Salmon bycatch in the Pacific Coast Groundfish Fisheries

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Document Summary

This document provides information on salmon interactions relative to the operation of the Pacific Coast groundfish fishery (groundfish fishery) as implemented under the Pacific Coast Groundfish Fishery Management Plan (FMP). The groundfish fishery is a year-round, multi-species fishery occurring off the Coasts of Washington, Oregon, and California. A limited entry (LE) program was established in 1994 for vessels using trawl, longline, and trap (or pot) gears. The majority of commercial groundfish harvest is taken by the LE fleet. There is also an open access (OA) fishery that targets small amounts of groundfish or that takes groundfish incidental to other non-groundfish fisheries. Gears used in the OA fishery include longline, vertical hook-and-line, pot, setnet, trammel net, shrimp and prawn trawl, California halibut trawl, and sea cucumber trawl. There is also a commercial tribal fishery off Washington in which participants use gear similar to that used in the non-tribal fisheries. State managed recreational fisheries also harvest groundfish. The commercial LE, OA, tribal and recreational fisheries targeting Pacific whiting, sablefish, lingcod, rockfish and flatfish take salmon as bycatch.

Substantial management changes have occurred in the trawl fisheries since the last full biological opinion in 1999, and the supplemental biological opinion for the Pacific whiting and bottom trawl fisheries in 2006. In addition, new information on salmon bycatch has become available for the non-trawl sectors. In 2011, a catch share program was implemented in the trawl fishery. As a result of the new catch share program, some trawl effort has shifted. Under gear switching provisions some vessels are catching trawl allocations with fixed gears and a non-whiting midwater trawl fishery has emerged in the area north of 40°10' N. lat.

NMFS estimates the bycatch of salmon from observer and catch monitor data. The availability of data to monitor salmon bycatch varies between sectors. The greatest amount of data is available for trawl fisheries and the least amount of data is available in the incidental OA and recreational fisheries. In the trawl sectors, catch composition is generally monitored through an on board observer program in which nearly 100 percent of all hauls are sampled. The Pacific whiting Shorebased Individual Fishery Quota (IFQ) Program fishery generally retains unsorted catch and most bycatch data on salmon are gathered on shore by catch monitors at the trip level. The Pacific whiting at-sea fisheries are monitored by observers and nearly all hauls are sampled. Lower rates of monitoring occur in the remaining LE and OA fisheries. In 2011, 25 percent of the sablefish tier fishery, 10 percent of the non-sablefish landings, 6 percent of the OA fixed gear fishery for sablefish, 4 percent of the nearshore OA fishery, 14 percent of the pink shrimp trawl, and 14 percent of the California Halibut were monitored by observers. Tribal-directed groundfish fisheries are monitored by the tribes and the recreational fisheries are monitored by the states. Other than the Pacific whiting tribal fishery, salmon bycatch data are not available for either of these fisheries.

Most salmon caught in the groundfish fishery are Chinook salmon. During the 2002 to 2014 period, Chinook bycatch averaged 6,727 fish per year in the Pacific whiting fisheries, 3,067 fish per year in the bottom trawl fisheries, and 58 fish per year in the non-trawl fisheries. Since 2002, the groundfish fishery as a whole has exceeded 20,000 Chinook once in the 12 years between 2002 and 2013. The highest annual catch of Chinook occurred in 2003, when the groundfish fisheries took 23,013 Chinook. Coho, chum, pink and sockeye make up much smaller portions of the salmon catch in groundfish fisheries. For all sectors combined between 2002 and 2013, coho averaged less than 300 fish per year. Chum has averaged less than 100 fish per year between 2002 and 2013 for all groundfish sectors combined. The highest catch of chum was 291 fish in 2007, with all catch occurring in the Pacific whiting fisheries. Sockeye salmon are rarely encountered and pink salmon encounters are very sporadic ranging from 0 to 7,315 fish in a year.

For the Pacific whiting fisheries, the biological opinion limits the bycatch rate in the whiting sectors to 0.05 Chinook per metric ton (mt) of Pacific whiting, with an associated total annual catch of 11,000 Chinook. The Pacific whiting fishery catch has exceeded 11,000 Chinook in four years (1995, 2000, 2005, and 2014) during the 1991 to 2014 period. Chinook bycatch rates and number caught vary by year, month, area and depth where the

Pacific whiting fisheries occur. For the at-sea sectors the majority of the Chinook were caught is waters deeper than 150 fm. In general, salmon bycatch rates have been highest in the fall, September to December, and lowest from late-spring to summer, May to August. The majority of the Chinook taken in the at-sea sectors were taken between Cape Falcon (45°46 N. lat.) and Cape Blanco (42°50' N. lat.), with almost all of the Chinook being caught in the fall from September to December. For the Pacific whiting shorebased fishery the number of Chinook caught was highest from June to August in waters shallower than 100 fm. However, from September to December, bycatch rates more frequently exceeded 0.05 Chinook per mt of Pacific whiting with November having the high bycatch rates in all depths. Approximately 36 percent of the Chinook bycatch in the Pacific whiting shorebased fishery occurred north of Cape Falcon and 64 percent occurring between Cape Falcon and Cape Blanco with the highest Chinook bycatch occurring from July to November, with bycatch rates most frequently exceeding 0.05 Chinook per mt of Pacific whiting in the area between Cape Falcon to Cape Blanco. All Pacific whiting sectors have high bycatch rates in the area west of Heceta Bank. The tribal fishery, which is more spatially constrained than non-tribal whiting fisheries, most frequently exceeded the 0.05 Chinook per mt of Pacific whiting bycatch rate. However, the small amount of Pacific whiting harvest in tribal fishery in recent years, 2012 to 2014, has resulted in minor amounts of Chinook bycatch.

From 2009 to 2013, 933 readable Coded Wire Tags (CWTs) were recovered from Chinook and 16 from coho salmon. Of all Chinook with CWTs, 30 percent were from Endangered Species Act (ESA) listed hatchery stocks, with the remaining 70 percent from unlisted U.S. stocks, Canadian Stocks, or of unknown origin. For the at-sea, 42 percent of the listed fish were Puget Sound Chinook, 34 percent were lower Columbia River Chinook, 16 percent were Snake River fall run Chinook, 4 percent were Upper Willamette River Chinook, 3 percent were Snake River spring/summer run Chinook and 2 percent were Central Valley spring run Chinook. This is in contrast to the Shorebased fishery during the same time period, where 77 percent of the listed Chinook were lower Columbia River Chinook, 15 percent were Snake River Fall run, 6 percent were Puget Sound Chinook, and 1 percent were Central Valley spring run Chinook. Although fewer overall salmon are caught in the Pacific whiting sectors in the May to July time period, a greater proportion of the fish recovered with CWTs during the May to July time period were from ESA-listed stocks. CWT data indicates that all sectors of the Pacific whiting fishery were dominated by two and three year old Chinook.

Genetic analysis from the 2009 and 2010 Pacific whiting at-sea sectors indicated that the Chinook bycatch in 2009 and 2010 had a northerly distribution. In both 2009 and 2010, southern stocks were abundant early in the season, between mid-May and mid-Aug, but declined later as northern stocks increased. Bycatch in the Eureka area was dominated by southern stocks. Columbia River stocks were dominant in the Columbia area. Although Columbia River stocks were abundant in the Vancouver area the stock composition included Puget Sound and Fraser River stocks. The genetic analysis showed that the major contributors of Chinook bycatch in 2009 and 2010 were lower Fraser populations (>25 percent each year) followed by Columbia River stocks in 2009 but shifting south to Klamath, Rogue, and Mid-Oregon coastal stocks in 2010.

The coastwide catch of Chinook in the bottom trawl fishery based on bottom trawl tow hours from 1985-1990 and estimated the annual catch to be between 6,000 and 9,000 fish per year. In 2002 and 2003, the first two years that the bottom trawl fishery carried observers, the Chinook bycatch exceeded 9,000 fish. After 2003 a large drop in coastwide Chinook bycatch occurred that may have been the result of changes in management measures affecting the nearshore trawl fishery. Since 2006, only a few hundred Chinook have been caught annually with bottom trawl. From 2009 to 2013, only six percent of the Chinook bycatch in the bottom trawl fishery has occurred south of 40°10' N. lat.. Chinook bycatch north of 40°10' N. lat. has been fairly divided between the three geographic areas, with 36 percent caught north of Cape Falcon, 24 percent caught between Cape Falcon and Cape Blanco, and 34 percent caught from Cape Blanco to 40°10' N. lat.. CWT data indicates that the bottom trawl fishery primarily took two year old Chinook. The use of midwater trawl gear for species other than whiting has been increasing since 2011. Annual catch of Chinook by vessels using midwater trawl has been increasing from less than 20 Chinook in 2011 to 641 Chinook in 2014. Increased non-whiting midwater trawl fishing has resulted Chinook salmon bycatch increasing, particularly north of Cape Blanco.

List of Acronyms

ACL	Annual catch limit
A-SHOP	At-sea Hake Observation Program
BRA	Bycatch Reduction Areas
CCA	Cowcod Conservation Area
CPFV	Commercial Passenger Fishing Vessels
CWT	Coded Wire Tags
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFHCA	Essential Fish Habitat Conservation Areas
EFP	Exempted Fishing Permit
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
FMP	Fishery Management Plan
fm	Fathom
ft	Feet
GCA	Groundfish Conservation Area
IFQ	Individual fishing quota
ITS	Incidental Take Statement
LE	Limited Entry
LEFG	Limited Entry Fixed Gear
MPA	Marine Protected Area
MSA	Magnuson-Stevens Fishery Conservation and Management Act
m	Meter
mt	Metric ton
nm	Nautical miles
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NorPac	North Pacific fishery database
OA	Open Access
OLE	Office for Law Enforcement
OSCZ	Ocean salmon conservation zone
PacFIN	Pacific Fishery Information Network
PFMC	Pacific Fishery Management Council
PSMFC	Pacific States Marine Fisheries Commission
RCA	Rockfish Conservation Area
RecFIN	Recreational Fisheries Information Network
RMIS	Regional Mark Information System
VMS	Vessel Monitoring System
WCGOP	West Coast Groundfish Observer Program
YRCA	Yelloweye Rockfish Conservation Areas

I. Description of the Proposed Action

The proposed action is the continued operation of the Pacific Coast groundfish fishery as implemented under the Pacific Coast Groundfish Fishery Management Plan (FMP). The term "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies. The groundfish FMP is implemented through regulations that are generally recommended by the Pacific Fishery Management Council (PFMC) and adopted by the National Marine Fisheries Service (NMFS). Active management of the fishery began in the early 1980s with the establishment of optimum yields (OYs) for several managed species and trip limits that slow the pace of fishing and allow for year-round fishing. Since the 1980s, management has evolved to further separate individual groundfish species for management purposes and currently uses cumulative two-month trip limits and individual fishing quotas for most species (PFMC 2008). Cumulative trip limits are a specified weight of fish that can be landed during a particular time period. Under the FMP, the groundfish fishery is defined as consisting of four management components: limited entry (LE) which includes all commercial fishers who hold a Federal limited entry permit; open access (OA) which includes commercial fishers who are not federally permitted; tribal fisheries; and recreational fisheries. The total number of limited entry permits is capped, and permitted vessels are allotted a larger portion of the total allowable catch for commercially desirable species than non-permitted vessels. Although OA vessels do not have federal permits, state agencies (California Department of Fish and Game and Oregon Department of Fish and Wildlife) have instituted permit programs for certain OA fisheries. There are no interrelated or interdependent actions of the proposed action. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

II. Action Area

Action area means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For the Pacific Coast Groundfish Fishery the action area includes the Exclusive Economic Zone (EEZ) and state waters of the Pacific Ocean. As discussed in the description of the proposed action, the state-managed groundfish fisheries are not interrelated to, or interdependent with, the proposed action. However, vessels participating in federally-managed fisheries transit through state waters and land fish within the coastal states. Thus, some effects of the federally-managed groundfish fishery occur in state waters. Figure 1 shows the area where fishing has occurred, and where we anticipate the direct effects to the ESA-listed species are most likely to occur (distribution for each species is identified in the respective status sections). It is reasonable to expect that future fishing will occur in the same areas because they are areas where the target fish occur.

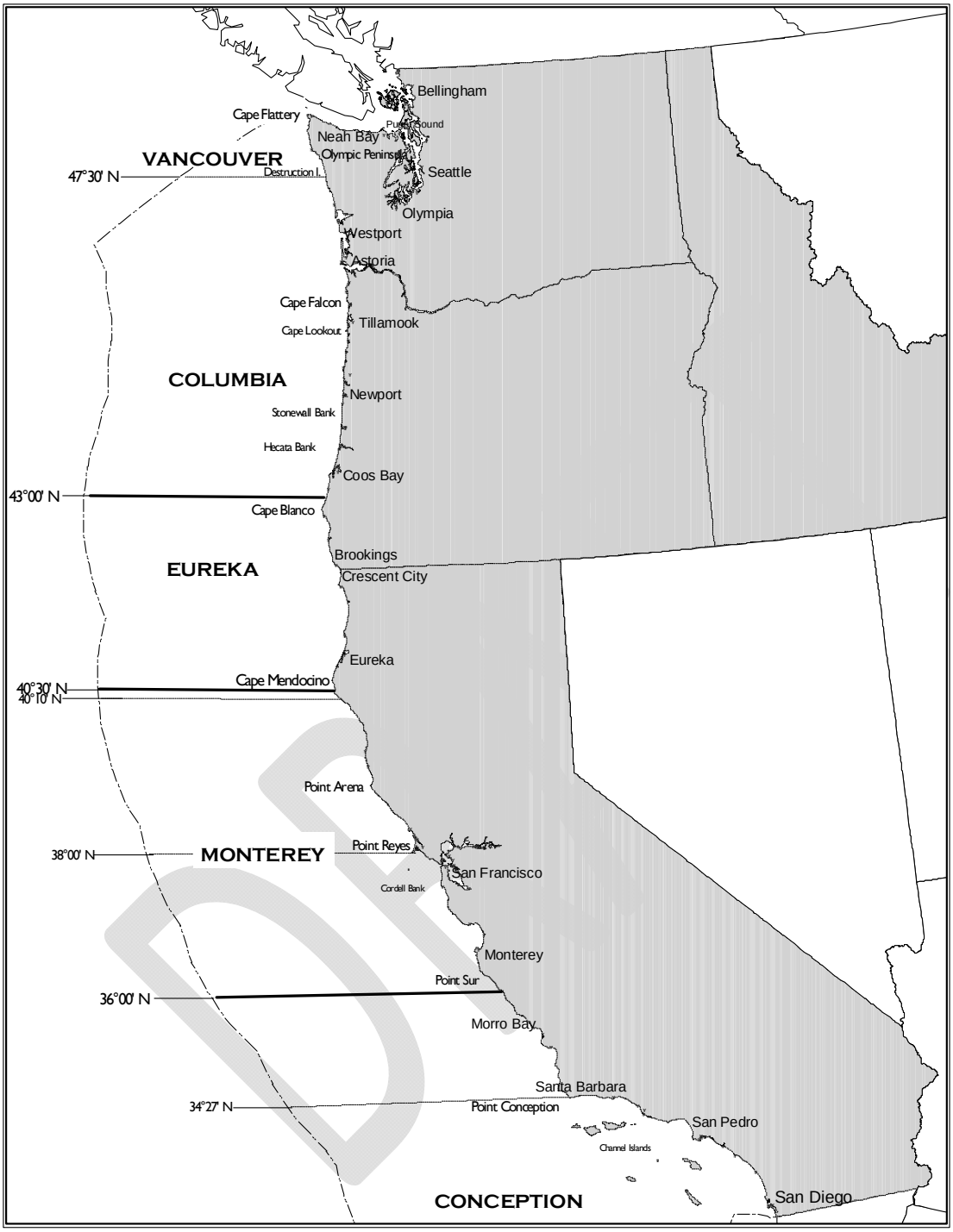

Figure 1. The fishery management area, showing major coastal communities and groundfish management areas (PFMC 2015).

III. Overview of the Groundfish Fisheries

The groundfish fishery includes vessels that use a variety of gear types to directly harvest groundfish species or to land groundfish incidentally caught while targeting non-groundfish. These gears have a potential for direct interaction with listed salmonids. The seasonality and geographic extent, including fishing depth and north/south distribution of the different target strategies and gears result in different direct effects on salmonids. This section presents an overview of groundfish species, management structure, gear types, seasonality and geographic extent of the fishery. In addition, catch monitoring strategies and data flow are described.

a. Groundfish Species

The FMP includes more than 90 species: 60-plus rockfish, including all genera and species from the family *Scorpaenidae* (*Sebastes*, *Scorpaena*, *Sebastolobus*, and *Scorpaenodes*) occurring in waters off Washington, Oregon, and California; 12 flatfish species, 6 roundfish species; and miscellaneous fish species that include sharks, skates, grenadiers, rattails, and morids. Commercial and recreational fisheries targeting Pacific whiting, sablefish, lingcod, rockfish and flatfish species encounter salmon (Table 1). All groundfish fisheries that encounter salmon will be addressed in the updated opinion.

Rockfish make up the majority of species managed under the FMP. Rockfish vary greatly in their morphological and behavioral traits, with some species being semi-pelagic and found in midwater schools, and others leading solitary, sedentary, bottom-dwelling lives (Love, *et al.* 2002). Rockfish inhabit a wide range of depths, from nearshore kelp forests and rock outcrops to varied deepwater (greater than 150 fm) habitats on the continental slope. Despite the range of behaviors and habitats, most rockfish share general life history characteristics, which include slow growth rates, bearing live young, and large but infrequent recruitment events.

Roundfish managed under the FMP include lingcod, cabezon, kelp greenling, Pacific cod, sablefish and Pacific whiting. Adult lingcod are a relatively sedentary species found coastwide along the rocky shelf and in nearshore habitats. Lingcod grow rapidly; reaching 12 inches in the first year. Cabezon is a coastwide species that is primarily found nearshore, in intertidal areas and among jetty rocks out to 100 m (Love 1996; Miller and Lea 1972). Kelp greenling are relatively common along the west coast, with the adults found in rocky reefs of shallow nearshore areas. Pacific cod are widely distributed along the Pacific Coast from Alaska to Santa Monica, California (Hart 1988: Love 1996). Although Pacific cod prefer shallow, soft bottom habitats in marine and estuarine environments (Garrison and Miller 1982), adults have been found associated with coarse sand and gravel substrates (Garrison and Miller 1982; Palsson 1990). Compared to the other roundfish species, adult sablefish are a longer living species that is found in deeper waters, being most abundant between 200 and 1,000 m, and found as deep as 3,000 m (Beamish and McFarlane 1988; Kendall, Jr. and Matarese 1987; Love 1996; Mason, et al. 1983). Adult sablefish commonly occur over sand and mud (McFarlane and Beamish 1983; NOAA 1990) in deep marine waters, but have also been found over hard-packed mud and clay bottoms in the vicinity of submarine canyons (MBC 1987). The coastal stock of Pacific whiting is semi-pelagic and is the most abundant single-species groundfish population in the California Current system (Stewart and Hamel 2010). The stock is characterized by highly variable recruitment patterns and a relatively short lifespan. In general, the species referred to as roundfish share similar morphology, are faster growing with shorter

life spans then many of the rockfish, and have external fertilization with some species having large and highly variable recruitment events.

Flatfish species from the order *Pleuronectiformes* have asymmetrical skulls with both eyes on the same side of the head. The 12 flatfish species in the FMP include species that have been assessed, such as arrowtooth flounder, Dover sole, English sole, Pacific sanddabs, petrale sole, rex sole, and starry flounder, as well as those species that have not been assessed and are managed within the Other Flatfish complex (i.e., butter sole, curlfin sole, flathead sole, rock sole, and sand sole). Most of the flatfish species are distributed coastwide in waters of the continental shelf with the exception of arrowtooth flounder, butter sole, and flathead sole, which are found on the shelf in waters north of central California. Flatfish species vary in depth distribution. The flatfish species primarily found in more nearshore areas include starry flounder, Pacific sanddab, butter sole, curlfin sole, sand sole and rock sole. Flatfish species found in deep waters include Dover sole, flathead sole, and petrale sole. The remaining species show more variation in depth distribution. Many of the flatfish species migrate seasonally from shallow water summer feeding grounds on the continental shelf to deep water spawning grounds over the continental slope (NOAA 1990). Though there are variations between species, most of the flatfishes are found on soft bottom such as sand or sandy gravel substrates and mud; however, some are found in eelgrass habitats (Pearson and Owen 1992) and, in the case of arrowtooth flounder, occasionally over low-relief rock-sponge bottoms (NOAA 1990).

Annual catch limits (ACLs) and harvest guidelines are specified for the various groundfish stocks and stock complexes. These may be coastwide specifications or they may be subdivided geographically. Most of the ACLs are specified in metric tons and allocated to specific sectors of the fishery. Allocations may be "formal" or "informal." Formal allocations are generally established to ensure that a sector has the opportunity to catch their portion of the ACL. Informal allocations are a function of the particular management measures which constrain catch opportunities. In addition to allocations, managers also consider set-asides. Set-asides are intended to prevent catch from exceeding the ACLs. Set-asides are established for research catch, incidental fisheries, tribal fisheries and exempted fishing permits. Figures 2 and 3 show the distribution of catch between fishery sectors. Table 1 shows total commercial catch mortality in metric tons by species and species groupings in recent years. Figure 4 shows participation trends.

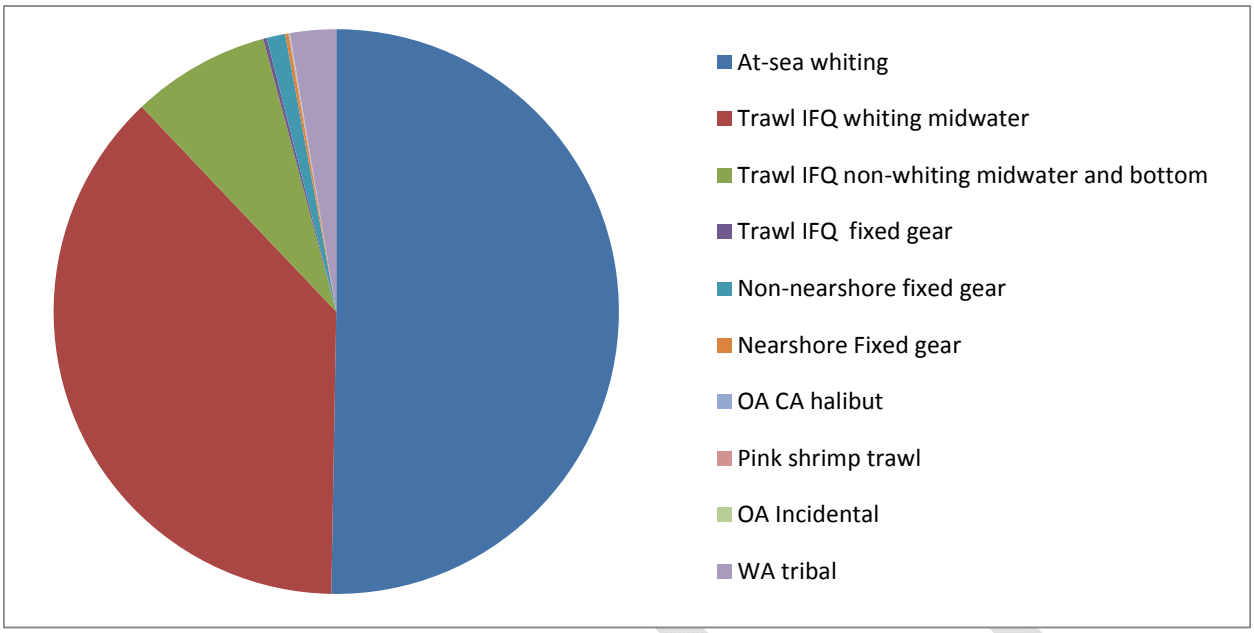

Figure 2. Total groundfish mortality (mt) by commercial sector, metric tons in 2013 (Bellman *et al*. 2013)

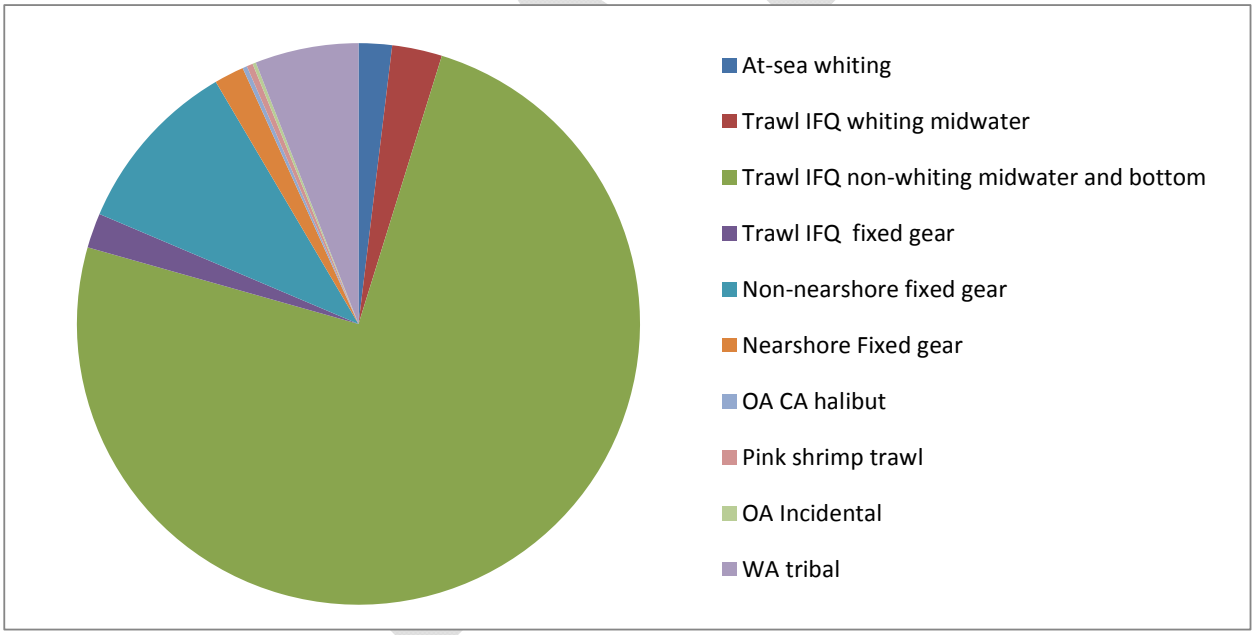

Figure 3. Total non-whiting groundfish mortality by commercial sector, metric tons in 2013 (Bellman *et al*. 2013)

Table 1. Groundfish mortality (mt) by species and species groups, commercial and recreational fisheries (Bellman *et al*. 2008, Bellman *et al.* 2009, Bellman *et al*. 2010, Bellman *et al.* 2011, Bellman *et al* 2012, Bellman *et al*. 2013, Summers *et al*. 2014). a/

Species & Species Groups		Fishing Year										
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Roundfish	Cabezon b/		--	133	106	42	39	105	108	98	121	103
	California Scorpionfish		--	--	--	68	65	70	67	104	120	115
	Lingcod		588	890	952	706	574	581	450	852	1,068	1,294
	Pacific Cod		--	864	385	101	39	248	347	607	634	391
	Pacific Whiting		226,615	261,212	267,707	215,340	250,205	122,165	165,717	231,996	160,706	234,499
	Sablefish		6,235	6,543	6,470	5,545	6,078	7,400	7,205	6,582	5,406	4,193
Flatfish	Arrowtooth		5,668	3,706	3,105	3,099	3,409	5,443	4,090	2,666	2,508	2,510
	Dover Sole		7,213	7,507	7,730	10,227	11,820	12,546	10,952	7,927	7,175	8,081
	English Sole		1,229	1,222	1,336	914	436	501	311	205	224	357
	Petrale Sole		2,119	2,766	2,723	2,340	2,260	1,978	936	953	1,111	2,265
	Starry Flounder		--	--	--	30	21	28	38	24	17	9
	All other Flatfish		1,889	1,965	1,962	1,649	1,040	1,565	1,144	921	897	1,080
Rockfish	Bocaccio		105	97	61	67	47	70.6	72	112	140	149
	Canary		48	49	57	46	41	38	43	52	45	43
	Chilipepper		153	97	126	128	151	311	376	329	302	404
	Cowcod		2	2	1	3	1	1	1	1	1	2
	Darkbloched		231	124	193	285	253	301	332	133	105	133
	POP		152	76	80	157	131	181	159	62	56	58
	Thornyheads		1,562	1,546	1,707	2,114	2,972	3,377	3,263	2,001	1,861	2,171
	Widow		119	199	214	259	238	195	173	216	278	499
	Yelloweye		16	16	12	19	12	11	8	9	12	11
	Yellowtail		739	935	493	389	476	751	955	1,352	1,570	1,424
	Nearshore, unspecified b/		--	1,527	1,703	1,436	1,240	1,442	1,308	1,266	1,353	1,667
	Shelf, unspecified b/		--	501	230	519	296	352	335	433	499	521
	Slope, unspecified b/		1,754	672	701	814	850	951	884	574	772	552
Other	Kelp Greenling		--	35	48	53	57	63	59	75	65	70
	Genadiers, unspecified		--	--	--	414	379	248	365	240	201	318
	Spiny dogfish		--	2,044	1,407	1,504	2,497	1,207	1,215	1,662	831	652
	Skates,unspecified		--	1,920	1,029	2,192	2,314	2,186	1,723	1,555	1,396	1,178
	All other Groundfish		--	2,425	1,015	414	277	212	215	122	209	145

a/ Included small amounts of research catch

b/ 2007-2008 includes only California catch, 2009-2013 includes both California and Oregon catch.

c/ These are an aggregation of species specific to this report and combined species managed individually with species managed in complexes.

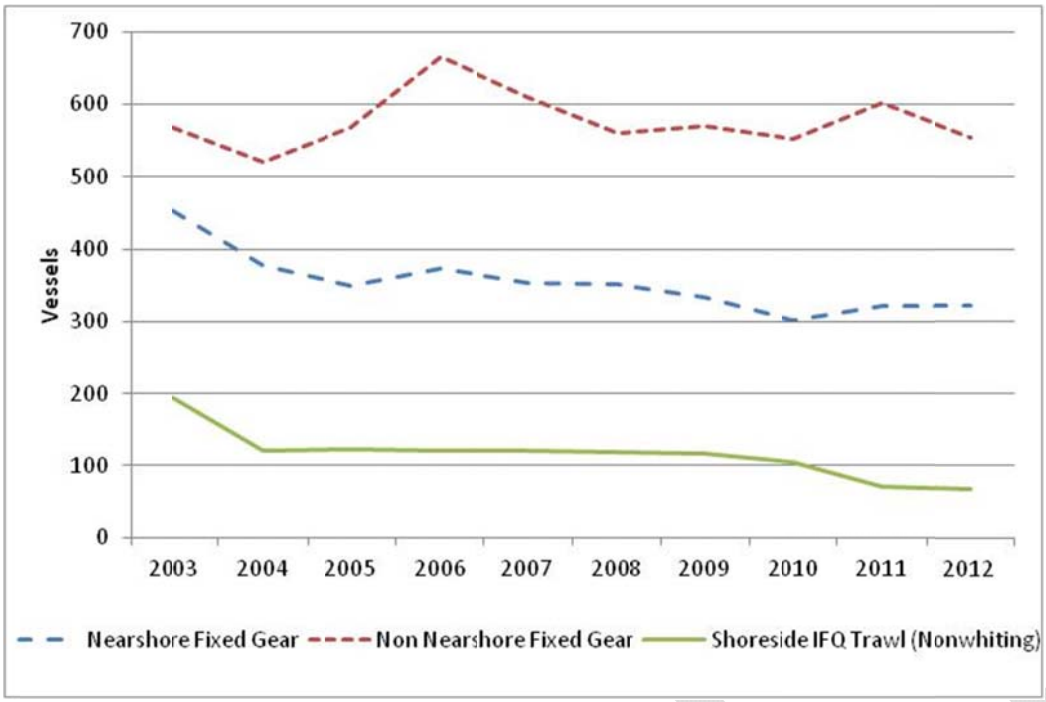

Figure 4. Commercial vessel participation by year, 2003-2012 (PFMC 2015).

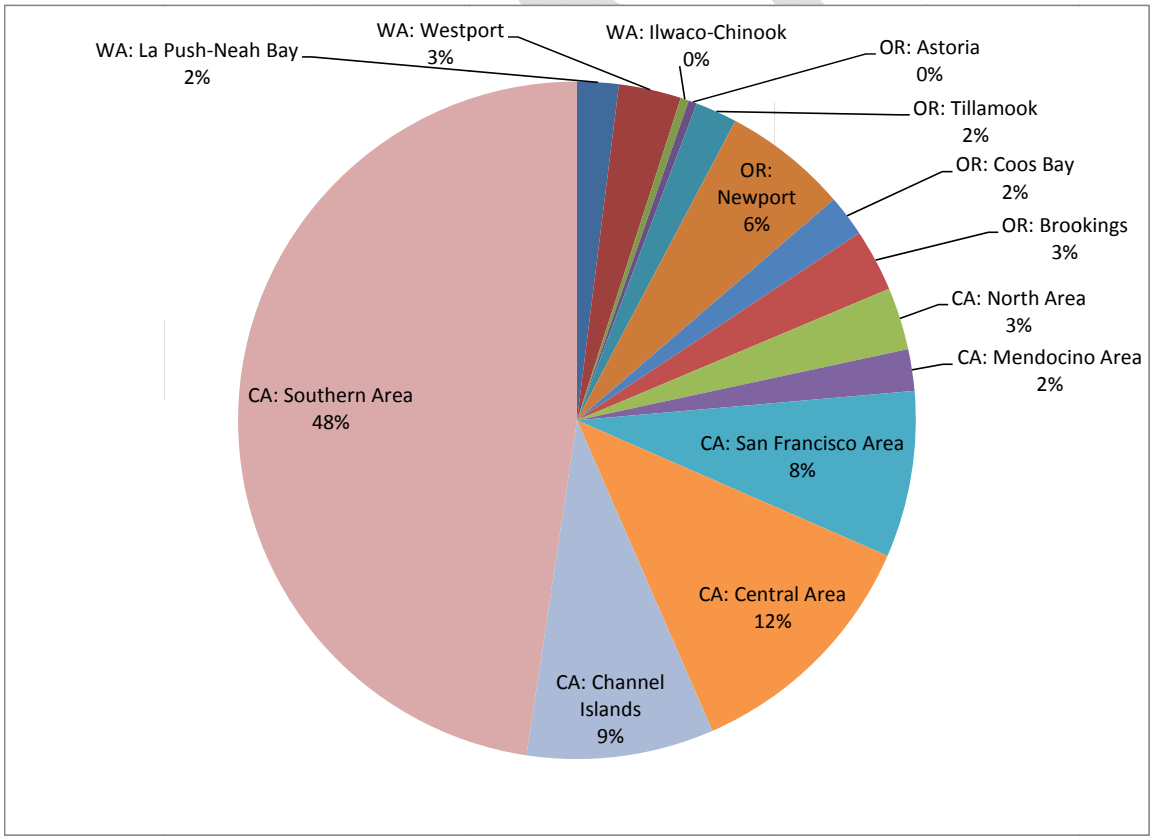

Figure 5. Distribution of recreational boat trips by reporting area, 2004-2012, includes bottomfish plus Pacific halibut marine angler boat trips (PFMC 2015).

b. Current Management Structure and Fishing Gears

The Pacific coast groundfish fishery is a year-round, multi-species fishery occurring off the Coasts of Washington, Oregon, and California. A LE permit program for a commercial non-tribal fishery that was established in 1994 for trawl, longline, and trap (or pot) gears. The majority of commercial groundfish harvest is taken by the LE fleet. There is also an OA fishery that takes groundfish incidentally or in small amounts. OA fishery participants may use, but are not limited to longline, vertical hook-and-line, pot, setnet, trammel net, and non-groundfish trawl. There is also a commercial tribal fishery off Washington. Participants in the tribal fishery use gear similar to that used in the non-tribal fisheries. The groundfish fisheries can be categorized into the following groups based on permitting requirements, gear, and target strategy:

Limited Entry Fisheries – vessels registered to a federal LE groundfish permits.

Trawl - At-sea Pacific whiting cooperatives:

- *Catcher/processor cooperative*
- *Mothership sector cooperative*

Trawl - Shorebased Individual Fishery Quota (IFQ) program:

Fixed Gear

- *Sablefish tier limit fishery*
- *LEFG trip limit fishery*

Open Access Fisheries

- *Directed OA*
- *Incidental OA*

Tribal Fisheries

- *Pacific whiting midwater trawl*
- *Non-whiting midwater trawl*
- *Bottom trawl*
- *Fixed gear*

Recreational Fisheries

- *Commercial Passenger Vessels*
- *Private Party Vessels*

In 2013 there were 322 LE vessels harvesting vessels managed under the FMP. The harvesting vessels include vessels that harvest catch and deliver it to land based processing facilities and vessels that both harvest and process catch. In addition, there are 7 mothership processors. The number of vessels in the LE fisheries vary between years as a result of: permits being transferred to multiple vessels; vessels in the sablefish tier fishery stacking or unstack permits[1]; and, permits being moved into unidentified status. Each permit is endorsed for a particular gear type and cannot be changed. Therefore, the distribution of permits between LE trawl and fixed gears is fairly stable. Each permit also has a length endorsement.

[1] Stacking is the practice of registering more than one limited entry permit for use with a single vessel.

The overall number of permits is reduced when multiple permits are combined to create a new permit with a longer length endorsement. The distribution of permits between the three states often shifts.

Management of the LE fisheries has evolved over the past 10 years. In 2005, the limited entry fixed gear fishing opportunity was constrained by measures needed to reduce catch of canary rockfish coastwide, yelloweye rockfish north of 40°10′ N, latitude, and bocaccio and cowcod south of 40°10' N. lat. Landing limits for the limited entry fixed gear fleet north of 40°10' N. lat. provided vessels with access to continental slope and nearshore species, and less access to continental shelf species. Retention of canary rockfish, yelloweye rockfish, and cowcod was prohibited throughout the year, and only minimal levels of bocaccio retention were permitted. Landing lingcod was prohibited from January through April and from November through December to protect lingcod during their spawning and nest-guarding season. Minimum size limits for lingcod were in place to reduce the catch of young fish. For waters south of 40°10′ N. lat., the landings limits were intended to draw vessels away from continental shelf species. Non-trawl Rockfish Conservation Areas (RCA) were closed areas used to move fixed gear effort away from areas with higher yelloweye and canary rockfish abundance. Trawl RCAs were used to move effort off the shelf and allowed fishing for shallow flatfish (with selective flatfish trawl gear in the north) and off the slope where canary rockfish and bocaccio were less abundant. The Cowcod Conservation Areas (CCAs) off the Southern California Bight were closed to commercial groundfish fishing to prevent vessels from fishing in areas of higher cowcod abundance.

Although the open access non-trawl fishery is managed separate from the limited entry fixed gear fishery, overfished species protection measures were similar for both sectors. The non-trawl RCA boundaries that apply to the limited entry fixed gear fleet also apply to the open access non-trawl fleet, as do the CCAs. Also similar to the limited entry fleet, greater landings limits are provided for continental slope and nearshore species, with closed seasons and lower limits for continental shelf species, including the same closed periods for lingcod as in the limited entry fixed gear fisheries. Non-groundfish target fisheries for pink shrimp, salmon troll, California halibut, sea cucumber, and ridgeback prawn have incidental landing allowances.

In 2013, management measures for the limited entry fixed gear and open access non-trawl fisheries were similar to 2005. The changes in 2013 from 2005 that did occur were primarily driven by the lower sablefish ACL for the area north of 36° N. lat. and species-specific limits for blackgill rockfish south of 40°10′ N. lat. From 2009 to 2011, the shoreward boundary of the non-trawl RCA in the north was adjusted to reduce yelloweye rockfish mortality in areas that have higher yelloweye rockfish bycatch. Non-trawl RCAs north of 46°16' N. lat. remained the most restrictive. Since 2009, incidental lingcod landing allowances have been permitted in the salmon troll fishery. The trawl fishery management changed substantially in 2011 from a trip limit structure to an IFQ program. The trawl RCA structure has been adjusted over time with greater changes expected in the coming years. The trawl RCA north of 48°10' N. lat. has remained the most restrictive since 2007, given canary rockfish abundance in the area.

Groundfish Trawl Fisheries

In 2011, a major change occurred in the management of the trawl fishery when a catch share program was implemented. Catch shares consists of an IFQ program for the shorebased trawl fleet and harvester cooperatives for the at-sea mothership and catcher/processor fleets. The catch shares system divides the portion of the ACL allocated to the trawl fishery into shares controlled by individual fishermen or groups of fishermen (cooperatives). The shares can be harvested largely at the fishermen's discretion.

All groundfish and Pacific halibut catch are deducted from the fisherman's personal quota or the pooled quota (cooperatives). Under catch shares, some management measures from the previous management structure remain in place including: trip limits for non-IFQ species, size limits, and area restrictions.

At-Sea Pacific Whiting Cooperative Fisheries **-** During specified dates referred to as the primary season, midwater trawl gear is used to target Pacific whiting in the at-sea sectors (mothership and catcher/processor cooperatives). Catcher/processors both harvest and process catch while mothership vessels process catch received from catcher vessels. In 2013, there were 10 permitted catcher/processors, 7 permitted motherships and 38 LE catcher vessels with mothership endorsements.

The at-sea fleet has the mobility to follow the movement of Pacific whiting. The catcher/processors are large vessels that have the capacity to target Pacific whiting at deeper depths than some of the smaller catcher vessels that harvest in the mothership or IFQ sectors. To avoid salmon bycatch, the at-sea fleet has at times fished at depths greater than 200 fm. Catch of non-whiting species during this period has largely been composed of spiny dogfish, yellowtail rockfish, widow rockfish, minor slope rockfish, thornyheads, sablefish, darkblotched rockfish, POP, and arrowtooth flounder. Annual set-asides of the overall trawl allocations are established for most incidentally caught groundfish.

Shorebased IFQ Trawl Fishery **-** The IFQ fishery is comprised of permit owners who are issued quota pounds for most groundfish species and complexes; vessels registered to LE trawl permits; and shorebased IFQ first receivers. The fishery includes: vessels using midwater trawl gear to target Pacific whiting and non-whiting groundfish during the primary whiting season; vessels using bottom trawl gear to harvest non-whiting and minor levels of Pacific whiting; and vessels using fixed gears (gear switching) to harvest trawl IFQ. IFQ vessels deliver their catch to ports along the Washington, Oregon, and California coast. Pacific whiting IFQ vessels tend to fish in waters closer to the ports where first receivers are located as compared to the at-sea fleet.

In 2013, there were 178 LE trawl permits issued for the shorebased IFQ fishery (all gears). Participants in the Shorebased IFQ Program may take IFQ species using trawl gear or any legal groundfish non-trawl gear (i.e gear switching) Vessels fished throughout the year in a wide range of depths and delivered catch to shoreside processors. Bottom trawlers often target species assemblages, which can result in diverse catch. Small (footrope <8”) and large footrope (footrope >8”) trawl gear are designed to remain in contact with the ocean floor and are used to target species that reside along the ocean bottom such as flatfish on the continental shelf and slope species such as Dover sole, thornyhead and sablefish. Fishers generally use small footrope trawl gear in areas that have few rocks or outcroppings and more widely on the continental shelf than on the continental slope; this is due in large part to regulatory requirements. Only small footrope gear is allowed in areas shallower than 100 fm. In nearshore areas, selective flatfish[2] trawl gear has been required north of 40°10' N. lat. Fishers most commonly use large footrope trawl gear in areas that have an irregular substrate, along the continental slope and in deeper water. A single groundfish bottom trawl tow often includes fifteen to twenty groundfish species. By weight, the following species account for the bulk of non-whiting landings: Dover sole, arrowtooth flounder, petrale sole, sablefish, longspine thornyhead and shortspine thornyhead, yellowtail rockfish, and skates/rays.

[2] Although used voluntarily by vessels fishing under EFPs in 2004, selective flatfish trawl became a requirement in May 2005 for waters shoreward of the RCAs north of 40°10’ N. lat. Chinook salmon catch in the bottom trawl fishery has dropped significantly since early 2003.

Since 2011, midwater trawl vessels have increased targeting of widow and yellowtail rockfish with midwater trawl gear. In the 1980s and 1990s, midwater trawl gear was used to harvest large volumes of widow, yellowtail, and chilipepper rockfish. In 2001, widow rockfish was declared overfished and targeting opportunities for widow and yellowtail rockfish were eliminated in 2002. Retention was restricted to the Pacific whiting trips with greater than 10,000 pounds (lb) of whiting. Trip limits for widow and yellowtail rockfish were reduced to accommodate incidental catch and prevent targeting on widow rockfish while fishing for Pacific whiting. Targeting opportunities for chilipepper rockfish with midwater gear were eliminated in 2003, but larger limits (large enough to allow targeting) were reinstated seaward of the RCAs in 2005. With implementation in 2011of the Shorebased IFQ program, in which catch of all IFQ species, including discards, is accounted for with quota pounds, the restrictive trip limits that allowed widow and yellowtail rockfish retention only by vessels harvesting Pacific whiting during the primary fishery were eliminated. Widow rockfish was considered rebuilt and the ACL substantially increased. As the widow rockfish ACL increases, more targeting of rockfish such as yellowtail rockfish, widow, and chilipepper that can be targeted off bottom by mid-water gears, is expected to occur. In addition, new midwater trawl target species may emerge and seasons may be expanded to start earlier in the year prior to start of the Pacific whiting fishing season. Figure 6 shows the changes in widow rockfish landings from 1981 to 2013 by trawl gears, and Table 2 shows the change in non-whiting midwater trawl trips since the implementation of IFQ.

Table 2. Non-whiting midwater trawl [a/] IFQ groundfish trips and vessels non-whiting) for 2011- 2013 (NMFS 2014)**.**

	Vessels	Trips	Percent of Non-whiting Landings
2011	5	5	0.2%
2012	7	17	1.6%
2013	6	23	3.4%

a/ Less than 50 percent of the weight of the landing was Pacific whiting.
b/ Trips were defined as vessel days

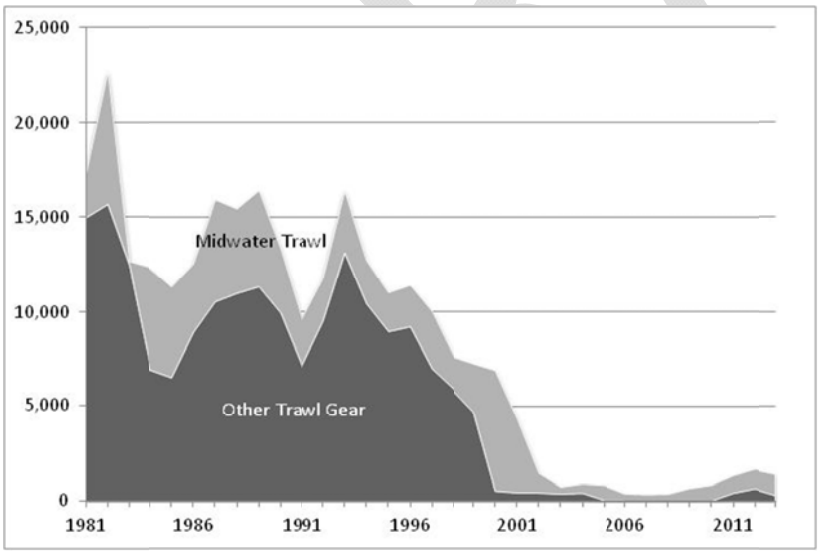

Figure 6. Landings of widow and yellowtail rockfish by trawl gear type, 1981-2013 (PFMC 2015)

The Shorebased IFQ Program allows limited entry trawl permit holders to switch from trawl to fixed gears (longline and pot gear) to fish their individual quota. Fixed gears, used to catch sablefish, are more selective than trawl gear and have less potential impact to benthic habitat. This opportunity for

gear switching mainly relates to sablefish, which are caught in deeper water, rather than nearshore groundfish species subject to state regulatory constraints.

Fixed Gear Fisheries

Limited Entry Fixed Gear - Fixed gear vessels primarily target high-value sablefish with the majority of landings occurring in Oregon and Washington. In 2013, there were 227 fixed gear permits including both sablefish-endorsed and non-sablefish-endorsed permits. Of the 227 LE fixed gear permits, 164 had sablefish-endorsements. In addition, all LE fixed gear permits have gear endorsements (longline, pot/trap, or both). Of the sablefish endorsed permits, 132 were associated with longline gear, 28 were associated with pot/trap gear, and 4 were associated with both longline and pot/trap gear. The remaining 63 non-sablefish-endorsed permits were associated with longline gear.

The LE fixed gear groundfish fishery is comprised of vessels fishing in the sablefish-endorsed tier fishery, and the trip limit fishery targeting nearshore species and non-nearshore species including the daily trip limit fishery for sablefish. In the sablefish tier fishery, the permit holder of a sablefish-endorsed permit is given an annual share of the sablefish catch. Permits are assigned to Tier 1, 2 or 3. Each Tier 1 permit receives 1.4 percent of the sablefish allocation, with Tiers 2 and 3 receiving 0.64 percent and 0.36 percent, respectively. Each year, these shares are translated into amounts of catch (in pounds), or "tier limits", which could be caught during the primary fishery. Regulations allow for up to three sablefish-endorsed permits to be 'stacked' on a single vessel. Stacking more than one sablefish-endorsed permit allows the vessel to land sablefish up to the sum of the associated tier limits, but does not convey additive landing limits for species other than sablefish. Once the primary season opens, all sablefish landed by a sablefish-endorsed permit is counted toward attainment of its tier limit. Sablefish-endorsed vessels generally fish in depths greater than 80 fathoms and land catch composed mostly of sablefish, with groundfish bycatch primarily composed of spiny dogfish shark, Pacific halibut, rockfish species, and skates. As a result of catch shares and permit stacking which were put in place in 1998 and 2001 respectively, the monthly distribution of effort has become more spread out over the year and the number of vessels participating has declined (Figure 4).

Vessels fishing under trip limits generally target sablefish, thornyheads, and other groundfish species. These vessels primarily fish out of California ports. Vessels catch a variety of groundfish species, including thornyheads, sablefish, rockfish, and flatfish. Fixed gear vessels are more prone than trawl vessels to catching some overfished rockfish species, such as yelloweye rockfish, and are therefore have greater fishing restrictions that limit the amount of fishing on the continental shelf. Limited entry fixed gear vessels may also participate in OA fisheries or in the LE trawl fishery. Like the limited entry trawl fleet, limited entry fixed gear vessels deliver their catch to ports along the Washington, Oregon, and California coast.

Open Access Fixed Gear - The OA sector consists of vessels that do not hold a federal groundfish LE permit. They target groundfish (called OA directed fisheries) or catch them incidentally (called OA incidental fisheries) using a variety of gears. Vessels in this sector may hold Federal or State permits for non-groundfish fisheries. OA vessels must comply with cumulative trip limits established for the open access sector and are subject to the other operational restrictions imposed in the regulations, including general compliance with the RCA restrictions.

Fishers use various non-trawl gears (including: longline, trap or pot, setnet, and stationary hook-and-line, vertical hook-and-line, troll) to target particular groundfish species or species groups. Longline and hook and line gear are the most common open access gear types used by vessels directly targeting groundfish and are generally used to target sablefish, rockfish, and lingcod. Pot gear is used for

targeting sablefish, thornyheads and rockfish. The directed open access fishery is further grouped into the "dead" and/or "live" fish fisheries. In the live-fish fishery, groundfish are primarily caught with hook-and-line gear (rod-and-reel), limited entry longline gear, and a variety of other hook gears (e.g. stick gear). The fish are kept alive in a seawater tank on board the vessel.

For vessels targeting non-groundfish species, the groundfish catch is incidental to the target species. Only the groundfish catch is regulated under the Groundfish FMP. Incidental catch occurs in the following state managed non-groundfish trawl fisheries: California halibut, pink shrimp, ridgeback prawn, sea cucumber and spot prawn. The fixed gear fisheries that take incidental amounts of groundfish include the following fisheries managed by the states or under other federal FMPs: California halibut, coastal pelagic species, crab pot, fish pot, highly migratory species, Pacific halibut, salmon, sea urchin, and set net fisheries. Groundfish delivered live were primarily nearshore rockfish, but also included thornyheads, sablefish and lingcod.

OA groundfish landings vary according to which non-groundfish fisheries are landing groundfish as bycatch. The number of OA boats that land groundfish also varies with the changes in the non-groundfish fisheries and participation varies between years. For the directed OA fisheries, participation from 2008 to 2012 the nearshore fixed gear fishery has had approximately 597 unique vessels (216 from Oregon and 282 from California), and the non-fixed gears had approximately 150 unique vessels(18 from Washington, 44 from Oregon and 88 from California) (PFMC 2014). For the incidental OA fisheries, from 2008 to 2012 there were approximately 604 unique vessels (46 from Washington, 200 from Oregon and 367 from California) (PFMC 2014). There is limited information on the distribution of effort by OA vessels. The OA sector is made up of many different gear types involved in directed and incidental catch, which makes it difficult to discern the location of effort. However based on the diversity of this sector, it is reasonable to assume that effort is widespread across the west coast.

Open Access non-groundfish Trawl - Non-groundfish trawl vessels use trawl gear under state permits and target pink shrimp, ridgeback prawn, and California halibut or sea cucumbers (south of Pt. 38°57.50' N. lat.) and who land incidentally caught groundfish. Pink shrimp are harvested with trawl gear from Northern Washington to Central California from 25 to 200 fm. The majority of pink shrimp catch is taken off the coast of Oregon. Required sorting grids greatly reduce the catch of finfish in the fishery. The Ridgeback prawn fishery occurs exclusively in California, centered in the Santa Barbara Channel and off Santa Monica Bay. The sea cucumber trawl fishery occurs over sandy flat habitat off of Santa Barbara. The California halibut fishery primarily occurs in central and southern California. Between 2008 and 2014 there were approximately 218 (19 from Washington, 76 from Oregon, and 133 from California) incidental OA vessels that used non-groundfish trawl gear (PFMC 2014).

Tribal Groundfish Fisheries - Washington coastal tribes (Makah, Quileute, Hoh, and Quinault) fish under treaties with the Federal government. The tribal fishing is restricted to their usual and accustomed grounds and stations. Under treaty arrangements, each tribe manages the fisheries prosecuted by their members. Their management is coordinated through the PFMC process. Washington state treaty tribes have formal allocations for sablefish, black rockfish, and Pacific whiting established through the PFMC. For other groundfish species without formal allocations, the tribes propose trip limits to the PFMC, which the PFMC tries to accommodate while ensuring that catch limits for all groundfish species are not exceeded. All four tribes have longline vessels in their fleets, only the Makah tribe has trawlers. The Makah trawl vessels that use both midwater and bottom trawl gear to target groundfish. The Makah tribe also has the majority of longline vessels, followed by Quinault, Quileute, and Hoh tribes. Since 1996, a portion of the U.S. Pacific whiting OY has been allocated to the west coast treaty tribes. Tribal allocations have been based on discussions with the tribes regarding their intent for a specific fishing year. From 2005 to 2014 the tribal allocation has ranged from 12 to 37 percent of the U.S. Pacific whiting OY. The tribal whiting annual allocations are interim allocations not intended to set precedent

for future allocations. Although the Quinault, Quileute, and Makah tribes have expressed interest in the whiting fishery, to date, only the Makah tribe has participated in the Pacific whiting fishery. In addition, the Makah tribe has a midwater trawl fishery that primarily targets yellowtail rockfish and a bottom trawl fishery that targets petrale sole.

In developing its trawl fisheries, the Makah tribe has implemented management practices that include test fishing to show to tribal managers that the fishery can be conducted with gear and in areas without harming existing tribal fisheries. In the Makah bottom trawl fishery, the Tribe adopted small footrope restrictions as a means to reduce rockfish bycatch and avoid areas where higher incidences of rockfish occur. In addition, the bottom trawl fishery is limited by overall footrope length as a means to conduct a more controlled fishery. Harvest is restricted by time and area to focus on harvestable species while avoiding bycatch of other species. If bycatch of rockfish is above a set amount, the fishery is modified to stay within the bycatch limit. The midwater trawl fishery has similar control measures. A trawl area must first be tested to determine the incidence of overfished rockfish species prior to opening the area to harvest. Vessels are provided guidelines for fishing techniques and operation of their net. Fishing effort is closely monitored by the on-board observer and harvest manager and changes or restrictions are implemented as needed to stay within the bycatch limits.

Approximately one-third of the tribal sablefish allocation is taken during an open competition fishery, where vessels from all the four tribes have access to the overall tribal sablefish allocation. The open competition portion fishery tends to be taken during the same period as the major tribal commercial Pacific halibut fisheries in March and April. The remaining two-thirds of the tribal sablefish allocation are split between the tribes according to a mutually agreed-upon allocation scheme. Specific sablefish allocations are managed by the individual tribes. Participants in the halibut and sablefish fisheries tend to use hook and line gear, as required by the IPHC. The tribes use snap-line gear in the fully competitive sablefish fishery.

Recreational **-** Recreational fisheries are primarily managed by the states with a distinction made between charter vessels (commercial passenger fishing vessels or CPFVs) and private party recreational vessels (individuals fishing from their own or rented boats). Gears used in the recreational fisheries include: dip nets, throw nets, hook-and-line, dive/spears, and pots.

c. Seasonality

Groundfish Trawl Fisheries

At-sea Pacific Whiting Cooperative Fisheries **-** The Pacific whiting primary season for the at-sea sectors begins on May 15 and continues until the sector allocations are taken. Allocation remaining on December 31 are not carried into the new fishing year. Because many of the vessels are also used in the Alaska groundfish fishery and participate in the pollock B-season (June-October) much of the participation in the Pacific whiting fishery has occurred before the Alaskan pollock fishery and then again after the Alaskan fishery. Since 2011, most of the catcher processor activity has occurred from mid-May to early June and late September to late November and most of the mothership activity has occurred from mid-May to early June and from mid-September to mid-November. Generally, there is little or no fishing activity in the Pacific whiting at-sea fishery during July and August.

Shorebased IFQ Trawl Fishery- Like the at-sea sectors, the Pacific whiting shorebased IFQ fishery has a specified start date for the primary season. Since 1997 a framework has been used for setting Pacific whiting fishery season dates for the area north of 40°30 north latitude. Under the framework the fishery

opens north of 42° north latitude on June 15; between 42°–40°30' north latitude the season opens April 1; and south of 40°30' north latitude the season opens April 15. The Pacific whiting shorebased IFQ fishery primary season start dates changed in 2015 to allow the midwater fishery north of 40°30 north latitude to open coastwide on May 15. Since 2011, the Pacific whiting shorebased IFQ fishery has harvested most of its landings from mid-June through September, with smaller amounts being taken after September. Changing the season start date will align the Pacific whiting shorebased IFQ fishery with the at-sea sector start data and allow access to non-whiting species one month earlier. The non-whiting midwater trawl fishery has not yet established a clear seasonality. In 2015, the Council is considering removing the season restrictions for midwater non-whiting IFQ and allow the fishery to operate year round either north of 40°10' N. lat. or coastwide.

The bottom trawl fishery, which typically does not target Pacific whiting, is a year round fishery, however target strategies vary somewhat throughout the year. IFQ vessels also use non trawl gears (gear switching). Non-trawl gears are primarily used to target sablefish. Since 2011, the peak in non-whiting groundfish catch (all gears) has occurred in the spring, in either March or April; with a secondary, lower peak happening in October. Two important and valuable species in this fishery are Sablefish and Petrale Sole. Sablefish catch peaks in the fall, during September and October, and Petrale Sole catch peaks in the winter during December and January. January catch of Petrale Sole has been rising each year since 2011. Some trawlers report that Petrale Sole has been a good alternative to Dungeness crab fishing in January. Given the gear switching provision, the overwhelming majority of fish landed with fixed gear and attributed to the Shorebased trawl IFQ program are sablefish, and the seasonality is the same as IFQ in general.

Fixed Gear Fisheries

Sablefish tier limit fishery - LE sablefish-endorsed primary season fishing currently takes place from April 1 to October 31. The seven-month season was first implemented in 2002. Each permit is assigned to tier 1, 2 or 3 which corresponds to an annual vessel limit referred to as tier limits. Permit holders land their tier limits at any time during the seven-month season. Once the primary season opens, all sablefish landed by a sablefish-endorsed permit is counted toward attainment of its tier limit.

LEFG trip limit fishery - The non-IFQ fixed gear fishery operates year-round (January-December) with most fishing activity occurring in the summer months. Landings have been highest from August through October, followed by the April to July period. The lowest amount of landings have been taken from December through March. The LEFG trip limit vessel primarily fish out of California ports.

Open Access Fisheries - The fishery operates year-round (January -December). Assuming that landed catch represents directed OA, and that landed catch is a function of effort, then more OA related fishing activity occurs during the spring, summer, and fall months than during winter months, although seasonal patterns have varied considerably among years, especially since 2011. In previous years there was a more pronounced peak in effort and landings during August and September. Incidental fisheries vary with fishing seasons for the intended target species

Tribal Fisheries - The tribal non-whiting groundfish fishery shows a dome shaped seasonal pattern during the years 2011 through 2014; generally peaking in the summer months, between May and September. The main groundfish species landed include Sablefish, Yellowtail Rockfish, Pacific Cod,

Petrale Sole, and Dover Sole. Historically the Pacific whiting tribal fishery generally occurred between June and September. However, there has been little activity in the tribal Pacific whiting fishery since 2011.

Recreational Fisheries – Recreational fisheries are year round fisheries with participation highest during warmer months. Coastwide the number of marine angler trips peaks in the July–August period, but seasonal concentrations are more pronounced in Oregon and Washington where weather is more variable. Tables 3-5 show the recreational fishing season and bag limit restrictions by state for recent years. The tables are intended to show the general structure of the recreational fisheries by state and may may not accurately capture all inseason changes.

Table 3. Washington recreational fishing seasons and bag limit, 2005-2013

Year	Season	Bag Limit	Sub-bag limits		
		Groundfish	Lingcod	Cabezon/	Rockfish
2005	Year round, except lingcod. Lingcod Mar 12-Oct 15	15 a/	2 (≥ 24")	--	10 b/
2006	Year round, except lingcod. Lingcod Mar 18-Oct 14	15 c/	2 (≥ 24")	--	10 b/
2007	Year round, except lingcod. Lingcod N of 48°10′ N. lat. - Apr 15-Oct 13; 48°10′ N. lat. to 46°16′ N. lat. - Mar 17- Oct 13	15 c/	2 (≥ 22")	--	10 b/
2008	Year round, except lingcod. Lingcod N of 48°10′ N. lat. - Apr 15-Oct 15; 48°10′ N. lat. to 46°16′ N. lat. - Mar 15- Oct 18	15 c/	2 (≥ 22")	--	10 b/
2009 & 2010	Year round, except lingcod. Lingcod N of 48°10′ N. lat. - Apr 16-Oct 15; 48°10′ N. lat. to 46°16′ N. lat. - Mar 19- Oct 15	15 c/	2 (≥ 22")	--	10 b/
2011	Year round, except lingcod. Lingcod N of 48°10′ N. lat. - Apr 16-Oct 15; 48°10′ N. lat. to 46°16′ N. lat. - Mar 12- Oct 15	Jan 1 - Feb 28 - 15 c/, Mar 1- Dec 31 - 12 c/	2 (≥ 24")	2	10 b/
2012	Year round, except lingcod. Lingcod N of 48°10′ N. lat. - Apr 16-Oct 13; 48°10′ N. lat. to 46°16′ N. lat. - Mar 17- Oct 13	12 c/	2 (≥ 24")	2	10 b/
2013	Year round, except lingcod. Lingcod North of 48°10′ N. lat. - Apr 16-Oct 12; 48°10′ N. lat. to 46°16′ N. lat. - Mar 16- Oct 12	12 c/	2 (≥ 22")	North of 48°10′ N. lat. - 1 (≥ 18"); 48°10′ N. lat. to 46°16′ N. lat. -2	10 b/

a/ South of 46°38.17' N. lat. groundfish retention is prohibited except that when Pacific halibut are onboard sablefish may be retained.
b/ Canary and yelloweye rockfish retention prohibited
c/ South of 46°38.17' N. lat. groundfish retention is prohibited except that when Pacific halibut are onboard sablefish and Pacific cod may be retained.

Table 4. Oregon recreational fishing season and bag limit restrictions, 2005-2013

Year	Season	Bag Limits			Marine fish sub-bag & size limits		Inseason Adjustments
		Marine Fish	Lingcod	Flatfish/ Sanddab	Cabezon	Kelp Greenling	
2005	Year round	10 a/	2 (≥ 24")	--	(≥ 16")	(≥ 10")	8/11 cabezon closed, 10/18 Black rockfish closed
2006	Year round b/	6 a/	2 (≥ 24")	--	(≥ 16")	(≥ 10")	7/24 vermillion closed, 9/23 cabezon closed
2007	Year round b/	8 a/	2 (≥ 22")	25	(≥ 16")	(≥ 10")	8/11 cabezon closed
2008	Year round b/	8 a/	2 (≥ 22")	25	(≥ 16")	(≥ 10")	8/21 cabezon closed
2009	Year round	10 c/	3 (≥ 22")	25	(≥ 16")	(≥ 10")	
2010	Year round	10 c/	3 (≥ 22")	25	(≥ 16")	(≥ 10")	
2011	Year round	10 c/	3 (≥ 22")	25	(≥ 16"), limit 1 Apr 1-Sep 30	(≥ 10")	
2012	Year round	10 c/	3 (≥ 22")	25	(≥ 16"), limit 1 Apr 1-Sep 30	(≥ 10")	
2013	Year round	10 c/	3 (≥ 22")	25	(≥ 16"), limit 1 Apr 1-Sep 30	(≥ 10")	

a/ Canary and yelloweye rockfish prohibited

b/ From the WA/OR border to Cape Falcon groundfish retention is prohibited when Pacific halibut are on board except sablefish and Pacific cod may be retained. Cape Falcon and Humbug Mountain, groundfish retention is prohibited when Pacific halibut are on board except sablefish.

c/ From the WA/OR border to Cape Falcon groundfish retention is prohibited when Pacific halibut are on board except sablefish and Pacific cod may be retained. Cape Falcon and Humbug Mountain, during the days open to all depth sport halibut, groundfish retention is prohibited when Pacific halibut are on board except sablefish and Pacific cod.

Table 5. California recreational fishing season and bag limit restrictions, 2005-2013

Year	Management areas	Overall Finfish Bag Limit	RCG Season	RCG Bag and sub-bag limits				Lingcod Season	Ling-cod bag limit	Other flatfish Season	Other flatfish bag limits	CA scorpion-fish season	CA scorpio-nfish bag limits
				Over-all	Boca-ccio	Green-ling	Cabe-zon						
2005	North of 40°10' N. lat.	20 a/ b/	Jul 1-Oct 31	10	2 ≥10"	2 ≥12"	3 ≥15"	Jul 1-Oct 31	2 ≥ 24"	Year round	20 a/	--	--
	40°10'-36° N. lat.		Jul 1-Nov 30					Jul 1-Nov 30				Jul 1-Nov 30	5 ≥ 10"
	36°-34°27'N. lat.		May 1-Sep 30					May 1-Sep 30				May 1-Sep 30	
	South of 34°27'N. lat		Mar 1-Sep 30					Mar 1-Sep 30				Oct 1- Dec 31	
2006	North of 40°10' N. lat.	20 a/ b/	May 1-Dec 31	10	2 ≥10"	1 ≥12"	1 ≥15"	May 1-Dec 31	2 ≥ 24"	Year round	20 a/	--	--
	40°10-36° N. lat.		Jul 1-Dec 31					Jul 1-Nov 30				Jul 1- Nov 30	5 ≥ 10"
	36°-34°27'N. lat.		May 1-Sep 30					May 1-Sep 30				May 1-Sep 30	
	South of 34°27'N. lat.		Mar 1-Dec 31					Apr 1-Nov 30				Oct 1- Dec 31	
2007	North of 40°10' N. lat.	20 a/ b/	May 1-Sep 30	10	2 ≥10"	2 ≥12"	1 ≥15"	May 1-Sep 30	2 ≥ 24"	Year round	20 d/	--	--
	40°10'-37°11' N. lat.		Jun 1-Sep 30		1 ≥10"	2 ≥12"	1 ≥15"	Jun 1-Sep 30				Jun 1-Nov30	5 ≥ 10"
	37°11'-34°27' N. lat.		May 1-Nov 30					May 1 Nov 30				May 1-Nov 30	
	South of 34°27'N. lat.		Mar 1-Dec 31					Mar 1-Dec 31				Jan 1-Dec 31	
2008	North of 40°10' N. lat.		May 1-Dec 31	10	2 ≥10"	2 ≥12"	1 ≥15"	May 1-Nov 30	2 ≥ 24"	Year round	20 d/	--	--
	40°10-37°11' N. lat.		Jun 1-Nov 30		1 ≥10"	2 ≥12"	1 ≥15"	Jun 1-Nov 30				Jun 1-Nov30	5 ≥ 10"
	37°11'-34°27' N. lat.		May 1-Nov 30					May 1-Nov 30				May 1-Nov 30	
	South of 34°27'N. lat.		Mar 1-Dec 31					Mar 1-Dec 31				Jan 1-Dec 31	
2009	North of 40°10' N. lat.	20 a/ b/ e/	May 15-Sep 15	10	2 ≥10"	2 ≥12"	2 ≥15"	May 15 -Sep 15	2 ≥ 24"	Year Round	20 d/	Jun 1-Nov 30	5 ≥ 10"
	40°10'-38°57.50' N. lat.		May 15-Aug 15					May 15-Aug 15					
	38°57.50'-37°11' N. lat.		Jun 13-Oct 31					Jun 13-Oct 31				May 1-Nov 30	
	37°11' -36° N. lat.		May 1-Nov 15					May 1-Nov 15					
	36°- 34°27' N. lat.		May 1-Nov 15					May 1-Nov 15					
	South of 34°27' N. lat.		Mar 1-Dec 31					Apr 1-Nov 30				Jan 1-Dec 31	
2010	North of 40°10' N. lat.	20 a/ b/ e/	May 15-Sep 15	10	2 ≥10"	2 ≥12"	2 ≥15"	May 15-Sep 15	2 ≥ 24"	Year Round	20 d/	Jun 1-Nov 30	5 ≥ 10"
	40°10'-38°57.50' N. lat.		May 15-Aug 15					May 15-Aug 15					
	38°57.50'-37°11' N. lat.		Jun 13-Oct 31					Jun 13-Oct 31				May 1-Nov 30	
	37°11' -36° N. lat.		May 1-Nov 15					May 1-Nov 15					
	36°-34°27' N. lat.		May 1-Nov 15					May 1-Nov 15					
	South of 34°27' N. lat.		Mar 1-Dec 31					Apr 1-Nov 30				Jan 1-Dec 31	
2011	North of 40°10' N. lat.	20 a/ b/ e/	May 14-Oct 31	10	2 ≥10"	2 ≥12"	3 ≥15	May 14-Oct 31	2 ≥ 22"	Year Round	20 d/	Jun 1-Nov 30	5 ≥ 10"
	40°10'-38°57.50' N. lat.		May 14-Aug 15					May 14-Aug 15					
	38°57.50'-37°11' N. lat.		Jun 1-Dec 31					Jun 1-Dec 31				May 1-Nov 30	
	37°11' -34°27' N. lat		May 1-Dec 31					May 1-Dec 31					
	South of 34°27' N. lat		Mar 1-Dec 31					Mar 1-Dec 31				Jan 1-Dec 31	

Table 5. (continued)

Year	Management areas	Overall Finfish Bag Limit	RCG Season	RCG Bag and sub-bag limits				Lingcod Season	Ling-cod bag limit	Other flatfish Season	Other flatfish bag limits	CA scorpion-fish season	CA scorpio-nfish bag limits
				Over-all	Boca-ccio	Green-ling	Cabe-zon						
2012	North of 40°10’ N. lat.	20 a/ b/ e/	May 14-Oct 31	10	2 ≥10”	2 ≥12”	3 ≥15	May 14-Oct 31	2 ≥ 22”	Year Round	20 d/	Jun 1-Nov 30	5 ≥ 10”
	40°10' -38°57.50' N. lat.		May 14-Aug 15					May 14-Aug15					
	38°57.50' -37°11' N. lat.		Jun 1-Dec 31					Jun 1-Dec 31				May 1-Nov 30	
	37°11' -34°27' N. lat		May 1-Dec 31					May 1-Dec 31					
	South of 34°27' N. lat		Mar 1-Dec 31					Mar 1-Dec 31				Jan 1-Dec 31	
2013	North of 40°10’ N. lat.	20 a/ b/ e/	May 15 - Oct 31	10	3	≥12"	3 ≥15”	May 15-Oct 31	2 ≥ 22”	Year Round	20 d/	May 15-Sep 2	5 ≥ 10”
	40°10'-38°57.50' N. lat.		May 15- Sep 2					May 15-Sep 2					
	38°57.50'-37°11' N. lat.		Jun 1- Dec 31					Jun 1-Dec 31				Jun 1-Dec 31	
	37°11'-34°27' N. lat		May 1 - Dec 31					May 1-Dec 31				May 1-Dec 31	
	South of 34°27' N. lat		Mar 1 - Dec 31					Mar 1-Dec 31				Jan 1-Dec 31	

a/ No more than 10 fish of any one species except for petrale sole, Pacific sanddab and starry flounder.
b/ retention of cowcod, canary and yelloweye rockfish is prohibited
c/ Rockfish/cabezon/greenling complex
d/ Subject to the overall 20 fish limit for all fin fish. No more than 10 fish of any one species except for Pacific sanddab.
e/ Recreational spearfishing for all federally-managed groundfish, except lingcod during January, February, March, and December, is exempt from closed areas and seasons

d. Geographic Distribution

The groundfish fisheries operate coastwide in state and Federal waters. Groundfish fisheries managed under the FMP occur in the EEZ. However, there are restrictions on where specific gear types maybe used. Area closures are a primary tool used in management of the fishery and vary as management objectives evolve. This section describes the various types of closed areas. Although most of the closed areas do not have non-groundfish bycatch reduction as an objective, an ancillary effect may be that they do mitigate some adverse effects including bycatch reduction. The following section describes the various types of closed areas currently in use in the groundfish fishery. However, as of April 2015, the Council is considering modifying or removing certain area management restrictions, including revisions to Essential Fish Habitat Conservation Areas (EFHCAs), reducing or eliminating trawl RCAs, removing closure of nearshore areas to trawl gear than small footrope trawl gear, removing closure of nearshore areas north of 40°10' N. lat., to trawl gear other than selective flatfish trawl gear, and prohibiting commercial and recreational fixed gears in the area known as 60 Mile Bank off southern California.

Groundfish Conservation Areas (GCAs)
GCAs are closed areas used to prevent commercial and, in some cases, recreational vessels from targeting groundfish in areas where catch of overfished groundfish species is likely to be high. The areas are defined by coordinates expressed in degrees latitude and longitude. The CGAs include depth-based management areas. Regulations at 50 CFR 660.60 state that depth-based closed areas may be used: to protect and rebuild overfished stocks, to prevent the overfishing of any groundfish species by minimizing the direct or incidental catch of that species, to minimize the incidental harvest of any protected or prohibited species taken in the groundfish fishery, to extend the fishing season in areas outside the closed zones; to minimize disruption of traditional fishing and marketing patterns for the commercial fisheries, to spread the available catch over a large number of anglers for the recreational fisheries; to discourage target fishing while allowing small incidental catches to be landed; and to allow small fisheries to operate outside the normal season. Specific GCAs include: RCAs, CCAs, Yelloweye Rockfish Conservation Areas (YRCAs) and Bycatch Reduction Areas (BRAs). Closed areas also encircle the Farallon Islands and the Cordell Banks.

Rockfish Conservation Areas - RCAs are large-scale closed areas that extend along the entire length of the West Coast, from the Mexican border to the Canadian border. The boundaries are defined by a series of latitude/longitude coordinates that are intended to approximate particular depth contours. RCAs are specified for particular gear types (trawl, non-trawl, and non-groundfish trawl) and differ north and south of 40°10' north latitude. The operation of a vessel with trawl gear onboard is prohibited in a trawl RCA, except for the purpose of continuous transiting. However, midwater trawl fishing within the RCAs north of 40°10' N. lat. is allowed during the Pacific whiting season. From 2002 to 2011, midwater trawl gear used to target Pacific whiting (trips with more than 10,000 lb of whiting) has been exempted from RCA restrictions north of 40°10' N. lat. during the primary whiting season. Beginning in 2011, all midwater trawl fishing (Pacific whiting and non-whiting) was allowed within the RCAs during the primary whiting season. Since 2005, midwater trawling has been allowed in the area south of 40°10' north latitude for all groundfish species when fishing seaward of the trawl RCA. RCA boundaries have changed over time, as shown in Tables 6 and 7. The recreational RCAs are closed to recreational fishing for groundfish, except that recreational fishing for "other flatfish" is permitted within the recreational RCA (Table 8).

Table 6. Trawl RCA depth boundaries by year and month, 2006 to 2014, including inseason changes.

Year	Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014a	North of 48°10'	0 - m200		0 - 200		0 - 150				0 - 200		0 - m200	
	48°10' - 45°46'	100 - 150											
	45°46' - 40°10'	100 - m200		100 - 200								100 - m200	
	40°10' - 34°27'	100 - 150											
	South 34°27' (mainland)												
	South 34°27' (islands)	0 - 150											
2013a	North of 48°10'	0 - m200		0 - 200		0 - 150				0 - 200		0 - m200	
	48°10' - 45°46'	75 - m200		75 - 150		100 - 150						75 - 150	
	45°46' - 40°10'			75 - 200		100 - 200						75 - m200	
	40°10' - 34°27'	100 - 150											
	South 34°27' (mainland)												
	South 34°27' (islands)	0 - 150											
2012a	North of 48°10'	0 - m200		0 - 200		0 - 150				0 - 200		0 - m200	
	48°10' - 45°46'	75 - m200		75 - 150		100 - 150						75 - 150	
	45°46' - 40°10'			75 - 200		100 - 200						75 - m200	
	40°10' - 34°27'	100 - 150											
	South 34°27' (mainland)												
	South 34°27' (islands)	0 - 150											
2011a	North of 48°10'	0 - m200		0 - 200		0 - 150				0 - 200		0 - m200	
	48°10' - 45°46'	75 - m200		75 - 200		75 - 150		100 - 150		75 - 150			
	45°46' - 40°10'					75 - 200		100 - 200		75 - 200		75 - m200	
	40°10' - 34°27'	100 - 150											
	South 34°27' (mainland)												
	South 34°27' (islands)	0 - 150											
2010a	North of 48°10'	0 - m200		0 - 200		0 - 150				0 - 200		0 - m200	0 - 250
	48°10' - 45°46'	75 - m200		75 - 200		75 - 150		100 - 150		75 - 200		75 - m200	75 - 250
	45°46' - 40°10'					75 - 200		100 - 200					
	40°10' - 34°27'	100 - 150											
	South 34°27' (mainland)												
	South 34°27' (islands)	0 - 150											
2009a	North of 48°10'	0 - m200			0 - 200	0 - 150				0 - 200		0 - m200	
	48°10' - 45°46'	75 - m200			75 - 200	75 - 150		100 - 150		75 - 200		75 - m200	
	45°46' - 40°10'					75 - 200		100 - 200					
	40°10' - 34°27'	100 - 150											
	South 34°27' (mainland)												
	South 34°27' (islands)	0 - 150											
2008a	North of 48°10'	0 - m200		0 - 200		0 - 150						0 - m200	
	48 10 - 46 38.17	75 - m200		60 - 200		60 - 150					75 - 150	75 - m200	
	46 38.17 - 46 16			60 - 200				60 - 150					
	46 16 - 45 46			75 - 200		75 - 150				75 - 200			
	45 46 - 43 20.83			75 - 200									
	43 20.83 - 42 40.50	0 - m200		0 - 200								0 - m200	
	42 40.5 - 40 10	75 - m200		75 - 200		60 - 200					75 - 200	75 - m200	
	40 10 - 34 27	100 - 150											
	South 34 27 (mainland)												
	South 34 27 (islands)	0 - 150											
2007a	North of 48o10'	75 - m250		75 - 250		0 - 150				0 - 200	75 - 200	75 - m200	
	48o10' - 46o38'					75 - 150				75 - 200			
	46o38' - 46o16'					60 -150				60 -200			
	46o16' - 45o03'					75 - 150			75 - 200				
	45o03' - 43o20'					75 - 200							
	43o20' - 42o40'					0 - 200					75 - 200		
	42o40' -40o10'					75 - 200							
	40°10' - 38'	100 - m200		100 - 150								100 - m200	
	38° - 34°27'	100 - 150											
	South 34°27' (mainland)												
	South 34°27' (islands)	0 - 150											
2006a	North 40 10	75 - m200		75 - 200				100 - 250		75 - 250		75 - m250	
	40 10 - 38	75 - 150		100 - 150				100 - 200		100 - 250			
	38 - 34 27							100 - 150				75 - 150	
	South 34 27 (mainland)												
	South 34 27 (islands)	0 - 150											
2005a	North 40 10	75 - m200		100 - 200							0 - 250		
	40 10 - 38	75 - 150		100 - 200		100 - 150							
	38 - 36			100 - 150							0 - 200		
	36 - 34 27										50 - 200		
	South 34 27 (mainland)												
	South 34 27 (islands)	0 - 150									0 - 200		
2004	North 40 10	75 - m200		60 - 200		60 - 150		75 - 150			0 - 250		
	40 10 - 38	75 - 150z				100 - 150z				75 - 150z			
	38 - 36										0 - 200z		
	36 - 34 27										0 - 150		
	South 34 27 (mainland)												
	South 34 27 (islands)	0 - 150											
2003	North 40 10	100 - m250		100 - 250		50 - 200		75 - 200		50 - 200		0 - m200	
	40 10 - 38	50 - m250		60 - 250		60 - 200							
	38 - 34 27	50 - 150		60 - 150									
	South 34 27 (mainland)	100 - 150				100 - 200							
	South 34 27 (islands)	0 - 150				0 - 200							
2002	North 40 10	Within DBCA - CLOSED TO TRAWLING, September - December, special footrope requirements outside DBCA											

mThe "modified" depth" line is modified to exclude certain petrale sole areas from the RCA.
aSelective flatfish trawl required shoreward of the RCA north of 40 10

Table 7. Fixed gear RCA depth boundaries by year and month, 2002 to 2013, including inseason changes.

Year	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	North 46 16	shore - 100 fm											
	43 00 - 46 16	30 - 100 fm											
	42 00 - 43 00												
	40 10 - 42 00	20 fm depth contour - 100 fm											
	34 27 - 40 10	30 fm - 150 fm line											
	South 34 27 (+ islands)	60 fm - 150 fm line (also applies around islands)											
2013	North 46 16	shore - 100 fm											
	43 00 - 46 16	30 - 100 fm											
	42 00 - 43 00												
	40 10 - 42 00	20 fm depth contour - 100 fm											
	34 27 - 40 10	30 fm - 150 fm line											
	South 34 27 (+ islands)	60 fm - 150 fm line (also applies around islands)											
2012	North 46 16	shore - 100 fm											
	43 00 - 46 16	30 - 100 fm											
	42 00 - 43 00	20 - 100 fm											
	40 10 - 42 00	20 fm depth contour - 100 fm											
	34 27 - 40 10	30 fm - 150 fm line											
	South 34 27 (+ islands)	60 fm - 150 fm line (also applies around islands)											
2011	North 46 16	shore - 100 fm											
	45 03 83 - 46 16	30 - 100 fm											
	43 00 - 45 03 83	30 - 125 fm (125 line reduced to 100 fm during directed halibut days)											
	42 00 - 43 00	20 - 100 fm											
	40 10 - 42 00	20 fm depth contour - 100 fm											
	34 27 - 40 10	30 fm - 150 fm line											
	South 34 27 (+ islands)	60 fm - 150 fm line											
2010	North 46 16	shore - 100 fm											
	45 03 83 - 46 16	30 - 100 fm											
	43 00 - 45 03 83	30 - 125 fm (125 line reduced to 100 fm during directed halibut days)											
	42 00 - 43 00	20 - 100 fm											
	40 10 - 42 00	20 fm depth contour - 100 fm											
	34 27 - 40 10	30 fm - 150 fm line											
	South 34 27 (+ islands)	60 fm - 150 fm line											
2009	North 46 16	shore - 100 fm											
	45 03 83 - 46 16	30 - 100 fm											
	43 00 - 45 03 83	30 - 125 fm (125 line reduced to 100 fm during directed halibut days)											
	42 00 - 43 00	20 - 100 fm											
	40 10 - 42 00	20 fm depth contour - 100 fm											
	34 27 - 40 10	30 - 150 fm											
	South 34 27 (+ islands)	60 fm - 150 fm											
2008	North 46 16	shore - 100 fm											
	40 10 - 46 16	30 - 100 fm											
	34 27 - 40 10	30 - 150 fm											
	South 34 27 (+ islands)	60 fm - 150 fm											
2007	North 46 16	shore - 100 fm											
	40 10 - 46 16	30 - 100 fm											
	34 27 - 40 10	30 - 150 fm											
	South 34 27 (+ islands)	60 fm - 150 fm											
2006	North 46 16	shore - 100 fm											
	40 10 - 46 16	30 - 100 fm											
	34 27 - 40 10	30 - 150 fm					20 - 150 fm				30 - 150 fm		
	South 34 27 (+ islands)	60 fm - 150 fm											
2005	North 46 16	shore - 100 fm											
	40 10 - 46 16	30 - 100 fm											
	34 27 - 40 10	30 - 150 fm					20 - 150 fm				30 - 150 fm		
	South 34 27 (+ islands)	60 fm - 150 fm											
2004	North 46 16	shore - 100 fm											
	40 10 - 46 16	30 - 100 fm											
	34 27 - 40 10 (+ islands	30 - 150 fm					20 - 150 fm				30 - 150 fm		
	South 34 27 (+ islands)	60 fm - 150 fm											
2003	North 46 16	shore - 100 fm										shore - 200 fm	
	40 10 - 46 16	27 - 100 fm										shore - 150 fm	
	34 27 - 40 10	20 - 150 fm											
	South 34 27 (+ islands)	20 - 150 fm								30 - 150 fm			
2002	South 40 10							CLOSED > 20fm (exceptions: sablefish, S Thorny and slope					

Table 8. Recreational RCAs, 2013 and 2014

Year	Area **	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	North of 47°31.70'	Unrestricted				Seaward of 20 fm closed, except days when halibut fishery is open					Unrestricted		
	47°31.70'-46°38.17'	Unrestricted		Seaward of 30 fm closed (Mar 15-Jun 15), except days when halibut fishery is open *				Seaward of 30 fm closed for lincod on Fridays and Saturdays		Unrestricted			
	46°38.17'-46°16	Unrestricted											
	42°–46°16′	Unrestricted				Seaward of 40 fm closed					Unrestricted		
	42°–40°10′	All depths closed				Seaward of 20 fm closed (May 15-Oct31)						All depths closed	
	40°10′ – 38°57.50'	All depths closed				Seaward of 20 fm closed (May 15-Sep 2)					All depths closed		
	38°57.50'-37°11'	All depths closed					Seaward of 30 fm closed (Cordell Banks closed shoreward if 100 fm)						
	37°11'-34°27'	All depths closed				Seaward of 40 fm closed							
	South of 34°27'	All depths closed, except for CA scorpionfish which is closed seaward of 50 fm		Seaward of 50 fm closed (CCAs closed seaward of 20 fm when groundfish seacon is open)									
2013	North of 47°31.70'	Unrestricted				Seaward of 20 fm closed, except days when halibut fishery is open					Unrestricted		
	47°31.70'-46°38.17'	Unrestricted		Seaward of 30 fm closed (Mar 15-15-Jun 2)				Seaward of 30 fm closed for lincod on Fridays and Saturdays		Unrestricted			
	46°38.17'-46°16	Unrestricted											
	42°–45°46′	Unrestricted				Seaward of 40 fm closed					Unrestricted		
	42°–40°10′	All depths closed				Seaward of 20 fm closed (May 15-Oct31)						All depths closed	
	40°10′ – 38°57.50'	All depths closed				Seaward of 20 fm closed (May 15-Sep 1)					All depths closed		
	38°57.50'-37°11'	All depths closed					Seaward of 30 fm closed (Cordell Banks closed shoreward if 100 fm)						
	37°11'-34°27'	All depths closed				Seaward of 40 fm closed							
	South of 34°27'	All depths closed, except for CA scorpionfish which is closed seaward of 50 fm		Seaward of 50 fm closed (CCAs closed seaward of 20 fm when groundfish seacon is open)									

* lingcod is prohibited year round seaward of a straight line connecting all of the following points in the order stated: 47°31.70' N. lat., 124°45.00' W. long.; 46°38.17' N. lat., 124°30.00' W. long. with the following exceptions: On days that the primary halibut fishery is open lingcod may be taken, retained and possessed within the lingcod area closure.

** California RCA depth contours apply along the mainland coast and along islands and offshore seamounts

Cowcod Conservation Areas - The CCAs are two areas off of the southern California coast intended to reduce the catch of cowcod during rebuilding. These areas have been in place since 2001 and are expected to remain in effect in the near future. Fishing is prohibited in CCAs with the following exceptions: Fishing for "Other Flatfish" when using no more than 12 hooks, #2 or smaller and fishing for rockfish and lingcod shoreward of 20 fm. In general, these areas do not change between years.

The Western CCA is an area south of Point Conception defined by the straight lines connecting the following specific latitude and longitude coordinates in the order listed:

(1) 33°50.00' N. lat., 119°30.00' W. long.;
(2) 33°50.00' N. lat., 118°50.00' W. long.;
(3) 32°20.00' N. lat., 118°50.00' W. long.;
(4) 32°20.00' N. lat., 119°37.00' W. long.;
(5) 33°00.00' N. lat., 119°37.00' W. long.;
(6) 33°00.00' N. lat., 119°53.00' W. long.;
(7) 33°33.00' N. lat., 119°53.00' W. long.;
(8) 33°33.00' N. lat., 119°30.00' W. long.;
and connecting back to 33°50.00' N. lat., 119°30.00' W. long.

The Eastern CCA is an area west of San Diego defined by the straight lines connecting the following specific latitude and longitude coordinates in the order listed:

(1) 32°42.00' N. lat., 118°02.00' W. long.;
(2) 32°42.00' N. lat., 117°50.00' W. long.;
(3) 32°36.70' N. lat., 117°50.00' W. long.;
(4) 32°30.00' N. lat., 117°53.50' W. long.;
(5) 32°30.00' N. lat., 118°02.00' W. long.;
and connecting back to 32°42.00' N. lat., 118°02.00' W. long.

Yelloweye Rockfish Conservation Areas - Although there are YRCA defined for waters off California and Oregon, the following YRCA off Washington are those that are currently in use. North Coast commercial YRCA off Washington has been closed to limited entry and open access fixed gears since 2007.

The North Coast Commercial YRCA is defined by straight lines connecting the following specific latitude and longitude coordinates in the order listed:

(1) 48°11.77' N. lat., 125°13.03' W. long.;
(2) 48°16.43' N. lat., 125°07.55' W. long.;
(3) 48°14.72' N. lat., 125°01.84' W. long.;
(4) 48°13.36' N. lat., 125°03.20' W. long.;
(5) 48°12.74' N. lat., 125°05.83' W. long.;
(6) 48°11.55' N. lat., 125°04.99' W. long.;
(7) 48°09.96' N. lat., 125°06.63' W. long.;
(8) 48°09.68' N. lat., 125°08.75' W. long.;
and connecting back to 48°11.77' N. lat., 125°13.03' W. long.

The Salmon Troll YRCA applies to the OA sector and is defined by straight lines connecting the following specific latitude and longitude coordinates in the order listed:

(1) 48°00.00' N. lat., 125°14.00' W. long.;
(2) 48°02.00' N. lat., 125°14.00' W. long.;
(3) 48°02.00' N. lat., 125°16.50' W. long.;
(4) 48°00.00' N. lat., 125°16.50' W. long.;
and connecting back to 48°00.00' N. lat., 125°14.00' W. long.

Recreational YRCAs include the North Coast Recreational YRCA and the Westport Offshore Recreational YRCA. The North Coast Recreational YRCA is a voluntary YRCA that is C-shaped and defined by straight lines connecting the following specific latitude and longitude coordinates in the order listed:

(1) 48°18.00' N. lat.; 125°18.00' W. long.;
(2) 48°18.00' N. lat.; 124°59.00' W. long.;
(3) 48°11.00' N. lat.; 124°59.00' W. long.;
(4) 48°11.00' N. lat.; 125°11.00' W. long.;
(5) 48°04.00' N. lat.; 125°11.00' W. long.;
(6) 48°04.00' N. lat.; 124°59.00' W. long.;
(7) 48°00.00' N. lat.; 124°59.00' W. long.;

(8) 48°00.00' N. lat.; 125°18.00' W. long.;
and connecting back to 48°18.00' N. lat.; 125°18.00' W. long.

The Westport Offshore Recreational YRCA is an voluntary YRCA area off the southern Washington coast defined by straight lines connecting the following specific latitude and longitude coordinates in the order listed:

(1) 46°54.30' N. lat., 124°53.40' W. long.;
(2) 46°54.30' N. lat., 124°51.00' W. long.;
(3) 46°53.30' N. lat., 124°51.00' W. long.;
(4) 46°53.30' N. lat., 124°53.40' W. long.;
and connecting back to 46°54.30' N. lat., 124°53.40' W. long.

Bycatch Reduction Areas - Regulations at 50 CFR § 660.131 for the Pacific whiting fishery include closed areas referred to as BRAs. BRAs may be implemented inseason under automatic action authority when NMFS projects that a whiting sector will exceed an allocation for a non-whiting groundfish species specified for that sector before the sector's whiting allocation is projected to be reached. The BRAs are depth closures that use the 75-fm (137-m), 100-fm (183-m) or 150-fm (274-m) depth contours to shift the Pacific whiting fishery into deeper waters. Because the Pacific whiting fishery is exempt from the RCA restrictions North of 40°10' north latitude, when necessary the BRAs allow depth based management in the Pacific whiting fishery (all vessels declared as "Limited entry midwater trawl, Pacific whiting shorebased IFQ" regardless of target species).

During 2006, the Pacific whiting primary seasons for the catcher/processors, motherships, and shore-based sectors were closed on July 26, 2007 (72 FR 46176) because the fleetwide bycatch limit for widow rockfish had been reached. At its September 2007 meeting the PFMC recommended increasing the widow rockfish bycatch limit and reopening all sectors of the Pacific whiting fisheries, but recommended depth-based measures be taken to reduce the risk of increased canary rockfish catch. The fisheries were reopened on October 5, 2007 (72 FR 56664) with voluntary depth restrictions in effect in the at-sea sectors and revised exempted fishing permits (EFPs) with depth based restrictions for the shore-based sector. Because most all shore-based fishing activity was conducted under EFPs, the EFPs were effective in moving EFP fishing seaward of the150 fathom (274 m) depth contour.

In response to the 2007 whiting fishery closure, sector-specific bycatch limits and BRAs were implemented for the Pacific whiting fishery with the 2009-2010 Harvest Specification and Management Measures. At its June 2008 meeting, the PFMC recommended that a regulatory provision be added to allow NMFS to impose depth-specific closures using the specified depth-based management lines in the 75 fm to 150 fm zone in the non-tribal whiting fishery by sector, if a sector is projected to attain a bycatch limit prior to attaining their whiting quota.

Pacific whiting fishery bycatch limits were removed from regulation with implementation of trawl rationalization. The use of BRAs were further refined in 2011 and in 2013 (76 FR 53833, August 30, 2011 and 78 FR 580, January 3, 2013). Since implementation of the trawl IFQ program individuals cease fishing when they catch their allocations therefore the authority to close the Pacific whiting shorebased fishery through an automatic action has been removed. The BRAs also been modified such that they are now considered to be a type of GCA (§ 660.11). Like RCAs, the BRAs, are areas closed to fishing by particular gear types, bounded by lines approximating particular depth contours (660.11).

Regulations at §660.55 (c)(3)(i) continue to allow BRAs to be implemented through automatic action to prevent a Pacific whiting sector allocation from being exceeded. BRAs can also be implemented through routine inseason action to address broader conservation concerns.

Farallon Islands and the Cordell Banks - The Farallon Islands, off San Francisco and San Mateo Counties, include Southeast Farallon Island, Middle Farallon Island, North Farallon Island and Noon Day Rock. Generally, the State of California prohibits fishing for groundfish between the shoreline and the 10 fm (18 m) depth contour around the Farallon Islands.

Cordell Banks are located offshore of California's Marin County. Generally, fishing for groundfish is prohibited in waters of depths less than 100 fm (183 m) around Cordell Banks as defined by specific latitude and longitude coordinates. The Cordell Banks closed area is defined by straight lines connecting the following specific latitude and longitude coordinates in the order listed:

(1) 38°03.18' N. lat., 123°20.77' W. long.;
(2) 38°06.29' N. lat., 123°25.03' W. long.;
(3) 38°06.34' N. lat., 123°29.32' W. long.;
(4) 38°04.57' N. lat., 123°31.30' W. long.;
(5) 38°02.32' N. lat., 123°31.07' W. long.;
(6) 38°00.00' N. lat., 123°28.40' W. long.;
(7) 37°58.10' N. lat., 123°26.66' W. long.;
(8) 37°55.07' N. lat., 123°26.81' W. long.;
(9) 38°00.00' N. lat., 123°23.08' W. long.;
and connecting back to 38°03.18' N. lat., 123°20.77' W. long.

***Essential Fish Habitat Conservation Area*s (EFHCAs)**
The EFHCAs are geographic area defined by coordinates expressed in degrees latitude and longitude, wherein fishing by a particular gear type or types may be prohibited. EFHCAs are created and enforced for the purpose of contributing to the protection of West Coast groundfish essential fish habitat. The EFHCAs include the closure in waters deeper than 700 fm to bottom trawl; the prohibition of large footrope trawl shoreward of the 100 fm depth contour; and the specification of closed areas where bottom trawl gear, and bottom contact gears are prohibited.

Closed areas specific to the Pacific whiting fisheries
Vessels fishing in the Pacific whiting primary seasons for the Shorebased IFQ Program, Mothership Cooperative Program, or Catcher/Processor Cooperative Program are prohibited from target Pacific whiting in the following areas in order to reduce salmon bycatch:

Klamath River Salmon Conservation Zone - The targeting of Pacific whiting with midwater trawl is prohibited in the ocean area surrounding the Klamath River mouth bounded on the north by 41°38.80′ N. lat. (approximately 6 nautical miles (nm) north of the Klamath River mouth), on the west by 124°23′ W. long. (approximately 12 nm from shore), and on the south by 41°26.80′ N. lat. (approximately 6 nm south of the Klamath River mouth). The Klamath River conservation zone was established in 1993 because of the concentrations of Chinook salmon in the area.

Columbia River Salmon Conservation Zone - The targeting of Pacific whiting with midwater trawl is prohibited in the ocean area surrounding the Columbia River mouth bounded by a line extending for 6

nm due west from North Head along 46°18′ N. lat. to 124°13.30′ W. long., then southerly along a line of 167 True to 46°11.10′ N. lat. and 124°11′ W. long. (Columbia River Buoy), then northeast along Red Buoy Line to the tip of the south jetty. The Columbia River conservation zone was established in 1993 because of the concentrations of Chinook salmon in the area.

Ocean Salmon Conservation Zone (OSCZ) **-** In 2005, OSCZ was added to the regulations by emergency action and was effective from August 26, 2005 to February 27, 2006 (70 FR 51682, August 31, 2005). On January 1, 2007 the OSCZ were added to the regulations through a full rulemaking process (71 FR 78638, December 29, 2006). The OSCZ is a mitigation measure that may be implemented when the 11,000 chinook threshold had been exceeded. The intent of the closed area was to moved whiting fishing (targeting of whiting) offshore of a boundary line approximating the 100-fm (183-m) depth contour to reduce that Chinook salmon bycatch rates. The data available in 2005 indicated that incidental catch rates of Chinook salmon by vessels targeting Pacific whiting tended to be higher in the nearshore areas.

Eureka Area 100 fm Limit **-** Regulations at 50 CFR § 660.131 for the Pacific whiting fishery (any vessels with a valid "Limited entry midwater trawl, Pacific whiting shorebased IFQ fishing" declaration) **s**tate that unless otherwise specified, no more than 10,000-lb (4,536 kg) of whiting may be taken and retained, possessed, or landed by a vessel that, at any time during a fishing trip, fished in the fishery management area shoreward of the 100 fm (183 m) contour in the Eureka management area. In 1992, management actions were taken to limit salmon bycatch, particularly in Monterey and Eureka management areas (south of 43° north latitude). The actions included restrictions on fishing for whiting inside of 100-fathoms in the Eureka area. Action was taken because a depth effect had been observed in the Eureka area with higher salmon bycatch rates observed inside of the 100 fathom contour.

Higher bycatch rates were also observed in the bottom trawl fishery. The continental shelf off the Eureka area is narrow and the 100 fathom contour generally occurs 6 to 10 nm Offshore (NMFS 1992). The year round trip limits for Pacific whiting are in place for bottom trawl should limit salmon bycatch by bottom trawl. Before the primary whiting season there is a 20,000 lb/trip and during and after the primary season there is a 10,000 lb/trip limit.

e. Catch Monitoring

Vessel monitoring systems (VMS) that automatically transmit hourly position reports to NMFS are the primary management tool used to monitor vessel compliance with time and area restrictions. All non-tribal vessels are required to have an operational VMS to fish in the groundfish fishery. In addition, each vessel operator is required to submit declaration reports to the Office for Law Enforcement (OLE) that allows the vessel's position data to be linked to the type(s) of fishing gear and in some cases a target strategy. For the Shorebased IFQ Program, vessels using midwater trawl may declare either "limited entry midwater trawl, non-whiting shorebased IFQ" or "limited entry midwater trawl, Pacific whiting shorebased IFQ".

The monitoring of fishing mortality varies widely between sectors. The greatest amount of monitoring occurs in the trawl fisheries and the least in the incidental OA and recreational fisheries (Table 4). In the at-sea Pacific whiting sectors, catch composition is closely monitored through an on board observer program. Each processing vessel 125 ft and longer carry two observers that subsample close to 100

percent of all hauls. Although there are currently no processing vessels under 125 ft must, any that come into the fishery would be required to carry one observer. Since 2011, each mothership catcher vessel has carried one observer to account for discards. Prior to 2011, mothership catcher vessels were not monitored. In 2015, electronic monitoring will be available under to monitor mothership catcher vessels in lieu of the 100 percent observer coverage requirement. Vessels that voluntarily use electronic monitoring in 2015, would operate under EFPs. Observers on the processing vessels subsample the catch to collect data used to estimate catch composition. In addition, the observers collect biological data from groundfish, protected species, and prohibited species. Catch data by species are generally available and will continue to be available into the future for use in management decisions within 24 hours during the season.

Implementation of the Shorebased IFQ program included an increase in observer coverage for all vessels fishing on IFQ quota pounds. This was an increase in coverage from approximately 25 percent pre-IFQ to nearly 100 percent of all groundfish landings with IFQ. With on board observers close to 100 percent of the hauls are sampled with discards being accounted for at the haul level. The exception is in the Pacific whiting Shorebased IFQ fishery where most vessels retain nearly all their catch and do not sort at sea. In the Pacific whiting Shorebased IFQ fishery observers primarily monitor the retention of catch. Catch composition data are gathered on shore by catch monitors. Beginning in 2015 whiting vessels may voluntarily use electronic monitoring EFPs to monitor catch retention. Observers collect valuable fisheries data, including fishing effort and location, estimates of retained and discarded catch, species composition, biological data, and protected species interactions. The data informs fisheries managers and stock assessment scientists, as well as other fisheries researchers. Observer catch data informs the vessel accounting system used for quota management.

Shorebased IFQ vessels are required to land catch at IFQ first receivers where the landed catch is sorted and weighed. Catch monitors are individuals who collect data to verify that the catch is correctly sorted, weighed and reported. Landings data and at-sea discards are later combined for total catch estimation. Prohibited species catch data for the IFQ fishery has not been available to fishery participants inseason. Total catch data for groundfish species are available approximately 11-12 months following the end of the fishing year.

In 2015, electronic monitoring is being considered as a replacement for the Observer Coverage Requirement. The preliminary study is being conducted under EFPs, potentially followed by a rulemaking in 2016 or 2017. Retention requirements will be evaluated and further specified. Maximized retention may be allowed on a broader range of vessels to land unsorted catch.

The West Coast Groundfish Observer Program (WCGOP) provides observer coverage for the LE fixed gear fisheries. Observers collect discard data at sea and biological data from groundfish, protected, and prohibited species. Prohibited species catch is not available inseason. Groundfish Total catch data are available approximately 11-12 months following the end of the fishing year after sample data are extrapolated and combined with landings data. In 2011, 25 percent of the sablefish tier fishery and 10 percent of the non-sablefish landings were monitored by observers.

In 2011, 6 percent of the OA fixed gear fishery for sablefish and 4 percent of the nearshore OA fishery and 14 percent of the pink shrimp trawl, 14 percent of the California Halibut (99 percent of those taken by vessels with LE trawl permits) landings were monitored by observers.

Tribal-directed groundfish fisheries are subject to full rockfish retention. Shorebased sampling, and observer coverage are also used to monitor the fisheries. Information on current coverage levels and protocols were not available.

Recreational catch is generally monitored by the states as it is landed in port. However, there may also be on the water effort estimates as well. These data are compiled by the Pacific States Marine Fisheries Commission (PSMFC) in the Recreational Fisheries Information Network (RecFIN) database. The types of data compiled in RecFIN include sampled biological data, estimates of landed catch plus discards, and economic data. Data are generally available within 3 months. Descriptions of the RecFIN program, state recreational fishery sampling programs and the most recent data available to managers, assessment scientists, and the general public can be found on the PSMFC web site at http://www.psmfc.org/program/prog-3

Table 9. Type and level of monitoring by fishery sector

Fishing Sector	**Time Area Monitoring**	**Catch and Discard Monitoring**	
	VMS Coverage	**Observer Coverage** (2013)	**Other Coverage**
Trawl IFQ	Vessel registered to LE permits must operate VMS 24 hours a day throughout the fishing year	1 observer per harvesting vessel, 1 catch monitor at first receivers.	2015 optional electronic monitoring under EFPs.
Trawl at-sea whiting		2 observers per processor 125 ft and over, 1 per processor under 125 ft. 1 observe per mothership harvesting vessel	Mothership harvesting vessels - 2015 optional electronic monitoring under EFPs.
LEFG sablefish tier limit fishery		Observer coverage of all groundfish landings was 22% of the longline and 15% of pot gear landings	
LEFG trip limit fishery		Observer coverage coastwide was 6% of all groundfish.	
OA directed	Any vessel that takes, and retains, or possess groundfish in the EEZ must operate VMS 24 hours a day throughout the fishing year	Observer coverage coastwide was: 3-4% of all groundfish landings in non-nearshore 5-6% for all nearshore landings 10% of pink shrimp trawl	
OA incidental	Any vessel that takes, and retains, or possess groundfish in the EEZ and any vessel that uses non-groundfish trawl gear to fish in the EEZ must operate VMS 24 hours a day throughout the fishing year		
Tribal	Not required, unless vessel is registered to non-tribal groundfish permit	Observer coverage and shore-based sampling of groundfish directed fishing.	
Recreational			State surveys - may include, catch data and estimates from private, rental and charter vessels, beach and private access effort, and effort based on license data. Coverage varies

IV. Fishery Impacts

This summary characterizes the catch of salmonids in the Pacific Coast groundfish fishery, including: total salmon mortality by species and sector; overall Chinook bycatch and bycatch rates in the midwater trawl fisheries; geographic distribution of Chinook bycatch and bycatch rates in the bottom trawl and non-whiting midwater trawl fisheries; depth distribution of Chinook bycatch and bycatch rates in the non-whiting midwater trawl fisheries; Coded wire tag (CWT) recovery estimations by evolutionary significant units (ESU), year, and month for Chinook and coho; CWT recoveries for unlisted Chinook; and Chinook distribution by age for fish with CWTs.

a. Bycatch of Salmon in the Pacific Coast Groundfish Fisheries

NMFS estimates the bycatch of salmon from observer and catch monitor data. Most salmon caught in the groundfish fishery are Chinook salmon. Table 10 shows catch by groundfish fishery sector for 2002 to 2014. During the 2002 to 2014 period, Chinook bycatch averaged 6,727 fish per year in the Pacific whiting fisheries, 3,067 fish per year in the bottom trawl fisheries, and 58 fish per year in the non-trawl fisheries. Since 2002, the groundfish fishery as a whole has exceeded 20,000 Chinook once in the 12 years between 2002 and 2013 (Table 11). The highest annual catch of Chinook occurred in 2003, when the groundfish fisheries took 23,013 Chinook. A large drop in coastwide Chinook bycatch occurred in the non-whiting limited entry bottom trawl fishery after 2003. That post-2003 reduction may have been the result of changes in management measures affecting the nearshore trawl fishery (Figure 8). Prior to the implementation of trawl RCAs, flatfish species were caught by vessels using large and small footrope bottom trawl gear in 50–150 fathoms depths. Beginning in 2003, many of the areas where these flatfish species had been harvested fell within the Trawl RCAs, where bottom trawl is prohibited (See Table 6 for Trawl RCA boundaries). In October 2003, NMFS and the Council implemented differential trip limits allowances (68 FR 52519, September 4, 2003), so that north of 40°10' N. lat., large footrope trawl was prohibited shoreward of the RCAs, and differential trip limits were used to discourage vessels from fishing shoreward of the trawl RCAs. In 2003 and 2004, the states and groundfish industry vessels tested a type of small footrope bottom trawl called selective flatfish trawl gear for its utility in reducing bycatch of species other than flatfish. In January 2005 selective flatfish trawl became required shoreward of the RCAs in the area north of 40°10' N. lat. (69 FR 77013, December 23, 2004).[3]

Coho, chum, pink and sockeye make up much smaller portions of the salmon bycatch in groundfish fisheries. For all sectors combined between 2002 and 2013, coho averaged less than 300 fish per year. The highest annual catch of coho occurred in 2013 when 760 fish were taken. In 2013, 581 coho were taken with nearshore fixed gear during the summer months (May-October) between Cape Falcon and Cape Blanco Oregon. Chum has averaged less than 100 fish per year between 2002 and 2013 for all groundfish sectors combined. The highest catch of chum was 291 fish in 2007, with all catch occurring in the Pacific whiting fisheries. Sockeye salmon are rarely encountered and pink salmon encounters are very sporadic ranging from 0 to 7,315 fish in a year. In 2011, the groundfish fisheries took 7,315 pink salmon, with 6,113 taken in the Pacific whiting shorebased fishery. Two steelhead were taken in the 2014 Pacific whiting shorebased fishery.

[3] Selective flatfish trawls are very low-rise nets with a cutback headrope design that allows them to effectively catch bottom-tending fishes while avoiding species that are either distributed off-bottom or tend to rise when disturbed (King et al. 2004, Hannah et al. 2005).

Table 10. Salmon mortality (number of fish) by species and fishing sector in Pacific Coast Groundfish Fisheries, 2002-2014.

Fishery	Species	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 a/
At-Sea whiting	Chinook	1,679	2,648	805	3,963	1,209	1,321	722	319	714	3,990	4,232	3,737	6,685
	Coho	146	3	1	86	28	227	21	12	0	5	17	6	108
	Chum	24	11	52	20	88	170	60	41	10	46	53	26	4
	Pink	0	17	0	48	0	34	0	2	0	12	22	37	0
	Sockeye	0	0	0	0	0	0	2	0	2	0	0	0	0
Shorebased whiting	Chinook	1,062	425	4,206	4,018	839	2,462	1,962	378	2,997	3,727	2,333	1,313	7,554
	Coho	14	0	8	37	18	141	10	37	16	137	15	33	175
	Chum	72	0	43	6	3	113	8	2	8	42	3	8	4
	Pink	0	0	0	49	0	47	7	26	0	6,113	2	2	0
	Sockeye	0	0	0	0	0	0	0	0	0	2	0	0	1
	Steelhead	0	0	0	0	0	0	0	0	0	0	0	0	2
Tribal whiting c/	Chinook	1,018	3,439	3,740	3,985	1,940	2,404	697	2,147	678	906	17	1,025	154
	Coho	23	193	207	344	3	107	21	57	5	27	0	91	0
	Chum	51	9	11	2	24	8	11	11	1	23	0	1	0
	Pink	0	3,766	0	384	0	513	9	129	0	1,190	0	5	0
	Sockeye	0	0	0	0	0	0	0	0	0	2	0	0	0
Bottom trawl d/	Chinook	14,915	16,460	2221	1,242	175	317	324	299	53	175	304	323	NA
	Coho	25	31	65	5	48	13	0	0	31	20	27	49	NA
	Chum	14	36	4	0	0	0	0	0	0	0	0	0	NA
	Pink	0	0	0	0	0	0	0	2	0	0	2	0	NA
	Sockeye	0	0	0	0	0	0	0	0	0	1	0	0	NA
Non-trawl gear	Chinook	0	41	33	32	20	0	0	22	33	40	66	404	NA
	Coho	0	5	38	6	0	15	42	71	42	64	16	581	NA
	Chum	0	0	0	0	0	0	0	0	0	0	0	0	NA
	Pink	0	0	0	0	0	0	0	0	0	0	0	0	NA
	Sockeye	0	0	0	0	0	0	0	0	0	0	0	0	NA

a/ Preliminary data

b/ Includes approximately 19 Chinook in 2011, 69 Chinook in 2012, and 78 Chinook in 2013 from midwater non-whiting targeting north of 40°10’ north latitude.

c/ Tribal non-whiting values were not available

d/ Between 2011 and 2013 includes 1-2 Chinook from vessel targeting Pacific whiting with bottom trawl

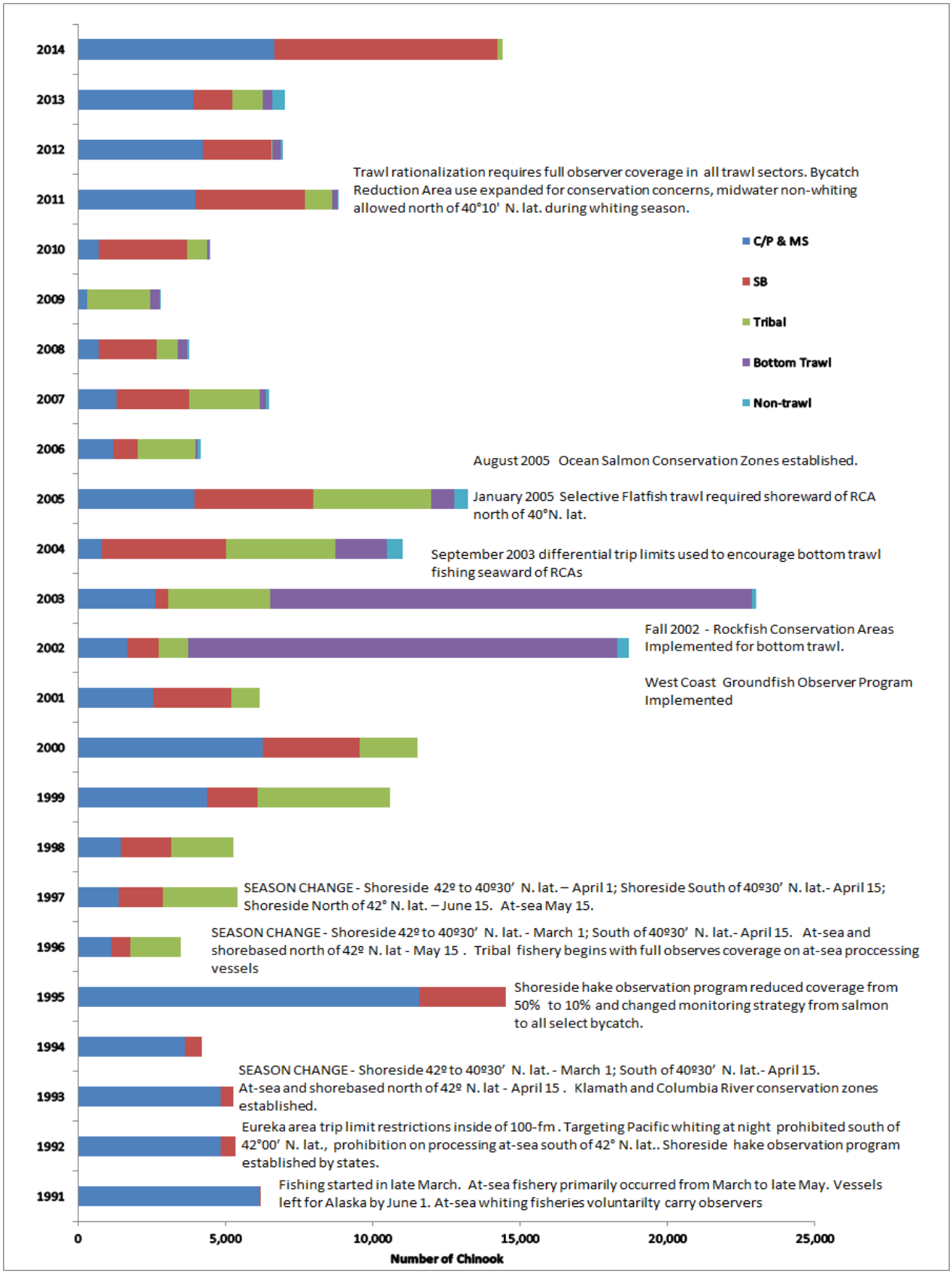

Figure 8. Chinook bycatch (number of fish) by sector 1991-2014, with related management measures.

Chinook bycatch in the Pacific whiting fisheries

The Pacific whiting fishery became a fully domestic fishery in 1991. Bycatch in the Pacific whiting fisheries from 1991 to 2014 are shown in Table 11. During the 1991 to 2014 period, Chinook bycatch averaged 6,901 fish per year. The ESA consultation on the groundfish fisheries limits the bycatch rate in the whiting sectors to 0.05 Chinook per mt of Pacific whiting, with an associated total annual catch of 11,000 Chinook. The Pacific whiting fishery catch has exceeded 11,000 Chinook in four years (1995, 2000, 2005, and 2014) in the 1991 to 2014 period.

The annual Chinook bycatch rate for the Pacific whiting sectors for 2002 to 2014 are shown in Table 12. Although one or more sectors of the Pacific whiting fishery exceeded the bycatch rate of 0.05 Chinook per mt of Pacific whiting in nine of the thirteen years between 2002 and 2014, the fishery as a whole exceeded 0.05 Chinook per mt of Pacific whiting only in 2014. The tribal fishery, which is much more spatially constrained than non-tribal whiting fisheries, most frequently exceeded the 0.05 Chinook per mt of Pacific whiting bycatch rate. However, the small amount of Pacific whiting harvest in tribal fishery in recent years, 2012 to 2014, has resulted in minor amounts of Chinook bycatch. Chinook bycatch rates in the Pacific whiting sectors vary between years, between months, and by geographic area and depth. NMFS and the Council have implemented management measures that restrict fishing in areas or at times where there is high Chinook bycatch. These measures are the result of previous ESA consultations, or were recommended by the Council to reduce overall catch of salmon. The evolution of management measures relative to salmon bycatch from 1991 to 2014 is shown in Figure 8.

Previous biological opinions included conservation measures designed to minimize the catch of Chinook, including a delayed the start of the Pacific whiting fishery north of 42° North latitude until May 15. The delayed opening was implemented in 1996, because about one third of the observed bycatch in previous years had occurred prior to May 1. The fishery delay was intended to reduce the likelihood that Upper Willamette River Chinook would be taken in the whiting fishery (NMFS 1999). From 1997 to 2014, the Pacific whiting shorebased fishery north of 42° N. lat. was delayed until June 15. Beginning in 2015, the Pacific whiting shorebased fishery primary season will open on May 15. Since 1997, the primary season start date for the at-sea sectors has been May 15.

Aggregate monthly bycatch rates in the Pacific whiting fisheries are provided in Table 13, and aggregate monthly bycatch rates by geographic area and depth bin are provided in Tables 15 and 20. In general, the Pacific whiting fisheries salmon bycatch rates have been highest in the fall, September to December, and lowest from late-spring to summer, May to August. The exception to this trend has been higher bycatch rates observed in the shorebased sector's early season fishery off California. The early season Pacific whiting fishery off California has had little activity since implementation of the Shorebased IFQ Program in 2011. The 2015 changes in the primary season start date for the fishery north of 42° N. lat. are expected to result in minimal or no early season (April) fishing off California for Pacific whiting in future years.

Catch of Chinook in the Pacific whiting fisheries varies by latitude. Tables 15 to 17 provide monthly Chinook and Pacific whiting catch as well as bycatch rates by geographic area and month. For the at-sea sectors, the majority (81 percent) of the Chinook were taken between Cape Falcon (45°46 N. lat.) and Cape Blanco (42°50' N. la.t), with almost all of the Chinook (95 percent) being caught in the fall from September to December. Bycatch rates are generally lower, well below 0.05 Chinook per mt of Pacific

whiting in the May to August time period, regardless of geographic area. Bycatch rates for the September to December time period more frequently exceeded 0.05 Chinook per mt of Pacific whiting, most frequently in the area between Cape Falcon and Cape Blanco. Figures 9 and 10 contain maps of Chinook bycatch rates relative to Pacific whiting catch in the at-sea sectors for 2011 to 2014. The highest bycatch rates for the catcher/processor sector occurred in areas west and south of Heceta Bank. The highest bycatch rates for the mothership sector occurred in the same areas, plus an area west of Coos Bay, Oregon in waters deeper than 150 fm. Since 1992, catcher/processors and mothership processing vessels have been prohibited from processing south of 42° N. lat. to reduce salmon interception in those sectors (PFMC 1997). Therefore, no at-sea sector catch has occurred south of 40°10' N. lat. in recent years.

In contrast to the at-sea sectors, the shorebased Pacific whiting fishery Chinook bycatch has been less concentrated between Cape Falcon and Cape Blanco. The shorebased catch has been split, with 36 percent occurring north of Cape Falcon and 64 percent occurring between Cape Falcon and Cape Blanco. The highest Chinook bycatch in the shorebased Pacific whiting fishery occurred from July to November, with bycatch rates most frequently exceeding 0.05 Chinook per mt of Pacific whiting in the area between Cape Falcon to Cape Blanco. Figures 11 contains a map showing Chinook bycatch rates relative to Pacific whiting catch in the shorebased sectors for 2011-2014. Similar to the at-sea sectors, the highest bycatch rates can be seen in the in the area west of Heceta Bank. To minimize the catch of Chinook salmon, previous ESA consultations contained terms and conditions prohibiting the targeting of Pacific whiting in the Eureka management area (43° to 40°30' N. lat) shoreward of 100 fm (183 m) (NMFS 1999). No more than 10,000 lb (4.5 mt) of whiting may be taken and retained, possessed, or landed by a vessel that, at any time during a fishing trip, fished in the Eureka management area shoreward of the 100 fm. Therefore, only small amounts of Chinook bycatch has occurred south of Cape Blanco.

Catch of Chinook in the Pacific whiting fisheries varies by depth. If NMFS projects the Pacific whiting fishery may take in excess of 11,000 Chinook, the OSCZ will be activated to close waters shoreward of the 100 fm depth contour to Pacific whiting targeting. To address conservation concerns, depth-based closures called BRAs may also be taken inseason to close waters shoreward of the 75 fm, 100 fm or 150 fm depth contours to all midwater trawl gear. Tables 18 to 20 show Chinook and Pacific whiting catch and bycatch rates by month and depth bin. The selected depth bins relate to the OSCZ and BRAs, which can be used inseason to address salmon bycatch concerns. Because the distribution of fishing by depth varies between sectors, the effectiveness of bycatch reduction measures would also be expected to vary.

For the at-sea sectors between 2011 and 2014, 49 percent of the Chinook were caught in hauls fishing deeper than 200 fm, approximately 82 percent of the Chinook were caught is waters deeper than 150 fm, while the remaining 18 percent were caught in waters shallower than 150 fm. Although the highest bycatch rates occurred in waters shallower than 100 fm, only 3 percent of the salmon bycatch occurred in waters shallower than 100 fm. This is because little fishing effort targeting Pacific whiting occurred in the area. In contrast to the at-sea sectors, between 2011 and 2014 the Pacific whiting shorebased sector caught only 5 percent of the Chinook in waters deeper than 200 fm, with most occurring in catches taken between September and November. Only 29 percent of the Chinook were caught in waters deeper than 150 fm, while 71 percent were caught in waters shallower than 150 fm. From June to August, the bycatch rates in excess of 0.05 Chinook per mt of Pacific whiting occurred in waters shallower than 100 fm, where 40 percent of the Chinook were caught. From September to December,

bycatch rates more frequently exceeded 0.05 Chinook per mt of Pacific whiting, with November having the highest bycatch rates in all depth bins.

With a limit of 11,000 Chinook for the Pacific whiting fisheries, changes in the Pacific whiting Total Allowable Catch (TAC) levels affect the bycatch rate expectations for the fishery. The Pacific whiting TAC and catch varies widely between years. Between 2002 and 2014, the fishery-wide total catch of Pacific whiting ranged from 121,863 mt in 2009 to 263,901 mt in 2014 (Table 12). In years with high Pacific whiting TAC, the fishery's bycatch rates must be below 0.05 Chinook per mt of Pacific whiting to prevent the fishery from exceeding 11,000 Chinook (i.e. a 265,000 mt TAC would require a bycatch rate of 0.04 Chinook/mt Pacific whiting). In most years, the fishery has stayed below both the bycatch rate of 0.05 Chinook per mt of Pacific whiting and the catch of 11,000 fish (Table 12).

Table 11. Chinook salmon mortality in Pacific Coast Groundfish Fisheries, 1991-2013. (years in bold show when reinitiation occurred)

Year	Chinook bycatch by Fishery d/				
	Whiting Sectors			Bottom Trawl b/	Non-trawl gears
	At-sea	Shorebased a/	Tribal		
1991	6,165	41	--	NA	NA
1992	4,863	491	--	NA	NA
1993	4,843	419	--	NA	NA
1994	3,626	581	--	NA	NA
1995	11,579	2,954	--	NA	NA
1996	1,145	651	1,707	NA	NA
1997	1,398	1,482	2,524	NA	NA
1998	1,477	1,699	2,085	NA	NA
1999	4,391	1,696	4,497	NA	NA
2000	6,260	3,306	1,947	NA	NA
2001	2,568	2,627	959	NA	NA
2002	1,679	1,062	1,018	14,534	381
2003	2,648	425	3,439	16,340	161
2004	805	4,206	3,740	1,729	525
2005	3,963	4,018	3,985	818	456
2006	1,209	839	1,940	68	127
2007	1,321	2,462	2,404	193	124
2008	722	1,962	697	324	75
2009	319	378	2,147	299	22
2010	714	2,997	678	53	33
2011	3,990	3,727	906	175	40
2012	4,232	2,333	17	304	66
2013	3,937	1,313	1,025	323	429
2014	6,685	7,554 c/	154	--	--

1991-2014 At-sea whiting and tribal catch processed at sea values were derived from A-SHOP observer data.
1991-2008 Shorebase whiting estimates are those reported in annual exempted Fishing Reports prepared by ODFW.
2009-2010 Shorebased whiting estimates were derived from catch monitor database.
2011-2013 Shorebased whiting and all non-whiting estimates for 2002-2013 are those reported by the WCGOP
2003-2014 Tribal Shorebased estimates provided by the Makah Fisheries
a/ Includes midwater trawl whiting and non-whiting targeting North of 40°10 north lat.
b/ Includes IFQ landings by vessels fishing on trawl allocations with fixed gears
c/ Estimates are based on preliminary data.
d/ Tribal non-whiting and recreational values were not available.

Table 12. Chinook bycatch rates by Pacific whiting sector, 2002-2014 (rates in excess of 0.05 Chinook/mt whiting shown in bold)(A-SHOP/PacFin).

		Year												
		2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014 a/**
Chinook	Mothership	707	2,078	417	2,207	1,095	585	226	296	457	1,296	2,300	1,979	2,906
	Catcher Processor	970	570	388	1,756	114	736	496	23	257	2,694	1,932	1,758	3,779
	Tribal	1,018	3,439	3,740	3,985	1,940	2,404	697	2,147	678	906	17	1,025	154
	Shorebased a/ b/	1,062	425	4,206	4,018	839	2,462	1,962	378	2,997	3,727	2,333	1,313	7,554
	Whiting Sector Total	3,759	6,512	8,751	11,966	3,988	6,187	3,381	2,844	4,389	8,624	6,586	6,078	14,395
Whiting	Mothership	26,593	26,021	24,102	48,571	55,355	47,809	57,432	24,090	35,714	50,051	38,480	52,472	62,098
	Catcher Processor	36,341	41,214	73,175	78,890	78,864	73,263	108,121	34,800	54,292	71,679	55,263	77,950	103,203
	Tribal	21,793	23,454	28,648	34,357	35,441	30,177	31,907	22,381	18,255	18,234	658	4,906	617
	Shorebased a/ b/	45,276	51,061	89,670	97,381	97,297	73,280	50,423	40,293	62,653	90,354	65,280	96,857	97,965
	Whiting Sector Total	130,003	141,750	215,595	259,199	266,957	224,529	247,883	121,564	170,914	230,318	159,681	232,185	263,883
Chinook/mt Whiting	Mothership	0.027	**0.079**	0.017	0.045	0.020	0.012	0.004	0.012	0.013	0.026	**0.060**	0.038	0.047
	Catcher Processor	0.026	0.014	0.005	0.022	0.001	0.010	0.005	0.001	0.005	0.038	0.035	0.023	0.037
	Tribal	0.047	**0.147**	**0.131**	**0.116**	**0.055**	**0.080**	0.022	**0.096**	0.037	**0.050**	0.026	**0.209**	**0.250**
	Shorebased	0.023	0.008	0.047	0.041	0.009	0.034	0.039	0.009	0.048	0.041	0.036	0.014	**0.077**
	Whiting Sector Total	0.029	0.046	0.041	0.046	0.015	0.028	0.014	0.023	0.026	0.037	0.041	0.026	**0.055**

a/ 2014 estimates are based on preliminary data

b/ includes all midwater trawl north of 40°10 N. lat

Table 13. Monthly Chinook bycatch rates by sector, 2009-2014 (rates in excess of 0.05 Chinook/mt whiting are shown bold)(A-SHOP/PacFin).

		Number per Month								
		Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Chinook	Mothership	--	989	698	31	6	1,754	3,365	2,144	247
	Catcher Processor	--	988	83	1	30	974	4,055	2,867	1,445
	Shorebased a/ b/		475	716	1,676	3,861	3,778	4,668	2,711	313
	Whiting Sector Total		2,452	1,497	1,708	3,897	6,506	12,088	7,722	2,005
Whiting	Mothership	--	83,379	35,806	2,827	3,717	31,779	76,915	26,928	1,552
	Catcher Processor	--	101,914	16,215	280	23,961	90,163	88,941	57,910	17,801
	Shorebased a/ b/		4,211	70,586	96,424	117,097	78,734	59,800	23,578	2,975
	Whiting Sector Total		189,504	122,607	99,531	144,775	200,676	225,597	108,416	22,328
Chinook/ mt Whiting	Mothership	--	0.012	0.019	0.011	0.002	**0.055**	0.044	**0.080**	**0.159**
	Catcher Processor	--	0.010	0.005	0.004	0.001	0.011	0.046	0.050	**0.081**
	Shorebased b/		**0.113**	0.010	0.017	0.033	0.048	**0.078**	**0.115**	**0.105**
	Whiting Sector Total		0.013	0.012	0.017	0.027	0.032	**0.054**	**0.071**	**0.090**

a/ 2014 estimates are based on preliminary data

b/ includes all midwater trawl north of 40°10 N. lat

Table 14. Geographic areas used for salmon bycatch estimation.

Management Area	Latitude
North of Cape Falcon	North of 45°46’ N. Lat.
Cape Falcon to Cape Blanco	Between 42°50’ and 45°46’ N. Lat.
Cape Blanco to North/South management line	Between 40°10’ and 42°50’ N. Lat.
South of North/South management line	South of 40°10’ N. Lat.

Table 15. Monthly Chinook counts by geographic area in the Pacific whiting fisheries, 2011-2014 (A-SHOP/WCGOP).

		Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
At-sea sectors a/										
2011	North of Cape Falcon	0	228	82	0	0	52	6	233	326
	Cape Falcon to Cape Blanco	0	0	c/	0	0	c/	313	1,497	386
	Cape Blanco to Cape Mendocino	0	c/	c/	0	0	0	c/	c/	861
	South of 40°10’ N. Lat. b/	0	0	0	0	0	0	0	0	0
2012	North of Cape Falcon	0	429	c/	c/	c/	4	c/	0	0
	Cape Falcon to Cape Blanco	0	c/	c/	c/	c/	104	3,589	29	0
	Cape Blanco to 40°10’ N. Lat.	0	c/	c/	0	0	37	0	c/	0
	South of 40°10’ N. Lat. b/	0	0	0	0	0	0	0	0	0
2013	North of Cape Falcon	0	80	c/	0	c/	64	c/	c/	0
	Cape Falcon to Cape Blanco	0	41	52	c/	c/	59	580	2,054	0
	Cape Blanco to 40°10’ N. Lat.	0	0	4	0	0	0	0	743	0
	South of 40°10’ N. Lat. b/	0	0	0	0	0	0	0	0	0
2014	North of Cape Falcon	0	36	c/	0	c/	39	c/	c/	0
	Cape Falcon to Cape Blanco	0	318	c/	0	c/	2,361	2,845	361	0
	Cape Blanco to 40°10’ N. Lat.	0	52	228	0	0	0	71	15	0
	South of 40°10’ N. Lat. b/	0	0	0	0	0	0	0	0	0
Shorebased IFQ (>50% Pacific whiting by weight at landing)										
2011	North of Cape Falcon	0	0	138	343	1,717	547	18	13	0
	Cape Falcon to Cape Blanco	0	0	27	4	2	116	704	72	0
	Cape Blanco to 40°10’ N. Lat.	0	0	0	0	0	0	0	0	0
	South of 40°10’ N. Lat.	0	0	0	0	0	0	0	0	0
2012	North of Cape Falcon	0	0	25	26	29	9	238	978	0
	Cape Falcon to Cape Blanco	0	0	1	1	4	248	299	221	185
	Cape Blanco to 40°10’ N. Lat.	0	0	0	0	0	c/	0	0	0
	South of 40°10’ N. Lat.	0	0	0	0	0	0	0	0	0
2013	North of Cape Falcon	0	0	1	0	9	41	83	c/	0
	Cape Falcon to Cape Blanco	0	0	9	54	142	407	104	359	0
	Cape Blanco to 40°10’ N. Lat.	0	0	2	1	0	0	0	0	0
	South of 40°10’ N. Lat.	0	0	0	0	0	0	0	0	0
2014 /d	North of Cape Falcon	0	0	93	284	24	79	205	95	c/
	Cape Falcon to Cape Blanco	0	0	164	809	303	1,076	2,736	777	0
	Cape Blanco to 40°10’ N. Lat.	0	0	11	16	0	0	0	0	c/
	South of 40°10’ N. Lat.	0	0	0	0	0	0	0	0	0

a/ Catcher/processor and Mothership sector

b/ At-sea processing is prohibited south of 42° N. Lat.

c/ Confidential data

d/ Estimates are based on preliminary data

Table 16. Monthly Pacific whiting (mt) by geographic area, 2011-2014 (A-SHOP/WCGOP).

		Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
At-sea sectors a/										
2011	North of Cape Falcon	0	31,085	13,275	0	0	8,611	955	10,949	4,226
	Cape Falcon to Cape Blanco	0	0	c/	0	0	c/	13,714	27,122	6,612
	Cape Blanco to Cape Mendocino	0	c/	c	0	0	0	c/	c	3,104
	South of 40°10′ N. Lat. b/	0	0	0	0	0	0	0	0	0
2012	North of Cape Falcon	0	23,586	c/	c/	c/	1,765	c/	0	0
	Cape Falcon to Cape Blanco	0	c/	c/	c/	c/	15,382	36,137	c/	0
	Cape Blanco to 40°10′ N. Lat.	0	c/	c/	0	0	4,891	0	0	0
	South of 40°10′ N. Lat. b/	0	0	0	0	0	0	0	0	0
2013	North of Cape Falcon	0	13,535	c/	0	c/	187	c/	c/	0
	Cape Falcon to Cape Blanco	0	15,819	10,813	c/	c/	23,779	40,861	10,729	0
	Cape Blanco to 40°10′ N. Lat.	0	222	c/	0	0	0	0	5,645	0
	South of 40°10′ N. Lat. b/	0	0	0	0	0	0	0	0	0
2014	North of Cape Falcon	0	6,606	c/	0	c/	2,888	c/	c/	0
	Cape Falcon to Cape Blanco	0	20,514	c/	0	c/	33,765	37,018	7,372	0
	Cape Blanco to 40°10′ N. Lat.	0	19,946	9,595	0	0	0	13,364	6,953	0
	South of 40°10′ N. Lat. b/	0	0	0	0	0	0	0	0	0
Shorebased IFQ (>50% Pacific whiting by weight at landing)										
2011	North of Cape Falcon	0	0	8,490	19,826	24,691	8,431	1,287	717	0
	Cape Falcon to Cape Blanco	0	0	2,473	5,073	4,235	5,966	7,764	1,292	0
	Cape Blanco to 40°10′ N. Lat.	0	0	0	0	0	0	0	0	0
	South of 40°10′ N. Lat.	0	0	0	0	0	0	0	0	0
2012	North of Cape Falcon	0	0	4,866	7,069	10,275	2,652	6,850	6,126	0
	Cape Falcon to Cape Blanco	0	0	192	3,236	4,480	7,753	7,470	3,687	547
	Cape Blanco to 40°10′ N. Lat.	0	0	0	0	0	c/	0	0	0
	South of 40°10′ N. Lat.	0	0	0	0	0	0	0	0	0
2013	North of Cape Falcon	0	0	2,261	219	7,043	2,464	8,584	c/	0
	Cape Falcon to Cape Blanco	0	0	3,369	19,096	22,269	18,682	9,669	1,474	0
	Cape Blanco to 40°10′ N. Lat.	0	0	307	786	0	0	0	0	0
	South of 40°10′ N. Lat.	0	0	0	3	0	0	0	0	0
2014 /b	North of Cape Falcon	0	0	6,329	6,311	2,135	11,682	5,071	1,287	c/
	Cape Falcon to Cape Blanco	0	0	1,811	14,278	26,409	10,907	6,175	1,533	0
	Cape Blanco to 40°10′ N. Lat.	0	0	1,579	1,266	0	0	0	689	c/
	South of 40°10′ N. Lat.	0	0	0	0	0	0	0	0	0

a/ At-sea processing is prohibited south of 42° N. Lat.

b/ Preliminary data

c/ Confidential data

Table 17. Monthly Chinook bycatch rates (# Chinook/Mt Pacific whiting) by geographic area for the Pacific whiting fisheries, 2011-2014.

		Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
At-sea sectors										
2011	North of Cape Falcon	0	0.007	0.006	0	0	0.006	0.006	0.021	**0.077**
	Cape Falcon to Cape Blanco	0	0	c/	0	0	c/	0.023	**0.055**	**0.058**
	Cape Blanco to Cape 40°10′ N. Lat.	0	c/	c/	0	0	0	c/	c/	**0.277**
	South of 40°10′ N. Lat. a/	0	0	0	0	0	0	0	0	0
2012	North of Cape Falcon	0	0.018	c/	c/	c/	0.002	c/	0	0
	Cape Falcon to Cape Blanco	0	c/	c/	c/	c/	0.007	**0.099**	c/	0
	Cape Blanco to 40°10′ N. Lat.	0	c/	c/	0	0	0.008	0	0	0
	South of 40°10′ N. Lat. a/	0	0	0	0	0	0	0	0	0
2013	North of Cape Falcon	0	0.006	c/	0	c/	**0.342**	c/	c/	0
	Cape Falcon to Cape Blanco	0	0.003	0.005	c/	c/	0.002	0.014	**0.191**	0
	Cape Blanco to 40°10′ N. Lat.	0	0.000	c/	0	0	0	0	**0.132**	0
	South of 40°10′ N. Lat. a/	0	0	0	0	0	0	0	0	0
2014	North of Cape Falcon	0	0.005	c/	0	0.000	c/	c/	c/	0
	Cape Falcon to Cape Blanco	0	0.016	c/	0	0.004	c/	**0.077**	0.049	0
	Cape Blanco to 40°10′ N. Lat.	0	0.003	0.024	0	0		0.005	0.002	0
	South of 40°10′ N. Lat. a/	0	0	0	0	0	0	0	0	0
Shorebased IFQ (>50% Pacific whiting by weight)										
2011	North of Cape Falcon	0	0	0.016	0.017	**0.070**	**0.065**	0.014	0.018	0
	Cape Falcon to Cape Blanco	0	0	0.011	0.001	0.000	0.019	**0.091**	**0.056**	0
	Cape Blanco to 40°10′ N. Lat.	0	0	0	0	0	0	0	0	0
	South of 40°10′ N. Lat.	0	0	0	0	0	0	0	0	0
2012	North of Cape Falcon	0	0	0.005	0.004	0.003	0.004	0.035	**0.160**	0
	Cape Falcon to Cape Blanco	0	0	0.005	0	0.001	0.032	0.040	**0.060**	**0.338**
	Cape Blanco to 40°10′ N. Lat.	0	0	0	0	0	c/	0		0
	South of 40°10′ N. Lat.	0	0	0	0	0	0	0	0	0
2013	North of Cape Falcon	0	0	0	0	0.001	0.017	0.010	c/	0
	Cape Falcon to Cape Blanco	0	0	0.003	0.003	0.006	0.022	0.011	**0.243**	0
	Cape Blanco to 40°10′ N. Lat.	0	0	0.006	0.001	0	0	0	0	0
	South of 40°10′ N. Lat.	0	0	0	0	0	0	0	0	0
2014 /b	North of Cape Falcon	0	0	0.015	0.045	0.011	0.007	0.040	**0.074**	c/
	Cape Falcon to Cape Blanco	0	0	**0.091**	**0.057**	0.011	**0.099**	**0.443**	**0.507**	0
	Cape Blanco to 40°10′ N. Lat.	0	0	0.007	0.013	0	0	0	0	c/
	South of 40°10′ N. Lat.	0	0	0	0	0	0	0	0	0

a/ At-sea processing is prohibited south of 42° N. Lat.

b/ Estimates are based on preliminary data

c/ Confidential data

Table 18. Monthly Chinook counts by depth bin in the Pacific whiting fisheries, 2011-2014 (A-SHOP/WCGOP).

		Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
At-sea sectors a/										
2011	0-100 fm	0	c/	c/	0	0	c/	0	0	0
	101-150 fm	0	c/	8	0	0	0	c/	0	0
	151-200 fm	0	14	2	0	0	c/	155	78	172
	>200 fm	0	190	32	0	0	22	166	1,652	1,401
2012	0-100 fm	0	0	0	0	0	0	0	0	0
	101-150 fm	0	c/	c/	0	c/	c/	562	0	0
	151-200 fm	0	8	c/	c/	0	c/	942	c/	0
	>200 fm	0	422	c/	c/	6	77	2,089	c/	0
2013	0-100 fm	0	c/	c/	c/	0	c/	0	0	0
	101-150 fm	0	4	c/	c/	c/	82	303	c/	0
	151-200 fm	0	28	19	c/	c/	19	113	1,431	0
	>200 fm	0	89	2	c/	c/	12	164	620	0
2014	0-100 fm	0	0	c/	0	0	c/	0	0	0
	101-150 fm	0	52	c/	0	c/	862	c/	0	0
	151-200 fm	0	100	163	0	c/	546	2,342	c/	0
	>200 fm	0	254	57	0	c/	839	555	360	0
Shorebased IFQ (>50% Pacific whiting by weight)										
2011	0-100 fm	0	0	136	305	1,713	538	125	0	0
	101-150 fm	0	0	24	27	0	39	442	6	0
	151-200 fm	0	0	5	7	2	76	120	13	0
	>200 fm	0	0	1	7	4	10	35	66	0
2012	0-100 fm	0	0	11	16	11	29	255	146	0
	101-150 fm	0	0	6	3	10	153	224	626	79
	151-200 fm	0	0	9	8	6	66	54	251	c/
	>200 fm	0	0	c/	1	6	9	c/	176	c/
2013	0-100 fm	0	0	2	36	90	402	23	13	0
	101-150 fm	0	0	10	18	48	32	122	203	0
	151-200 fm	0	0	0	1	11	9	16	150	0
	>200 fm	0	0	c/	1	2	5	26	c/	0
2014 /b	0-100 fm	0	0	214	1,050	280	156	52	0	0
	101-150 fm	0	0	43	41	43	689	1,267	152	0
	151-200 fm	0	0	11	12	2	292	1,581	504	c/
	>200 fm	0	0	c/	6	c/	c/	42	217	c/

a/ Catcher/processor and mothership sectors
b/ Estimates are based on preliminary data
c/ Confidential data

Table 19. Monthly Pacific whiting (mt) by bottom depth bin, 2011-2014 (A-SHOP/WCGOP).

		Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
At-sea sectors a/										
2011	0-100 fm	0	c/	c/	0	0	c/	0	0	0
	101-150 fm	0	c/	843	0	0	0	c/	0	0
	151-200 fm	0	1,671	1,686	0	0	c/	4,078	2,335	1,073
	>200 fm	0	27,656	8,687	0	0	8,525	10,761	35,968	12,868
2012	0-100 fm	0	0	0	0	0	0	0	0	0
	101-150 fm	0	c/	c/	0	c/	c/	2,595	0	0
	151-200 fm	0	662	c/	c/	822	2,304	10,944	c/	0
	>200 fm	0	23,366	c/	c/	4,979	19,701	23,077	c/	0
2013	0-100 fm	0	c/	c/	c/	363	184	0	0	0
	101-150 fm	0	892	c/	c/	c/	2,975	3,648	c/	0
	151-200 fm	0	3,278	2,794	c/	c/	10,223	5,956	7,449	0
	>200 fm	0	25,298	5,119	c/	c/	10,584	31,403	9,094	0
2014	0-100 fm	0	0	c/	0	0	c/	0	0	0
	101-150 fm	0	2,877	c/	0	c/	3,102	c/	0	0
	151-200 fm	0	12,059	4,786	0	c/	6,591	9,625	c/	0
	>200 fm	0	32,130	6,287	0	c/	26,880	40,885	14,216	0
Shorebased IFQ (>50% Pacific whiting by weight)										
2011	0-100 fm	0	0	8,649	11,589	21,226	6,158	762	0	0
	101-150 fm	0	0	1,691	7,448	1,168	4,043	4,694	504	0
	151-200 fm	0	0	464	2,661	2,729	2,943	2,359	930	0
	>200 fm	0	0	159	3,199	3,803	1,254	1,236	575	0
2012	0-100 fm	0	0	2,144	3,066	2,377	768	7,807	1,474	0
	101-150 fm	0	0	1,530	1,681	4,087	5,823	5,597	4,999	266
	151-200 fm	0	0	1,318	2,429	4,807	3,108	668	1,976	c/
	>200 fm	0	0	c/	3,129	3,484	797	c/	1,363	c/
2013	0-100 fm	0	0	2,511	11,183	12,757	12,618	2,153	78	0
	101-150 fm	0	0	2,602	6,298	11,103	5,809	10,349	872	0
	151-200 fm	0	0	750	1,962	3,438	1,864	2,561	950	0
	>200 fm	0	0	c/	658	2,013	855	3,190	c/	0
2014 /b	0-100 fm	0	0	4,101	13,785	16,131	7,742	2,169	0	0
	101-150 fm	0	0	3,976	4,790	10,105	10,196	4,542	151	0
	151-200 fm	0	0	1,322	1,815	2,145	3,781	3,660	1,885	c/
	>200 fm	0	0	c/	1,464	c/	c/	876	1,474	c/

a/ Catcher/processor and mothership sectors

b/ Estimates are based on preliminary data

c/ Confidential data

Table 20. Monthly Chinook bycatch rates (#Chinook/MT Pacific whiting) by depth bin for the Pacific whiting fisheries, 2011-2014.

		Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
At-sea sectors a/										
2011	0-100 fm	0	c/	c/	0	0	c/	0	0	0
	101-150 fm	0	c/	0.009	0	0		c/	0	0
	151-200 fm	0	0.008	0.001	0	0	c/	0.038	0.033	**0.160**
	>200 fm	0	0.007	0.004	0		0.003	0.015	0.046	0.109
2012	0-100 fm	0	0	0	0	0	0	0	0	0
	101-150 fm	0	c/	c/	0	c/	0.000	**0.217**	0.000	0
	151-200 fm	0	0.012	c/	c/	0.000	0.029	**0.086**	c/	0
	>200 fm	0	0.018	c/	c/	0.001	0.004	**0.091**	c/	0
2013	0-100 fm	0	c/	c/	c/	0.000	**0.054**	0	0	0
	101-150 fm	0	0.004	c/	c/	c/	0.028	**0.083**	c/	0
	151-200 fm	0	0.009	0.007	c/	c/	0.002	0.019	**0.192**	0
	>200 fm	0	0.004	0.000	c/	c/	0.001	0.005	**0.068**	0
2014	0-100 fm	0	0	c/	0	0	c/	0	0	0
	101-150 fm	0	0.018	c/	0	c/	**0.278**	c/	0	0
	151-200 fm	0	0.008	0.034	0	c/	**0.083**	**0.243**	c/	0
	>200 fm	0	0.008	0.009	0	c/	0.031	0.014	0.025	0
Shorebased IFQ (>50% Pacific whiting by weight)										
2011	0-100 fm	0	0	0.016	0.026	**0.081**	**0.087**	**0.164**	0	0
	101-150 fm	0	0	0.014	0.004	0.000	0.010	**0.094**	0.012	0
	151-200 fm	0	0	0.011	0.003	0.001	0.026	**0.051**	0.014	0
	>200 fm	0	0	0.006	0.002	0.001	0.008	0.028	**0.115**	0
2012	0-100 fm	0	0	0.005	0.005	0.005	0.038	0.033	**0.099**	0
	101-150 fm	0	0	0.004	0.002	0.002	0.026	0.040	**0.125**	**0.297**
	151-200 fm	0	0	0.007	0.003	0.001	0.021	**0.081**	**0.127**	c/
	>200 fm	0	0	c/	0.000	0.002	0.011	c/	**0.129**	c/
2013	0-100 fm	0	0	0.001	0.003	0.007	0.032	0.011	**0.167**	0
	101-150 fm	0	0	0.004	0.003	0.004	0.006	0.012	**0.233**	0
	151-200 fm	0	0	0.000	0.001	0.003	0.005	0.006	**0.158**	0
	>200 fm	0	0	c/	0.002	0.001	0.006	0.008	c/	0
2014 /b	0-100 fm	0	0	**0.052**	**0.076**	0.017	0.020	0.024	0	0
	101-150 fm	0	0	0.011	0.009	0.004	**0.068**	**0.279**	**1.009**	0
	151-200 fm	0	0	0.008	0.007	0.001	**0.077**	**0.432**	**0.267**	c/
	>200 fm	0	0	c/	0.004	c/	c/	0.048	**0.147**	c/

a/ Catcher/processor and mothership sectors

b/ Estimates based on preliminary data

c/ Confidential data

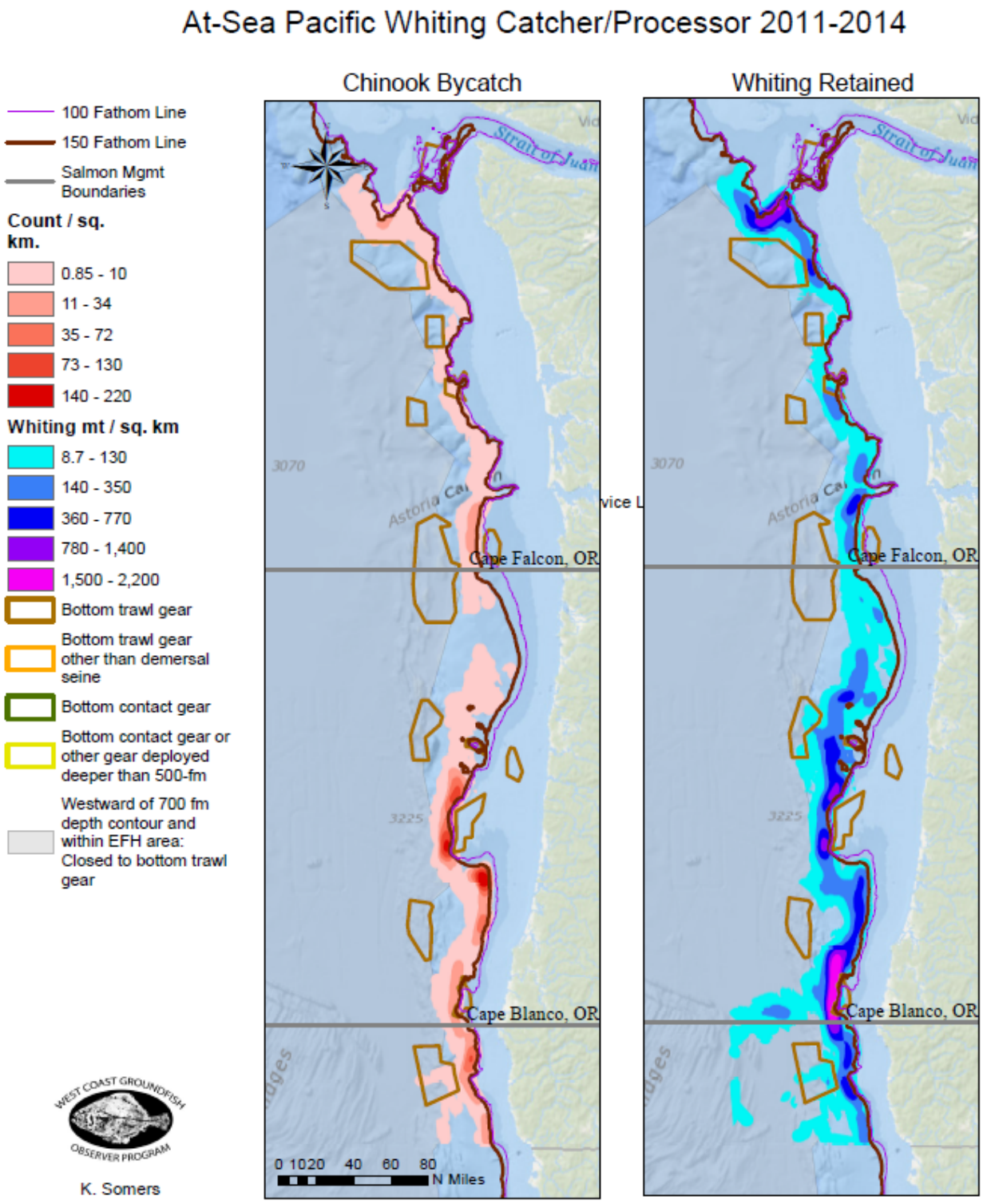

Figure 9. Catcher/processor sector Chinook and Pacific whiting catch coastwide, 2011-2014.

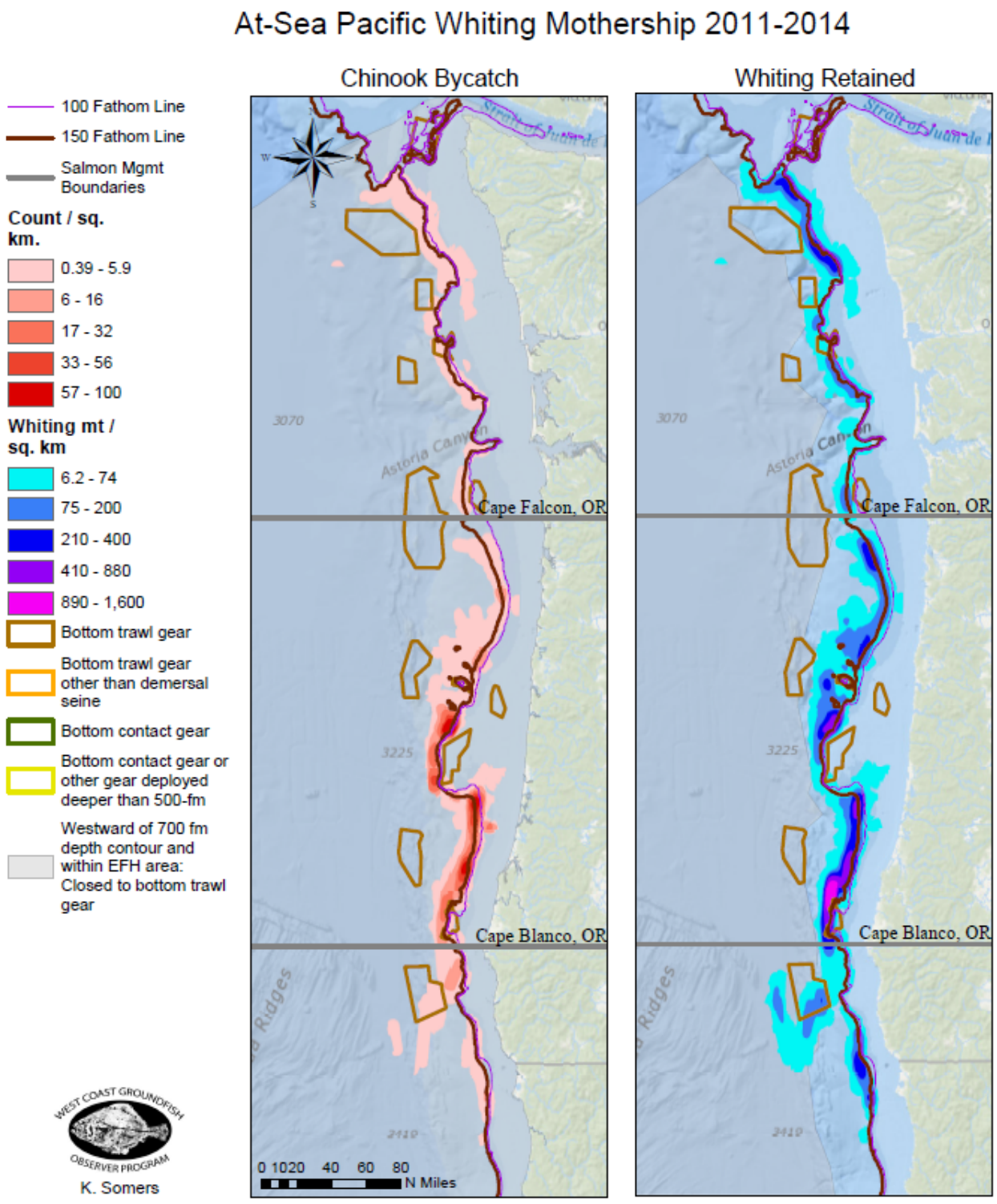

Figure 10. Mothership sector Chinook and Pacific whiting catch coastwide, 2011-2014.

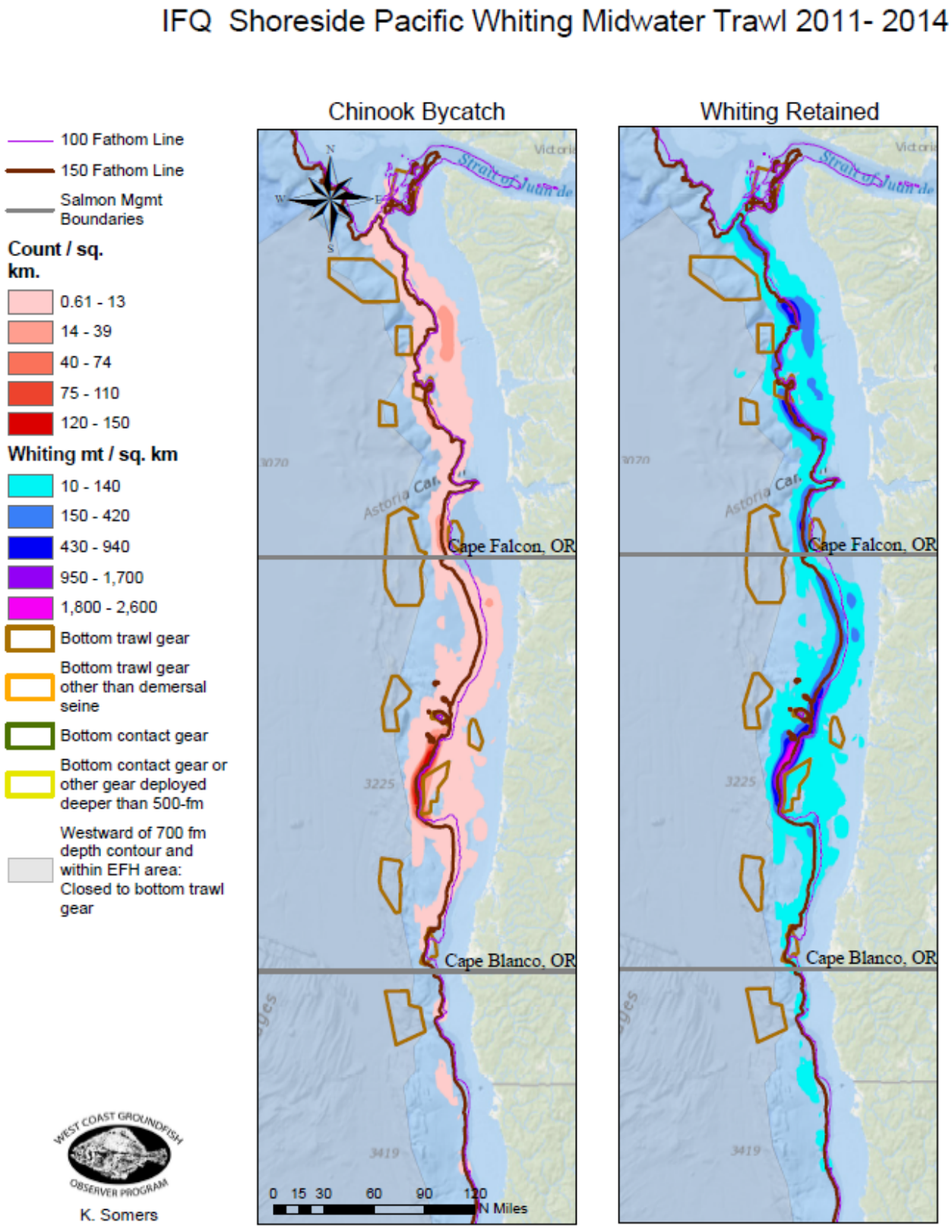

Figure 11. Shorebased IFQ Program Pacific whiting midwater trawl Chinook and Pacific whiting catch coastwide, 2011-2014.

Non-whiting bottom trawl and midwater trawl fisheries

In the 1992 groundfish fisheries' biological opinion (NMFS 1992), NMFS developed bycatch estimates by expanding bycatch rates using logbook estimates of total trawl hours from 1985-1990. Quarterly estimates of bottom trawl effort in depths less than 300 fm were multiplied by Chinook bycatch rates for each management area. The resulting catch of Chinook in the bottom trawl fishery was estimated to be between 6,000 and 9,000 fish per year coastwide. The available information in 1992 suggested that the bycatch of Chinook for northern areas was on the order of 5,000 to 8,000 fish taken off Washington and northern Oregon, with another 1,000 Chinook taken off southern Oregon and California. Table 21 shows the change in annual bottom trawl tow hours from 1987 to the current fishing years under the Shorebased IFQ program. The average bottom trawl tow hours coastwide from 2011 to 2013, have been 47-52 percent of the hours that occurred in 1987. However, if in future years the fleet takes higher percentages of more IFQ species, the number of hours trawled may increase by as much as 20 percent over the hours in 2011 to 2013 (Jim Hastie Pers. Comm.).

Table 21. Change in bottom trawl tow hours between 1987 and the shorebased IFQ fishery, 2011-2013 (Jannot et al. 2014, Pikitch et al. 1995).

Geographical Area	Year	Bottom Trawl Tow Hours
Coastwide	1987	81,397
	2011	40,057
	2012	37,887
	2013	42,309

Table 22 provides Chinook salmon counts for the shorebased IFQ fishery by bottom trawl and mid-water trawl gears. Since 2002, RCA configurations have restricted the depths where groundfish bottom trawl gear can be fished. Since 2006, bottom trawling has also been prohibited in several EFH Conservation Areas. Chinook bycatch by vessels using bottom trawl has been low since 2009, ranging from 53 Chinook to 321 Chinook annually. Over the entire time period of 2009 to 2013, only six percent of the Chinook bycatch in the bottom trawl fishery has occurred south of 40°10' N. lat. The remaining catch caught north of 40°10' N. lat. has been fairly equally divided between the three geographic areas, with 36 percent caught north of Cape Falcon, 24 percent caught between Cape Falcon and Cape Blanco, and 34 percent caught from Cape Blanco to 40°10' N. lat. Figures 12 and 13 contain maps showing Chinook bycatch rates relative to all retained groundfish in the shorebased IFQ fishery by vessels using bottom trawl gear 2011-2014. Areas with highest bycatch occur: north of the Eel River Canyon of northern California; west of Crescent City, California; south and west of Heceta Bank off Oregon; shoreward of Grays Canyon off the Washington Coast; and west of Taholah (Quinault River) off Washington.

The use of midwater trawl gear for species other than whiting has been increasing since 2011. The implementation of the IFQ program eliminated restrictive trip limits that had allowed widow and yellowtail rockfish retention only by vessels harvesting Pacific whiting during the primary season. Because widow rockfish have been rebuilt, that species ACL has increased, as has the opportunity for targeting yellowtail, widow, and chilipepper rockfish. Midwater trawl is only allowed during the dates of the primary whiting season north of 40°10' N. lat., but it is not restricted by the trawl RCAs; however, midwater trawl gear is allowed year-round south of north of 40°10' N. lat. and is only allowed seaward of the trawl RCAs.

From 2011 to 2014, most non-whiting midwater trawling appears to have been targeting yellowtail and widow rockfish. Annual catch of Chinook by vessels using midwater trawl has been increasing from less than 20 Chinook in 2011 to 641 Chinook in 2014. The availability of target species has increased over this same time period. Over the entire time period that the midwater non-whiting fishery has been active, no Chinook bycatch has occurred south of Cape Blanco and 80 percent of the Chinook bycatch has occurred north of Cape Falcon. Midwater trawl catch of Chinook are shown by geographic area and depth bin for 2011 to 2014 in Tables 23 and 24. The data show that most Chinook bycatch has occurred in the fall months (September to November) north of Cape Falcon and in depths shoreward of 100 fm. Figure 14 contains a map showing Chinook bycatch rates relative to yellowtail rockfish catch in the shorebased IFQ fishery by vessels using midwater trawl gear 2011-2014.

Table 22. Chinook counts by area for the IFQ non-whiting fisheries, 2009-2013.

		Bottom Trawl	Midwater Non-whiting Trawl a/
2009	North of Cape Falcon	152	--
	Cape Falcon to Cape Blanco	51	--
	Cape Blanco to 40°10' N. Lat.	41	--
	South of 40°10' N. Lat.	55	--
2010	North of Cape Falcon	0	--
	Cape Falcon to Cape Blanco	37	--
	Cape Blanco to 40°10' N. Lat.	16	--
	South of 40°10' N. Lat.	0	--
2011	North of Cape Falcon	45	c/
	Cape Falcon to Cape Blanco	117	0
	Cape Blanco to 40°10' N. Lat.	8	0
	South of 40°10' N. Lat.	4	0
2012	North of Cape Falcon	46	54
	Cape Falcon to Cape Blanco	39	15
	Cape Blanco to 40°10' N. Lat.	217	0
	South of 40°10' N. Lat.	1	0
2013	North of Cape Falcon	172	73
	Cape Falcon to Cape Blanco	36	5
	Cape Blanco to 40°10' N. Lat.	106	0
	South of 40°10' N. Lat.	7	0
2014 /b	North of Cape Falcon	NA	501
	Cape Falcon to Cape Blanco	NA	140
	Cape Blanco to 40°10' N. Lat.	NA	0
	South of 40°10' N. Lat.	NA	0
Percent by area	North of Cape Falcon	36%	80%
	Cape Falcon to Cape Blanco	24%	20%
	Cape Blanco to 40°10' N. Lat.	34%	0
	South of 40°10' N. Lat.	6%	0

a/ <50 Percent whiting by weight at landing
b/ Estimates based on preliminary data
c/ Confidential data

Table 23. Monthly Chinook counts and bycatch rates aggregated by geographic area, 2011-2014 for midwater non-whiting trawl (WCGOP).

		Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Chinook Counts (Total fish = 807)										
2011-2014 /a	North of Cape Falcon	0	0	c/	18	c/	411	85	119	c/
	Cape Falcon to Cape Blanco	0	0	0	c/	c/	c/	0	c/	c/
	Cape Blanco to 40°10' N. Lat.	0	0	0	0	0	0	0	0	0
	South of 40°10' N. Lat.	0	0	0	0	0	0	0	0	0
Chinook Bycatch rates (#chinook/mt yellowtail)										
2011-2014 /a	North of Cape Falcon	0	0	**c/**	**0.858**	c/	**1.149**	**0.156**	**0.456**	**c/**
	Cape Falcon to Cape Blanco	0	0	0	c/	c/	**c/**	0	**c/**	**c/**
	Cape Blanco to 40°10' N. Lat.	0	0	0	0	0	0	0	0	0
	South of 40°10' N. Lat.	0	0	0	0	0	0	0	0	0

a/ 2014 estimates based on preliminary data
c/ Confidential data

Table 24. Chinook counts and bycatch rates aggregated by depth bin, 2011-2014 for midwater non-whiting (WCGOP)**.**

		Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Chinook Counts (Total fish = 807)										
2011-2014 /a	0-100 fm	0	0	c/	18	c/	410	84	100	13
	101-150 fm	0	0	0	0	0	c/	c/	c/	2
	151-200 fm	0	0	0	0	0	0	0	0	c/
	>200 fm	0	0	0	c/	c/	c/	0	0	c/
Chinook Bycatch rates (#chinook/mt yellowtail)										
2011-2014 /a	0-100 fm	0	0	c/	**1.071**	c/	**1.187**	**0.159**	**0.398**	**0.820**
	101-150 fm	0	0	0	0	0	c/	c/	c/	**1.786**
	151-200 fm	0	0	0	0	0	0	0	0	c/
	>200 fm	0	0	0	c/	c/	c/	0	0	c/

a/ 2014 estimates based on preliminary data
c/ Confi

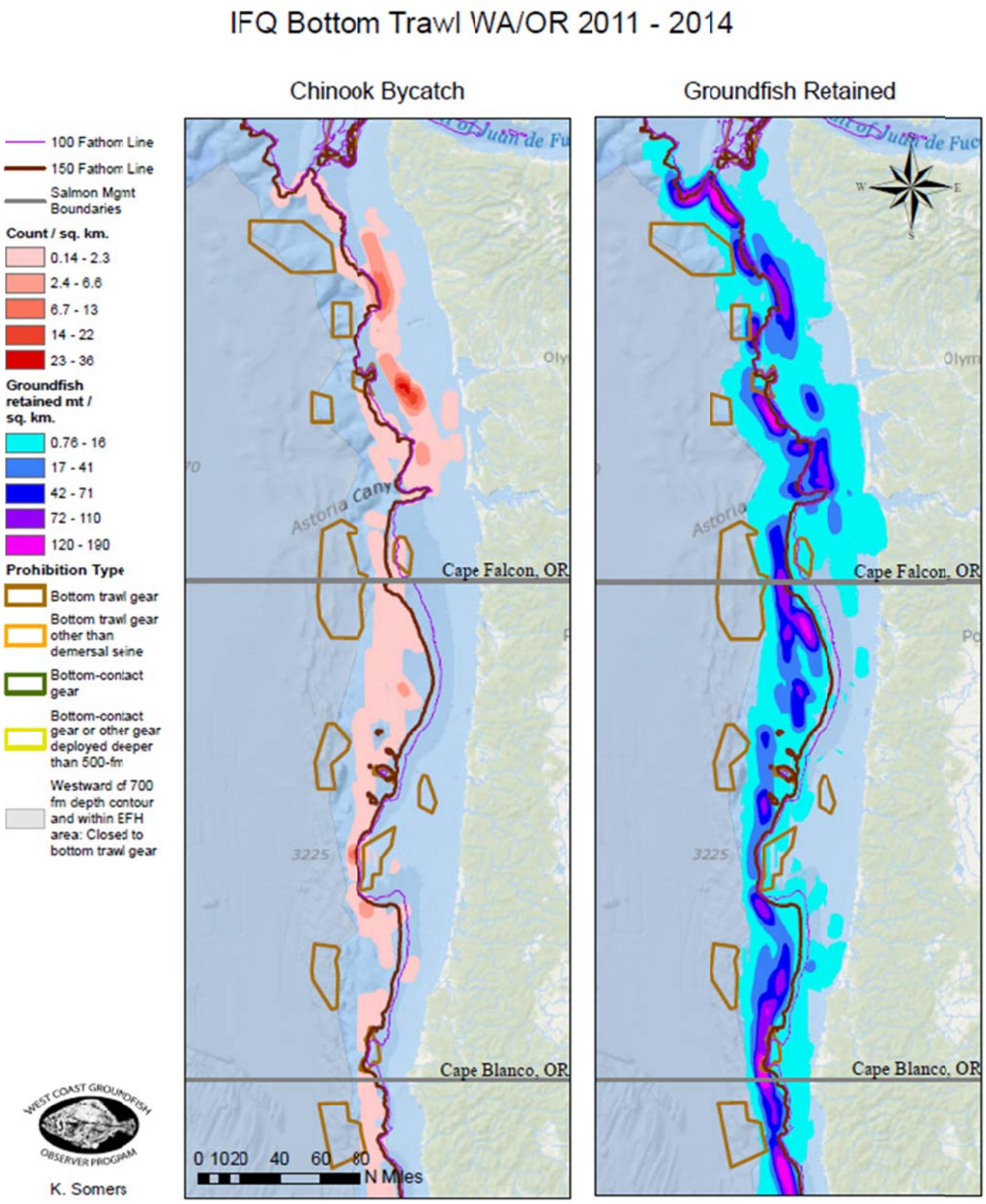

Figure 12. Shorebased IFQ Program bottom trawl Chinook and groundfish catch off Oregon and Washington, 2011-2014.

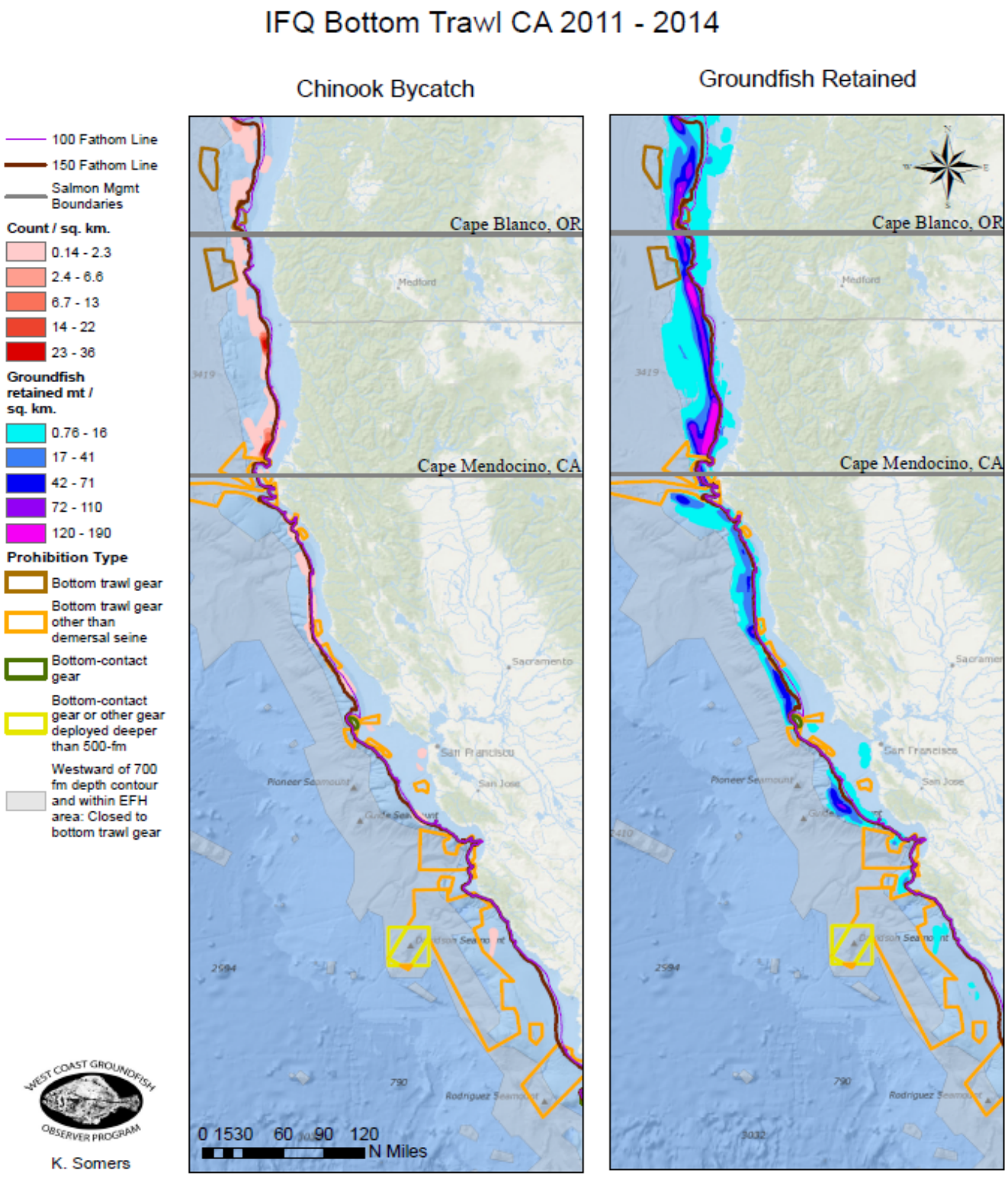

Figure 13. Shorebased IFQ Program bottom trawl Chinook and groundfish catch off California, 2011-2014.

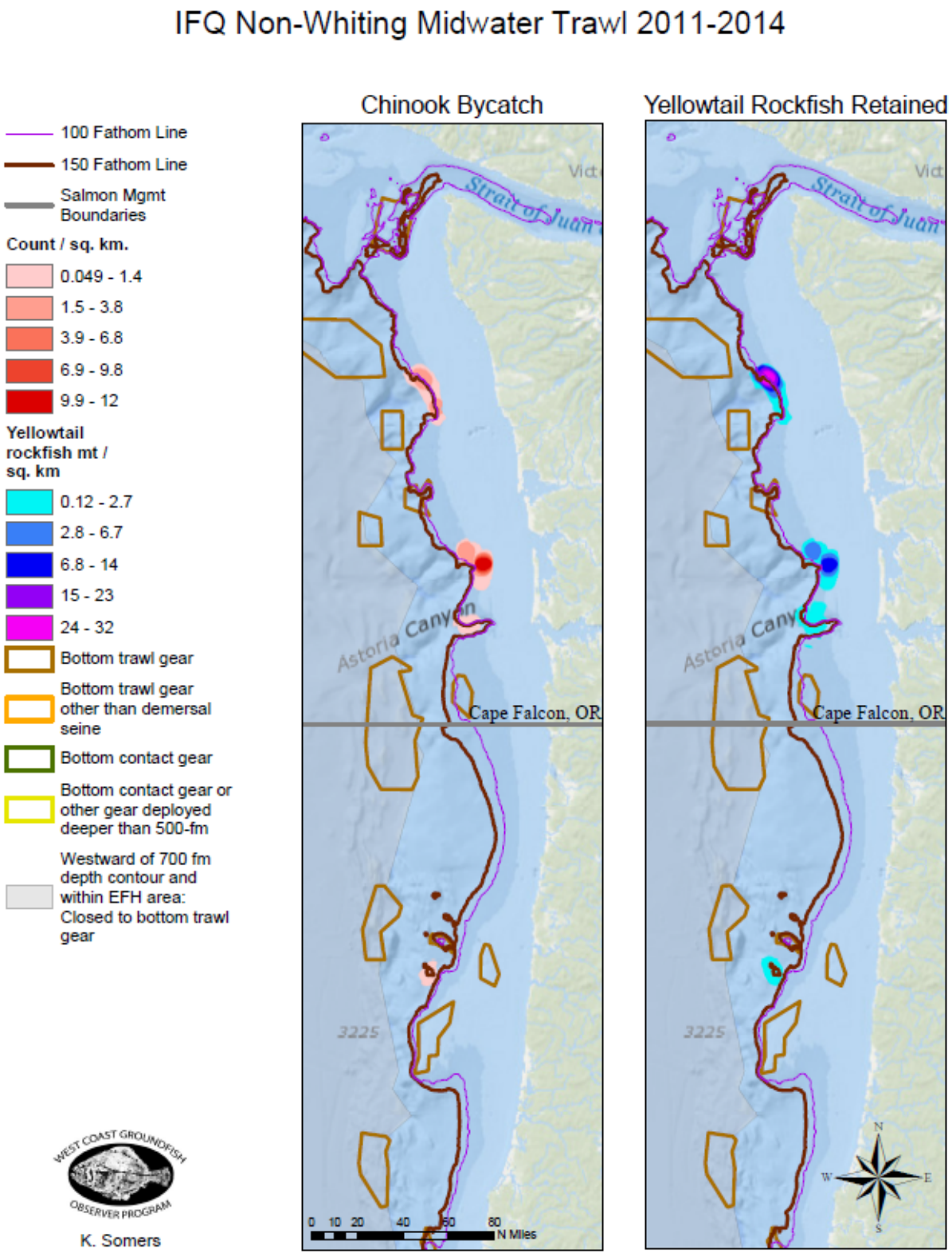

Figure 14. Shorebased IFQ Program non-whiting midwater trawl Chinook and groundfish catch coastwide, 2011-2014.

Non-trawl fisheries

Chinook bycatch by geographic area for the non-trawl fisheries are shown in Table 25 for 2009 to 2013. The annual catch has been low over that time period, ranging from 16 to 429 Chinook. The majority of the catch, 85 percent, was taken between Cape Falcon to Cape Blanco, and 15 percent taken between Cape Blanco to 40°10' N. Lat.

Table 25. Chinook counts by area for the nearshore non-trawl fisheries, 2009-2013 (Somers *et al*. 2015)

		Nearshore Non-trawl
2009	North of Cape Falcon	0
	Cape Falcon to Cape Blanco	12
	Cape Blanco to 40°10' N. Lat.	10
	South of 40°10' N. Lat.	0
2010	North of Cape Falcon	0
	Cape Falcon to Cape Blanco	16
	Cape Blanco to 40°10' N. Lat.	0
	South of 40°10' N. Lat.	0
2011	North of Cape Falcon	0
	Cape Falcon to Cape Blanco	0
	Cape Blanco to 40°10' N. Lat.	8
	South of 40°10' N. Lat.	32
2012	North of Cape Falcon	0
	Cape Falcon to Cape Blanco	43
	Cape Blanco to 40°10' N. Lat.	21
	South of 40°10' N. Lat.	0
2013	North of Cape Falcon	0
	Cape Falcon to Cape Blanco	366
	Cape Blanco to 40°10' N. Lat.	38
	South of 40°10' N. Lat.	25
Percent by area	North of Cape Falcon	0%
	Cape Falcon to Cape Blanco	85%
	Cape Blanco to 40°10' N. Lat.	15%
	South of 40°10' N. Lat.	0%

b. Coded Wire Tag Summary

Coded Wire Tags (CWTs) are an important source of stock-specific information on salmon caught in the groundfish fishery. The following section summarizes coded wire tag data from 2009 to 2013 that was collected by the observer and catch monitor programs. In the at-sea Pacific whiting fisheries, observers attempt to sample all Chinook and coho for CWTs. However, if salmon are too numerous, observers may take random subsamples with a goal of 25 fish sampled. Similarly, in the shorebased Pacific whiting fishery, catch monitors attempt to sample all Chinook and Coho for CWTs. However, if there are more than 40 salmon, random subsamples may be taken by catch monitors with a goal of 25 fish sampled. In the non-whiting fisheries, all salmon are sampled for CWTs when possible, otherwise a subsample of 10 fish are taken. Biological data including sex, length, and weight, are also gathered from fish thought to have CWTs. Once the recovery data have been verified and finalized they are reported to the coastwide Regional Mark Information System (RMIS) of the PSMFC and are available for analysis.

Recovery Estimation

CWTs recovered from hatchery stocks include both ESA listed stocks and unlisted stocks. NMFS assembled a database to identify which bycaught salmon had originated from ESA-listed ESUs. Estimating the contributions for CWT recoveries of ESA listed stocks was done in a two-step process (Johnson 2004, Nador *et* al. 2010), where the CWT data were first expanded from the observer or catch monitor sub-sample data to the total number of all salmon in the catch for a given year. The data were then expanded to take into account the untagged portion of hatchery release groups. The CWT estimation method is shown in Table 26.

Table 26. Coded wire tag recovery estimation technique.

STEP 1: Estimate the number of tagged fish in the fishery sample for the release groups

$$R_T = aR_O$$

Where

R_T is the estimated total recoveries of tags bearing the release group's code;

R_O is the observer number of tags bearing the appropriate group's code;

a is a sampling expansion factor: total catch/sampled catch

STEP 2: Account for the fraction of the release group that was tagged

$$C = bR_T$$

Where

C is the total estimated contribution of the release group to the fishery for the time and area;

b is a mark expansion factor: total fish released/total fish marked

R_T is the estimated total recoveries of tags bearing the release group's code

http://www.psmfc.org/wp-content/uploads/2012/03/Nandor_et.al_.Chap02.pdf

From 2009 to 2013, from all groundfish fisheries 937 readable CWTs were recovered from Chinook salmon and 16 from coho salmon. Of all Chinook with CWTs, 278 fish (30 percent) were from ESA-listed hatchery stocks, with the remaining 655 fish (70 percent) from unlisted U.S. stocks, Canadian Stocks, or of unknown origin. It should be noted that there are no contemporary tag groups representing the California Coastal Chinook, which means that California Coastal Chinook may be taken as bycatch but could not be identified via CWT. Table 18 shows the number of CWTs recovered by ESU, as well as the number estimate in the total catch for the Pacific whiting fisheries and the bottom trawl fishery. Table 19 further expands the bycatch number estimated in the total catch to represent the untagged portion of hatchery release groups. In the at-sea fisheries 439 tags were recovered during the 2009-2013 time period and expanded to represent all Chinook in the catch. Of the recovered tags in the at-sea fisheries 42 percent (348 fish) of the listed fish were Puget Sound Chinook, 34 percent (277 fish) were lower Columbia River Chinook, 16 percent (129 fish) were Snake River fall run Chinook, 4 percent (29 fish) were Upper Willamette River Chinook, 3 percent (22 fish) were Snake River spring/summer run Chinook and 2 percent (14 fish) were Central Valley spring run Chinook. This is in contrast to the Shorebased Pacific whiting fishery during the same time period, where 77 percent (1,160 fish) of the listed Chinook were lower Columbia River Chinook, 15 percent (226 fish) were Snake River Fall run, 6 percent (96 fish) were Puget Sound Chinook, and 1 percent (20 fish) were Central Valley spring run Chinook. In the shorebased Pacific whiting fishery, 482 tags were recovered during the 2009-2013 time period and expanded to represent all Chinook in the catch.

CWTs recovered from Chinook that were not from ESA-listed stocks are shown in Table 29 by sector, showing the number that occurred in the samples and as expanded to estimate the number of fish in the total catch. In the at-sea Pacific whiting fisheries, the unlisted hatchery stocks projected to have occurred in the catch over the five year period from 2009 to 2013 were primarily Klamath/Trinity River fall run Chinook (39 percent), followed by northern Washington fall run (11 percent), Klamath/Trinity River spring run (7 percent), Central California Coastal fall run (6 percent) and Upper Columbia River summer run (6 percent). The remaining stocks made up 5 percent or less of the Chinook total catch with CWT in the at-sea sectors. In the shorebased Pacific whiting fisheries, the unlisted hatchery stocks projected to have occurred in the catch over the five year period from 2009 to 2013 were primarily Klamath/Trinity River fall run Chinook (26 percent), followed by Upper Columbia River summer run (10 percent), Central California Coastal fall run (9 percent), Sacramento/Central California Coastal Fall (9 percent), Canadian stocks (8 percent), and lower Columbia River fall run (6 percent). The remaining stocks made up 5 percent or less of the Chinook total catch with CWT in the shorebased Pacific whiting sector. Unlisted Chinook in the bottom trawl fishery, are almost all from California hatchery stocks.

Although unlisted, fall Chinook CWT groups from Iron Gate and Trinity hatcheries have been used as a surrogate for California coastal Chinook for ESA assessment because California coastal Chinook are not tagged. Klamath tag recoveries and their associated ocean distribution are considered to be representative of California Coastal Chinook. Genetic Stock Identification (GSI) work indicates that California Coastal Chinook appear to have an ocean distribution that is intermediate between Klamath and Central Valley (Larrie Lavoy Pers. comm.). However, Klamath tag recoveries cannot be directly related to a number of California coastal Chinook, but only the likelihood that the fishery may intercept California Coastal Chinook.

Table 21 shows 2009 to 2013 CWT recoveries by month and by sector for April to December. Although fewer overall salmon are caught in the Pacific whiting sectors in the May to July time period (Table 13), a greater proportion of the fish with recovered CWTs were from listed ESUs (Table 30). In August, the at-sea fisheries slow when most vessels leave for the Alaska Pollock fishery, but the shorebased Pacific whiting fishery tends have peak catches of Pacific whiting and higher Chinook bycatch (Table 13). In recent years, the highest catches of Chinook have occurred in the fall months from September to

November. The data in Table 30 indicates that a lower proportion of the Chinook caught in the fall with CWTs are from listed ESUs.

Figure 15 shows CWT recoveries for Chinook by age and sector. Figures 16 and 17 show Chinook age data by Pacific whiting sector and month. Overall for the 2009-2013 time period, all sectors of the Pacific whiting fishery were dominated by two and three year old Chinook. The bottom trawl fishery primarily took two year old fish during the same time period. The age of the Chinook caught in the at-sea sectors of the Pacific whiting fisheries varies by month, with three year old fish dominating the May and June catch, and two year old fish dominating the November and December catch. In the shorebased Pacific whiting fisheries, three year old fish dominated the fishery from May to June and again at the end of the year from October to December. However, two year old fish have been dominant in August and September.

Table 31 shows CWT recovery data for coho from listed ESUs by sector and Table 32 shows recoveries by month. With only 16 CWT recovered from coho and only 4 from listed ESUs, the data can only be used to indicate that listed ESUs are encountered in all sectors of the Pacific whiting fishery.

c. Genetic Data Summary

Moran and Tuttle (2011) used genetic mixture analysis to obtain stock composition estimates for Chinook salmon bycatch from the 2009 and 2010 Pacific whiting at-sea sectors. The following information on genetic structure was summarized from Moran and Tuttle (2011).

Chinook bycatch in 2009 and 2010 had a northerly distribution. In both 2009 and 2010, southern stocks were abundant early in the season, between mid-May and mid-Aug, but declined later as northern stocks increased. Bycatch in the Eureka area was dominated by southern stocks. Columbia River stocks were dominant in the Columbia area. Although Columbia River stocks were abundant in the Vancouver area the stock composition included Puget Sound and Fraser River stocks. The Lower Fraser genetic stock group contributed more than 30 percent of the Chinook salmon bycatch in the Vancouver area. The genetic analysis showed that the major contributors of Chinook bycatch in 2009 and 2010 were lower Fraser populations (>25 percent each year) followed by Columbia River stocks in 2009 but shifting south to Klamath, Rogue, and Mid-Oregon coastal stocks in 2010. Several genetic stock groups that include ESA-listed populations showed statistically significant contributions to these bycatch mixtures (95 percent confidence limits not overlapping zero). In 2009, these included West Cascade spring and fall groups and Spring Cr. Group tules (2.8 percent, 7.4 percent, and 10.3 percent), Snake River falls (3.9 percent), Hood Canal and North and South Puget Sound stocks (6.2 percent, 6.2 percent, and 5.2 percent). In 2010, genetic stock groups with protected populations included California Coast (2 percent), West Cascade falls and Spring Cr. Group (3.6 percent and 4.8 percent), Hood Canal and North and South Puget Sound (4.9 percent, 5.2 percent, and 4.2 percent). Stratified results, as well as differences among years, underscored the importance of proximity of contributing stocks. Significant temporal differences were also observed in the timing of shifts between northern and southern stocks.

NOTE: Further genetic analysis on Chinook caught in 2011-2013 for all sectors of the Pacific whiting fishery are expected to be added to this document by September 2015.

d. Fishery Impacts Summary

- In the Pacific whiting fisheries, Chinook bycatch catch rates and number vary by year and month, and by the available harvest of target species, areas and depth where the fisheries occur.
- Chinook salmon bycatch was highest in the shorebased whiting sector from June to August in waters shallower than 100 fm. However, from September to December, bycatch rates more frequently exceeded 0.05 Chinook per mt of Pacific whiting with November having the highest bycatch rates in all depths.
- For the at-sea sectors the majority of the Chinook were caught is waters deeper than 150 fm. In general, salmon bycatch rates have been highest in the fall, September to December, and lowest from late-spring to summer, May to August.
- Although fewer overall salmon are caught in the Pacific whiting sectors in the May to July time period, a greater proportion of the fish with recovered CWTs were from listed ESUs.
- All Pacific whiting sectors have high bycatch rates in the area west of Heceta Bank.
- When the whiting TAC exceeds 220,000 mt, a Chinook bycatch rate of 0.05 will not keep the Chinook bycatch below 11,000 fish
- CWT data indicates that catch in all sectors of the Pacific whiting fishery were dominated by two and three year old Chinook. The bottom trawl fishery primarily took two year old fish.
- Genetic analysis of Chinook caught in the 2009-2010 at-sea fisheries showed stratified results, as well as differences among years that underscored the importance of proximity of contributing stocks.
- Chinook bycatch rates and amounts have been higher in the midwater trawl fisheries than in the groundfish bottom trawl and longline fisheries, particularly since the implementation of RCAs and EFHCAs, and prohibitions on large footrope gear shoreward of the RCAs, and the required use of selective flatfish trawl north of 40°10’ N. lat.
- Chinook salmon bycatch is increasing in the non-whiting midwater trawl fishery, particularly north of Cape Blanco.
- Coho, chum, pink and sockeye salmon continue to make up much smaller portions of the salmon bycatch in groundfish fisheries.

Table 27. Number coded wire tag recoveries in samples and expanded to total Chinook bycatch, by ESA ESU for 2009-2013 (RMIS, A-SHOP Snoutbase, Catch monitor Program).

		2009		2010		2011		2012		2013		2014	
ESA Listed Chinook by ESU	**At-sea Pacific Whiting Fisheries** a/	**CWT in samples**	**CWT in total catch**	**CWT in samples**	**CWT in total catch**	**CWT in samples**	**CWT in total catch**	**CWT in samples**	**CWT in total catch**	**CWT in samples**	**CWT in total catch**	**CWT in samples**	**CWT in total catch**
	Annual Expansion Factor b/		**2.74**		**2.00**		**2.30**		**2.10**		**2.46**		NA
	Central Valley Spring run	0	0	0	0	4	9	0	0	2	5	NA	NA
	Upper Willamette River Chinook	0	0	0	0	1	2	0	0	0	0	NA	NA
	Lower Columbia River Chinook	2	5	5	10	3	7	0	0	0	0	NA	NA
	Puget Sound Chinook	5	14	4	8	5	13	5	11	0	0	NA	NA
	Snake River Fall-run	13	36	8	16	16	37	4	8	1	2	NA	NA
	Snake River spring/summer run	1	3	1	2	2	5	1	2	0	0	NA	NA
	Pacific Whiting Shorebased IFQ												
	Annual Expansion Factor b/		**2.36**		**1.38**		**1.31**		**1.30**		**1.20**		**2.10**
	Central Valley Spring run	0	0	5 b/	7	1 b/	1	1	1	6	7	NA	NA
	Upper Willamette River Chinook	0	0	0	0	0	0	0	0	0	0	NA	NA
	Lower Columbia River Chinook	0	0	30	41	33	43	0	0	2	2	NA	NA
	Puget Sound Chinook	0	0	4	6	5	7	1	1	0	0	NA	NA
	Snake River Fall-run	12	28	61	84	25	33	4	5	3	4	NA	NA
	Snake River spring/summer run	0	0	0	0	0	0	0	0	0	0	NA	NA
	Bottom Trawl Shorebased IFQ												
	Annual Expansion Factor		NA		NA				NA		NA		NA
	Central Valley Spring run	0		0		1		0		0		NA	NA

a/ Includes Catcher/processor sector, Mothership sector, and tribal Chinook bycatch processed at-sea

b/ #Chinook caught/#Chinook sampled

c/ 2 hybrids not included in total in 2010 and 1 hybrid not included in 2011

Table 28. Number of coded wire tag recoveries expanded to represent unsampled Chinook by ESA ESU, 2009-2013 (RMIS, A-SHOP Snoutbase, Catch monitor Program).

Chinook Salmon Listed ESU by Sector	2009		2010		2011		2012		2013		2014	
At-sea Pacific Whiting Fisheries a/	CWT in total catch	Total Mark expansion	CWT in total catch	Total Mark expansion	CWT in total catch	Total Mark expansion	CWT in total catch	Total Mark expansion	CWT in total catch	Total Mark expansion	CWT in total catch	Total Mark expansion
Average Mark Expansion		**4.78**		**6.42**		**2.93**		**4.24**		**1.14**		NA
Central Valley Spring run	0	0	0	0	9	9	0	0	5	5	NA	NA
Upper Willamette River Chinook	0	0	0	0	2	29	0	0	0	0	NA	NA
Lower Columbia River Chinook	5	90	10	132	7	55	0	0	0	0	NA	NA
Puget Sound Chinook	14	135	8	73	13	67	11	73	0	0	NA	NA
Snake River Fall-run	36	42	16	23	37	48	8	13	2	3	NA	NA
Snake River spring/summer run	3	10	2	3	5	6	2	3	0	0	NA	NA
Pacific Whiting Shorebased IFQ												
Average Mark Expansion		**1.50**		**5.64**		**7.44**		**3.00**		**2.46**		NA
Central Valley Spring run	0	0	7	10	1	2	1	1	7	7	NA	NA
Upper Willamette River Chinook	0	0	0	0	0	0	0	0	0	0	NA	NA
Lower Columbia River Chinook	0	0	41	606	43	534	0	0	2	20	NA	NA
Puget Sound Chinook	0	0	6	39	7	46	1	11	0	0	NA	NA
Snake River Fall run	28	42	84	124	33	46	5	9	4	5	NA	NA
Snake River spring/summer run	0	0	0	0	0	0	0	0	0	0	NA	NA
Bottom Trawl Shorebased IFQ												
Central Valley Spring run	NA		NA		NA		NA		NA		NA	

a/ Includes Catcher/processor sector, Mothership sector, and tribal Chinook bycatch processed at-sea

Table 29. Number coded wire tag recoveries in samples and expanded to total Chinook bycatch, by river basin for stocks not listed under ESA for 2009-2013 (RMIS, A-SHOP Snoutbase, Catch monitor Program).

	2009		2010		2011		2012		2013		2014	
	CWT in samples	CWT in total catch	CWT in samples	CWT in total catch	CWT in samples	CWT in total catch	CWT in samples	CWT in total catch	CWT in samples	CWT in total catch	CWT in samples	CWT in total catch
At-sea Pacific Whiting Fisheries												
Annual Expansion Factor		**2.74**		**2.00**		**2.30**		**2.10**		**2.46**		NA
British Columbia	7	19	6	12	4	9	0	0	0	0	NA	NA
Northern Washington Fall	0	0	1	2	4	92	1	2	0	0	NA	NA
Northern Washington Coast Fall	0	0	2	4	0	0	0	0	0	0	NA	NA
Northern Washington Coast Summer	0	0	0	0	2	3	0	0	0	0	NA	NA
Hood Canal Fall	0	0	0	0	0	0	1	2	0	0	NA	NA
Mid Puget Sound Fall	2	5	1	2	5	12	0	0	0	0	NA	NA
South Puget Sound Fall	0	0	1	2	1	2	0	0	0	0	NA	NA
Upper Columbia River Fall	0	0	1	2	1	2	0	0	0	0	NA	NA
Upper Columbia River Summer	5	14	2	4	9	21	0	0	5	12	NA	NA
Lower Columbia River Fall	0	0	2	4	3	4	0	0	1	2	NA	NA
Central Columbia River Late & URB L-Fall	0	0	0	0	2	3	1	1	0	0	NA	NA
Central Columbia River Spring	1	3	0	0	0	0	0	0	0	0	NA	NA
Snake River Spring	0	0	0	0	1	2	0	0	0	0	NA	NA
North Oregon Coast Spring	1	3	0	0	5	12	0	0	0	0	NA	NA
Southern Oregon Coast Fall	1	3	3	6	3	7	6	13	5	12	NA	NA
Southern Oregon Coast Spring	0	0	0	0	9	21	9	19	2	5	NA	NA
Northern California Coastal Fall	0	0	3	6	0	0	0	0	4	10	NA	NA
Klamath/Trinity River Fall	1	3	2	4	53	121	74	155	26	64	NA	NA
Klamath/Trinity River Spring	0	0	4	9	10	23	9	19	5	12	NA	NA
Central California Coastal Fall	0	0	1	2	9	21	5	11	6	15	NA	NA
Sacramento/Central California Coastal Fall	0	0	15	30	0	0	0	0	4	10	NA	NA
Sacramento/San Joaquin Late Fall	0	0	0	0	0	0	0	0	4	10	NA	NA
San Joaquin Fall	0	0	0	0	5	12	1	2	2	5	NA	NA
Pacific Whiting Shorebased IFQ												
Annual Expansion Factor		**2.36**		**1.38**		**1.31**		**1.30**		**1.20**		**NA**
British Columbia	0	0	13	18	10	13	1	1	0	0	NA	NA
Northern Washington Fall	0	0	3	4	0	0	0	0	0	0	NA	NA
Northern Washington Coast Fall	0	0	1	1	1	1	0	0	0	0	NA	NA

Table 29. (continued)

	2009		2010		2011		2012		2013		2014	
	CWT in samples	CWT in total catch	CWT in samples	CWT in total catch	CWT in samples	CWT in total catch	CWT in samples	CWT in total catch	CWT in samples	CWT in total catch	CWT in samples	CWT in total catch
Mid Puget Sound Fall	1	2	0	0	1	1	0	0	0	0	NA	NA
South Puget Sound Fall	0	0	2	3	0	0	1	1	0	0	NA	NA
Strait of Juan de Fuca	0	0	1	1	0	0	0	0	0	0	NA	NA
Grays Harbor Fall	0	0	0	0	0	0	0	0	1	1	NA	NA
Upper Columbia River Fall	0	0	0	0	1	1	0	0	0	0	NA	NA
Upper Columbia River Summer	2	5	7	10	15	20	3	4	1	0	NA	NA
Upper Columbia River Spring	0	0	1	1	0	0	0	0	0	0	NA	NA
Lower Columbia River Fall	1	2	5	7	5	7	2	3	3	4	NA	NA
Lower Columbia River URB L-Fall	0	0	1	1	1	1	0	0	0	0	NA	NA
Central Columbia River Fall	0	0	4	6	1	1	0	0	0	0	NA	NA
Central Columbia River Late & URB L-Fall	0	0	3	4	2	3	0	0	0	0	NA	NA
Central Columbia River Spring	0	0	2	3	0	0	0	0	0	0	NA	NA
North Oregon Coast Fall	0	0	0	0	2	3	0	0	0	0	NA	NA
North Oregon Coast Spring	0	0	3	4	0	0	1	1	0	0	NA	NA
Southern Oregon Coast Fall	5	12	1	1	2	3	1	1	1	1	NA	NA
Southern Oregon Coast Spring	0	0	1	1	3	4	3	4	1	1	NA	NA
Klamath/Trinity River Fall	1	2	6	8	10	13	43	56	17	20	NA	NA
Klamath/Trinity River Spring	0	0	4	6	2	3	6	8	3	4	NA	NA
Northern California Coastal Fall	0	0	7	10	0	0	0	0	1	1	NA	NA
Central California Coastal Fall	1	2	8	11	5	7	5	7	5	6	NA	NA
Sacramento River Hybrid	0	0	2	3	1	1	0	0	0	0	NA	NA
Sacramento/Central California Coastal Fall	0	0	9	12	8	10	5	7	4	5	NA	NA
Sacramento/San Joaquin Late Fall	0	0	3	4	1	1	1	1	0	0	NA	NA
San Joaquin Fall	0	0	1	1	5	7	3	4	0	0	NA	NA
Bottom Trawl Shorebased IFQ												
Annual Expansion Factor		NA		NA		NA		NA		NA		NA
Lower Columbia River Fall	0		0		1		0		0		NA	NA
Klamath/Trinity River Fall	0		0		7		0		0		NA	NA
Klamath/Trinity River Spring	0		0		2		0		0		NA	NA
Central California Coastal Fall	1		0		1		0		0		NA	NA
Sacramento/Central California Coastal Fall	0		0		1		0		0		NA	NA
Sacramento/San Joaquin Late Fall	0		0		1		0		0		NA	NA

Table 30. Chinook salmon coded wire tag recoveries by month, 2009-2013 (RMIS)

	Number per Month								
	Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
At-sea Pacific Whiting Fisheries									
Chinook with CWT a/	--	75	9	10	12	31	125	103	73
ESA Listed ESUs (unexpanded) Central Valley Spring run Upper Willamette River Chinook Lower Columbia River Chinook Puget Sound Chinook Snake River Fall run Snake River spring/summer run	--	31 (1) (0) (3) (7) (16) (4)	3 (0) (0) (0) (0) (2) (1)	2 (1) (0) (0) (0) (1) (0)	6 (0) (0) (2) (1) (3) (0)	10 (0) (1) (3) (5) (1) (0)	8 (1) (0) (1) (2) (4) (0)	12 (3) (0) (1) (0) (8) (0)	11 (0) (0) (0) (4) (7) (0)
Listed ESUs as % of Chinook with CWTs	--	41%	33%	20%	50%	32%	6%	12%	15%
Pacific Whiting Shorebased IFQ									
Chinook with CWT	--	16	39	38	189	72	49	68	8
ESA Listed ESUs (unexpanded) Central Valley Spring run Upper Willamette River Chinook Lower Columbia River Chinook Puget Sound Chinook Snake River Fall run Snake River spring/summer run	--	0 (0) (0) (0) (0) (0) (0)	22 (1) (0) (5) (0) (16) (0)	20 (2) (0) (1) (0) (17) (0)	110 (4) (0) (46) (7) (53) (0)	35 (5) (0) (13) (2) (15) (0)	2 (0) (0) (0) (0) (2) (0)	3 (1) (0) (0) (1) (1) (0)	1 (0) (0) (0) (0) (1) (0)
Listed ESUs as % of Chinook with CWTs	--	0	56%	53%	58%	49%	4%	4%	13%
Bottom Trawl Shorebased IFQ									
Chinook with CWT	--	1	1	0	0	1	1	**0**	12
ESA Listed ESUs (unexpanded) Central Valley Spring run	--	0	1 (1)	0	0	0	0	0	1 (1)
Listed ESUs as % of Chinook with CWTs	--	0	100%	0	0	0	0	0	8%

a/ includes Canadian fish and fish with unknown origin.

Table 31. Number coded wire tag recoveries in samples and expanded to total coho catch, by ESA ESU for 2009-2013 (RMIS, A-SHOP Snoutbase, Catch monitor Program).

		2009		2010		2011		2012		2013		2014	
ESA Listed Coho by ESU		CWT in samples	CWT in total catch	CWT in samples	CWT in total catch	CWT in samples	CWT in total catch	CWT in samples	CWT in total catch	CWT in samples	CWT in total catch	CWT in samples	CWT in total catch
	At-sea Pacific Whiting Fisheries												
	Annual Expansion Factor a/						**1.5**						NA
	Lower Columbia River Coho	0	0	0	0	1	2	0	0	0	0	NA	NA
	Pacific Whiting Shorebased IFQ												
	Annual Expansion Factor												**NA**
	Lower Columbia River Coho	2		1		1		0		0		NA	NA

a/ #Coho caught/#Coho sampled

Table 32. Coho salmon with coded wire tag recoveries by month, 2009-2013 (RMIS).

	Number per Month								
	Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
At-sea Pacific Whiting Fisheries									
Coho CWT	--	2	0	0	0	0	0	0	1
ESA Listed ESUs (unexpanded) Lower Columbia River Coho	--	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Listed ESUs as % of Chinook with CWTs	--	50%	0%	0%	0%	0%	0%	0%	0%
Pacific Whiting Shorebased IFQ									
Coho with CWT	--	0	2	1	2	1	0	0	0
ESA Listed ESUs (unexpanded) Lower Columbia River Coho	--	0 (0)	2 (2)	0 (0)	1 (1)	1 (1)	0 (0)	0 (0)	0 (0)
Listed ESUs as % of Coho with CWTs	--	0%	100%	0%	50%	100%	0%	0%	0%

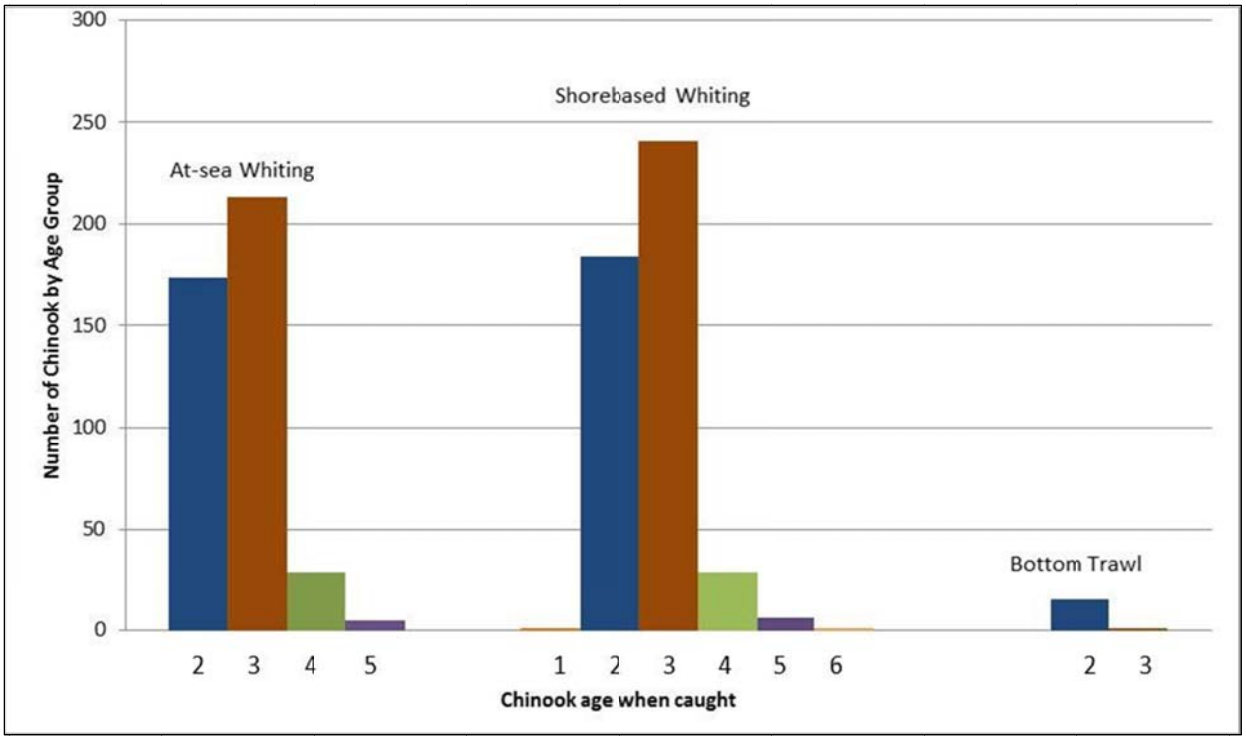

Figure 15. Number of Chinook with coded wire tags catch by age and sector 2009-2013, includes ESA listed and unlisted U.S. stocks (RMIS)**.**

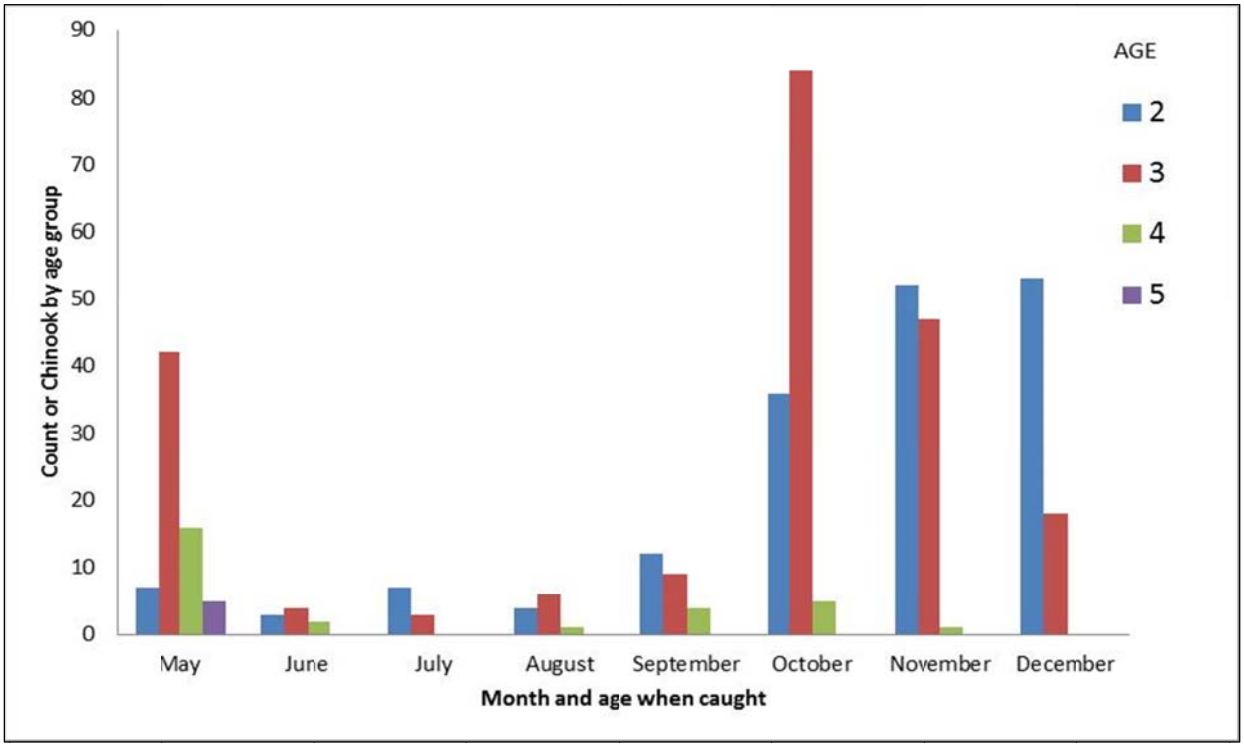

Figure 16. At-sea Pacific whiting Fisheries, number of Chinook with coded wire tags by age and month 2009-2013, includes ESA listed and unlisted U.S. stocks (RMIS)**.**

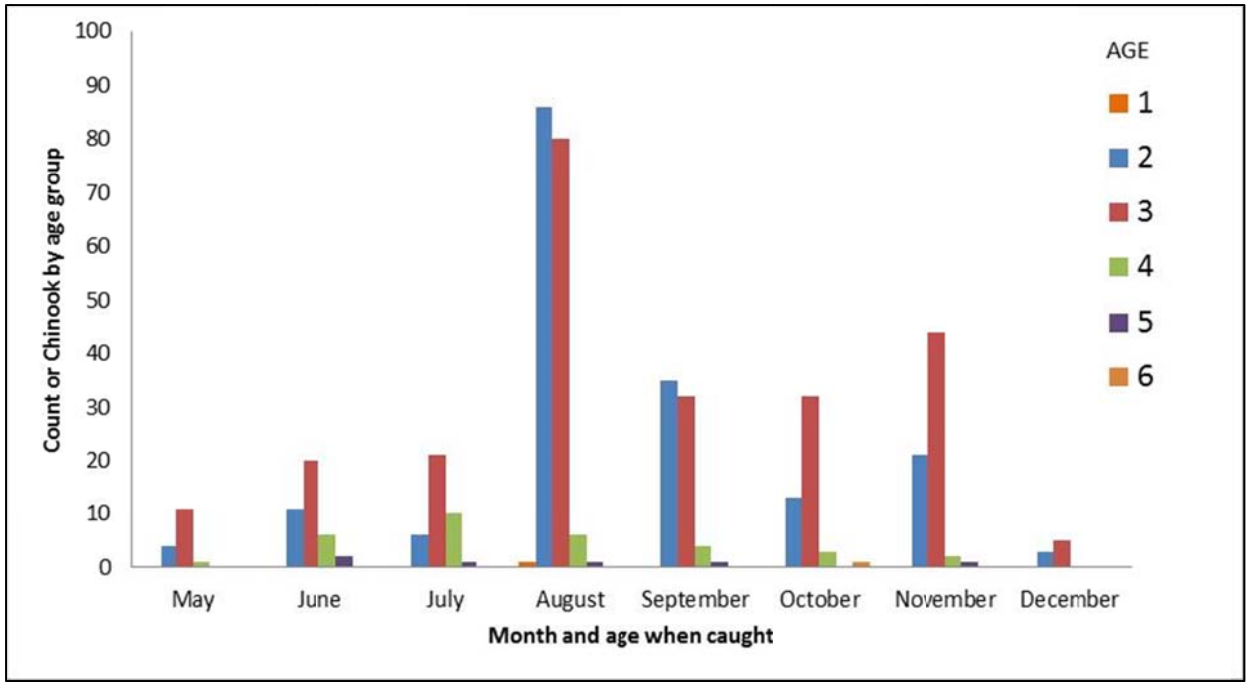

Figure 17. Shorebased Pacific whiting Fisheries, number of Chinook with coded wire tags by age and month 2009-2013, includes ESA listed and unlisted U.S. stocks (RMIS)**.**

V. Conservation Measures

The Pacific whiting fisheries have a history of salmon take that is well documented. Documentation of take in other sectors has improved since implementation of the WCGOP in 2002. As noted above, with implementation of the Shorebased IFQ program in 2011, documentation of catch in the bottom trawl fishery has significantly improved. Since 2009 the WCGOP has prepared catch reports showing salmon bycatch in all commercial sectors of the Pacific Coast groundfish fishery.

Provisions in previous biological opinions for Pacific whiting aimed at reducing the overall catch of Chinook salmon. The following provisions in the current groundfish regulations were designed to minimize the bycatch of Chinook salmon in the Pacific Whiting Fishery (bolded provisions are also identified in the term and conditions of the biological opinion):

- **The start of the at-sea whiting fisheries north of 42°00' north latitude has been delayed until at least May 15.**

- From 1997 to 2014, shorebased fishing was allowed to start on April 1 between 40°30' and 42°00' north latitude, but only 5 percent of the shore-based allocation was allowed to be taken prior to the opening of coastwide fishery on June 15. Beginning in 2015, the fishery north of 40°30' is proposed to begin on May 15.

- **Harvest of whiting has been restricted to 10,000 lb per trip shoreward of 100 fathoms (183 m) in the Eureka catch area (40°30'- 43°00' north latitude) year round.**

- Night fishing (midnight to one hour after official sunrise) is prohibited south of 42°00' north latitude.

- Whiting may not be processed at sea south of 42°00 N. lat.

- The targeting of Pacific whiting is prohibited within the nearshore Klamath and Columbia River Salmon Conservation Zones.

- Ocean salmon conservation zones – allow for the closure of fishing for whiting shoreward of 100 fathoms if and when NMFS determines that the bycatch of Chinook is likely to exceed the 11,000 Chinook bycatch.

On January 22, 2013 the NMFS West Coast Region's Sustainable Fisheries Division requested reinitiation of the current salmon biological opinion for the groundfish fisheries. The request resulted from the evolution of the trawl fishery under the trawl rationalization framework and improving conditions for species such as widow rockfish that are expected to change the characteristics of the fishery. In addition, routine WCGOP data reports contained new estimates of Chinook and coho salmon bycatch in the nearshore fixed gear fisheries (open access and limited entry fisheries), limited entry sablefish fishery, and open access California Halibut fishery. The updated biological opinion was expected to be completed prior to implementation of the 2015-2016 harvest specifications and management measures.

In October 2014 prior to completion of the update biological opinion, catch data indicated that the Pacific whiting fisheries in aggregate exceeded the 11,000 Chinook threshold, also requiring reinitiation of the consultation. Together with the changes in the fishery identified in the January 22, 2013 reinitiation request, NMFS determined that the reinitiation should address all fishing under the Pacific Coast Groundfish FMP, including the Pacific whiting and non-whiting fisheries and all gears. Concurrently, NMFS determined that the action on which the consultation would occur required revision to reflect the on-going and anticipated changes in the fisheries and developed several options.

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