.05	--	0.03	0.23	34.00	--	--	--	--	10.48	828.48
Shortspine thornyhead (South of 34°27' N. lat.)	--	--	--	--	0.67	76.17	1.32	--	--	0.24	--	--	--	--	--	0.38	78.78
Spiny dogfish	97.31	190.19	54.24	192.24	13.57	89.97	0.15	2.36	0.90	0.74	26.98	--	0.44	0.02	1.47	34.27	704.85
Splitnose rockfish (South of 40°10' N. lat.)	--	--	--	28.81	--	0.13	0.00	--	--	0.11	--	--	--	--	--	2.78	31.83
Starry flounder	--	--	--	6.41	--	11.25	0.15	7.09	--	0.66	0.00	--	--	2.96	0.84	0.08	29.45
Widow rockfish	34.67	323.21	479.18	11.66	0.00	0.52	0.18	--	--	0.16	25.58	--	--	1.50	4.75	5.08	886.49
YELLOWEYE ROCKFISH	--	--	--	0.03	0.01	0.76	2.11	--	--	0.00	0.64	--	2.51	3.25	1.66	0.71	11.67
Yellowtail rockfish (North of 40°10' N. lat.)	86.39	129.96	1,193.84	125.06	0.05	2.98	2.15	--	0.39	4.08	346.52	--	16.52	17.16	0.60	5.37	1,931.07
Non-groundfish species																	
California halibut	--	--	--	0.83	--	1.08	0.66	103.33	14.00	79.05	--	--	--	--	69.60	--	268.54
Dungeness crab	--	0.01	--	95.58	0.80	2.06	3.28	132.49	0.04	4,415.52	735.58	--	--	--	--	0.01	5,385.38
Non-FMP flatfish																	
Deepsea Sole	--	--	--	9.84	0.00	0.01	--	--	--	--	--	--	--	--	--	0.00	9.86
Diamond Turbot	--	--	--	0.01	--	--	--	0.33	--	--	--	--	--	--	--	--	0.33
Hornyhead Turbot	--	--	--	0.00	--	--	--	0.63	0.01	0.07	--	--	--	--	--	--	0.71
Longfin Sanddab	--	--	--	--	--	--	--	0.00	--	--	--	--	--	--	--	--	0.00
Slender Sole	0.00	--	--	30.17	--	0.00	--	--	120.40	--	--	--	--	--	--	0.03	150.59
Speckled Sanddab	--	--	--	--	--	--	0.00	0.01	--	--	--	--	--	--	--	--	0.01
Other nongroundfish																	
Brown Irish Lord Sculpin	--	--	--	--	--	--	0.06	0.00	--	--	--	--	--	--	--	--	0.06
Buffalo Sculpin	--	--	--	--	--	--	0.85	--	--	--	--	--	--	0.23	--	--	1.10
California Sheephead	--	--	--	--	--	--	73.81	--	--	0.11	--	--	--	--	40.03	0.00	113.40
Greenling Unid	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pacific Electric Ray	--	--	--	2.43	--	--	--	1.16	0.00	--	--	--	--	--	--	--	3.59
Red Irish Lord Sculpin	--	--	--	--	--	--	0.30	--	--	--	--	--	--	0.43	--	--	0.73
Sculpin Unid	--	--	--	0.74	--	0.01	0.40	0.21	0.13	0.07	0.03	--	--	0.01	--	0.00	1.62

Table 16. Fishing Mortality Estimates Relative to Harvest Specifications.

Estimated fishing mortality (mt) of major west coast groundfish species in 2015 and corresponding management reference points (harvest specifications). Values which are greater than 90% relative to a management reference point are highlighted in red. Rebuilding species are capitalized.

	Estimated fishing mortality (mt)	Management reference points (harvest specifications)					
		ACL (mt)	Estimated mortality (% of ACL)	**ABC** (mt)	Estimated mortality (% of ABC)	**OFL** (mt)	Estimated mortality (% of OFL)
Arrowtooth flounder	**1,780**	5,497	32	5,497	32	6,599	27
Black rockfish (North of 46°16' N. lat.)	**306**	402	76	402	76	421	73
Black rockfish (South of 46°16' N. lat.)	**908**	1,000	91	1,124	81	1,176	77
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	**142**	349	41	1,380	10	1,444	10
Cabezon (California)	**90**	154	59	154	59	161	56
Cabezon (Oregon)	**27**	47	58	47	58	49	56
California scorpionfish (South of 34°27' N. lat.)	**84**	114	74	114	74	119	70
Canary rockfish	**112**	122	92	701	16	733	15
Chilipepper rockfish (South of 40°10' N. lat.)	**204**	1,628	13	1,628	13	1,703	12
COWCOD ROCKFISH (South of 40°10' N. lat.)	**1**	10	14	60	2	67	2
DARKBLOTCHED ROCKFISH	**148**	338	44	549	27	574	26
Dover sole	**6,354**	50,000	13	63,929	10	66,871	10
English sole	**389**	9,853	4	9,853	4	10,792	4
Lingcod (North of 40°10' N. lat.)	**765**	2,830	27	2,830	27	3,010	25
Lingcod (South of 40°10' N. lat.)	**723**	1,004	72	1,004	72	1,205	60
Longnose skate	**850**	2,000	43	2,341	36	2,449	35
Minor rockfish (North of 40°10' N. lat.)	**505**	3,706	14	3,714	14	4,128	12
Nearshore	**64**	69	93	77	83	88	73
Shelf	**70**	1,944	4	1,944	4	2,209	3
Slope	**371**	1,693	22	1,693	22	1,831	20
Minor rockfish (South of 40°10' N. lat.)	**1,335**	3,431	39	3,499	38	4,044	33
Nearshore	**676**	1,114	61	1,169	58	1,313	51
Shelf	**553**	1,624	34	1,625	34	1,918	29
Slope	**107**	693	15	705	15	813	13
Other flatfish	**1,110**	8,749	13	8,749	13	11,453	10
Other groundfish	**83**	242	34	242	34	291	29
Pacific cod	**776**	1,600	48	2,221	35	3,200	24
Pacific hake	**155,860**	2015 US TAC = 383,365 mt, 41% of US TAC					
PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	**60**	158	38	805	8	842	7
Petrale sole	**2,668**	2,816	95	2,816	95	2,946	91
Sablefish (North of 36° N. lat.)	**4,683**	4,793	98	7,173	74	7,857	67
Sablefish (South of 36° N. lat.)	**606**	1,719	35				
Shortbelly rockfish	**9**	500	2	5,789	0	6,950	0
Spiny dogfish	**705**	2,101	34	2,101	34	2,523	28
Splitnose rockfish (South of 40°10' N. lat.)	**32**	1,715	2	1,715	2	1,794	2
Starry flounder	**29**	1,534	2	1,534	2	1,841	2
Thornyheads							
Longspine Thornyhead (North of 34°27' N. lat.)	**777**	3,170	25	4,171	19	5,007	16
Longspine Thornyhead (South of 34°27' N. lat.)	**9**	1,001	1				
Shortspine Thornyhead (North of 34°27' N. lat.)	**828**	1,745	47	2,668	34	3,203	28
Shortspine Thornyhead (South of 34°27' N. lat.)	**79**	923	9				
Mixed thornyheads	**4**						
Widow rockfish	**886**	2,000	44	3,929	23	4,137	21
YELLOWEYE ROCKFISH	**12**	18	65	43	27	52	22
Yellowtail rockfish (North of 40°10' N. lat.)	**1,931**	6,590	29	6,590	29	7,218	27

Appendix A

Table A-1. Species identification codes used in the Pacific Coast Fisheries Information Network (PacFIN) database and assigned to WCGOP data.

Species identification codes used in the Pacific Coast Fisheries Information Network (PacFIN) database and assigned to WCGOP observer data. Columns on the far right specify which species were defined as groundfish, as identified in the Pacific Coast Groundfish Fishery Management Plan, as nearshore species, as Individual Fishing Quota (IFQ) managed species or categories, or as rebuilding species in 2015.

PacFIN Species ID	PacFIN Common Name	IFQ Grouping	Limited Entry/Non-nearshore Species Group		Nearshore Fixed Gear Species Group		FMP Species	Nearshore Species	IFQ Species	Rebuilding Species
			North of 40° 10' latitude	South of 40° 10' latitude	North of 40° 10' latitude	South of 40° 10' latitude				
ART1	NOM. ARROWTOOTH FLOUNDER	Arrowtooth Flounder	Arrowtooth flounder	Arrowtooth flounder	Arrowtooth flounder	Arrowtooth flounder	X		X	
ARTH	ARROWTOOTH FLOUNDER	Arrowtooth Flounder	Arrowtooth flounder	Arrowtooth flounder	Arrowtooth flounder	Arrowtooth flounder	X		X	
CNR1	NOM. CANARY ROCKFISH	Canary Rockfish	Canary rockfish	Canary rockfish	Canary rockfish	Canary rockfish	X		X	
CNRY	CANARY ROCKFISH	Canary Rockfish	Canary rockfish	Canary rockfish	Canary rockfish	Canary rockfish	X		X	
RCK8	CANARY+VERMILION RCKFSH	Canary Rockfish	Canary rockfish	Canary rockfish	Canary rockfish	Canary rockfish	X		X	
DBR1	NOM. DARKBLOTCHED ROCKFISH	DARKBLOTCHED ROC	DARKBLOTCHED ROCKFISH	DARKBLOTCHED ROCKFISH	DARKBLOTCHED ROCKFISH	DARKBLOTCHED ROCKFISH	X		X	X
DBRK	DARKBLOTCHED ROCKFISH	DARKBLOTCHED ROC	DARKBLOTCHED ROCKFISH	DARKBLOTCHED ROCKFISH	DARKBLOTCHED ROCKFISH	DARKBLOTCHED ROCKFISH	X		X	X
DOVR	DOVER SOLE	Dover Sole	Dover sole	Dover sole	Dover sole	Dover sole	X		X	
DVR1	NOM. DOVER SOLE	Dover Sole	Dover sole	Dover sole	Dover sole	Dover sole	X		X	
EGL1	NOM. ENGLISH SOLE	English Sole	English sole	English sole	English sole	English sole	X		X	
EGLS	ENGLISH SOLE	English Sole	English sole	English sole	English sole	English sole	X		X	
LCD1	NOM. LINGCOD	Lingcod	Lingcod (North of 40°10' N. lat.)	Lingcod (South of 40°10' N. lat.)	Lingcod (North of 40°10' N. lat.)	Lingcod (South of 40°10' N. lat.)	X	X	X	
LCOD	LINGCOD	Lingcod	Lingcod (North of 40°10' N. lat.)	Lingcod (South of 40°10' N. lat.)	Lingcod (North of 40°10' N. lat.)	Lingcod (South of 40°10' N. lat.)	X	X	X	
LSP1	NOM. LONGSPINE THORNYHEAD	Longspine Thornyhead	Longspine thornyhead	Longspine thornyhead	Longspine thornyhead	Longspine thornyhead	X		X	
LSPN	LONGSPINE THORNYHEAD	Longspine Thornyhead	Longspine thornyhead	Longspine thornyhead	Longspine thornyhead	Longspine thornyhead	X		X	
ODSR	OTHER DEMERSAL RKFSH	Minor Rockfish	Other rockfish	Other rockfish	Other rockfish	Other rockfish	X	X	X	
OPLG	OTHER PELAGIC RKFSH	Minor Rockfish	Other rockfish	Other rockfish	Other rockfish	Other rockfish	X		X	
RCK4	UNSP. REDS RCKFSH	Minor Rockfish	Other rockfish	Other rockfish	Other rockfish	Other rockfish	X	X	X	
RCK5	UNSP. SMALL REDS RCKFSH	Minor Rockfish	Other rockfish	Other rockfish	Other rockfish	Other rockfish	X	X	X	
RCK6	UNSP. ROSEFISH RCKFSH	Minor Rockfish	Other rockfish	Other rockfish	Other rockfish	Other rockfish	X	X	X	
RRCK	REMAINING ROCKFISH	Minor Rockfish	Other rockfish	Other rockfish	Other rockfish	Other rockfish	X	X	X	
UDM1	UNSP. DEMERSAL-91	Minor Rockfish	Other rockfish	Other rockfish	Other rockfish	Other rockfish	X	X	X	
UDSR	UNSP. DEMERSAL RKFSH	Minor Rockfish	Other rockfish	Other rockfish	Other rockfish	Other rockfish	X	X	X	
UPLG	UNSP. PELAGIC RKFSH	Minor Rockfish	Other rockfish	Other rockfish	Other rockfish	Other rockfish	X		X	
USR1	UNSP. SLOPE-91	Minor Rockfish	Other rockfish	Other rockfish	Other rockfish	Other rockfish	X		X	
USR2	UNSP. SLOPE-93	Minor Rockfish	Other rockfish	Other rockfish	Other rockfish	Other rockfish	X		X	
BCAC	BOCACCIO	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	BOCACCIO ROCKFISH (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	BOCACCIO ROCKFISH (South of 40°10' N. lat.)	X		X	X
BCC1	NOM. BOCACCIO	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	BOCACCIO ROCKFISH (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	BOCACCIO ROCKFISH (South of 40°10' N. lat.)	X		X	X
CLP1	NOM. CHILIPEPPER	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Chilipepper rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Chilipepper rockfish (South of 40°10' N. lat.)	X		X	
CLPR	CHILIPEPPER	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Chilipepper rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Chilipepper rockfish (South of 40°10' N. lat.)	X		X	
CWC1	NOM. COWCOD ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	COWCOD ROCKFISH (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	COWCOD ROCKFISH (South of 40°10' N. lat.)	X		X	X
CWCD	COWCOD ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	COWCOD ROCKFISH (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	COWCOD ROCKFISH (South of 40°10' N. lat.)	X		X	X
BRNZ	BRONZESPOTTED ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
BRZ1	NOM. BRONZESPOTTED ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
CMEL	CHAMELEON ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
CML1	NOM. CHAMELEON ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	

Table A-1 (continued).

PacFIN Species ID	PacFIN Common Name	IFQ Grouping	Limited Entry/Non-nearshore Species Group		Nearshore Fixed Gear Species Group		FMP Species	Nearshore Species	IFQ Species	Rebuilding Species
			North of 40° 10' latitude	South of 40° 10' latitude	North of 40° 10' latitude	South of 40° 10' latitude				
DARK	DARK ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
DUSK	DUSKY ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
DWRF	DWARF-RED ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
FLAG	FLAG ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
FLG1	NOM. FLAG ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
FRCK	FRECKLED ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
GBL1	NOM. GREENBLOTCHED ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
GBLC	GREENBLOTCHED ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
GSP1	NOM. GREENSPOTTED ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
GSPT	GREENSPOTTED ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
GSR1	NOM. GREENSTRIPED ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
GSRK	GREENSTRIPED ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
HBRK	HALFBANDED ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
HLQN	HARLEQUIN ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
HNY1	NOM. HONEYCOMB ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
HNYC	HONEYCOMB ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
MXR1	NOM. MEXICAN ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
MXRF	MEXICAN ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
NRCK	NORTHERN ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
NSLF	NORTHERN SHELF ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
NUSF	NOR. UNSP. SHELF ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
ORCK	OTHER ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
PGMY	PYGMY ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
PNK1	NOM. PINK ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
PNKR	PINK ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
PRR1	NOM. PINKROSE ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
PRRK	PINKROSE ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
PUGT	PUGET SOUND ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
RCK1	BOCACCIO+CHILIPEPPER RCKFSH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
REDS	REDSTRIPE ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
ROS1	NOM. ROSY ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
ROSY	ROSY ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
RST1	NOM. ROSETHORN ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
RSTN	ROSETHORN ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
SLGR	SILVERGREY ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
SPK1	NOM. SPECKLED ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
SPKL	SPECKLED ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
SQR1	NOM. SQUARESPOT	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
SQRS	SQUARESPOT ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
SSLF	SOUTHERN SHELF ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
STAR	STARRY ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	

Table A-1 (continued).

PacFIN Species ID	PacFIN Common Name	IFQ Grouping	Limited Entry/Non-nearshore Species Group		Nearshore Fixed Gear Species Group		FMP Species	Nearshore Species	IFQ Species	Rebuilding Species
			North of 40° 10' latitude	South of 40° 10' latitude	North of 40° 10' latitude	South of 40° 10' latitude				
STL1	NOM. STRIPETAIL ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
STR1	NOM. STARRY ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
STRK	STRIPETAIL ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
SUSF	SOU. UNSP. SHELF ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
SWS1	NOM. SWORDSPINE ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
SWSP	SWORDSPINE ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
TGR1	NOM. TIGER ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
TIGR	TIGER ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
URCK	UNSP. ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
USLF	UNSP. SHELF ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
VRM1	NOM. VERMILLION ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
VRML	VERMILION ROCKFISH	Minor Shelf Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Minor shelf rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
YTR1	NOM. YELLOWTAIL ROCKFISH	Minor Shelf Rockfish	Yellowtail rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Yellowtail rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
YTRK	YELLOWTAIL ROCKFISH	Minor Shelf Rockfish	Yellowtail rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	Yellowtail rockfish (North of 40°10' N. lat.)	Minor shelf rockfish (South of 40°10' N. lat.)	X		X	
ARR1	NOM. AURORA ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
ARRA	AURORA ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
BANK	BANK ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
BGL1	NOM. BLACKGILL ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
BLGL	BLACKGILL ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
BNK1	NOM. BANK ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
BSPR	BLACKSPOTTED ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
NSLP	NORTHERN SLOPE ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
NUSP	NOR. UNSP. SLOPE ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
ORCK	OTHER ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
OSLR	OTHER SLOPE RKFSH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
POP1	GEN. SHELF/SLOPE RF	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
RBR1	NOM. ROUGHEYE + BLACKSPOTTED	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
RCK3	UNSP. DPWTR REDS RCKFSH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
RDB1	NOM. REDBANDED ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
RDBD	REDBANDED ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
REYE	ROUGHEYE ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
SHRP	SHARPCHIN ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
SRK1	NOMINAL SHORTRAKER ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
SRKR	SHORTRAKER ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
SSLP	SOUTHERN SLOPE ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
SUSP	SOU. UNSP. SLOPE ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
UDW1	SHORTRAKER+ROUGHEYE	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	

Table A-1 (continued).

PacFIN Species ID	PacFIN Common Name	IFQ Grouping	Limited Entry/Non-nearshore Species Group		Nearshore Fixed Gear Species Group		FMP Species	Nearshore Species	IFQ Species	Rebuilding Species
			North of 40° 10' latitude	South of 40° 10' latitude	North of 40° 10' latitude	South of 40° 10' latitude				
URCK	UNSP. ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
URK1	SRKR+REYE+NRCK+SHRP	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
USLP	UNSP. SLOPE ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
USLR	UNSP. SLOPE RKFSH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
YMTH	YELLOWMOUTH ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	
SNOS	SPLITNOSE ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Splitnose rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Splitnose rockfish (South of 40°10' N. lat.)	X		X	
SNS1	NOM. SPLITNOSE ROCKFISH	Minor Slope Rockfish	Minor slope rockfish (North of 40°10' N. lat.)	Splitnose rockfish (South of 40°10' N. lat.)	Minor slope rockfish (North of 40°10' N. lat.)	Splitnose rockfish (South of 40°10' N. lat.)	X		X	
POP	PACIFIC OCEAN PERCH	Minor Slope Rockfish	PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	X
POP2	NOMINAL POP	Minor Slope Rockfish	PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	X
UPOP	UNSP. POP GROUP	Minor Slope Rockfish	PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	PACIFIC OCEAN PERCH (North of 40°10' N. lat.)	Minor slope rockfish (South of 40°10' N. lat.)	X		X	X
THD1	NOM. THORNYHEADS	Mixed Thornyhead	Mixed thornyheads	Mixed thornyheads	Mixed thornyheads	Mixed thornyheads	X		X	
THDS	THORNYHEADS (MIXED)	Mixed Thornyhead	Mixed thornyheads	Mixed thornyheads	Mixed thornyheads	Mixed thornyheads	X		X	
BSOL	BUTTER SOLE	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
CSL1	NOM. CURLFIN SOLE	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
CSOL	CURLFIN SOLE	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
DFLT	UNSP. DEEP FLOUNDERS	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
FSOL	FLATHEAD SOLE	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
OFLT	OTHER FLATFISH	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
PDAB	PACIFIC SANDDAB	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
PDB1	NOM. PACIFIC SANDDAB	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
REX	REX SOLE	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
REX1	NOM. REX SOLE	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
RFLT	REMAINING FLATFISH	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
RSL1	NOM. ROCK SOLE	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
RSOL	ROCK SOLE	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
SFLT	UNSP. SHALLOW FLOUNDERS	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
SSO1	NOM. SAND SOLE	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
SSOL	SAND SOLE	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
UDAB	UNSP. SANDDABS	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
UDF1	UNSP. DEEP-91 FLOUNDERS	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
UDF2	UNSP. DEEP-95 FLOUNDERS	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
UFL1	FLOUNDERS (NO FSOL)	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
UFLT	UNSP. FLATFISH	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
USF1	UNSP. SHALLOW-91 FLOUNDERS	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
UTRB	UNSP. TURBOTS	Other Flatfish	Other flatfish	Other flatfish	Other flatfish	Other flatfish	X		X	
PCOD	PACIFIC COD	Pacific Cod	Pacific cod	Pacific cod	Pacific cod	Pacific cod	X		X	
PWHT	PACIFIC WHITING	Pacific Hake	Pacific hake	Pacific hake	Pacific hake	Pacific hake	X		X	
PHLB	PACIFIC HALIBUT	Pacific Halibut	Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish			X	

Table A-1 (continued).

PacFIN Species ID	PacFIN Common Name	IFQ Grouping	Limited Entry/Non-nearshore Species Group		Nearshore Fixed Gear Species Group		FMP Species	Nearshore Species	IFQ Species	Rebuilding Species
			North of 40° 10' latitude	South of 40° 10' latitude	North of 40° 10' latitude	South of 40° 10' latitude				
PTR1	NOM. PETRALE SOLE	Petrale Sole	Petrale sole	Petrale sole	Petrale sole	Petrale sole	X		X	
PTRL	PETRALE SOLE	Petrale Sole	Petrale sole	Petrale sole	Petrale sole	Petrale sole	X		X	
SABL	SABLEFISH	Sablefish	Sablefish	Sablefish	Sablefish	Sablefish	X		X	
SSP1	NOM. SHORTSPINE THORNYHEAD	Shortspine Thornyhead	Shortspine thornyhead	Shortspine thornyhead	Shortspine thornyhead	Shortspine thornyhead	X		X	
SSPN	SHORTSPINE THORNYHEAD	Shortspine Thornyhead	Shortspine thornyhead	Shortspine thornyhead	Shortspine thornyhead	Shortspine thornyhead	X		X	
SFL1	NOM. STARRY FLOUNDER	Starry Flounder	Starry flounder	Starry flounder	Starry flounder	Starry flounder	X		X	
STRY	STARRY FLOUNDER	Starry Flounder	Starry flounder	Starry flounder	Starry flounder	Starry flounder	X		X	
WDOW	WIDOW ROCKFISH	Widow Rockfish	Widow rockfish	Widow rockfish	Widow rockfish	Widow rockfish	X		X	
WDW1	NOM. WIDOW ROCKFISH	Widow Rockfish	Widow rockfish	Widow rockfish	Widow rockfish	Widow rockfish	X		X	
YEY1	NOM. YELLOWEYE ROCKFISH	YELLOWEYE ROCKFIS	YELLOWEYE ROCKFISH	YELLOWEYE ROCKFISH	YELLOWEYE ROCKFISH	YELLOWEYE ROCKFISH	X		X	X
YEYE	YELLOWEYE ROCKFISH	YELLOWEYE ROCKFIS	YELLOWEYE ROCKFISH	YELLOWEYE ROCKFISH	YELLOWEYE ROCKFISH	YELLOWEYE ROCKFISH	X		X	X
BLCK	BLACK ROCKFISH		Black rockfish	Black rockfish	Black rockfish	Black rockfish	X	X		
BLK1	NOM. BLACK ROCKFISH		Black rockfish	Black rockfish	Black rockfish	Black rockfish	X	X		
RCK9	BLACK+BLUE ROCKFISH		Black rockfish	Black rockfish	Black rockfish	Black rockfish	X	X		
CHL1	NOM. CALIFORNIA HALIBUT		California halibut	California halibut	California halibut	California halibut				
CHLB	CALIFORNIA HALIBUT		California halibut	California halibut	California halibut	California halibut				
SCOR	CALIFORNIA SCORPIONFISH		California scorpionfish	California scorpionfish	California scorpionfish	California scorpionfish	X	X		
SCR1	NOM. CALIF. SCORPIONFISH		California scorpionfish	California scorpionfish	California scorpionfish	California scorpionfish	X	X		
DCRB	DUNGENESS CRAB		Dungeness crab	Dungeness crab	Dungeness crab	Dungeness crab				
AKSK	ALASKA SKATE		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
ASKT	ALEUTIAN SKATE		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
BLSK	BLACK SKATE		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
BSK1	NOM. BIG SKATE		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
BSKT	BIG SKATE		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
CSKT	CALIFORNIA SKATE		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
GGRD	GIANT GRENADIER		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
GRDR	UNSP. GRENADIERS		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
GREN	PACIFIC GRENADIER		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
OSKT	OTHER SKATES		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
PFNS	PACIFIC FLATNOSE		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
RATF	SPOTTED RATFISH		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
SPSK	SANDPAPER SKATE		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
SSKT	STARRY SKATE		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
SSRK	SOUPFIN SHARK		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
USKT	UNSP. SKATE		Ecosystem component species	Ecosystem component species	Ecosystem component species	Ecosystem component species	X			
EULC	EULACHON		Eulachon	Eulachon	Eulachon	Eulachon				
OGRN	OTHER GROUNDFISH		Groundfish unid	Groundfish unid	Groundfish unid	Groundfish unid	X			
RGRN	REMAINING GROUNDFISH		Groundfish unid	Groundfish unid	Groundfish unid	Groundfish unid	X			

Table A-1 (continued).

PacFIN Species ID	PacFIN Common Name	IFQ Grouping	Limited Entry/Non-nearshore Species Group		Nearshore Fixed Gear Species Group		FMP Species	Nearshore Species	IFQ Species	Rebuilding Species
			North of 40° 10' latitude	South of 40° 10' latitude	North of 40° 10' latitude	South of 40° 10' latitude				
UGRN	UNSP. GROUNDFISH		Groundfish unid	Groundfish unid	Groundfish unid	Groundfish unid	X			
LSKT	LONGNOSE SKATE		Longnose skate	Longnose skate	Longnose skate	Longnose skate	X			
BLU1	NOM. BLUE ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
BLUR	BLUE ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
BRW1	NOM. BROWN ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
BRWN	BROWN ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
CLC1	NOM. CALICO ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
CLCO	CALICO ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
COP1	NOM. COPPER ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
COPP	COPPER ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
OLV1	NOM. OLIVE ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
OLVE	OLIVE ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
QLB1	NOM. QUILLBACK ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
QLBK	QUILLBACK ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
RCK2	UNSP. BOLINA RCKFSH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
TRE1	NOM. TREEFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
TREE	TREEFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
UDNR	UNSP. DEEP NEAR-SHORE RF		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
USHR	UNSP. NEAR-SHORE ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
NSHR	NORTHERN NEAR-SHORE ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	X	X		
NUSR	NOR. UNSP. NEAR-SHORE ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	X	X		
BYEL	BLACK-AND-YELLOW ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		
BYL1	NOM. BLACK-AND-YELLOW ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		
CHN1	NOM. CHINA ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		
CHNA	CHINA ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		
GPH1	NOM. GOPHER ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		
GPHR	GOPHER ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		
GRAS	GRASS ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		
GRS1	NOM. GRASS ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		
KLP1	NOM. KELP ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		
KLPR	KELP ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		
RCK7	UNSP. GOPHER RCKFSH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		
USHR	UNSP. NEAR-SHORE ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (North of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		
SSHR	SOUTHERN NEAR-SHORE ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
SSRD	Deep So. Near-shore RF		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
SUSR	SOU. UNSP. NEAR-SHORE ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Deeper nearshore rockfish	X	X		
SSHR	SOUTHERN NEAR-SHORE ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		
SSRS	Shallow So. Near-shore RF		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		

Table A-1 (continued).

PacFIN Species ID	PacFIN Common Name	IFQ Grouping	Limited Entry/Non-nearshore Species Group		Nearshore Fixed Gear Species Group		FMP Species	Nearshore Species	IFQ Species	Rebuilding Species
			North of 40° 10' latitude	South of 40° 10' latitude	North of 40° 10' latitude	South of 40° 10' latitude				
SUSR	SOU. UNSP. NEAR-SHORE ROCKFISH		Minor nearshore rockfish (North of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Minor nearshore rockfish (South of 40°10' N. lat.)	Shallow nearshore rockfish	X	X		
APLC	ALASKA PLAICE		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
BMO1	NOM. BIGMOUTH SOLE		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
BMOL	BIGMOUTH SOLE		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
CTRB	C-O SOLE		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
DSOL	DEEPSEA SOLE		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
DTRB	DIAMOND TURBOT		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
FNTS	FANTAIL SOLE		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
GTRB	GREENLAND TURBOT		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
HTRB	HORNYHEAD TURBOT		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
KMKA	KAMCHATKA FLOUNDER		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
LDAB	LONGFIN SANDDAB		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
LDB1	NOM. LONGFIN SANDDAB		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
SDB1	NOM. SPECKLED SANDDAB		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
SLNS	SLENDER SOLE		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
SSDB	SPECKLED SANDDAB		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
STRB	SPOTTED TURBOT		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
YSOL	YELLOWFIN SOLE		Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish	Non-FMP flatfish				
CBZ1	NOM. CABEZON		Other groundfish	Other groundfish	Other groundfish	Other groundfish	X	X		
CBZN	CABEZON		Other groundfish	Other groundfish	Other groundfish	Other groundfish	X	X		
KGL1	NOM. KELP GREENLING		Other groundfish	Other groundfish	Other groundfish	Other groundfish	X	X		
KLPG	KELP GREENLING		Other groundfish	Other groundfish	Other groundfish	Other groundfish	X	X		
LSRK	LEOPARD SHARK		Other groundfish	Other groundfish	Other groundfish	Other groundfish	X			
ALBC	ALBACORE		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
AMCK	ATKA MACKEREL		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
ASRK	PACIFIC ANGEL SHARK		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
BABL	BLACK ABALONE		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
BCLM	BUTTER CLAM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
BHAG	BLACK HAGFISH		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
BISC	BROWN IRISH LORD		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish		X		
BKCR	BLUE KING CRAB		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
BLPT	BLACK EELPOUT		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
BMCK	BULLET MACKEREL		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
BMRL	BLUE MARLIN		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
BMSL	BLUE OR BAY MUSSEL		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
BSCL	BUFFALO SCULPIN		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish		X		
BSJK	BLACK SKIPJACK		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
BSRK	BLUE SHARK		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				

Table A-1 (continued).

PacFIN Species ID	PacFIN Common Name	IFQ Grouping	Limited Entry/Non-nearshore Species Group		Nearshore Fixed Gear Species Group		FMP Species	Nearshore Species	IFQ Species	Rebuilding Species
			North of 40° 10' latitude	South of 40° 10' latitude	North of 40° 10' latitude	South of 40° 10' latitude				
BSRM	UNSP. BAIT SHRIMP		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
BTCR	BAIRDI TANNER CRAB		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
BTNA	BLUEFIN TUNA		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
BTRY	BAT RAY		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
CEEL	SPOTTED CUSK-EEL		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
CHNK	CHINOOK SALMON		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
CHUM	CHUM SALMON		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
CKLE	BASKET COCKLE		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
CMCK	CHUB MACKEREL		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
CMSL	CALIFORNIA MUSSEL		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
COHO	COHO SALMON		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
CPLN	CAPELIN		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
CSLK	CALIFORNIA SLICKHEAD		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
CSRK	BROWN CAT SHARK		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
CUDA	PACIFIC BARRACUDA		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
DRDO	DORADO		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
EELS	UNSPECIFIED EELS		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
ESTR	EASTERN OYSTER		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
ETNA	BIGEYE TUNA		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
EURO	EUROPEAN OYSTER		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
GABL	GREEN ABALONE		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
GBAS	GIANT SEA BASS		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
GCLM	GAPER CLAM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
GDUK	GEODUCK		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
GKCR	GOLDEN KING CRAB		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
GPRW	GOLDEN PRAWN		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
GSQD	GIANT SQUID		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
GSRM	GHOST SHRIMP		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
GSTG	GREEN STURGEON		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
HCLM	HORSE CLAMS		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
ISRK	BIGEYE THRESHER SHARK		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
JCLM	CALIFORNIA JACKKNIFE CLAM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
JMCK	JACK MACKEREL		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
KFSH	GIANT KELPFISH		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
KSTR	KUMAMOTO OYSTER		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
LCLM	NATIVE LITTLENECK		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
LOBS	CALIF. SPINY LOBSTER		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
LSTR	OLYMPIA OYSTER		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				

Table A-1 (continued).

PacFIN Species ID	PacFIN Common Name	IFQ Grouping	Limited Entry/Non-nearshore Species Group		Nearshore Fixed Gear Species Group		FMP Species	Nearshore Species	IFQ Species	Rebuilding Species
			North of 40° 10' latitude	South of 40° 10' latitude	North of 40° 10' latitude	South of 40° 10' latitude				
LUVR	LOUVAR		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
MACL	MUD CLAMS		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
MAKO	SHORTFIN MAKO SHARK		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
MCLM	MANILA CLAM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
MEEL	MONKEYFACE EEL		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
MISC	MISC. FISH/ANIMALS		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
MOLA	COMMON MOLA		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
MRLN	STRIPED MARLIN		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
MSC2	MISCELLANEOUS FISH		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
MSHP	PLAINFIN MIDSHIPMAN		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
MSQD	MARKET SQUID		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
MSRM	MUD SHRIMP		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
NANC	NORTHERN ANCHOVY		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OABL	OTHER ABALONE		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OANC	OTHER ANCHOVY		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OBAS	OTHER BASS		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OCLM	OTHER CLAM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OCRB	OTHER CRAB		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OCRK	OTHER CROAKER		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OCTP	UNSP. OCTOPUS		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OECH	OTHER ECHINODERM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OMSK	OTHER MOLLUSKS		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OSCL	OTHER SCALLOP		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OSRK	OTHER SHARK		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OSRM	OTHER SHRIMP		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OSTR	OTHER OYSTER		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OTNA	OTHER TUNA		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OURC	OTHER SEA URCHINS		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
OWFS	OCEAN WHITEFISH		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
PABL	PINK ABALONE		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
PBNT	PACIFIC BONITO		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
PBTR	PACIFIC BUTTERFISH		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
PCLM	PISMO CLAM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
PHAG	PACIFIC HAGFISH		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
PHRG	PACIFIC HERRING		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
PINK	PINK SALMON		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
PLCK	WALLEYE POLLOCK		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
POMF	PACIFIC POMFRET		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				

Table A-1 (continued).

PacFIN Species ID	PacFIN Common Name	IFQ Grouping	Limited Entry/Non-nearshore Species Group		Nearshore Fixed Gear Species Group		FMP Species	Nearshore Species	IFQ Species	Rebuilding Species
			North of 40° 10' latitude	South of 40° 10' latitude	North of 40° 10' latitude	South of 40° 10' latitude				
PRCL	PURPLE CLAM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
PROW	PROWFISH		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
PSDN	PACIFIC SARDINE		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
PSHP	PINK SHRIMP		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
PSRK	PELAGIC THRESHER SHARK		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
PSTR	PACIFIC OYSTER		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
QCLM	NORTHERN QUAHOG CLAM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
QFSH	QUEENFISH		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
RABL	RED ABALONE		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
RCKG	ROCK GREENLING		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
RCLM	RAZOR CLAM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
RCRB	ROCK CRAB		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
RGL1	NOM. ROCK GREENLING		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
RHRG	ROUND HERRING		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
RKCR	RED KING CRAB		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
RPRW	RIDGEBACK PRAWN		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
RSCL	RED IRISH LORD		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish		X		
RSRM	GRASS SHRIMP		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
RURC	RED SEA URCHIN		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
RZCL	ROSY RAZOR CLAM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SAIL	SAILFISH		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SARY	PACIFIC SAURY		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SCLM	SOFT-SHELLED CLAM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SCLP	UNSP. SCULPIN		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SHAD	UNSPECIFIED SHAD		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SHP1	NOM. CALIFORNIA SHEEPHEAD		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish		X		
SHPD	CALIFORNIA SHEEPHEAD		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish		X		
SKCR	SCARLET KING CRAB		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SKIL	SKILFISH		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SMLT	UNSP. SMELT		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SOCK	SOCKEYE SALMON		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SPRW	SPOTTED PRAWN		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SQID	UNSP. SQUID		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SRFP	SURFPERCH SPP.		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SRMP	__ALL SHRIMP & PRAWNS		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SSCL	SHARPNOSE SCULPIN		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SSPF	SHORTBILL SPEARFISH		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
STLH	STEELHEAD		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				

Table A-1 (continued).

PacFIN Species ID	PacFIN Common Name	IFQ Grouping	Limited Entry/Non-nearshore Species Group		Nearshore Fixed Gear Species Group		FMP Species	Nearshore Species	IFQ Species	Rebuilding Species
			North of 40° 10' latitude	South of 40° 10' latitude	North of 40° 10' latitude	South of 40° 10' latitude				
STNA	SKIPJACK TUNA		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
SWRD	SWORDFISH		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
TCOD	PACIFIC TOMCOD		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
TSRK	COMMON THRESHER SHARK		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
UABL	UNSPECIFIED ABALONE		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
UCLM	UNSPECIFIED CLAM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
UCRB	UNSPECIFIED CRAB		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
UECH	UNSPECIFIED ECHINODERM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
UGLG	UNSP. GREENLING		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish		X		
UHAG	UNSPECIFIED HAGFISH		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
UHLB	UNSPECIFIED HALIBUT		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
UJEL	UNSP. JELLYFISH		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
UKCR	UNSP. KING CRAB		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
UMCK	UNSP. MACKEREL		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
UMSK	UNSPECIFIED MOLLUSKS		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
USCL	UNSPECIFIED SCALLOP		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
USCU	UNSP. SEA CUCUMBERS		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
USMN	UNSP. SALMON		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
USRK	UNSP. SHARK		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
USRM	UNSP. OCEAN SHRIMP		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
USTG	UNSP. STURGEON		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
USTR	UNSPECIFIED OYSTER		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
UTNA	UNSPECIFIED TUNA		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
UURC	UNSP. SEA URCHINS		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
VCLM	VARNISH CLAM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
WABL	WHITE ABALONE		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
WBAS	WHITE SEABASS		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
WCLM	WASHINGTON CLAM		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
WCRK	WHITE CROAKER		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
WEEL	WOLF EEL		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
WHOO	WAHOO		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
WSTG	WHITE STURGEON		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
YLTL	YELLOWTAIL		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
YTNA	YELLOWFIN TUNA		Other nongroundfish	Other nongroundfish	Other nongroundfish	Other nongroundfish				
ORND	OTHER ROUNDFISH		Roundfish unid	Roundfish unid	Roundfish unid	Roundfish unid	X			
RRND	REMAINING ROUNDFISH		Roundfish unid	Roundfish unid	Roundfish unid	Roundfish unid	X			
URND	UNSP. ROUNDFISH		Roundfish unid	Roundfish unid	Roundfish unid	Roundfish unid	X			
SBL1	NOM. SHORTBELLY ROCKFISH		Shortbelly rockfish	Shortbelly rockfish	Shortbelly rockfish	Shortbelly rockfish	X			
SBLY	SHORTBELLY ROCKFISH		Shortbelly rockfish	Shortbelly rockfish	Shortbelly rockfish	Shortbelly rockfish	X			
DSRK	SPINY DOGFISH		Spiny dogfish	Spiny dogfish	Spiny dogfish	Spiny dogfish	X			
OTCR	OPILIO TANNER CRAB		Tanner crab	Tanner crab	Tanner crab	Tanner crab				
UTCR	UNSP. TANNER CRAB		Tanner crab	Tanner crab	Tanner crab	Tanner crab				

Table A-2. Species belonging to each WCGOP unsampled IFQ catch category.

Species belonging to each WCGOP unsampled IFQ catch category. The IFQM catch category includes all 2015 IFQ species and the NIFQ category includes all fish species except 2015 IFQ species.

IFQFF	IFQRF	IFQRD
Arrowtooth Flounder	Aurora Rockfish	Lingcod
Butter Sole	Bank Rockfish	Pacific Cod
Curlfin Turbot	Blackgill Rockfish	Pacific Hake
Dover Sole	Bocaccio Rockfish	Sablefish
English Sole	Canary Rockfish	
Flatfish Unid	Chilipepper Rockfish	
Flathead Sole	Cowcod Rockfish	
Pacific Halibut	Darkblotched Rockfish	
Pacific Sanddab	Flag Rockfish	
Petrale Sole	Greenspotted Rockfish	
Rex Sole	Greenstriped Rockfish	
Rock Sole	Halfbanded Rockfish	
Sand Sole	Harlequin Rockfish	
Sanddab Unid	Longspine Thornyhead	
Starry Flounder	Pacific Ocean Perch	
	Pygmy Rockfish	
	Redbanded Rockfish	
	Redstripe Rockfish	
	Rockfish Unid	
	Rosethorn Rockfish	
	Rosy Rockfish	
	Rougheye Rockfish	
	Sharpchin Rockfish	
	Shortraker Rockfish	
	Shortspine Thornyhead	
	Silvergray Rockfish	
	Splitnose Rockfish	
	Spotted Rockfish Unid	
	Squarespot Rockfish	
	Starry Rockfish	
	Stripetail Rockfish	
	Widow Rockfish	
	Yelloweye Rockfish	
	Yellowmouth Rockfish	
	Yellowtail Rockfish	

Table A-3. Mortality rates applied in bottom trawl and fixed gear fisheries.

Species without a rate listed were assumed to have 100% mortality rate. Rates are provided by the Groundfish Mortality Team (GMT).

Species	Fishery	Gear	Discard Mortality Rate
Big Skate	California Halibut	Trawl	50%
	IFQ Bottom Trawl	Trawl	50%
	LE Bottom Trawl	Trawl	50%
Lingcod	California Halibut	Trawl	50%
	IFQ Bottom Trawl	Trawl	50%
	IFQ Fixed Gear	Line	7%
	LE Bottom Trawl	Trawl	50%
	Non-Nearshore Fixed Gear	Line	7%
Longnose Skate	California Halibut	Trawl	50%
	IFQ Bottom Trawl	Trawl	50%
	IFQ Fixed Gear	Line and Pot	50%
	LE Bottom Trawl	Trawl	50%
	Non-Nearshore Fixed Gear	Line and Pot	50%
Sablefish	California Halibut	Trawl	50%
	IFQ Bottom Trawl	Trawl	50%
	IFQ Fixed Gear	Line and Pot	20%
	LE Bottom Trawl	Trawl	50%
	Non-Nearshore Fixed Gear	Line and Pot	20%
Spiny Dogfish Shark	IFQ Fixed Gear	Line	50%
	Non-Nearshore Fixed Gear	Line	50%

Table A-4. Depth-dependent mortality rates applied in the Nearshore Fixed Gear fishery.

Species without a rate listed were assumed to have 100% mortality rate. Rates are provided by the Groundfish Mortality Team (GMT).

Nearshore Grouping	Species	Depth (fm)	Discard Mortality Rate
Black rockfish (North of 46°16' N. lat.)	Black Rockfish	0 - 10	0.23
Black rockfish (North of 46°16' N. lat.)	Black Rockfish	11 - 20	0.42
Black rockfish (North of 46°16' N. lat.)	Black Rockfish	> 20	0.9
Black rockfish (South of 46°16' N. lat.)	Black Rockfish	0 - 10	0.23
Black rockfish (South of 46°16' N. lat.)	Black Rockfish	11 - 20	0.42
Black rockfish (South of 46°16' N. lat.)	Black Rockfish	> 20	0.9
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	Bocaccio Rockfish	0 - 10	0.3
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	Bocaccio Rockfish	11 - 20	0.51
BOCACCIO ROCKFISH (South of 40°10' N. lat.)	Bocaccio Rockfish	> 20	1
Cabezon (California)	Cabezon	0 - 10	0.07
Cabezon (California)	Cabezon	11 - 20	0.07
Cabezon (California)	Cabezon	> 20	0.07
Cabezon (Oregon)	Cabezon	0 - 10	0.07
Cabezon (Oregon)	Cabezon	11 - 20	0.07
Cabezon (Oregon)	Cabezon	> 20	0.07
Cabezon (Washington)	Cabezon	0 - 10	0.07
Cabezon (Washington)	Cabezon	11 - 20	0.07
Cabezon (Washington)	Cabezon	> 20	0.07
California scorpionfish (North of 34°27' N. lat.)	California Scorpionfish	0 - 10	0.07
California scorpionfish (North of 34°27' N. lat.)	California Scorpionfish	11 - 20	0.07
California scorpionfish (North of 34°27' N. lat.)	California Scorpionfish	> 20	0.07
California scorpionfish (South of 34°27' N. lat.)	California Scorpionfish	0 - 10	0.07
California scorpionfish (South of 34°27' N. lat.)	California Scorpionfish	11 - 20	0.07
California scorpionfish (South of 34°27' N. lat.)	California Scorpionfish	> 20	0.07
Canary rockfish	Canary Rockfish	0 - 10	0.32
Canary rockfish	Canary Rockfish	11 - 20	0.54
Canary rockfish	Canary Rockfish	> 20	1
Deeper nearshore rockfish	Blue Rockfish	0 - 10	0.29
Deeper nearshore rockfish	Blue Rockfish	11 - 20	0.49
Deeper nearshore rockfish	Blue Rockfish	> 20	1
Deeper nearshore rockfish	Brown Rockfish	0 - 10	0.23
Deeper nearshore rockfish	Brown Rockfish	11 - 20	0.48
Deeper nearshore rockfish	Brown Rockfish	> 20	1
Deeper nearshore rockfish	Calico Rockfish	0 - 10	0.23
Deeper nearshore rockfish	Calico Rockfish	11 - 20	0.48
Deeper nearshore rockfish	Calico Rockfish	> 20	1
Deeper nearshore rockfish	Copper Rockfish	0 - 10	0.23
Deeper nearshore rockfish	Copper Rockfish	11 - 20	0.48
Deeper nearshore rockfish	Copper Rockfish	> 20	1
Deeper nearshore rockfish	Olive Rockfish	0 - 10	0.23
Deeper nearshore rockfish	Olive Rockfish	11 - 20	0.48
Deeper nearshore rockfish	Olive Rockfish	> 20	1
Deeper nearshore rockfish	Quillback Rockfish	0 - 10	0.23
Deeper nearshore rockfish	Quillback Rockfish	11 - 20	0.48
Deeper nearshore rockfish	Quillback Rockfish	> 20	1
Deeper nearshore rockfish	Treefish Rockfish	0 - 10	0.23
Deeper nearshore rockfish	Treefish Rockfish	11 - 20	0.48
Deeper nearshore rockfish	Treefish Rockfish	> 20	1

Table A-4 (continued).

Nearshore Grouping	Species	Depth (fm)	Discard Mortality Rate
Ecosystem component species	Alaska Skate	0 - 10	0.07
Ecosystem component species	Alaska Skate	11 - 20	0.07
Ecosystem component species	Alaska Skate	> 20	0.07
Ecosystem component species	Aleutian Skate	0 - 10	0.07
Ecosystem component species	Aleutian Skate	11 - 20	0.07
Ecosystem component species	Aleutian Skate	> 20	0.07
Ecosystem component species	Big Skate	0 - 10	0.07
Ecosystem component species	Big Skate	11 - 20	0.07
Ecosystem component species	Big Skate	> 20	0.07
Ecosystem component species	Black Skate	0 - 10	0.07
Ecosystem component species	Black Skate	11 - 20	0.07
Ecosystem component species	Black Skate	> 20	0.07
Ecosystem component species	California Skate	0 - 10	0.07
Ecosystem component species	California Skate	11 - 20	0.07
Ecosystem component species	California Skate	> 20	0.07
Ecosystem component species	Sandpaper Skate	0 - 10	0.07
Ecosystem component species	Sandpaper Skate	11 - 20	0.07
Ecosystem component species	Sandpaper Skate	> 20	0.07
Ecosystem component species	Skate Unid	0 - 10	0.07
Ecosystem component species	Skate Unid	11 - 20	0.07
Ecosystem component species	Skate Unid	> 20	0.07
Ecosystem component species	Spotted Ratfish	0 - 10	0.07
Ecosystem component species	Spotted Ratfish	11 - 20	0.07
Ecosystem component species	Spotted Ratfish	> 20	0.07
Ecosystem component species	Starry Skate	0 - 10	0.07
Ecosystem component species	Starry Skate	11 - 20	0.07
Ecosystem component species	Starry Skate	> 20	0.07
Lingcod (North of 40°10' N. lat.)	Lingcod	0 - 10	0.07
Lingcod (North of 40°10' N. lat.)	Lingcod	11 - 20	0.07
Lingcod (North of 40°10' N. lat.)	Lingcod	> 20	0.07
Lingcod (South of 40°10' N. lat.)	Lingcod	0 - 10	0.07
Lingcod (South of 40°10' N. lat.)	Lingcod	11 - 20	0.07
Lingcod (South of 40°10' N. lat.)	Lingcod	> 20	0.07
Longnose skate	Longnose Skate	0 - 10	0.07
Longnose skate	Longnose Skate	11 - 20	0.07
Longnose skate	Longnose Skate	> 20	0.07
Minor nearshore rockfish (North of 40°10' N. lat.)	Black and Yellow Rockfish	0 - 10	0.24
Minor nearshore rockfish (North of 40°10' N. lat.)	Black and Yellow Rockfish	11 - 20	0.48
Minor nearshore rockfish (North of 40°10' N. lat.)	Black and Yellow Rockfish	> 20	1
Minor nearshore rockfish (North of 40°10' N. lat.)	Blue Rockfish	0 - 10	0.29
Minor nearshore rockfish (North of 40°10' N. lat.)	Blue Rockfish	11 - 20	0.49
Minor nearshore rockfish (North of 40°10' N. lat.)	Blue Rockfish	> 20	1
Minor nearshore rockfish (North of 40°10' N. lat.)	Brown Rockfish	0 - 10	0.24
Minor nearshore rockfish (North of 40°10' N. lat.)	Brown Rockfish	11 - 20	0.48
Minor nearshore rockfish (North of 40°10' N. lat.)	Brown Rockfish	> 20	1
Minor nearshore rockfish (North of 40°10' N. lat.)	Calico Rockfish	0 - 10	0.24
Minor nearshore rockfish (North of 40°10' N. lat.)	Calico Rockfish	11 - 20	0.48
Minor nearshore rockfish (North of 40°10' N. lat.)	Calico Rockfish	> 20	1

Table A-4 (continued).

Nearshore Grouping	Species	Depth (fm)	Discard Mortality Rate
Minor nearshore rockfish (North of 40°10' N. lat.)	China Rockfish	0 - 10	0.24
Minor nearshore rockfish (North of 40°10' N. lat.)	China Rockfish	11 - 20	0.48
Minor nearshore rockfish (North of 40°10' N. lat.)	China Rockfish	> 20	1
Minor nearshore rockfish (North of 40°10' N. lat.)	Copper Rockfish	0 - 10	0.24
Minor nearshore rockfish (North of 40°10' N. lat.)	Copper Rockfish	11 - 20	0.48
Minor nearshore rockfish (North of 40°10' N. lat.)	Copper Rockfish	> 20	1
Minor nearshore rockfish (North of 40°10' N. lat.)	Gopher Rockfish	0 - 10	0.24
Minor nearshore rockfish (North of 40°10' N. lat.)	Gopher Rockfish	11 - 20	0.48
Minor nearshore rockfish (North of 40°10' N. lat.)	Gopher Rockfish	> 20	1
Minor nearshore rockfish (North of 40°10' N. lat.)	Grass Rockfish	0 - 10	0.24
Minor nearshore rockfish (North of 40°10' N. lat.)	Grass Rockfish	11 - 20	0.48
Minor nearshore rockfish (North of 40°10' N. lat.)	Grass Rockfish	> 20	1
Minor nearshore rockfish (North of 40°10' N. lat.)	Kelp Rockfish	0 - 10	0.24
Minor nearshore rockfish (North of 40°10' N. lat.)	Kelp Rockfish	11 - 20	0.48
Minor nearshore rockfish (North of 40°10' N. lat.)	Kelp Rockfish	> 20	1
Minor nearshore rockfish (North of 40°10' N. lat.)	Olive Rockfish	0 - 10	0.24
Minor nearshore rockfish (North of 40°10' N. lat.)	Olive Rockfish	11 - 20	0.48
Minor nearshore rockfish (North of 40°10' N. lat.)	Olive Rockfish	> 20	1
Minor nearshore rockfish (North of 40°10' N. lat.)	Quillback Rockfish	0 - 10	0.24
Minor nearshore rockfish (North of 40°10' N. lat.)	Quillback Rockfish	11 - 20	0.48
Minor nearshore rockfish (North of 40°10' N. lat.)	Quillback Rockfish	> 20	1
Minor nearshore rockfish (North of 40°10' N. lat.)	Treefish Rockfish	0 - 10	0.24
Minor nearshore rockfish (North of 40°10' N. lat.)	Treefish Rockfish	11 - 20	0.48
Minor nearshore rockfish (North of 40°10' N. lat.)	Treefish Rockfish	> 20	1
Minor shelf rockfish (North of 40°10' N. lat.)	Bocaccio Rockfish	0 - 10	0.3
Minor shelf rockfish (North of 40°10' N. lat.)	Bocaccio Rockfish	11 - 20	0.51
Minor shelf rockfish (North of 40°10' N. lat.)	Bocaccio Rockfish	> 20	1
Minor shelf rockfish (North of 40°10' N. lat.)	Tiger Rockfish	0 - 10	0.1
Minor shelf rockfish (North of 40°10' N. lat.)	Tiger Rockfish	11 - 20	0.5
Minor shelf rockfish (North of 40°10' N. lat.)	Tiger Rockfish	> 20	1
Minor shelf rockfish (North of 40°10' N. lat.)	Vermilion Rockfish	0 - 10	0.1
Minor shelf rockfish (North of 40°10' N. lat.)	Vermilion Rockfish	11 - 20	0.55
Minor shelf rockfish (North of 40°10' N. lat.)	Vermilion Rockfish	> 20	1
Minor shelf rockfish (South of 40°10' N. lat.)	Tiger Rockfish	0 - 10	0.1
Minor shelf rockfish (South of 40°10' N. lat.)	Tiger Rockfish	11 - 20	0.5
Minor shelf rockfish (South of 40°10' N. lat.)	Tiger Rockfish	> 20	1
Minor shelf rockfish (South of 40°10' N. lat.)	Vermilion Rockfish	0 - 10	0.1
Minor shelf rockfish (South of 40°10' N. lat.)	Vermilion Rockfish	11 - 20	0.55
Minor shelf rockfish (South of 40°10' N. lat.)	Vermilion Rockfish	> 20	1
Minor shelf rockfish (South of 40°10' N. lat.)	Yellowtail Rockfish	0 - 10	0.1
Minor shelf rockfish (South of 40°10' N. lat.)	Yellowtail Rockfish	11 - 20	0.3
Minor shelf rockfish (South of 40°10' N. lat.)	Yellowtail Rockfish	> 20	0.75
Non-FMP skate	Thornback Skate	0 - 10	0.07
Non-FMP skate	Thornback Skate	11 - 20	0.07
Non-FMP skate	Thornback Skate	> 20	0.07
Other flatfish	Butter Sole	0 - 10	0.07
Other flatfish	Butter Sole	11 - 20	0.07
Other flatfish	Butter Sole	> 20	0.07

Table A-4 (continued).

Nearshore Grouping	Species	Depth (fm)	Discard Mortality Rate
Other flatfish	Pacific Sanddab	0 - 10	0.07
Other flatfish	Pacific Sanddab	11 - 20	0.07
Other flatfish	Pacific Sanddab	> 20	0.07
Other flatfish	Rock Sole	0 - 10	0.07
Other flatfish	Rock Sole	11 - 20	0.07
Other flatfish	Rock Sole	> 20	0.07
Other flatfish	Sand Sole	0 - 10	0.07
Other flatfish	Sand Sole	11 - 20	0.07
Other flatfish	Sand Sole	> 20	0.07
Other flatfish	Sanddab Unid	0 - 10	0.07
Other flatfish	Sanddab Unid	11 - 20	0.07
Other flatfish	Sanddab Unid	> 20	0.07
Other groundfish	California Scorpionfish	0 - 10	0.07
Other groundfish	California Scorpionfish	11 - 20	0.07
Other groundfish	California Scorpionfish	> 20	0.07
Other groundfish	Kelp Greenling	0 - 10	0.07
Other groundfish	Kelp Greenling	11 - 20	0.07
Other groundfish	Kelp Greenling	> 20	0.07
Other groundfish	Leopard Shark	0 - 10	0.07
Other groundfish	Leopard Shark	11 - 20	0.07
Other groundfish	Leopard Shark	> 20	0.07
Petrale sole	Petrale Sole	0 - 10	0.07
Petrale sole	Petrale Sole	11 - 20	0.07
Petrale sole	Petrale Sole	> 20	0.07
Sablefish (North of 36° N. lat.)	Sablefish	0 - 10	0.07
Sablefish (North of 36° N. lat.)	Sablefish	11 - 20	0.07
Sablefish (North of 36° N. lat.)	Sablefish	> 20	0.07
Sablefish (South of 36° N. lat.)	Sablefish	0 - 10	0.07
Sablefish (South of 36° N. lat.)	Sablefish	11 - 20	0.07
Sablefish (South of 36° N. lat.)	Sablefish	> 20	0.07
Shallow nearshore rockfish	Black and Yellow Rockfish	0 - 10	0.25
Shallow nearshore rockfish	Black and Yellow Rockfish	11 - 20	0.49
Shallow nearshore rockfish	Black and Yellow Rockfish	> 20	1
Shallow nearshore rockfish	China Rockfish	0 - 10	0.25
Shallow nearshore rockfish	China Rockfish	11 - 20	0.49
Shallow nearshore rockfish	China Rockfish	> 20	1
Shallow nearshore rockfish	Gopher Rockfish	0 - 10	0.25
Shallow nearshore rockfish	Gopher Rockfish	11 - 20	0.49
Shallow nearshore rockfish	Gopher Rockfish	> 20	1
Shallow nearshore rockfish	Grass Rockfish	0 - 10	0.25
Shallow nearshore rockfish	Grass Rockfish	11 - 20	0.49
Shallow nearshore rockfish	Grass Rockfish	> 20	1
Shallow nearshore rockfish	Kelp Rockfish	0 - 10	0.25
Shallow nearshore rockfish	Kelp Rockfish	11 - 20	0.49
Shallow nearshore rockfish	Kelp Rockfish	> 20	1
Spiny dogfish	Spiny Dogfish Shark	0 - 10	0.07
Spiny dogfish	Spiny Dogfish Shark	11 - 20	0.07
Spiny dogfish	Spiny Dogfish Shark	> 20	0.07

Table A-4 (continued).

Nearshore Grouping	Species	Depth (fm)	Discard Mortality Rate
Starry flounder	Starry Flounder	0 - 10	0.07
Starry flounder	Starry Flounder	11 - 20	0.07
Starry flounder	Starry Flounder	> 20	0.07
Widow rockfish	Widow Rockfish	0 - 10	0.32
Widow rockfish	Widow Rockfish	11 - 20	0.54
Widow rockfish	Widow Rockfish	> 20	1
YELLOWEYE ROCKFISH	YELLOWEYE ROCKFISH	0 - 10	0.32
YELLOWEYE ROCKFISH	YELLOWEYE ROCKFISH	11 - 20	0.56
YELLOWEYE ROCKFISH	YELLOWEYE ROCKFISH	> 20	1
Yellowtail rockfish (North of 40°10' N. lat.)	Yellowtail Rockfish	0 - 10	0.1
Yellowtail rockfish (North of 40°10' N. lat.)	Yellowtail Rockfish	11 - 20	0.3
Yellowtail rockfish (North of 40°10' N. lat.)	Yellowtail Rockfish	> 20	0.75

Table A-5. Updates to analysis used in this report.

Year	Estimation Updates	Discard Rate Updates	Management Updates
2015	Definition of midwater rockfish and midwater hake sectors improved. EM CS fleet discard estimated.	Nearshore rates updated for a variety of species.	New grouping of "Ecosystem Component Species" and changes to "Other fish"/"Other groundfish" grouping
2014	Failed data occurred and were estimated. CVs calculated. EFP displayed separately.	50% mortality rate applied to all Big Skate discard caught using trawl gear	Petrale sole, canary rockfish, widow rockfish declared rebuilt.
2013	Unsampled, unsorted (UNST) hauls occurred and were estimated.		Lingcod split at 40'10 deg. N.
2012		Longnose skate, spiny dogfish mortality rates applied.	
2011	IFQ estimations added.		IFQ management began. ACL, ABC, OFL harvest goals defined.

Table A-6. In-season adjustments to 2015 west coast groundfish fisheries.

A complete list of NMFS Public Notices and a complete list of Federal Register Notices can be found at www.westcoast.fisheries.noaa.gov. Provided by Gretchen Hanshew and Kelly Ames of the GMT.

Date	Adjustment	Details	Link to Public Notice
3/3/2015	Notice of EFP	EFP issuance for the San Francisco Community Fishing Organization and Dan Platt	http://www.westcoast.fisheries.noaa.gov/publications/frn/2015/80fr11398.pdf
3/10/2015	Biennial regs.	2015-2016 harvest specifications and management measures	http://www.westcoast.fisheries.noaa.gov/publications/frn/2015/80fr12567.pdf
4/9/2015	Season date	Modified the season start date for the shorebased IFQ midwater trawl fishery (both whiting and non-whiting) to May 15 north of 40°30´ N. lat. to the US/Canada border	http://www.westcoast.fisheries.noaa.gov/publications/frn/2015/80fr12567.pdf
6/4/2015	Trip limits	Shorebased IFQ program limits for big skate	http://www.westcoast.fisheries.noaa.gov/publications/frn/2015/80fr31858.pdf
8/14/2015	Trip limits	Limited entry and open access fixed gear limits for sablefish north of 40°10´ N. lat., blackgill rockfish south of 40°10´ N. lat., and black rockfish between 42° and 40°10´ N. lat. Shorebased IFQ limits for big skate	http://www.westcoast.fisheries.noaa.gov/publications/frn/2015/80fr50212.pdf
10/13/2015	Trip limits	Prohibit retention of Pacific halibut in the sablefish primary fishery north of Pt. Chehalis. Closure of the limited entry and open access fixed gear sablefish fisheries north of 36° N. lat.	http://www.westcoast.fisheries.noaa.gov/publications/frn/2015/80fr61318.pdf
10/14/2015	Season date	Modify the California recreational California scorpionfish season dates in the Southern Management Area	http://www.westcoast.fisheries.noaa.gov/publications/frn/2015/80fr61765.pdf
11/3/2015	Allocation	Transfer of darkblotched rockfish to the mothership and catcher-processor sectors	http://www.westcoast.fisheries.noaa.gov/publications/frn/2015/80fr67664.pdf