

Draft Socioeconomic Analyses for the 2025-26 Harvest Specifications and Management Measures

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Acronyms and Abbreviations

ABC	Acceptable biological catch
ACL	Annual catch limit
ACS	American Community Survey
ACT	Annual catch target
AFSC	Alaska Fisheries Science Center
AM	Accountability measure
APA	Administrative Procedures Act
B ₀	Biomass, unfished
BIOP	Biological opinion
BRA	Bycatch reduction area
BRD	Bycatch reduction device
CalCOFI	California Cooperative Oceanic Fisheries Investigations
CA/OR/WA	California, Oregon, and Washington
CCA	Cowcod Conservation Area
CCE	California Current Ecosystem
CCIEA	California Current Integrated Ecosystem Assessment
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CP	Catcher-processor
CPFV	Commercial passenger fishing vessel
CPS	Coastal pelagic species
CPUE	Catch per unit of effort
CRFS	California Recreational Fisheries Survey
CV	Coefficient of variation
CZMA	Coastal Zone Management Act
DB-SRA	Depletion-based stock reduction analysis
DCAC	Depletion-corrected average catch
DEIS	Draft Environmental Impact Statement
DO	Dissolved oxygen
DPS	Distinct population segment
DTL	Daily trip limit (fishery)
DTS	Dover sole, thornyheads, and sablefish
E	Exploitation
EA	Environmental Assessment
EC	Ecosystem component
EDC	Economic Data Collection (Program)
EEZ	Exclusive Economic Zone
EFH	Essential fish habitat
EFHRC	Essential Fish Habitat Review Committee
EFP	Exempted fishing permit
EIS	Environmental Impact Statement
ENSO	El Niño Southern Oscillation
EO	Executive Order
ESA	Endangered Species Act

ESU	Evolutionary significant unit
EwE	Ecopath with Ecosim
F	Fishing mortality
FEIS	Final Environmental Impact Statement
FEP	Fishery Ecosystem Plan
FM	Fathom or fathoms
FMP	Fishery Management Plan
GAP	Groundfish Advisory Subpanel
GCA	Groundfish Conservation Area
GIS	Geographic information system
GMT	Groundfish Management Team
h	Stock-recruitment steepness parameter
HA	Hectares
HAPC	Habitat Areas of Particular Concern
HCR	Harvest control rule
HG	Harvest guideline
HMS	Highly Migratory Species
IBQ	Individual bycatch quota
ID	Identification
IEA	Integrated Ecosystem Assessment
IFQ	Individual fishing quota
IOPAC	Input-output model for Pacific Coast fisheries
IPCC	Intergovernmental Panel on Climate Change
ITS	Incidental take statement
IUCN	International Union for the Conservation of Nature
LE	Limited entry
LEFG	Limited entry fixed gear
LOF	List of Fisheries
M	Instantaneous rate of natural mortality
MBTA	Migratory Bird Treaty Act
MEI	Multivariate ENSO Index
MFMT	Maximum Fishing Mortality Threshold
MHHW	Mean higher high water level
MMPA	Marine Mammal Protection Act
MPA	Marine Protected Area
MRFSS	Marine Recreational Fisheries Statistical Survey
MSA Stevens	Magnuson-Stevens Fishery Conservation and Management Act, Magnuson- Act
MSE	Management strategy evaluation
MSST	Minimum Stock Size Threshold
MSY	Maximum sustainable yield
MT	Metric ton
MTC	Mean temperature of catch
MTL	Mean trophic level
NAO	NOAA Administrative Order
NEPA	National Environmental Policy Act

NID	Negligible Impact Determination
NMFS	National Marine Fisheries Service
NMNU	Non-market and non-use
NOI	Notice of Intent
NORPAC	North Pacific Database Program
NPGO	North Pacific Gyre Oscillation
NWFSC	Northwest Fisheries Science Center
OA	Open access
ODFW	Oregon Department of Fish and Wildlife
OFL	Overfishing limit
OFS	Overfished species
ORBS	Ocean Recreational Boat Survey
OY	Optimum yield
P*	Overfishing probability
PacFIN	Pacific Fisheries Information Network
PBR	Potential biological removal
PCGW	Pacific Coast Groundfish and Endangered Species Workgroup
PDO	Pacific Decadal Oscillation
PMFC	Pacific Fishery Management Council (used in references)
POP	Pacific ocean perch
PR	Private/rental boats
PRD	NMFS Protected Resources Division
PSA	Productivity-susceptibility analysis
QP	Quota pounds
QS	Quota share
QSM	Quota species monitoring
Rec	Recreational
RecFIN	Recreational Fisheries Information Network
RBS	Rougheye/blackspotted/shorthead (rockfish complex)
RCA	Rockfish Conservation Area
RCG	Rockfish, cabezon, and greenling
RES	Research
RIR	Regulatory Impact Review
SAFE	Stock Assessment and Fishery Evaluation
SCWC	South and Central Washington Coast
SFD	Sustained Fisheries Division
SPID	Species identification code
SPR	Spawning potential ratio
SSC	Scientific and Statistical Committee
STAR	Stock Assessment Review
SWFSC	Southwest Fisheries Science Center
TAC	Total allowable catch
TCEY	Total constant exploitation yield
USFWS	United States Fish and Wildlife Service
V	Vulnerability
VMS	Vessel monitoring system

WCGOP	West Coast Groundfish Observer Program
WCR	West Coast Region
WDFW	Washington Department of Fish and Wildlife
WOC	Washington, Oregon, and California
XDB-SRA	Extended Depletion-based Stock Reduction Analysis
YOY	Young-of-the-year
YRCA	Yelloweye rockfish Conservation Area

1. Socioeconomic Environment

Previous EISs, EAs, decision documents, section 3.2 in the 2015 EIS for the biennial harvest specifications and management measures, and the Groundfish SAFE (PFMC 2024b) present detailed characterizations of the Pacific coast groundfish fishery. That information is incorporated by reference and updated here.

1.1 *Groundfish Fishery Sectors*

The commercial groundfish fishery comprises the following fishery sectors:

- **Pacific whiting trawl** is composed of at-sea and shoreside fisheries (the latter of which is a segment of the Individual Fishing Quota (IFQ) fishery, described below). The at-sea sector is subdivided between mothership processing vessels accepting fish from catcher boats, and catcher-processor vessels. The shoreside fishery delivers to processing plants on land; with Westport, Washington; and Astoria and Newport, Oregon being the principal ports receiving shoreside whiting landings.
- **Non-whiting trawl/shorebased IFQ** catches a variety of other species, although sablefish and some rockfish and flatfish are the main revenue earners. Beginning in 2011 this fishery has been managed under an IFQ program. This fishery is now usually referred to as “shorebased IFQ,” because an important feature of this management program is a relaxation on allowed gear types used by these permitted vessels. As a result, landings of sablefish by gear types other than trawl have emerged as an important part of the revenue earned by permitted vessels in this sector. In addition, a midwater trawl that targets non-whiting species, such as widow and yellowtail rockfish has redeveloped (gone since the 1990s).
- **Fixed gear (longline and pot) fisheries** are divided **into** limited entry (LE) and open access (OA) portions from a regulatory standpoint. The fixed gear fisheries are also split into a “non-nearshore” sector—primarily targeting sablefish—and a “nearshore” sector targeting various nearshore groundfish species.
- **Incidental OA fisheries** include a number of non-groundfish fisheries that take groundfish incidentally and have been characterized as groundfish incidental OA for the purpose of management and data presentation. In aggregate they account for a very small proportion of groundfish landings and revenue.

1.2 *Revenue Trends for Commercially Important Groundfish*

Although the Pacific Coast Groundfish Fishery Management Plan (FMP) includes many species, relatively few account for most of the revenue. For the period covered by Table 1, 2003-23, the combined top three species groups ranked by revenue [sablefish, Pacific whiting (hake), and Rockfish not elsewhere identified (NEI)] accounted for 71 percent of total inflation adjusted groundfish ex-vessel revenue. Adding in the next two most important species groups, Dover sole and petrale sole, accounts for another 17 percent of total inflation adjusted groundfish ex-vessel revenue during the 2003-23 period. Data during the 2011-12 biennial period show the highest average annual inflation-adjusted landings revenue over the period shown. As a share of the total,

revenues from Pacific whiting and Rockfish NEI have been particularly strong in the more recent years shown.

Table 1 Average annual ex-vessel revenue (inflation-adjusted 2023 \$1,000s) and share of total by groundfish species category. (Source: Groundfish SAFE Table 2 and PacFIN comprehensive ft 01/18/2022 and 1/18/2024).

Species Category	2003-10 (8 years)		2011-12		2013-14		2015-16	
	Revenue	Percent	Revenue	Percent	Revenue	Percent	Revenue	Percent
Sablefish	\$43,561	41%	\$55,214	44%	\$30,655	29%	\$40,232	42%
P. Whiting	\$19,250	18%	\$33,268	26%	\$36,137	34%	\$15,340	16%
Dover Sole	\$12,107	11%	\$10,352	8%	\$9,916	9%	\$8,812	9%
Rockfish NEI*	\$7,109	7%	\$8,232	7%	\$8,023	8%	\$8,453	9%
Petrale Sole	\$8,186	8%	\$4,887	4%	\$8,517	8%	\$9,433	10%
Thornyheads	\$6,823	6%	\$5,877	5%	\$5,623	5%	\$5,088	5%
Roundfish NEI*	\$2,647	2%	\$2,391	2%	\$1,710	2%	\$2,047	2%
Flatfish NEI*	\$3,869	4%	\$2,224	2%	\$2,010	2%	\$1,717	2%
Lingcod	\$973	1%	\$1,490	1%	\$1,744	2%	\$2,209	2%
Other	\$1,380	1%	\$1,680	1%	\$1,598	2%	\$1,762	2%
Total	\$105,906	100%	\$125,614	100%	\$105,932	100%	\$95,093	100%

Species Category	2017-18		2019-20		2021-22		2023	
	Revenue	Percent	Revenue	Percent	Revenue	Percent	Revenue	Percent
Sablefish	\$36,796	33%	\$18,764	23%	\$37,375	39%	\$31,706	39%
P. Whiting	\$28,849	26%	\$28,565	36%	\$25,726	27%	\$18,793	23%
Dover Sole	\$8,484	8%	\$5,400	7%	\$4,043	4%	\$3,574	4%
Rockfish NEI*	\$14,136	13%	\$13,891	17%	\$14,288	15%	\$13,984	17%
Petrale Sole	\$9,489	9%	\$7,037	9%	\$7,774	8%	\$7,650	9%
Thornyheads	\$6,040	5%	\$2,656	3%	\$1,656	2%	\$1,527	2%
Roundfish NEI*	\$1,099	1%	\$762	1%	\$44	0%	\$61	0%
Flatfish NEI*	\$1,279	1%	\$2,263	3%	\$457	0%	\$395	0%
Lingcod	\$2,901	3%	\$466	1%	\$2,294	2%	\$2,359	3%
Other	\$1,032	1%	\$571	1%	\$2,338	2%	\$2,079	3%
Total	\$110,104	100%	\$80,374	100%	\$95,994	100%	\$82,129	100%

*NEI indicates species not elsewhere identified.

1.2.1 Landings and Revenue by Commercial Fishery Sector

Non-whiting Fishery Sectors

Table 2 reports ex-vessel revenue for the main non-whiting fishery sectors. In aggregate, during 2013-23 the IFQ fishery (trawl and non-trawl) accounted for 54 percent of non-whiting ex-vessel revenue, followed by the non-nearshore fixed gear fishery (LE and OA, targeting mostly sablefish) which accounted for 39 percent.

Table 2. Non-whiting groundfish ex-vessel revenue (inflation-adjusted 2023 \$1,000s), by non-whiting commercial fishery sectors, 2013-23. (Source: PacFIN comprehensive ft 01/18/2022 and 1/18/2024).

Year	Shoreside IFQ Trawl (Non-whiting)	Shoreside IFQ Non-trawl	Non-Nearshore Fixed Gear	Nearshore Fixed Gear	Grand Total	Pct. of Annual Average
2013	32,262	3,520	15,679	4,568	56,030	81%
2014	31,139	5,143	17,200	4,516	57,998	83%
2015	29,666	6,030	16,979	4,148	56,822	82%
2016	33,387	10,929	40,683	4,523	89,523	129%
2017	38,835	17,034	49,085	5,062	110,016	158%
2018	32,502	12,831	39,296	5,032	89,660	129%
2019	31,023	4,783	17,674	5,164	58,644	84%
2020	21,249	5,822	20,909	4,364	52,344	75%
2021	24,435	6,303	24,283	4,657	59,678	86%
2022	28,136	8,221	31,773	5,313	73,443	106%
2023 ^a	24,656	5,915	25,944	4,114	60,629	87%
Grand Total	327,291	86,531	299,505	51,460	764,787	
% of Total	43%	11%	39%	7%	100%	

a/ 2023 data is considered preliminary.

Whiting Fishery Sectors

Table 3 reports Pacific whiting catch for non-tribal whiting sectors during 2013 to 2023. Although varying year to year, total catch since 2016 has been above the 11-year annual average in five of seven years. Total non-Tribal whiting catch was lowest during the period in 2015.

Table 3. Pacific whiting catch, mt, by whiting commercial fishery sectors, 2013-23. (Source: Groundfish SAFE Table 14a and GMT).

Year	Catcher-Processor Total	Mothership Total	Shoreside Whiting Trawl Total	Grand Total	Percent of Annual Average
2013	77,906	52,305	96,868	227,079	85%
2014	103,172	61,794	97,983	262,949	98%
2015	68,435	27,549	57,920	153,904	57%
2016	108,781	64,598	85,382	258,761	96%
2017	137,104	65,358	144,126	346,588	129%
2018	116,005	65,979	129,149	311,133	116%
2019	116,352	51,829	143,757	311,938	116%
2020	111,015	37,261	138,224	286,500	107%
2021	103,261	35,507	125,633	264,401	99%
2022	126,038	57,976	104,401	288,415	107%
2023 ^a	107,053	32,744	100,392	240,189	90%
Grand Total	1,175,122	552,900	1,223,835	2,951,857	
Pct. of Total	40%	19%	41%	100%	

a/ 2023 data is considered preliminary.

Midwater Trawl Fishery for Rockfish

The rebuilding of canary and widow rockfish has stimulated the reemergence of a fishery using midwater gear to target pelagic rockfish, principally widow and yellowtail rockfish. Widow rockfish was declared overfished in 2001 and declared rebuilt in 2011. Canary was declared overfished in 2000 and declared rebuilt in 2015. While canary was not a target, its frequency as bycatch presented a potential constraint on the midwater fishery. Figure 1 shows revenue from landings of widow, yellowtail, and chilipepper rockfish since 1981. From 1994 onward only landings from the non-whiting portion of the midwater trawl fishery are included; data prior to that year may include some whiting trips, however during that time the domestic shorebased whiting fishery was somewhat smaller than it is currently and nonwhiting species landings tend to be very low. Therefore, the figure adequately represents the trend for midwater rockfish trawl fishery ex-vessel revenue. The figure shows landings steadily declined beginning in the late 1980s, with the exception of 2000 and 2001. The nonwhiting midwater trawl fishery essentially ceased while widow rockfish was rebuilding between 2001 and 2011, but has generally shown notable growth since.

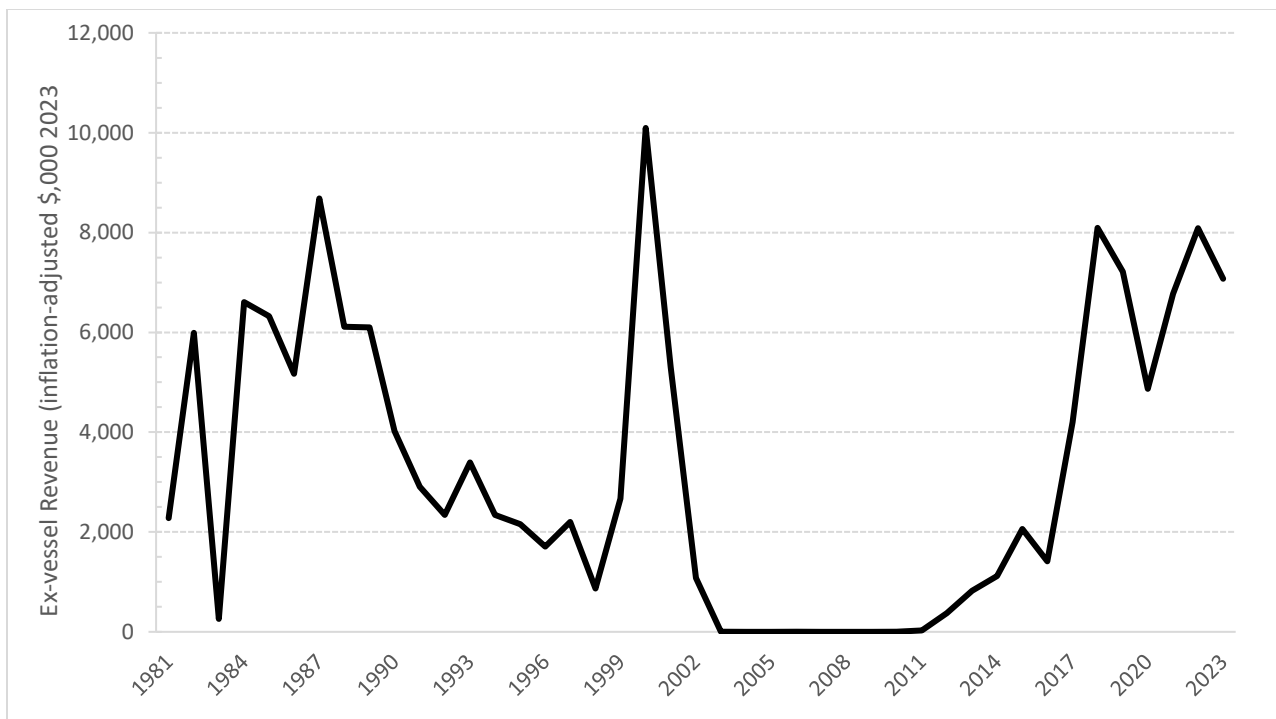


Figure 1. Ex-vessel revenue (inflation-adjusted 2023 \$1,000s) from landings of pelagic rockfish (widow, yellowtail, chilipepper), by midwater trawl gear in the non-whiting groundfish trawl sector, 1981-2023. Landings from 2004 to 2009 were excluded due to data confidentiality requirements. Landings from 1994-2023 are from the non-whiting trawl sector and EFPs. Data for 2023 should be considered preliminary. (Source: PacFIN comprehensive_ft, 1/11/2018, 1/18/2022 and 1/18/2024).

Table 4 provides a snapshot of the pelagic rockfish fishery over the past 12 years (2023 data should be considered preliminary). The data include landings made under EFPs which prior to 2017 would have been for purposes other than targeting pelagic rockfish. The fishery has ramped up substantially in recent years. Since 2014, participation (number of vessels) has been variable from

a low of 10 vessels in 2016 to a high of 28 vessels in 2022. Ex-vessel revenue in 2018, 2019, 2022 and preliminary ex-vessel revenue in 2023 exceeded \$7 million.

Table 4. Landings (mt), ex-vessel revenue (inflation-adjusted 2023 \$1,000s), and number of vessels making landings of pelagic rockfish (chilipepper, widow, and yellowtail rockfish) with midwater trawl gear, 2012-2023. (Source: PacFIN comprehensive_ft, 1/11/2018, 1/18/2022 and 1/18/2024).

Values	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023 ^{a/}
Metric tons	836	1,674	1,138	5,257	11,291	9,732	8,979	11,481	12,238	11,830
\$,000 (infl.-adj 2023)	1,183	2,187	1,570	4,664	8,985	8,013	4,867	6,775	8,087	7,071
Number of vessels	24	37	10	16	24	25	28	27	28	24

a/ 2021 data is considered preliminary.

1.2.2 Tribal Fishery

Several Pacific Northwest Indian tribes have treaty rights to fish for groundfish in their usual and accustomed fishing grounds. The Federal government has accommodated these fisheries through a regulatory process described at 50 CFR 660.50. Tribal fishery management is coordinated through the Council process so catches can be accounted for when developing management measures. West Coast treaty tribes in Washington State have formal allocations for sablefish and Pacific whiting. For other species without formal allocations, the tribes propose set-asides which the Council tries to accommodate while ensuring that catch limits are not exceeded. Whether or not they are formally allocated, tribal catches are accounted for through set-asides, which are deducted from the ACLs along with certain other sources of catch to determine the commercial fishery HG. Washington tribes participate in whiting fisheries with both a mothership and shorebased component. Landings and revenue from this fishery cannot be reported due to data confidentiality restrictions.

The tribal non-whiting sector is defined by groundfish landings other than whiting and, thus includes a variety of gear types. Table 5 shows ex-vessel revenue in tribal fisheries using hook-and-line and trawl gear. Landings from net and pot gear are not reported due to data confidentiality restrictions. Landings from shrimp trawl are not reported because this fishery does not target groundfish although it does land some incidentally-caught groundfish. Revenue from groundfish landings in the tribal net, pot and shrimp fisheries averaged less than \$70,000 annually during 2013-2023. Hook-and-line gear accounted for 68 percent of revenues reported in the table.

Prior to 2020, when the fishery was disrupted due to covid-19, inflation-adjusted revenue from combined hook-and-line and trawl landings in tribal non-whiting groundfish fisheries generally exceeded \$4 million, reaching more than \$6 million in 2016 and 2017. Since then, recorded revenues have been substantially lower. Note that 2023 data is incomplete,

Table 5. Estimated Treaty non-whiting groundfish ex-vessel revenue for hook-and-line and trawl gear 2013-23 (inflation-adjusted 2023 \$1,000s). (Source: Groundfish SAFE Table 13b and PacFIN comprehensive ft, 1/18/2022 and 1/18/2024).

Year	Hook-and-Line	Trawl	Total	Pct. of Annual Average
2013	\$2,464	\$1,997	\$4,460	118%
2014	\$4,056	\$1,269	\$5,325	141%
2015	\$3,014	\$1,088	\$4,102	108%
2016	\$4,253	\$1,967	\$6,220	164%
2017	\$4,449	\$2,272	\$6,720	177%
2018	\$2,992	\$1,985	\$4,977	131%
2019	\$1,791	\$1,895	\$3,686	97%
2020	\$753	\$134	\$887	23%
2021	\$1,751	\$281	\$2,032	54%
2022	\$2,085	\$243	\$2,327	61%
2023^a	\$657	\$266	\$923	24%
Grand Total	\$28,264	\$13,396	\$41,661	
Pct. of total	68%	32%	100%	

a/ 2023 data is considered preliminary.

1.2.3 Recreational Groundfish Fishery

Recreational fisheries are an important part of fishery-related economic activity. However, it is more difficult to impute the economic value of these fisheries because recreational catch is not sold. Past Groundfish Harvest Specifications documents have characterized recreational fisheries in terms of fishing effort (angler trips) to quantify spatio-temporal differences in West Coast recreational fisheries. Income and employment impacts derived using Input-Output (model) for the Pacific Coast (IOPAC) impact coefficients applied to GMT estimates of effort under the Alternatives analysis are reported in § 2.1.1

Recreational groundfish fisheries are broadly subdivided between private anglers and those fishing from commercial passenger fishing vessels, commonly referred to as charter vessels. Private anglers fish from shore, piers or from pleasure boats, while charter vessels take paying passengers.

Table 6 shows annual average numbers of groundfish (bottomfish+halibut) angler trips by mode compared to trips targeting other species. Private and charter trips targeting bottomfish+halibut comprised 24.8 percent of all trips and modes during the 2012-2023 period. A relatively small portion of West Coast groundfish effort also occurs from man-made structures (e.g., piers and jetties). Table 7 shows the annual average counts of bottomfish+halibut and other trip type marine angler trips by state and reporting area. California accounted for 81.4 percent of West Coast bottomfish+halibut angler trips, with the southern California (South Coast) region accounting for 46.6 percent of coastwide trips due to its large coastal population and potential year-round fishery. Figure 2 shows bottomfish+halibut trips by state and year. The number of coastwide bottomfish+halibut marine angler trips peaked in 2014 at more than 1 million trips. The 914,000 trips taken in 2019 exceeded the 17-year 2007-23 average of 806,400 trips by 13 percent. The

645,200 trips taken in 2020 was the lowest during the period, partly due to closures of some facilities and businesses and an undercount of anglers due to the absence of port samplers due to covid-19 restrictions. The 672,400 coastwide trips taken in 2023 was 17 percent below the 2007-2023 average and, with the exception of 2020, the lowest level of bottomfish+halibut effort since 653,300 trips taken in 2008.

Table 6. Coastwide recreational angler trips by type and mode, annual averages during 2012-23 (12 years). (Source: GMT state reps, RecFIN).

Type:	Bottomfish+Halibut		Other Trip Types ^{a/}		Total	
Mode	Annual Average	Percent of Total Trips	Annual Average	Percent of Total Trips	Annual Average	Percent of Total Trips
Beach/Bank	-	0.0%	836,894	24.7%	836,894	24.7%
Man-made	81,321	2.4%	1,033,980	30.5%	1,115,301	32.9%
Charter	539,681	15.9%	120,040	3.5%	659,720	19.5%
Private	300,787	8.9%	477,679	14.1%	778,467	23.0%
Total	921,789	27.2%	2,468,593	72.8%	3,390,382	100%

a/ Other trip types include Salmon, HMS, combo, and other.

Table 7. Bottomfish plus Pacific halibut marine angler boat trips (private and charter) by reporting area, 2012–23 annual averages (12 years). (Source: GMT state reps, RecFIN).

State/Region	Bottomfish + Halibut		Other Trip Types ^{a/}		Total	
	Annual Average	% of Bottomfish + Halibut Trips	Annual Average	% of Other Trips	Annual Average	% of All Trips
Washington Subtotal	39,752	4.7%	98,054	16.4%	137,807	9.6%
La Push-Neah Bay	14,554	1.7%	9,413	1.6%	23,967	1.7%
Westport	21,000	2.5%	36,418	6.1%	57,419	4.0%
Ilwaco-Chinook	4,198	0.5%	52,223	8.7%	56,421	3.9%
Oregon Subtotal	116,448	13.9%	96,479	16.1%	212,926	14.8%
Astoria	753	0.1%	10,077	1.7%	10,830	0.8%
Tillamook	17,818	2.1%	19,288	3.2%	37,107	2.6%
Newport	55,134	6.6%	31,844	5.3%	86,978	6.0%
Coos Bay	18,909	2.2%	24,494	4.1%	43,403	3.0%
Brookings	23,834	2.8%	10,776	1.8%	34,609	2.4%
California Subtotal	684,268	81.4%	403,186	67.5%	1,087,454	75.6%
North Coast: Humboldt and Del Norte	27,724	3.3%	18,854	3.2%	46,578	3.2%
Wine District: Mendocino	18,443	2.2%	8,673	1.5%	27,115	1.9%
SF District: San Mateo through Sonoma	67,400	8.0%	86,496	14.5%	153,896	10.7%
Central Coast: San Luis Obispo through Santa Cruz	97,174	11.6%	31,170	5.2%	128,345	8.9%
Channel: Ventura and Santa Barbara	82,115	9.8%	22,263	3.7%	104,379	7.3%
South Coast: San Diego, Orange and Los Angeles	391,411	46.6%	235,731	39.4%	627,141	43.6%

State/Region	Bottomfish + Halibut		Other Trip Types ^{a/}		Total	
	Annual Average	% of Bottomfish + Halibut Trips	Annual Average	% of Other Trips	Annual Average	% of All Trips
Grand Total	840,468	100%	597,719	100%	1,438,187	100%

a/ Other trip types include Salmon, HMS, combo, and other..

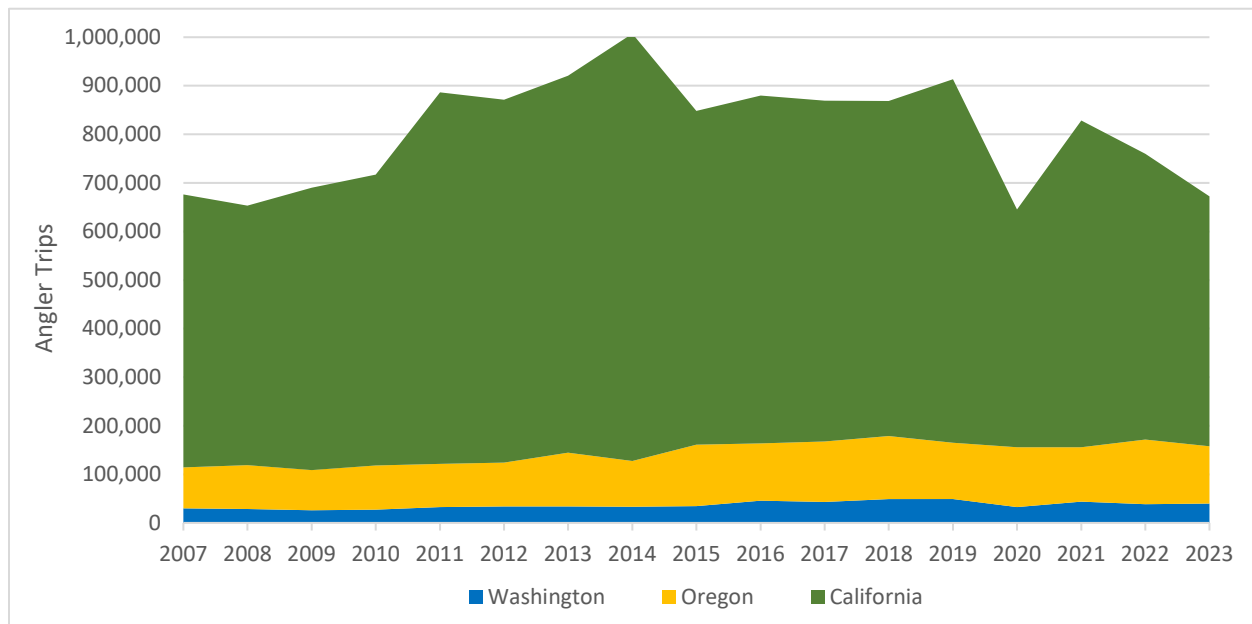


Figure 2. Total bottomfish plus Pacific halibut marine angler boat trips (private and charter) by state, 2007 to 2023. (Source: GMT state reps, RecFIN).

1.3 Fishing Communities

As in other recent decision documents, involvement by fishing communities in commercial groundfish fisheries is described below in terms of landings and ex-vessel revenue by West Coast Fisheries (IOPAC) port group.¹

Table 8 shows inflation-adjusted ex-vessel revenue from non-tribal groundfish landings in aggregate over 2013-23 by port group and groundfish fishery sector. Note that in some cases adjacent port groups have been aggregated to avoid disclosure of confidential data. Commercial groundfish landings and revenue tend to be concentrated in relatively few ports. The four top-ranked port areas of the 11 shown accounted for 77.4 percent of coastwide revenue during the period. All four are north of the Oregon/California border. Astoria-Tillamook is the top-ranked port overall, accounting for 27.7 percent of coastwide groundfish revenue shown. Newport ranks second at 23.5 percent of coastwide revenue, and the combined Washington port groups come third at 16.4 percent. Whiting landings occur in only three of the port areas shown, which are also

¹ See Table 9 in the NOAA Technical Memorandum NMFS-Northwest Fisheries Science Center (Leonard and Watson (2011)) for ports included in these port groups. IOPAC is also used to evaluate personal income and employment impacts of the proposed alternative management measures on West coast communities in Section 2.1.1.3 of this document.

the top three ranked groundfish ports overall (Astoria-Tillamook, Newport, and Washington). Astoria-Tillamook and Newport also rank first and second, respectively, for revenue from the non-whiting IFQ sector (combining trawl IFQ and non-trawl IFQ landings), while Crescent City-Eureka ranks third by this measure. The combined Washington ports rank first for revenues from the non-nearshore (sablefish) fixed gear sector, followed by Newport, Coos Bay-Brookings and Morro Bay-Santa Barbara, respectively. Morro Bay-Santa Barbara is the top port area for the nearshore fixed gear sector followed by Coos Bay-Brookings, Crescent City-Eureka, Fort Bragg and Monterey.

Focusing on the shoreside non-whiting IFQ sector, Table 9 shows revenues from fixed gear landings (often referred to as gear-switching) increasing from 9.8 percent of the sector total in 2013 to a high of 30.5 percent in 2017. The fixed-gear share of IFQ landings subsequently declined to 13.4 percent in 2019 before leveling out at between 19.3 and 22.6 percent during 2020 to 2023. For data confidentiality reasons, revenue from the IFQ fixed gear sector cannot be reported for many individual ports. The dominant port areas for IFQ fixed gear landings by revenue include Newport, Astoria-Tillamook, the Washington ports and Morro Bay-Santa Barbara. Coastwide IFQ non-whiting fixed gear landings totaled approximately \$86.5 million ex-vessel revenue in inflation-adjusted terms during 2013-2023. The combined Oregon ports recorded approximately 73 percent of this revenue, and Washington ports approximately 17 percent, with the California ports accounting for the remainder (10 percent) led by Morro Bay-Santa Barbara.

Table 8. Total ex-vessel revenue (inflation-adjusted 2023 \$1,000s) from groundfish landings, 2013-23 (11 years), by IOPAC port group and fishery sector. (Port groups have been aggregated to avoid disclosing confidential data, 2023 data is preliminary).

Port Group	Shoreside Non-whiting IFQ ^a	Shoreside Trawl Whiting IFQ	Non-Nearshore Fixed Gear	Nearshore Fixed Gear	Other Directed & Incidental Groundfish	Grand Total	Annual Average
Washington	33,090	70,650	69,006	15	938	173,699	15,791
Astoria-	149,884	121,028	17,305	1,950	4,359	294,526	26,775
Newport	92,299	92,167	61,064	1,150	2,589	249,269	22,661
Coos Bay-	45,660	-	42,432	15,313	1,474	104,879	9,534
Crescent City-	47,309	-	14,899	4,582	197	66,987	6,090
Fort Bragg	26,244	-	18,291	3,838	430	48,803	4,437
San Francisco (incl. Bodega)	6,561	-	12,930	2,101	1,082	22,673	2,061
Monterey	3,553	-	13,241	3,808	313	20,914	1,901
Morro Bay-Santa Barbara	9,221	-	37,770	17,785	1,670	66,445	6,040
Los Angeles	-	-	5,398	685	316	6,399	582
San Diego	-	-	7,171	234	183	7,589	690
Total	413,822	283,845	299,505	51,460	13,552	1,062,18	-
Average annual	37,620	25,804	27,228	4,678	1,232	96,562	-

a/ Includes non-trawl IFQ.

Table 9. Annual ex-vessel revenue (inflation-adjusted 2023 \$1,000s) from non-whiting IFQ groundfish landings by gear type (trawl and fixed gear), 2013-23.

Year	Shoreside Non-whiting Trawl	Shoreside Non-whiting Fixed Gear	Fixed Gear Share
2013	32,262	3,520	9.8%
2014	31,139	5,143	14.2%
2015	29,666	6,030	16.9%
2016	33,387	10,929	24.7%
2017	38,835	17,034	30.5%
2018	32,502	12,831	28.3%
2019	31,023	4,783	13.4%
2020	21,249	5,822	21.5%
2021	24,435	6,303	20.5%
2022	28,136	8,221	22.6%
2023^a	24,656	5,915	19.3%
Total	327,291	86,531	20.9%

a/ 2023 data is preliminary

2. Direct and Indirect Effects

2.1 Socioeconomic Environment

2.1.1 Estimated Commercial Ex-Vessel Revenue and Recreational Effort Impacts of the Alternatives

This section evaluates the effects of the Alternatives on fishery participants and fishing communities. The methodology for this analysis is described in Appendix C to the Council Analytical Document (PFMC 2024a) for this action and is incorporated by reference.

The No Action Alternative reports 2023 landings and revenue totals and associated income and employment impact projections based on end-of-year (2023) regulations. In order to incorporate consistent estimates of activity in the Pacific whiting fisheries that do not vary across the modelled economic scenarios, this analysis assumes the situation in place in late 2023, where a reapportionment of unused tribal fishery quota to the non-tribal commercial fishery occurred. When reapportionment has occurred, unused whiting quota and potential catch were shifted from the tribal sector to the non-tribal sector. Since such shifts generally have occurred late in the year, catch in the shorebased IFQ sector has been only slightly affected if at all. In this analysis the reapportionment of whiting quota is assumed to affect catch and revenue only in the at-sea tribal sector and at-sea non-tribal mothership and catcher-processor sectors. Since impacts to the tribal and at-sea whiting sectors are not traced through to communities in this analysis, any projected effects of whiting quota reapportionment do not extend to the estimated community income or employment impacts.

Action Alternatives 1-4 were constructed to illustrate the range of economic effects projected under the range of harvest specifications observed in the No Action (2023) Alternative 1 considers default HCRs and compliant management measures, Alternative 2 considers default HCRs for all stocks/stock complexes except shortspine thornyhead, Dover sole, rex sole, and California quillback under the action Alternatives and associated management measures. Alternative 3 and 4 consider alternative default HCRs for all stocks/stock complexes except California quillback rockfish. Within each modelled alternative there may be multiple options available corresponding to alternative assumptions about regulation of the nearshore commercial fishery and California recreational fishery. In the Commercial section of this discussion, a high/low range of IFQ attainments is shown in the appropriate columns, which corresponds to the Council Analytical Document (PFMC 2024a)

The No Action and the Action Alternatives scenarios all assume post-reapportionment 2023 whiting allocations and catch levels. Again, effects of the reapportionment do not affect the distribution of estimated community income and employment impacts described below.

The 2015 EIS included detailed descriptions of the models and data used to project socioeconomic impacts.

- GMT catch projection models for the various sectors of the commercial groundfish fishery.

- GMT fishing effort (angler trips) projections for the recreational groundfish fishery in each state.
- The landings distribution model (LDM), which is used to assign where commercial landings are likely to occur and the resulting port-level ex-vessel revenues.
- The IOPAC economic impact model used to evaluate the effects of the Alternatives on coastal communities (ports where commercial groundfish landings and recreational groundfish effort occur) in terms of personal income generated (“income impacts”) and associated “employment impacts.”
- Net revenue in commercial fishery operations based on projected sector landings and vessel cost-earnings surveys.

The following sections assess socioeconomic impacts in terms of:

- Changes in commercial ex-vessel revenue by fishery sector,
- Change in recreational angler trips by community,
- Change in net revenue by fishery,
- Change in income and employment impacts by community resulting from changes in commercial landings revenue and recreational effort.

2.2 *Commercial Fisheries*

Revenue estimates are based on projected landings estimates from the GMT models and LDM referenced above. Table 10, Table 11, and Table 12 compare ex-vessel revenue estimates under the Alternative scenarios to the No Action. All projections assume average ex-vessel prices observed in 2023. Effects are presented by groundfish fishery sector, which are described in § 1.1.

A number of caveats apply to modeling commercial fishery impacts. First, effort displaced by management measures is assumed not to switch readily into other fishery sectors or geographic regions. Second, landings projection models and economic impact models like IOPAC are calibrated to represent a “snapshot” of the economy at a particular point in time. Consequently, these models are best able to address impacts of scenarios that are not too far removed from what has occurred in the recent past. Third, catch projections in the IFQ fishery may not reflect the leveraging effect of changes in ACLs for certain “choke” species (those with low ACLs/allocations). A higher or lower allocation of a particularly constraining species may generate more or less actual revenue than is forecast using the current catch projection models. At the same time, market limitations may constrain the extent to which commercial fisheries are able to take advantage of increased allocations. Finally, stock recruitment variability and catch monitoring uncertainty will contribute to the divergence between actual catches and the projections. Although actual ACL attainment may differ from projections, inseason management measures are routinely applied to prevent ACLs from being exceeded.

As noted above, the Pacific whiting Total Allowable Catch (TAC) is determined annually, consistent with the Agreement with Canada on Pacific Hake/Whiting where 73.88 percent of the TAC is allocated to U.S. fisheries, of which 17.5 percent is allocated to the Tribal sector. Since the TAC and resulting allocation is not determined during the harvest specifications process, a historical TAC (2023) is used to estimate socioeconomic impacts. The actual TACs for 2025 and 2026 could be higher or lower than the assumed value.

Table 10. Estimated ex-vessel revenues by groundfish harvest sector under No Action and the Action Alternative scenarios (\$million).

	No Action	Alt 1	Alt 2	Alt 3	Alt 4	PPA
Shoreside Sectors:						
Whiting	19.0	19.0	19.0	19.0	19.0	19.0
Non-whiting Trawl+Non-trawl IFQ	28.5	28.5	36.3	36.3	36.3	36.3
Limited Entry Fixed Gear	22.3	55.3	55.3	55.3	55.3	55.3
Nearshore OA	3.7	3.8	3.8	3.8	1.6	3.8
Non-nearshore OA	4.4	21.7	21.7	21.7	21.7	21.7
Incidental OA	0.2	0.2	0.2	0.2	0.2	0.2
Tribal (incl. whiting)	2.5	11.4	11.4	11.4	11.4	11.4
Shoreside sectors' Totals	80.5	139.8	148.2	148.3	146.1	147.4
At-sea Sectors:						
Non-Tribal Whiting	46.2	46.2	46.2	46.2	46.2	46.2
Tribal Whiting	3.6	3.6	3.6	3.6	3.6	3.6
At-sea sectors' Totals	49.8	49.8	49.8	49.8	49.8	49.8
TOTAL Groundfish Revenue	130.3	189.6	198.0	198.0	195.9	197.1

Under the Alternative 1 and Action Alternative scenarios, the range of average annual coastwide ex-vessel revenue, including the at-sea sectors, is projected to exceed No Action by from \$59.3 million (Alternative 1) to \$67.7 million (Alternative 2 and 3). Alternative 4 average ex-vessel revenue is the lowest, but still \$65.6 million higher than No Action. Noting that under Alternative, all of the California nearshore would be closed. The difference of \$2.2 million in projected overall ex-vessel revenue between the Action Alternative scenarios is likely within the margin of error for these estimates. All of the differences between the commercial fishery Alternatives are due to projected effects in the Non-whiting IFQ and Nearshore sectors.

Key points regarding estimated ex-vessel revenue impacts by fishery sector are as follows:

- The TAC for Pacific whiting is set annually outside of this harvest specifications process. In this analysis the 2025-26 TAC and allocations are assumed to be the same as 2023: No Action and Action Alternative scenarios all assume post-reapportionment 2023 whiting allocations and catch levels.
 - Projections for the shorebased non-tribal whiting fishery do not vary under the No Action and Action Alternatives. Ex-vessel revenue from shoreside non-tribal whiting landings is estimated to be \$19.0 million under the baseline and all Alternatives.
 - In the non-Tribal and Tribal at-sea fisheries, ex-vessel revenue equivalents are projected to be \$46.2 million and \$3.6 million, respectively, under the No Action and the Action Alternatives.
- Estimated ex-vessel revenue in the shoreside Non-whiting IFQ fishery sectors ranges from No Action and Alternative 1 to an increase of \$7.8 million under Alternative 3, Alternative 4, and the PPA

- The limited entry fixed gear (LEFG) and non-nearshore open access (OA) sectors target sablefish, with sablefish landings accounting for the majority of these sectors ex-vessel revenue. Compared with No Action, both sectors show increased ex-vessel revenue under the Action Alternatives. Estimated increases in the LEFG sector are \$33.0 million under Action Alternatives. Revenues in the non-nearshore OA sector are projected to be \$17.3 million greater than No Action and the Action Alternatives .
- The nearshore OA sector primarily targets rockfish, cabezon, and lingcod with black rockfish accounting for the largest share of any single species (see Groundfish SAFE Table 9b). Annual ex-vessel revenues relative to the No Action are estimated to increase by \$0.1 million from No Action and four Action Alternatives, but to decrease by \$0.8 million under the PPA and by \$2.0 million under the Alternative 4. While the nearshore sector contributes a relatively small portion of coastwide shoreside revenue, it is especially important in Southern Oregon, Northern California and Central California fishing communities.
- Shoreside Tribal sector revenues (including whiting) are projected to increase relative to No Action by \$8.8 million under Action Alternatives.

Table 11. Change in groundfish ex-vessel revenues from No Action by groundfish harvest sector under the Action Alternatives scenarios (\$million).

	No Action	Alt 1	Alt 2	Alt 2	Alt 4	PPA
Shoreside Sectors:						
Whiting	19.0	+0.0	+0.0	+0.0	+0.0	+0.0
Non-whiting Trawl+Non-trawl IFQ	28.5	+0.0	+7.8	+7.8	+8.5	+8.5
LEFG	22.3	+33.0	+33.0	+33.0	+33.0	+33.0
Nearshore OA	3.7	+0.1	+0.1	+0.1	-2.0	-0.8
Non-nearshore OA	4.4	+17.3	+17.3	+17.3	+17.3	+17.3
Incidental OA	0.2	+0.0	+0.0	+0.0	+0.0	+0.0
Tribal (incl. whiting)	2.5	+8.8	+8.8	+8.8	+8.8	+8.8
Shoreside sectors' Totals	80.5	+59.3	+67.1	+67.1	+65.6	+66.8
At-sea Sectors:						
Non-Tribal Whiting	46.2	+0.0	+0.0	+0.0	+0.0	+0.0
Tribal Whiting	3.6	+0.0	+0.0	+0.0	+0.0	+0.0
At-sea sectors' Totals	49.8	+0.0	+0.0	+0.0	+0.0	+0.0
TOTAL Groundfish Revenue	130.3	+59.3	+67.1	+67.1	+65.6	+66.8

Table 12. Change in groundfish ex-vessel revenues from No Action by groundfish harvest sector under the Action Alternatives scenarios (percent).

	No Action	Alt 1	Alt 2	Alt 3	Alt 4	PPA
Shoreside Sectors:						
Whiting	19.0	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%
Non-whiting Trawl+Non-trawl IFQ	28.5	+0.0%	+29.6%	+29.7%	+29.7%	+29.7%
LEFG	22.3	+147.9%	+147.9%	+147.9%	+147.9%	+147.9%

	<i>No Action</i>	Alt 1	Alt 2	Alt 3	Alt 4	PPA
Shoreside Sectors:						
Nearshore OA	3.7	+3.6%	+3.6%	+3.6%	-55.6%	-20.9%
Non-nearshore OA	4.4	+397.9%	+397.9%	+397.9%	+397.9%	+397.9%
Incidental OA	0.2	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%
Tribal (incl. whiting)	2.5	+347.9%	+347.9%	+347.9%	+347.9%	+347.9%
Shoreside sectors' Totals	80.5	+73.6%	+84.1%	+84.1%	+81.4%	+83.0%
At-sea Sectors:						
Non-Tribal Whiting	46.2	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%
Tribal Whiting	3.6	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%
At-sea sectors' Totals	49.8	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%
TOTAL Groundfish Revenue	130.3	+45.5%	+52.0%	+52.0%	+50.3%	51.3%

2.3 Recreational Fisheries

For recreational fisheries, projected marine area angler boat trips taken in groundfish plus Pacific halibut recreational fisheries are compared to No Action fishing effort under the proposed management Alternative scenarios. Table 13, Table 14, and Table 15 compare projected recreational angler trips under the Action Alternatives to No Action average annual angler effort. Results are shown by coastal regions that are aggregated from statistical reporting regions²

Proposed management regimes for Oregon and Washington’s recreational fisheries consist of No Action and a single action Alternative (Alternative 2). Proposed management regimes for Washington’s recreational fisheries do not vary between No Action and the Action Alternatives. For the California recreational fishery there is a No Action and four Action Alternatives

For purposes of comparing the range of alternative California management options under consideration, effort under the PPA is assumed the same as under No Action; and effort under the Alternative 4 is assumed the same as No Action in Washington and Oregon but represents a closure of the boat-based fishery for all areas in California. These associations are maintained in this and subsequent sections of the economic analysis.

Key points regarding estimated recreational effort impacts by coastal region are as follows:

- Coastwide recreational effort is projected to increase from No Action (average of 2021-23 effort) by 341,600 trips under Alternative 1 and the PPA, by 740,300 trips under Alternative 3 , but decrease by 567,500 trips under Alternative 2 and by 562,200 trips under Alternative 4 due to assumed closure of the boat-based recreational fishery in California.

² The Puget Sound region is not shown in these tables because Council managed recreational fisheries do not occur in that region.

- Recreational fishing effort for the Washington Coast is projected to increase from No Action under all Alternatives by 5,200 trips. Washington Coast ports accounted for 5.5 percent of coastwide No Action fishing effort.
- Recreational fishing effort in Oregon is projected to increase from No Action by 12,100 trips under Alternative 1 and by 6,800 trips under Alternative 2 and Alternative 2 (although both Newport and Coos Bay-Brookings are projected to see reductions from No Action fishing effort under these Alternatives). Recreational fishing effort in Oregon is projected to be the same as Alternative 1 (i.e., increase from No Action by 12,100 trips) under the PPA and Alternative 4. The combined three coastal regions of Oregon account for 15.0 percent of coastwide No Action fishing effort.
- California recreational fishing effort is projected to increase from No Action by 324,300 trips under Alternative 1 and the PPA, and by 728,300 trips under Alternative 3, but is projected to be zero in all regions under Alternative 4 (i.e., a reduction of 100 percent) due to closure of the boat-based fishery. The five California regions combined account for 79.5 percent of coastwide No Action fishing effort. The Santa Barbara to San Diego region accounts for more than half (54.2 percent) of coastwide No Action recreational angler effort, and this region also shows the largest absolute and percentage changes in angler trips under each Alternative.

Table 13. Estimated Recreational Effort (halibut+bottomfish) under No Action by groundfish harvest sector under the Action Alternatives (thousands of angler trips).

Community Groups	<i>No Action</i> (Ave. 2021-23)	Alt 1	Alt 2	Alt 3	Alt 4	PPA
Washington Coast	39.7	45.0	45.0	45.0	45.0	45.0
Astoria-Tillamook	6.6	18.0	18.0	17.2	18.0	18.0
Newport	55.2	55.4	55.4	53.1	55.4	55.4
Coos Bay-Brookings	47.9	48.3	48.3	46.1	48.3	48.3
Crescent City-Eureka	23.6	32.7	32.7	40.5	0.0	32.7
Fort Bragg - Bodega Bay	24.7	31.4	31.4	37.6	0.0	31.4
San Francisco Area	60.7	103.2	103.2	131.8	0.0	103.2
SC – Mo – MB*	75.4	121.1	121.1	154.7	0.0	121.1
SB – LA – SD*	395.1	615.3	615.3	943.3	0.0	615.3
Coastwide Total	728.9	1,070.4	1,070.4	1,469.2	166.7	1,070.4

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego.

Table 14. Estimated change from No Action Recreational Effort (halibut+bottomfish) under the Action Alternative scenarios (thousands of angler trips).

Community Groups	<i>No Action</i> (Ave. 2021-23)	Alt 1	Alt 2	Alt 3	Alt 4	PPA
Washington Coast	39.7	+5.2	+5.2	+5.2	+5.2	+5.2
Astoria-Tillamook	6.6	+11.5	+10.6	+10.6	+11.5	+11.5

Community Groups	<i>No Action</i> <i>(Ave. 2021-23)</i>	Alt 1	Alt 2	Alt 3	Alt 4	PPA
Newport	55.2	+0.2	-2.0	-2.0	+0.2	+0.2
Coos Bay-Brookings	47.9	+0.4	-1.8	-1.8	+0.4	+0.4
Crescent City-Eureka	23.6	+9.1	+9.1	+16.9	-22.6	+9.1
Fort Bragg - Bodega Bay	24.7	+6.8	+6.8	+12.9	-24.7	+6.8
San Francisco Area	60.7	+42.5	+42.5	+71.0	-60.7	+42.5
SC – Mo – MB*	75.4	+45.7	+45.7	+79.3	-75.4	+45.7
SB – LA – SD*	395.1	+220.2	+220.2	+548.2	-395.1	+220.2
Coastwide Total	728.9	+341.6	+341.6	+740.3	-562.2	+341.6

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego.

Table 15. Estimated change from No Action Recreational Effort (halibut+bottomfish) under the Action Alternative scenarios (percent).

Community Groups	<i>No Action</i> <i>(Ave. 2021-23)</i>	Alt1	Alt 2	Alt 3	Alt 4	PPA
Washington Coast	39.7	+13.2%	+13.2%	+13.2%	+13.2%	+13.2%
Astoria-Tillamook	6.6	+174.8%	+174.8%	+161.9%	+174.8%	+174.8%
Newport	55.2	+0.4%	+0.4%	-3.7%	-3.7%	+0.4%
Coos Bay-Brookings	47.9	+0.8%	+0.8%	-3.8%	-3.8%	+0.8%
Crescent City-Eureka	23.6	+38.3%	+38.3%	+71.5%	-100%	+38.3%
Fort Bragg - Bodega Bay	24.7	+27.5%	+27.5%	+52.3%	-100%	+27.5%
San Francisco Area	60.7	+69.9%	+69.9%	+116.9%	-100%	+69.9%
SC – Mo – MB*	75.4	+60.7%	+60.7%	+105.1%	-100%	+60.7%
SB – LA – SD*	395.1	+55.7%	+55.7%	+138.8%	-100%	+55.7%
Coastwide Total	728.9	+46.9%	+46.9%	+101.6%	-77.9%	+46.9%

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego.

2.4 *Estimated Commercial Vessel Net Revenue Impacts of the Alternatives*

Table 16 provides estimates of net revenues for the 1) Shoreside Whiting, 2) Non-whiting Trawl and Non-whiting Non-trawl IFQ, and 3) LEFG sectors. These are based on the estimated gross revenues (Table 10) and projected landings from the GMT models. Combined with cost-earnings data collected from surveys fielded by the Economics and Social Science Research program at the Northwest Fisheries Science Center, we use an economic model linking historical landings and costs to construct measures of projected costs and net revenues. These measures are constructed only for sectors with sufficient cost and earnings data coverage to perform the modeling described below. It is mandatory for IFQ participants to annually submit cost-earnings data through the Economic Data Collection (EDC) Program, so there are more recent data and higher coverage rates for the Whiting and Non-whiting + Trawl + Non-trawl IFQ sectors compared to the LEFG sector.

This model is described in detail in Appendix C to the Council Analytical Document (PFMC 2024a) for this action

In order to project how changes in future landings may affect costs, we form a model where the landings (L) for each groundfish species (s), as well as their respective interactions, are associated with the natural log of non-labor variable costs (VC), for each vessel (i) and year (t) (equation 1). The economic rationale behind using a logarithmic function to model non-labor variable costs is that marginal costs increase with landings. Intuitively, we could expect marginal costs to increase when a vessel catches a greater quantity of fish for example due to search for fish or difficulties in hiring additional labor. For sectors whose species projected landings are far outside our historical data, we did not use the logarithmic function. An example is the LEFG sector, where sablefish landings are expected to more than double. This, however, is due to increased fishable biomass as projected by stock assessments. Increased landings may not increase the cost of finding fish as much as it typically would, for example, if there are more fish in the sea.

$$\ln(VC_{it}) = \sum_s L_{its} + \sum_s \sum_{r,r \neq s} L_{its} L_{itr} + \epsilon_{it} \quad (1)$$

First, we project non-labor variable costs for each alternative by inputting forecasted landings by species into the regression estimates from equation (1). Then, to obtain projected wages, we calculate the historical proportion of wages (wp) to variable costs net revenues based on actual recorded wages and net revenue, and apply them to projected variable cost net revenues. The intuition here is that wages are typically paid out as shares of variable costs net revenues. Wage projections are based on actual recorded wages.

Finally, fixed costs, including vessel and on-board equipment, fishing gear, moorage, and insurance are aggregated from survey data by sector for all vessels that fished in 2023. We impute these fixed costs using sector-specific means for any vessels not in the survey sample.

Total costs net revenues ($TCNR$) are calculated as revenues (R), less projections of non-labor variable costs (VC), wages (labor), cost recovery fees (CR), buyback fees (BB), and fixed costs (FC) in equation (2). Cost recovery fees and buyback fees were calculated using rates of 3.0% and 3.5% of revenue, respectively.

$$TCNR = R - VC - (R - VC) * wp - FC - CR - BB \quad (2)$$

We use the modeling described above to examine potential differences between the proposed Alternatives (Table 16, Table 17, Table 18). While additional model details can be obtained from the authors by request, key points regarding estimates of net revenue by fishery sector are as follows:

- As we note above, wages are typically paid out as shares of variable costs net revenues. We report that wages historically range from approximately 30 to 40 percent of revenue net non-labor variable costs. and then represent projected wages across forecasted Alternatives, between the 5th and 95th percentiles of our sampling distribution.
- Shoreside whiting net revenue is estimated at \$2.2 million. Note that whiting total allowable catch is determined by regulation and is constant across Alternatives. Although

bycatch-related fishing decisions could impact catch and ex-vessel revenue, it is not modeled across Alternatives.

- The LEFG sector net revenue is forecast to be 2.5 times higher than the No Action. This assumes that the fleet harvests the full sablefish catch forecast by the landings distribution model and that the increases in volume of sablefish do not result in decreases in ex-vessel prices
- Although the trawl IFQ sectors also are forecast to increase the catch of sablefish compared to the No Action, the impacts on net revenue are not as large because sablefish is part of the larger complex of species.
- The Non-nearshore Open Access fishery is also predicted to have a very large increase in net revenue, but the same caveats about catch volumes, supply, and ex-vessel prices apply.

Table 16. Estimated vessel net revenues by groundfish harvesting sector under the Alternatives (\$ million)..

	No Action	Alt 1	Alt 2	Alt 3	Alt 4	PPA
Whiting	2.2	2.2	2.2	2.2	2.2	2.2
Non-whiting Trawl+Non-trawl IFQ	6.1	6.1	8.5	8.7	8.5	8.7
Limited Entry Fixed Gear	6.0	22.2	22.2	22.2	22.2	22.2
Nearshore Open Access	0.4	0.3	0.3	0.3	0.3	0.3
Non-nearshore Open Access	0.6	7.6	7.6	7.6	7.6	7.6
Sum	15.3	38.4	40.8	41	40.8	41

Table 17. Estimated change from No Action in vessel net revenues by groundfish harvesting sector (\$ million).

	No Action	Alt 1	Alt 2	Alt 3	Alt 4	PPA
Whiting	2.2	+0	+0	+0	+0	+0
Non-whiting Trawl+Non-trawl IFQ	6.1	+0	+2.4	+2.6	+2.4	+2.6
Limited Entry Fixed Gear	6.0	+16.2	+16.2	+16.2	+16.2	+16.2
Nearshore Open Access	0.4	-0.1	-0.1	-0.1	-0.1	-0.1
Non-nearshore Open Access	0.6	+7	+7	+7	+7	+7
Sum	14.7	23.1	25.5	25.7	25.5	25.7

Table 18. Percent (%) estimated change from No Action in vessel net revenues by groundfish harvesting sector.

	No Action	Alt 1	Alt 2	Alt 3	Alt 4	PPA
Whiting	2.2	0%	0%	0%	0%	0%
Non-whiting Trawl+Non-trawl IFQ	6.1	0%	39%	43%	39%	43%
Limited Entry Fixed Gear	6.0	269%	269%	269%	269%	269%
Nearshore Open Access	-0.4	-25%	-25%	-25%	-25%	-25%

2.4.1 Estimated Change in Income and Employment Impacts by Community

Socioeconomic impacts to fishing communities engaged in groundfish fisheries are evaluated based on changes in personal income (dollar income impacts) and employment (number of jobs) under the Alternative scenarios. These effects are functions of the projected changes in commercial landings and recreational effort described above. Comparisons are presented with respect to the No Action and the Action Alternatives scenarios. For simplification and ease of comparing impacts from commercial and recreational fishing activities, commercial fisheries port groups are

aggregated regionally so as to be consistent with the recreational reporting regions. For a description of the counties included in these regions see page 378 in the 2015 EIS.

Projected changes in commercial ex-vessel revenues and recreational angler trips were converted into income and employment effects using results from the NWFSC IOPAC input-output model. Impacts include combined direct, indirect, and induced economic effects resulting from projected changes in recreational angling, commercial fishing, fish processing, and related input supply and industry support activities.

Community impacts from commercial and recreational fishing are displayed separately. Impacts are calculated by applying income and employment multipliers generated using IOPAC regional impact models to the projected levels of local expenditures by commercial harvesters, seafood processors, and recreational anglers under No Action and the Action Alternatives scenarios.

Income and employment impacts from Tribal fisheries and from at-sea Pacific whiting catcher-processor and mothership sectors are not included in the community impact totals for the following reasons:

1. Tribal groundfish harvesting and processing are not included in any of the cost-revenue data collected by NWFSC.
2. While overall estimators of income and employment impacts derived from the at-sea whiting fishery (tribal and non-tribal CPs and motherships) have been developed, the detail required to attribute these impacts to particular port groups has not.

That being said, presumably most of the income and employment impacts associated with at-sea whiting fisheries would likely accrue in the Seattle region and Washington and Oregon coastal communities; while impacts of shorebased tribal groundfish fisheries most likely accrue in Washington Coast communities.

Economic impact models like IOPAC are calibrated to represent a “snapshot” of the economy at a particular point in time. Consequently, these models are best able to address impacts of scenarios that are within the range of what may have occurred over the recent past. Analysis of scenarios that represent particularly large departures from the No Action may, therefore, result in biased impact estimates.

2.4.2 Commercial Fishery Community Income Impacts

Table 19 presents estimates of community personal income impacts by region due to projected commercial groundfish fishing activity under the range of Alternatives. Table 20 and Table 21 compare commercial groundfish fishery impact estimates under the Alternative scenarios against No Action. Table 22 presents estimated income impacts resulting from recreational groundfish fisheries, with Table 23 and Table 24 comparing the recreational estimates relative to No Action.

Key points regarding estimated income impacts from commercial groundfish fisheries by coastal region are as follows:

- Coastwide estimated personal income impacts from commercial groundfish fishing are estimated to be \$117.9 million under the No Action and are projected to increase to \$187.6

million under Alternative 1 and to range between approximately \$197 million (Alternative 4) and \$199 million (Alternative 3) under the Action Alternative scenarios. Note that the small differences between the Action Alternatives are likely well within the margin of error of the economic modeling.

- Puget Sound ports show increases over No Action ranging from \$4.7 million under Alternative 1 to approximately \$5 million under all Action Alternatives. Puget Sound ports account for 5.0 percent of estimated coastwide No Action personal income impacts from commercial fishing.
- Oregon and Washington Coast port areas show personal income increases ranging from of \$3.3 million (Washington Coast under Alternative 1) to \$12.8 million (Astoria-Tillamook under Alternative 3, Alternative 4, and PPA). In percentage terms, income impacts among Oregon and Washington Coast ports under the Alternatives range from increases of 19.7 percent for Astoria-Tillamook under Alternative 1 to 61.6 percent in Coos Bay-Brookings under Alternative 3, Alternative 4, and PPA . No Oregon and Washington Coast port areas show decreases from No Action in projected income impacts under the Alternatives. Combined Oregon and Washington Coast ports account for 77.6 percent of estimated coastwide No Action personal income impacts from commercial fishing.
- All California port groups are projected to see increases from No Action under all Alternatives, ranging from \$1.4 million (Crescent City-Eureka under No Action) to \$18.4 million (Santa Barbara-San Diego under all Alternatives except Alternative 4). In percentage terms, the largest relative increases in personal income impacts compared to No Action are also projected for the Santa Barbara-San Diego region, approximately 436 percent under all Alternatives except Alternative 4. Projected increased landings by Non-nearshore fixed gear fisheries in those ports account for much of the projected increases in income impacts. The combined California ports account for 17.4 percent of coastwide No Action income impacts from commercial fishing.

Table 19. Commercial fishery income impacts under No Action and the Action Alternatives scenarios by community group (\$million).

Community Groups	No Action	Alt 1	Alt 2	Alt 3	Alt 4 a/	PPA
Puget Sound	6.0	10.7	10.9	10.9	10.9	10.9
Washington Coast	14.6	17.9	18.3	18.3	18.3	18.3
Astoria-Tillamook	46.5	55.6	59.3	59.3	59.3	59.3
Newport	22.3	29.5	33.5	33.5	33.5	33.5
Coos Bay-Brookings	8.1	12.6	13.1	13.1	13.1	13.1
Crescent City-Eureka	4.5	6.0	6.9	7.1	0	6.9
Fort Bragg – Bodega Bay	5.4	9.2	9.3	9.9	0	9.3
San Francisco Area	2.6	6.2	6.0	6.2	0	6.0
SC – Mo – MB b/	3.7	17.3	17.9	17.9	0	17.9
SB – LA – SD b/	4.2	22.6	22.6	22.6	0	22.6
Coastwide Total	117.9	187.6	198.8	198.9	135.1	197.8

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego.

Table 20. Change in commercial fishery income impacts under No Action and the Action Alternative by community group (\$million).

Community Groups	No Action	Alt 1	Alt 2	Alt 3	Alt 4	PPA
Puget Sound	6.0	+4.7	+5.0	+5.0	+5.0	+5.0
Washington Coast	14.6	+3.3	+3.7	+3.7	+3.7	+3.7
Astoria-Tillamook	46.5	+9.2	+12.4	+12.8	+12.8	+12.8
Newport	22.3	+7.1	+11.0	+11.2	+11.2	+11.2
Coos Bay-Brookings	8.1	+4.5	+4.9	+5.0	+5.0	+5.0
Crescent City-Eureka	4.5	+1.4	+2.5	+2.6	-4.5	+2.4
Fort Bragg – Bodega Bay	5.4	+3.8	+4.5	+4.6	-5.4	+3.9
San Francisco Area	2.6	+3.7	+3.6	+3.6	-2.6	+3.4
SC – Mo – MB*	3.7	+13.6	+14.1	+14.1	-3.7	+14.1
SB – LA – SD*	4.2	+18.4	+18.4	+18.4	-4.2	+18.4
Coastwide Total	117.9	+69.6	+80.9	+80.9	+37.7	+89.9

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego.

Table 21. Percent (%) change in commercial fishery income impacts under No Action and the Action Alternative scenarios by community group.

Community Groups	No Action	Alt 1	Alt 2	Alt 3	Alt 4	PPA
Puget Sound	6.0	+79.0%	+83.4%	+83.4%	+83.4%	+83.4%
Washington Coast	14.6	+22.6%	+25.6%	+25.6%	+25.6%	+25.6%
Astoria-Tillamook	46.5	+19.7%	+27.5%	+27.5%	+27.5%	+27.5%
Newport	22.3	+31.9%	+50.2%	+50.2%	+50.2%	+50.2%
Coos Bay-Brookings	8.1	+55.3%	+61.6%	+61.6%	+61.6%	+61.6%
Crescent City-Eureka	4.5	+31.8%	+57.0%	+57.1%	-100%	+52.6%
Fort Bragg – Bodega Bay	5.4	+71.1%	+84.4%	+84.4%	-100%	+73.1%
San Francisco Area	2.6	+141.4%	+140.3%	+140.3%	-100%	+131.1%
SC – Mo – MB*	3.7	+362.8%	+377.4%	+377.4%	-100%	+377.4%
SB – LA – SD*	4.2	+435.9%	+435.9%	+435.9%	-100%	+435.9%

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego.

2.4.3 Recreational Fishery Community Income Impacts

Recreational income impacts are derived from changes in recreational fishing effort (angler trips) and associated expenditures. See Recreational Fisheries section, above, for discussion regarding change in projected fishing effort due to management changes. Table 22 shows estimated recreational income impacts under No Action and the Action Alternatives; Table 23 shows the incremental change with respect to the No Action; Table 24 shows the percentage change..

The Preliminary Preferred Alternative (PPA) was constructed assuming the same overall effort levels as under No Action for all areas. The Alternative 4 was constructed assuming the same overall effort levels as under PPA (No Action) for Washington and Oregon but closure of boat-based recreational fisheries in California. Key points regarding estimated income impacts from recreational groundfish fisheries by coastal region are as follows:

- Coastwide recreational fishing income impacts are projected to increase from No Action by approximately 52 percent (\$78.6 million) under No Action and PPA, and by 117 percent (\$177.6 million) under Alternative 2 (California Option 4), but to decrease by approximately 88 percent (\$133.1 million) under Alternative 2 and by \$132.6 million under the Alternative 4.
- The Washington Coast shows increases in estimated recreational fishing income impacts relative to No Action of 14.8 percent (\$0.9 million) under all Alternatives. Washington Coast ports account for 4.1 percent of No Action recreational fishing income impacts.
- Recreational fishing income impacts are projected to increase at least somewhat from No Action in all regions in Oregon under Alternative 1, and also in Astoria-Tillamook under Alternative 2 and Alternative 3 (although decrease by approximately 4.1 percent in both Newport and Coos Bay-Brookings regions). Recreational fishing income impacts in Oregon are projected to be the same as Alternative 1 (i.e., increase from No Action by \$0.8 million) under the PPA and Alternative 4. Combined Oregon Coast ports account for 7.2 percent of No Action recreational fishing income impacts.
- Recreational fishing income impacts in California are projected to increase from No Action overall and in all regions by at least 33.6 percent (in Crescent City-Eureka) under Alternative 1 and PPA, and by at least 60.7 percent (in Fort Bragg-Bodega Bay) under Alternative 3. Recreational fishing income impacts in California are projected to be zero under Alternative 2 and Alternative 4. (i.e., -100 percent) as no fishing would be allowed in any region. Under Alternative 3, the Santa Barbara to San Diego region shows the largest increase in income impacts, approximately \$145 million (139 percent). Increases in recreational fishing income impacts projected for California regions under Alternative 1 and PPA include: Crescent City-Eureka \$0.9 million (33.6 percent), Fort Bragg-Bodega Bay \$1.3 million (34.5 percent), San Francisco area \$9.0 million (78.9 percent), Santa Cruz to Morro Bay \$7.3 million (59.0 percent), and Santa Barbara to San Diego \$58.3 million (56.0 percent). Combined California Coast ports account for 88.7 percent of No Action recreational fishing income impacts.

Table 22. Recreational fishery income impacts under No Action and the Action Alternative scenarios by community group (\$million).

Community Groups	No Action	Alt 1	Alt 2	Alt 3	Alt 4 a/	PPA
Washington Coast	6.2	7.1	7.1	7.1	7.1	7.1
Astoria-Tillamook	0.8	1.6	1.6	1.5	1.6	1.6
Newport	6.5	6.5	6.5	6.2	6.5	6.5
Coos Bay-Brookings	3.6	3.6	3.6	3.4	3.6	3.6
Crescent City-Eureka	2.6	3.4	3.4	4.2	0.0	3.4
Fort Bragg – Bodega Bay	3.7	5.0	5.0	6.0	0.0	5.0

Community Groups	No Action	Alt 1	Alt 2	Alt 3	Alt 4 a/	PPA
San Francisco Area	11.5	20.5	20.5	26.2	0.0	20.5
SC – Mo – MB b/	12.4	19.7	19.7	25.2	0.0	19.7
SB – LA – SD b/	104.2	162.5	162.5	249.2	0.0	162.5
Coastwide Total	151.4	230.0	230.0	329.0	18.8	230.0

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego.

Table 23. Change in recreational fishery income impacts from No Action and the Action Alternative by community group (\$million)

Community Groups	No Action	Alt 1	Alt 2	Alt 3	Alt 4 a/	PPA
Washington Coast	6.2	+0.9	+0.9	+0.9	+0.9	+0.9
Astoria-Tillamook	0.8	+0.8	+0.8	+0.7	+0.8	+0.8
Newport	6.5	+0.0	+0.0	-0.3	+0.0	+0.0
Coos Bay-Brookings	3.6	+0.0	+0.0	-0.1	+0.0	+0.0
Crescent City-Eureka	2.6	+0.9	+0.9	+1.7	-2.6	+0.9
Fort Bragg – Bodega Bay	3.7	+1.3	+1.3	+2.2	-3.7	+1.3
San Francisco Area	11.5	+9.0	+9.0	+14.7	-11.5	+9.0
SC – Mo – MB b/	12.4	+7.3	+7.3	+12.8	-12.4	+7.3
SB – LA – SD b/	104.2	+58.3	+58.3	+145.0	-104.2	+58.3
Coastwide Total	151.4	+78.6	+78.6	+177.6	-132.6	+78.6

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego.

Table 24. Change in recreational fishery income impacts from No Action and the Action Alternative scenarios by community group (percent).

Community Groups	No Action	Alt 1	Alt 2	Alt 3	Alt 4 a/	PPA
Washington Coast	6.2	+14.8%	+14.8%	+14.8%	+14.8%	+14.8%
Astoria-Tillamook	0.8	+100.0%	+100.0%	+90.4%	+100.0%	+100.0%
Newport	6.5	+0.3%	+0.3%	-4.1%	+0.3%	+0.3%
Coos Bay-Brookings	3.6	+0.6%	+0.6%	-4.1%	+0.6%	+0.6%
Crescent City-Eureka	2.6	+33.6%	+33.6%	+65.6%	-100%	+33.6%
Fort Bragg – Bodega Bay	3.7	+34.5%	+34.5%	+60.7%	-100%	+34.5%
San Francisco Area	11.5	+78.9%	+78.9%	+128.5%	-100%	+78.9%
SC – Mo – MB b/	12.4	+59.0%	+59.0%	+103.1%	-100%	+59.0%
SB – LA – SD b/	104.2	+56.0%	+56.0%	+139.1%	-100%	+56.0%
Coastwide Total	151.4	+51.9%	+51.9%	+117.3%	-87.6%	+51.9%

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego.

2.4.4 Commercial Fishery Community Employment Impacts

Table 25 shows projected employment impacts due to the commercial groundfish fishery under No Action and the Action Alternative scenarios; Table 26 and Table 27 show the change in commercial fishery employment impacts relative to No Action in terms of dollars and percentage, respectively. Key points regarding estimated employment impacts from commercial groundfish fisheries by coastal region are as follows:

- Estimated coastwide employment impacts from commercial groundfish fishing are 1,688 jobs under the No Action and are projected to increase to from 2,877 jobs under Alternative 1. Coastwide commercial fishing employment impacts are estimated to be 2,982 jobs under Alternatives 2 and 2A, 2,946 jobs under PPA, and 2,876 jobs under Alternative 4.
- Puget Sound ports show increases in employment over No Action ranging from 44 jobs (72.4 percent) under Alternative 1 to 46 jobs (76.4 percent) under the Action Alternatives. Puget Sound ports account for 3.6 percent of estimated coastwide employment impacts from commercial fishing.
- Oregon and Washington Coast port areas show increases in employment impacts under the Action Alternatives. . Combined Oregon and Washington Coast ports account for 65 percent of estimated coastwide No Action employment impacts from commercial fishing.
- All California port groups are projected to see increases in employment impacts from No Action under all Alternatives, ranging from 22 jobs (Crescent City-Eureka under No Action) to 553 jobs (Santa Barbara to San Diego under all Alternatives except Alternative 4). The largest relative increases in employment impacts compared to No Action in percentage terms are likewise projected for the Santa Barbara to San Diego region (366 percent under all Alternatives except Alternative 4). Projected landings by Non-nearshore fixed gear fisheries in those ports account for much of the increased employment impacts. Combined California ports account for 31.4 percent of coastwide No Action employment impacts from commercial fishing.

Table 25. Commercial fishery employment impacts under No Action and the Action Alternative scenarios by community group (number of jobs).

Community Groups	No Action	Alt 1	Alt 2	Alt 3	Alt 4 a/	PPA
Puget Sound	61	104	107	107	107	107
Washington Coast	160	197	201	202	202	202
Astoria-Tillamook	505	589	619	623	623	623
Newport	269	347	389	392	392	392
Coos Bay-Brookings	163	212	215	216	216	216
Crescent City-Eureka	79	101	113	113	103	103
Fort Bragg – Bodega Bay	101	168	175	176	151	151
San Francisco Area	49	99	98	98	88	88
SC – Mo – MB b/	150	357	360	360	296	360
SB – LA – SD b/	151	704	704	704	698	704
Coastwide Total	1,688	2,877	2,982	2,991	2,876	2,946

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego.

Table 26. Change in commercial fishery employment impacts from No Action and the Action Alternative scenarios by community group (number of jobs).

Community Groups	No Action	Alt 1	Alt 2	Alt 3	Alt 4 a/	PPA
Puget Sound	61	+44	+46	+46	+46	+46
Washington Coast	160	+36	+41	+41	+41	+41
Astoria-Tillamook	505	+84	+114	+118	+118	+118
Newport	269	+77	+120	+122	+122	+122
Coos Bay-Brookings	163	+49	+53	+53	+53	+53
Crescent City-Eureka	79	+22	+34	+35	+24	+24
Fort Bragg – Bodega Bay	101	+66	+74	+74	+50	+50
San Francisco Area	49	+50	+50	+50	+39	+39
SC – Mo – MB b/	150	+207	+210	+210	+146	+210
SB – LA – SD b/	151	+553	+553	+553	+547	+553
Coastwide Total	1,688	+1,189	+1,303	+1,303	+1,188	+1,258

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego.

Table 27. Change in commercial fishery employment impacts from No Action and the Action Alternative scenarios by community group (percent).

Community Groups	No Action	Alt 1	Alt 2	Alt 3	Alt 4 a/	PPA
Puget Sound	61	+72.4%	+76.4%	+76.4%	+76.4%	+76.4%
Washington Coast	160	+22.7%	+25.8%	+25.8%	+25.8%	+25.8%
Astoria-Tillamook	505	+16.6%	+23.4%	+23.4%	+23.4%	+23.4%
Newport	269	+28.7%	+45.4%	+45.4%	+45.4%	+45.4%
Coos Bay-Brookings	163	+29.9%	+32.7%	+32.7%	+32.7%	+32.7%
Crescent City-Eureka	79	+28.4%	+44.2%	+44.2%	+30.5%	+30.5%
Fort Bragg – Bodega Bay	101	+65.6%	+73.4%	+73.4%	+49.5%	+49.5%
San Francisco Area	49	+102.5%	+102.0%	+102.0%	+80.7%	+80.7%
SC – Mo – MB b/	150	+137.7%	+139.7%	+139.7%	+139.7%	+97.4%
SB – LA – SD b/	151	+366.3%	+366.3%	+366.3%	+366.3%	+362.0%
Coastwide Total	1,688	+70.4%	+77.2%	+77.2%	+74.5%	+70.4%

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego.

2.4.5 Recreational Fishery Community Employment Impacts

Table 28 shows projected employment impacts due to the recreational groundfish fishery under No Action and the Alternatives; Table 29 and Table 30 show the change in recreational fishery employment impacts relative to the Alternative 1 in terms of dollars and percentage, respectively. Key points regarding estimated employment impacts from recreational groundfish fisheries by coastal region are as follows:

- Coastwide recreational fishing employment impacts are projected to increase by 1,270 jobs (47.6 percent) under Alternative 2 and PPA, and by 2,819 jobs (105.6 percent) under Alternative 2, but to decrease by 2,091 jobs (78.3 percent) under Alternative 2 and by 2,073 jobs under Alternative 4.
- Washington Coast ports show increases of 28 jobs (14.9 percent) in estimated employment impacts from the No Action under all Alternatives. Washington Coast ports account for 7 percent of No Action recreational fishing employment impacts.
- Recreational fishing employment impacts are projected to increase at least somewhat from No Action in all regions in Oregon under Alternative 1, Alternative 4, and PPA, and also in Astoria-Tillamook under the action Alternatives, but to decrease by approximately 4.2 percent in both Newport and Coos Bay-Brookings regions under Alternatives 1 and 2. Combined Oregon Coast ports account for 13.4 percent of No Action recreational fishing employment impacts.
- Recreational fishing employment impacts in California are projected to increase from No Action overall and in all areas by at least 32.2 percent (in Crescent City-Eureka) under Alternative 1 and PPA, and by at least 63.2 percent (in Fort Bragg-Bodega Bay) under Alternative 2 (California recreational Option 4). Recreational fishing employment impacts in California are projected to be zero under Alternative 4 as no fishing would be allowed in any area (i.e., -100 percent). Under Alternative 3, the Santa Barbara to San Diego region shows the largest increase in employment impacts, an increase of 2,261 jobs (139 percent). Increases in recreational fishing employment impacts projected for California regions under Alternative 1 and PPA include: Crescent City-Eureka 14 jobs (32.2 percent), Fort Bragg-Bodega Bay 23 jobs (36.7 percent), San Francisco area 141 jobs (80.4 percent), Santa Cruz to Morro Bay 129 jobs (58.6 percent), and Santa Barbara to San Diego 910 jobs (56.0 percent). Combined California Coast ports account for 79.7 percent of No Action recreational fishing employment impacts.

Table 28. Recreational fishery employment impacts under No Action and the Action Alternative scenarios by community group (number of jobs).

Community Groups	No Action	Alt 1	Alt 2	Alt 3	Alt 4 a/	PPA
Washington Coast	186	213	213	213	213	213
Astoria-Tillamook	28	52	52	50	52	52
Newport	217	217	217	208	217	217
Coos Bay-Brookings	112	113	113	108	113	113
Crescent City-Eureka	45	59	59	74	0	59
Fort Bragg - Bodega Bay	63	86	86	102	0	86
San Francisco Area	175	316	316	403	0	316
SC – Mo – MB b/	220	349	349	446	0	349
SB – LA – SD b/	1,624	2,534	2,534	3,885	0	2,534
Coastwide Total	2,669	3,940	3,940	5,488	596	3,940

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego.

Table 29. Change in recreational fishery employment impacts from No Action and the Action Alternative scenarios by community group (number of jobs).

Community Groups	No Action	Alt 1	Alt 2	Alt 3	Alt 4 a/	PPA
Washington Coast	186	+28	+28	+28	+28	+28
Astoria-Tillamook	28	+24	+24	+22	+24	+24
Newport	217	+1	+1	+1	+1	+1
Coos Bay-Brookings	112	+1	+1	+1	+1	+1
Crescent City-Eureka	45	+14	+14	+29	-45	+14
Fort Bragg - Bodega Bay	63	+23	+23	+40	-63	+23
San Francisco Area	175	+141	+141	+228	-175	+141
SC – Mo – MB b/	220	+129	+129	+226	-220	+129
SB – LA – SD b/	1,624	+910	+910	+2,261	-1,624	+910
Coastwide Total	2,669	+1,270	+1,270	+2,819	-2,073	+1,270

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego.

Table 30. Change in recreational fishery employment impacts from No Action and the Action Alternative scenarios by community group (percent).

Community Groups	No Action	Alt 1	Alt 2	Alt 3	Alt 4	PPA
Washington Coast	186	+14.9%	+14.9%	+14.9%	+14.9%	+14.9%
Astoria-Tillamook	28	+87.7%	+87.7%	+78.6%	+87.7%	+87.7%
Newport	217	+0.3%	+0.3%	-4.2%	+0.3%	+0.3%
Coos Bay-Brookings	112	+0.5%	+0.5%	-4.2%	+0.5%	+0.5%
Crescent City-Eureka	45	+32.2%	+32.2%	+63.8%	-100%	+32.2%
Fort Bragg - Bodega Bay	63	+36.7%	+36.7%	+63.2%	-100%	+36.7%
San Francisco Area	175	+80.4%	+80.4%	+130.4%	-100%	+80.4%
SC – Mo – MB b/	220	+58.6%	+58.6%	+102.6%	-100%	+58.6%
SB – LA – SD b/	1,624	+56.0%	+56.0%	+139.2%	-100%	+56.0%
Coastwide Total	2,669	+47.6%	+47.6%	+105.6%	-77.7%	+47.6%

a/ Assumes the groundfish fishery is closed in the EEZ off of California.

b/ SC – Mo – MB = Santa Cruz, Monterey and Morro Bay; SB – LA – SD = Santa Barbara, Los Angeles and San Diego..

2.4.6 At-sea Whiting Fishery Income and Employment Impacts

Economic impacts contributed by the at-sea whiting fishery are not assigned to coastal communities. That being said, presumably most of the income and employment impacts associated with non-Tribal and Tribal at-sea whiting fisheries would likely accrue in the Seattle region and also Washington and Oregon coastal communities. Impacts shown in Table 31 under the No Action or the Action Alternative assume 2023 Pacific whiting allocations after reapportionment of the unused Tribal portion to the non-Tribal whiting sectors.³ For that reason, there is no projected

³ There were no documented deliveries made in the shorebased or at-sea Tribal whiting fisheries in 2023.

variation in estimated income or employment impacts from No Action or the Action Alternative scenarios.

Table 31. Estimated total ex-vessel revenue equivalent, income and employment impacts under No Action and the Action Alternative scenarios for At-sea whiting sectors: Non-Tribal (Motherships, Catcher vessels and Catcher-Processors) and Tribal (Motherships and Catcher vessels).

At-sea Whiting Sectors	No Action	Alt 1	Alt 2	Alt 3	Alt 4	PPA
Ex-vessel Revenue Equivalent (\$mil)						
Non-Tribal Whiting	46.2	46.2	46.2	46.2	46.2	46.2
Tribal Whiting	3.6	3.6	3.6	3.6	3.6	3.6
Income Impacts (\$mil)						
Non-Tribal Whiting	314.2	314.2	314.2	314.2	314.2	314.2
Tribal Whiting	29.2	29.2	29.2	29.2	29.2	29.2
Employment Impacts (jobs)						
Non-Tribal Whiting	4,137	4,137	4,137	4,137	4,137	4,137
Tribal Whiting	375	375	375	375	375	375

3. Literature Cited

PFMC. 2024a. Pacific Coast Groundfish Fishery 2025-26 Harvest Specifications And Management Measures. Draft Analytical Document Showing The Preliminary Preferred Alternative Management Measures And The Preferred Alternative For Harvest Specifications. Pacific Fishery Management Council. Portland, Oregon

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