Preliminary 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
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
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	Magnuson-Stevens Fishery Conservation and Management Act, Magnuson-Stevens 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/shortraker (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
SWFSC	Southwest Fisheries Science Center
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

1. Socioeconomic Environment

Previous environmental impact statements (EIS), environmental assessments (EA), decision documents, section 3.2 in the 2015 EIS for the biennial harvest specifications and management measures, and the Groundfish SAFE (PFMC 2022) 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 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, 2003-2023, 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 petrale sole, accounts for another 17 percent of total inflation adjusted groundfish ex-vessel revenue during the 2003-2023 period. Data during the 2011-2012 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	2003-2010 (8 years)		2011-2012		2013-2014		2015-2016	
	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	2017-2018		2019-2020		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.

1.3 Landings and Revenue by Commercial Fishery Sector

1.3.1 Non-whiting Fishery Sectors

Table 2 reports ex-vessel revenue for the main non-whiting fishery sectors. In aggregate, during 2013-2023 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, 2013-2023. (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**	
Pct. of Total	**43%**	**11%**	**39%**	**7%**	**100%**	

a/ 2023 data is considered preliminary.

1.3.2 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, 2013-2023. (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.

1.3.3 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 1-1 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.

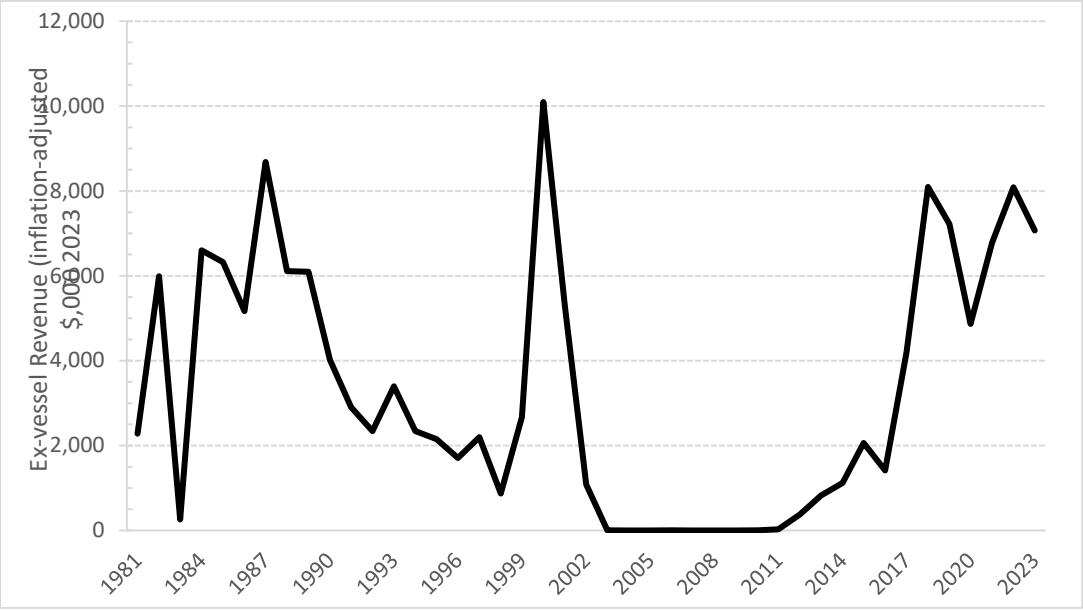

Figure 1. Ex-vessel revenue (inflation-adjusted 2023 $1,000s) from landings of pelagic rockfish (widow, yellowtail, chilipepper), by midwater trawl gear in the non-whiting groundfish trawl sector, 1981-2023. Landings from 2004 to 2009 were excluded due to data confidentiality requirements. Landings from 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 2012, participation (number of vessels) increased by more than 50 percent and landings revenue by nearly twenty-fold. 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	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023[a/]
Metric tons	249	606	836	1,674	1,138	5,257	11,291	9,732	8,979	11,481	12,238	11,830
$,000 (infl.-adj 2023)	396	871	1,183	2,187	1,570	4,664	8,985	8,013	4,867	6,775	8,087	7,071
Number of vessels	17	12	24	37	10	16	24	25	28	27	28	24

a/ 2021 data is considered preliminary.

1.3.4 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. While all four coastal tribes have longline fleets, only the Makah Tribe currently has a trawl fleet. 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 2013-2023 (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.

1.3.5 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 IOPAC impact coefficients applied to Groundfish Management Team (GMT) estimates of effort (Agenda Item F.5, Attachment 2, March 2024).

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 (Figure 2). 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.

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 2007-2023 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 2012-2023 (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, 2012–2023 annual averages (12 years). (Source: GMT state reps, RecFIN).

	Bottomfish + Halibut		Other Trip Types[a/]		Total	
State/Region	Annual Average	Percent of Bottomfish + Halibut Trips	Annual Average	Percent of Other Trips	Annual Average	Percent 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%

	Bottomfish + Halibut		Other Trip Types[a/]		Total	
State/Region	**Annual Average**	**Percent of Bottomfish + Halibut Trips**	**Annual Average**	**Percent of Other Trips**	**Annual Average**	**Percent of All Trips**
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%
Grand Total	**840,468**	**100%**	**597,719**	**100%**	**1,438,187**	**100%**

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

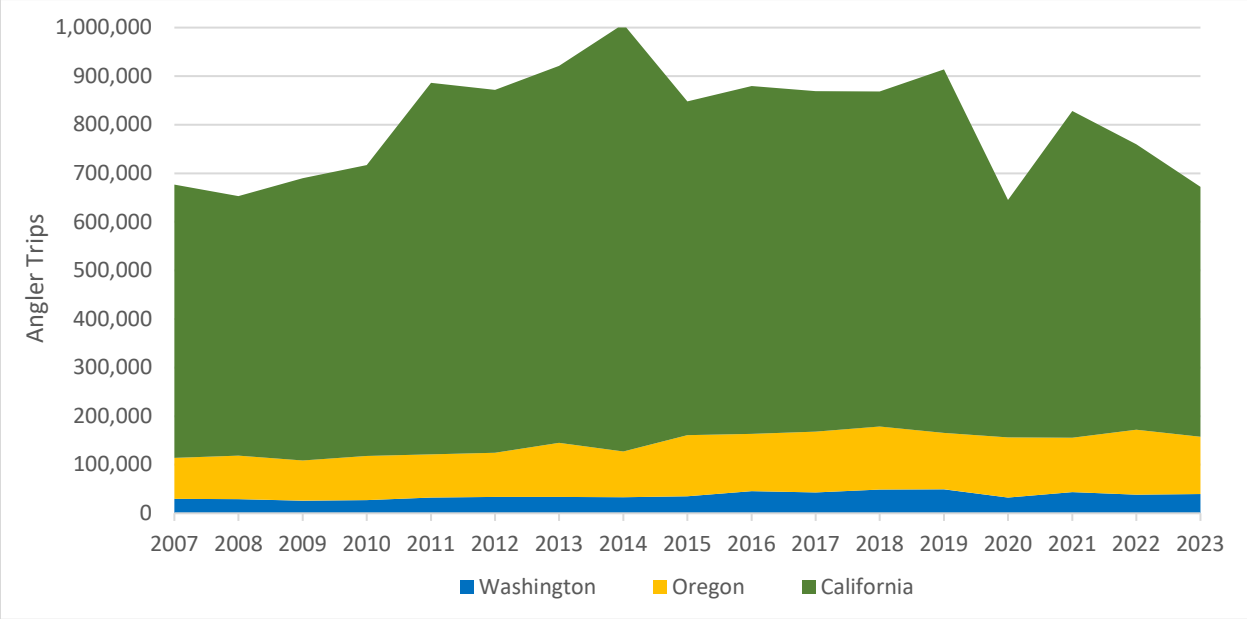

Figure 2. Total bottomfish plus Pacific halibut marine angler boat trips (private and charter) by state, 2007 to 2023. (Source: GMT state reps, RecFIN).

1.4 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 2013-2023 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 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.

[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.

Table 8. Total ex-vessel revenue (inflation-adjusted 2023 $1,000s) from groundfish landings, 2013-2023 (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 and Incidental Groundfish	Grand Total	Annual Average
Washington	33,090	70,650	69,006	15	938	173,699	15,791
Astoria-Tillamook	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-Brookings	45,660	-	42,432	15,313	1,474	104,879	9,534
Crescent City-Eureka	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 Bay)	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	1,062,184	
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), 2013-2023.

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 Integrated Alternatives

This section evaluates the effects of the alternatives on fishery participants and fishing communities. The No Action scenario characterizes "current" catch, ex-vessel revenue, and recreational fishing effort using the GMT catch projection methods that are consistent with those applied under the alternatives. (Section 1.1 supplements this characterization for the commercial fishery sectors with historical landings and ex-vessel revenue amounts recorded in the PacFIN database.)

No Action reports actual landings and revenue totals and associated income and employment impact projections based on regulations that were in place towards the end of 2023. 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.

The No Action and action alternative 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.

Alternatives were constructed to illustrate the range of economic effects projected under the range of harvest specifications observed in the No Action under default HCRs and compliant management measures. These items are illustrated in the Alternatives and under varying ACLs and management measures for certain stocks (e.g., Dover sole, canary rockfish, etc.) under the action alternatives and associated options. 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.

For simplicity, the broad range of potential impacts under the range of alternatives and associated options has been encapsulated in a set of modeled economic scenarios. Scenarios for the commercial fisheries sectors were constructed based on landings projections under three alternatives (Alternative 1, Alternative 2, and Alternative 3) plus two sub-alternatives (Low and High) for the shoreside IFQ sectors; a single Alternative 1 for the non-nearshore fixed gear sectors; an Alternative 1 for the nearshore fixed gear sectors; and an Alternative 1 for the Tribal fishery sectors. Scenarios for recreational fisheries sectors were constructed based on effort projections

for an Alternative 1, Alternative 2, and Alternative 3; plus, four action alternative options for the California recreational sector (Options 1-4); Alternative 1 and a single action alternative (Alternative 2) for the Oregon recreational sector; and a single (Alternative 1) scenario for the Washington recreational sector. A list of components by fisheries sector that were used in each modeled economic scenario is shown in Table 10.

Also, for simplicity, economic impacts described below are displayed for 2025, the first year of the two-year management cycle, only. Although projected effects would be somewhat different in some cases during the second year of the management cycle (2026), the relative distribution of economic effects and inferences regarding rankings of the alternatives would be very similar to those projected for 2025.

Table 1. Relationship between the modelled economic scenarios/alternatives (Alt.) and the individual fisheries sector alternatives and options.

Modeled Economic Scenario / Alternative	Shoreside IFQ Sectors [a/]	Non-nearshore Fixed gear Sectors [b/]	Nearshore Fixed gear Sectors [c/]	Tribal Sector [d/]	California Recreational Sector [e/]	Oregon Recreational Sector [f/]	Washington Recreational Sector [g/]
No Action	Alt 1	2023	2023	Adjusted 2023	2021-2023 average	2021-2023 average	2021-2023 average
Alternative 1	Alt 1	Alt 1	Alt 1	Alt 1	Alt 1	Alt 1	Alt 1
Alternative 2A	Alt 2 Low	Alt 1	Alt 1	Alt 1	Alt 2 Option 1	Alt 1	Alt 1
Alternative 2B	Alt 2 High	Alt 1	Alt 1	Alt 1	Alt 2 Option 1	Alt 1	Alt 1
Alternative 3A	Alt 3 Low	Alt 1	Alt 1	Alt 1	Alt 3 Option 4	Alt 1	Alt 1
Alternative 3B	Alt 3 High	Alt 1	Alt 1	Alt 1	Alt 3 Option 4	Alt 1	Alt 1

a/ For the Shoreside IFQ sectors there is an Alternative 1, Alternative 2 and Alternative 3) with Low and High sub-alternatives under each action alternative. The IFQ whiting sector is modeled under a single scenario based on 2023 reapportioned allocations and observed landings.

b/ The Non-nearshore fixed gear sectors are modeled under a single No Action alternative.

c/ The Nearshore fixed gear sectors are modeled under a single No Action alternative.

d/ Tribal commercial fisheries are modeled under a single No Action scenario.

e/ In addition to Alternative 1, there are actually four California Recreational sector options any of which could be selected under the action alternatives. However, since the effects of Option 3 cannot currently be quantified it has been omitted from the description of economic impacts in this section.

f/ There is an Alternative 1 and Alternative 2 are under consideration for Oregon recreational fisheries.

g/ There is a single No Action alternative under consideration for Washington recreational fisheries.

The 2015 EIS included detailed descriptions of the models and data used to project socioeconomic impacts. Updated documentation of the models may be found in Appendix D. The relevant projection models include:

- 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 2, Table 3, and Table 4 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 Section 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 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.

As shown in Table 1, the modeled commercial fisheries economic scenarios are constructed as follows: Alternative 1 includes the alternatives for Shoreside IFQ, Non-nearshore fixed gear,

Nearshore fixed gear, and Tribal sectors. Alternative 2A includes Shoreside IFQ Alternative 2 Low, plus No Action scenarios for Non-nearshore fixed gear, Nearshore fixed gear, and Tribal sectors. Alternative 2B includes Shoreside IFQ Alternative 2 High, plus Alternative 1 scenarios for Non-nearshore fixed gear, Nearshore fixed gear, and Tribal sectors. Alternative 3A includes Shoreside IFQ Alternative 3 Low, plus Alternative 2 scenarios for Non-nearshore fixed gear, Nearshore fixed gear, and Tribal sectors. Alternative 3B includes Shoreside IFQ Alternative 3 High, plus Alternative 1 scenarios for Non-nearshore fixed gear, Nearshore fixed gear, and Tribal sectors.

Under the action alternative scenarios, average annual coastwide ex-vessel revenue, including the at-sea sectors, is projected to exceed the No Action by from $59.3 million to $67.7 million. The difference in coastwide ex-vessel revenue between the four action alternative scenarios ranges from $67.1 million (Alternative 2 Low) to $67.7 million (Alternative 3 High). The small difference ($0.6 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 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 2025-2026 TAC and allocations are assumed to be the same as 2023: the 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 Action Alternatives. Ex-vessel revenue from shoreside non-tribal whiting landings is estimated to be $19.0 million under No Action 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 all alternatives.
- Estimated ex-vessel revenue in the shoreside Non-whiting IFQ fishery sectors ranges from no change from the No Action under Alternative 1 to an increase of $8.5 million under Alternative 3B.
- The limited entry fixed gear and non-nearshore open access sectors target sablefish, with sablefish landings accounting for approximately 87 percent of sector ex-vessel revenue (see Groundfish SAFE Table 8b). Compared with No Action both sectors show increased ex-vessel revenue under the action alternatives. Estimated increases in the limited entry fixed gear sector are $33.0 million under the action alternatives. Revenues in the non-nearshore open access sector are projected to be $17.3 million greater than No Action under the action alternatives.
- The nearshore open access 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 under the action alternatives. 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 the No Action by $8.8 million under the action alternatives.

Table 2. Estimated ex-vessel revenues by groundfish harvest sector under the economic alternative scenarios ($million).

	No Action	Alt 1	Alt2 A	Alt 2 B	Alt 3 A	Alt 3 B
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	36.9	36.3	36.9
LEFG	22.3	55.3	55.3	55.3	55.3	55.3
Nearshore OA	3.7	3.8	3.8	3.8	3.8	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**	**147.6**	**148.2**	**147.7**	**148.3**
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**	**197.4**	**198.0**	**197.4**	**198.0**

Table 3. Change in groundfish ex-vessel revenues from No Action by groundfish harvest sector under the economic alternative scenarios ($million).

	No Action	Alt 1	Alt2 A	Alt 2 B	Alt 3 A	Alt 3 B
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	+8.4	+7.9	+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	+0.1	+0.1
Non-nearshore OA	*4.4*	+17.3	+17.3	+17.3	+17.3	+17.3
Incidental	*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**	**+67.7**	**+67.1**	**+67.7**
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**	**+67.7**	**+67.1**	**+67.7**

Table 4. Change in groundfish ex-vessel revenues from No Action by groundfish harvest sector under the economic alternative scenarios (percent).

	No Action	Alt 1	Alt2 A	Alt 2 B	Alt 3 A	Alt 3 B
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%	+27.5%	+29.6%	+27.6%	+29.7%

	No Action	Alt 1	Alt2 A	Alt 2 B	Alt 3 A	Alt 3 B
Shoreside Sectors:						
LEFG	*22.3*	+147.9%	+147.9%	+147.9%	+147.9%	+147.9%
Nearshore OA	*3.7*	+3.6%	+3.6%	+3.6%	+3.6%	+3.6%
Non-nearshore OA	*4.4*	+397.9%	+397.9%	+397.9%	+397.9%	+397.9%
Incidental O	*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%**	**+83.4%**	**+84.1%**	**+83.4%**	**+84.1%**
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%**	**+51.5%**	**+52.0%**	**+51.5%**	**+52.0%**

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 5, Table 6, and Table 7 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 regions.[2]

To produce a tractable number of economic impact projections that cover the range of possible outcomes, action alternative scenarios were constructed from the range of management alternatives and/or options proposed for each state. Proposed management regimes for Washington's recreational fisheries do not vary between No Action and the action alternatives. Proposed management regimes for Oregon's recreational fisheries consist of a single action alternative (Alternative 1). For the California recreational fishery there are two action alternatives (Alternative 1 and Alternative 2) plus four management options (Options 1-4) which could be selected under either of the action alternatives. Since the effects of California Option 3 cannot currently be quantified, and projected effort under Option 1 and Option 2 appear to be identical, only California Option 1 and Option 4 have been analyzed under the set of alternative scenarios.[3]

For purposes of comparing the range of alternative California management options under consideration, Alternative 2 is associated with California Option 1 (Status Quo management including closure of the boat-based fishery), and Alternative 3 is associated with California Option 4 (year-round all depth fishing). These associations are maintained in this and subsequent sections of the economic analysis. For more information about the proposed recreational management

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

[3] While it is expected that decreases in groundfish effort would occur in all management areas under Option 3 (offshore fishery) relative to No Action/Alternative 1, the amount cannot be quantified as estimates of angler trips cannot be parsed into depth bins. Additionally, depending upon which RCA line is chosen under Option 3, effort levels could be closer to Baseline or closer to complete fishery closure.

options see Agenda Item F.5, Attachment 2, April 2024 -specifically, the California recreational Chapter).

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 2021-2023 effort) by 341,600 trips under No Action and by 740,300 trips under Alternative 2 (California Option 4), but decrease by 567,500 trips under Alternative 1 (California Option 1) due to closure of the boat-based recreational fishery in California.
- 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 the action alternative, although both Newport and Coos Bay-Brookings are projected to see reductions from No Action fishing effort under the action alternative). 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 by 728,300 trips under Alternative 3 (California recreational Option 4), but is projected to be zero in all regions under Alternative 2 (California recreational Option 1), i.e., a reduction of 100 percent. 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 Alternative 1 recreational angler effort, and this region also shows the largest absolute and percentage changes in angler trips under each alternative.

Table 5. Estimated Recreational Effort (halibut+bottomfish) under No Action and the economic alternative scenarios (thousands of angler trips).

Community Groups	No Action (average 2021-2023)	Alternative	Alt 2 (California Option 1)	Alt 3 (California Option 4)
Washington Coast	39.7	45.0	45.0	45.0
Astoria-Tillamook	6.6	18.0	17.2	17.2
Newport	55.2	55.4	53.1	53.1
Coos Bay-Brookings	47.9	48.3	46.1	46.1
Crescent City-Eureka	23.6	32.7	0.0	40.5
Fort Bragg - Bodega Bay	24.7	31.4	0.0	37.6
San Francisco Area	60.7	103.2	0.0	131.8
SC – Mo – MB*	75.4	121.1	0.0	154.7
SB – LA – SD*	395.1	615.3	0.0	943.3
Coastwide Total	**728.9**	**1,070.4**	**161.4**	**1,469.2**

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

Table 6. Estimated change from No Action recreational effort (halibut+bottomfish) under the economic alternative scenarios (thousands of angler trips).

Community Groups	*No Action (average 2021-23)*	No Action	Alt 1 (California Option 1)	Alt 2 (California Option 4)
Washington Coast	*39.7*	+5.2	+5.2	+5.2
Astoria-Tillamook	*6.6*	+11.5	+10.6	+10.6
Newport	*55.2*	+0.2	-2.0	-2.0
Coos Bay-Brookings	*47.9*	+0.4	-1.8	-1.8
Crescent City-Eureka	*23.6*	+9.1	-23.6	+16.9
Fort Bragg - Bodega Bay	*24.7*	+6.8	-24.7	+12.9
San Francisco Area	*60.7*	+42.5	-60.7	+71.0
SC – Mo – MB*	*75.4*	+45.7	-75.4	+79.3
SB – LA – SD*	*395.1*	+220.2	-395.1	+548.2
Coastwide Total	***728.9***	+341.6	-567.5	+740.3

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

Table 7. Estimated change from No Action Recreational Effort (halibut+bottomfish) under the economic alternative scenarios (percent).

Community Groups	*No Action (average 2021-23)*	Alternative 1	Alt 1 (California Option 1)	Alt2 (California Option 4)
Washington Coast	*39.7*	+13.2%	+13.2%	+13.2%
Astoria-Tillamook	*6.6*	+174.8%	+161.9%	+161.9%
Newport	*55.2*	+0.4%	-3.7%	-3.7%
Coos Bay-Brookings	*47.9*	+0.8%	-3.8%	-3.8%
Crescent City-Eureka	*23.6*	+38.3%	-100.0%	+71.5%
Fort Bragg - Bodega Bay	*24.7*	+27.5%	-100.0%	+52.3%
San Francisco Area	*60.7*	+69.9%	-100.0%	+116.9%
SC – Mo – MB*	*75.4*	+60.7%	-100.0%	+105.1%
SB – LA – SD*	*395.1*	+55.7%	-100.0%	+138.8%
Coastwide Total	***728.9***	+46.9%	-77.9%	+101.6%

*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 Integrated Alternatives

Table 8 provides estimates of net revenues for the 1) Shoreside Whiting, 2) Non-whiting Trawl and Non-whiting Non-trawl IFQ, and 3) Limited Entry Fixed Gear sectors. These are based on the estimated gross revenues (Table 2) 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 Limited Entry Fixed Gear sector.

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 Limited Entry Fixed Gear 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 7,Table 8, Table 9). 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 Limited Entry Fixed gear 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 8. Estimated vessel net revenues by groundfish harvesting sector under the alternatives ($ million).

	No Action	Alternative 1	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B
Shoreside Sectors:						
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

Table 9. Estimated change from No Action in vessel net revenues by groundfish harvesting sector ($ million).

	No Action	Alternative 1	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B
Shoreside Sectors:						
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	+8.2	+8.2	+8.2	+8.2	+8.2

Table 10. Estimated change from No in vessel net revenues by groundfish harvesting sector (percent).

	No Action	Alternative 1	Alternative 2A	Alternative 2B	Alternative 3A	Alternative 3B
Shoreside Sectors:						
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	---	---	---	---	---
Non-nearshore Open Access	-0.6	---	---	---	---	---

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 under Alternative 1 and modeled action alternative 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 alternative 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

presents estimates of community personal income impacts by region due to projected commercial groundfish fishing activity under the range of alternatives. and compare commercial groundfish fishery impact estimates under the alternative scenarios against the No Action. presents estimated income impacts resulting from recreational groundfish fisheries, with and comparing the recreational estimates relative to the No Action.

As noted in Table 1, for the commercial fishery community impact analyses, the modeled economic scenarios include the following: No Action includes the Alternative 1 for Shoreside IFQ, Non-nearshore fixed gear, and Nearshore fixed gear sectors. Alternative 2A includes Shoreside

IFQ Alternative 2 Low, plus No Action scenarios for Non-nearshore fixed gear, and Nearshore fixed gear sectors. Alternative 3B includes Shoreside IFQ Alternative 2 High, plus No Action scenarios for Non-nearshore fixed gear, and Nearshore fixed gear sectors. Alternative 3A includes Shoreside IFQ Alternative 3 Low, plus No Action scenarios for Non-nearshore fixed gear, and Nearshore fixed gear sectors. Alternative 3B includes Shoreside IFQ Alternative 3 High, plus Alternative 1 scenarios for Non-nearshore fixed gear, and Nearshore fixed gear sectors.

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 between $187.6 million under Alternative 1 to range from approximately $198 million and $199 million under the action alternatives. Among the action alternatives, the highest coastwide total and the highest level of income impacts for each community occur under Alternative 3B while the lowest occur under Alternative 2A. Note however 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 the 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 3B). 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 3B. No 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). 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. Projected increased landings by 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 11.Commercial fishery income impacts under No Action and the economic alternative scenarios by community group ($million).

	No Action	Alt 1	Alt 2A	Alt 2B	Alt 3A	Alt 3B
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	58.9	59.3	58.9	59.3

	No Action	Alt 1	Alt 2A	Alt 2B	Alt 3A	Alt 3B
Newport	22.3	29.5	33.3	33.5	33.3	33.5
Coos Bay-Brookings	8.1	12.6	13.0	13.1	13.0	13.1
Crescent City-Eureka	4.5	6.0	7.1	7.1	7.1	7.1
Fort Bragg – Bodega Bay	5.4	9.2	9.9	9.9	9.9	9.9
San Francisco Area	2.6	6.2	6.2	6.2	6.2	6.2
SC – Mo – MB*	3.7	17.3	17.9	17.9	17.9	17.9
SB – LA – SD*	4.2	22.6	22.6	22.6	22.6	22.6
Coastwide Total	117.9	187.6	197.99	198.83	198.01	198.85

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

Table 12. Change in commercial fishery income impacts (from No Action) under the economic alternative scenarios by community group ($million).

	No Action	Alt 1	Alt 2A	Alt 2B	Alt 3A	Alt 3B
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	+12.4	+12.8
Newport	*22.3*	+7.1	+11.0	+11.2	+11.0	+11.2
Coos Bay-Brookings	*8.1*	+4.5	+4.9	+5.0	+4.9	+5.0
Crescent City-Eureka	*4.5*	+1.4	+2.5	+2.6	+2.5	+2.6
Fort Bragg – Bodega Bay	*5.4*	+3.8	+4.5	+4.6	+4.5	+4.6
San Francisco Area	*2.6*	+3.7	+3.6	+3.6	+3.6	+3.6
SC – Mo – MB*	*3.7*	+13.6	+14.1	+14.1	+14.1	+14.1
SB – LA – SD*	*4.2*	+18.4	+18.4	+18.4	+18.4	+18.4
Coastwide Total	*117.9*	+69.6	+80.1	+80.9	+80.1	+80.9

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

Table 13. Change in commercial fishery income impacts (from No Action) under the economic alternative scenarios by community group (percent).

	No Action	Alt 1	Alt 2A	Alt 2B	Alt 3A	Alt 3B
Puget Sound	*6.0*	+79.0%	+83.3%	+83.4%	+83.3%	+83.4%
Washington Coast	*14.6*	+22.6%	+25.3%	+25.6%	+25.3%	+25.6%
Astoria-Tillamook	*46.5*	+19.7%	+26.6%	+27.5%	+26.7%	+27.5%
Newport	*22.3*	+31.9%	+49.1%	+50.2%	+49.1%	+50.2%
Coos Bay-Brookings	*8.1*	+55.3%	+60.9%	+61.6%	+60.9%	+61.6%
Crescent City-Eureka	*4.5*	+31.8%	+55.5%	+57.0%	+55.5%	+57.1%
Fort Bragg – Bodega Bay	*5.4*	+71.1%	+83.9%	+84.4%	+83.9%	+84.4%
San Francisco Area	*2.6*	+141.4 %	+140.2%	+140.3%	+140.2%	+140.3%
SC – Mo – MB*	*3.7*	+362.8 %	+377.4%	+377.4%	+377.4%	+377.4%
SB – LA – SD*	*4.2*	+435.9 %	+435.9%	+435.9%	+435.9%	+435.9%
Coastwide Total	*117.9*	+59.1%	+67.9%	+68.6%	+67.9%	+68.6%

* 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. shows estimated recreational income impacts under No Action and the alternative scenarios; shows the incremental change with respect to the No Action; shows the percentage change.

Proposed management regimes for Washington's recreational fisheries do not vary between No Action and the action alternatives. Proposed management regimes for Oregon's recreational fisheries consist of Alternative 1 and Alternative 2. For the California recreational fishery there is Alternative 1aAlternative 2 and Alternative 3, plus four management options (Options 1-4) which could be selected under either of the action alternatives. Since the effects of California Option 3 cannot currently be quantified, and projected effort under Option 1 and Option 2 appear to be identical, only California Option 1 and Option 4 have been analyzed under the set of alternative scenarios.

For purposes of comparing the range of alternative California management options under consideration, Alternative 1 is associated with California Option 1 (Status Quo management including closure of the boat-based fishery), and Alternative 2 is associated with California Option 4 (year-round all depth fishing).[4] 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 Alternative 1 and by 117 percent ($177.6 million) under Alternative 3 (California Option 4), but to decrease by approximately 88 percent ($133.1 million) under Alternative 2 (California Option 1).
- The Washington Coast shows increases in estimated recreational fishing income impacts relative to the 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 the action alternative, but to decrease by approximately 4.1 percent in both Newport and Coos Bay-Brookings regions under the action alternative. 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 under No Action (in Crescent City-Eureka), and by at least 60.7 percent (in Fort Bragg-Bodega Bay) under Alternative 3 (California recreational Option 4) (Fort Bragg-Bodega Bay). Recreational fishing income impacts in California are projected to be zero under Alternative 2 (California recreational Option 1) (i.e., -100 percent) as no fishing would be allowed in any region. Under Alternative 3 (California recreational Option 4), the Santa Barbara to San Diego region shows the largest increase in income impacts, approximately $145 million (139 percent). Increases in recreational fishing impacts projected for the other California regions under

[4] Any of the four California Recreational sector options could be selected under the action alternatives. Effects of Option 3 cannot currently be quantified and so are not included in this analysis.

Alternative 3 (California recreational Option 4) include: Crescent City-Eureka $1.7 million (65.6 percent), Fort Bragg-Bodega Bay $2.3 million (60.7 percent), San Francisco area $14.7 million (128.5 percent), and Santa Cruz to Morro Bay $12.8 million (103.1 percent). Combined California Coast ports account for 88.7 percent of No Action recreational fishing income impacts.

Table 14. Recreational fishery income impacts under No Action and the economic alternative scenarios by community group ($million).

Community Groups	No Action	Alternative 1	Alternative 2 (California Option 1)	Alternative 3 (California Option 4)
Washington Coast	6.2	7.1	7.1	7.1
Astoria-Tillamook	0.8	1.6	1.5	1.5
Newport	6.5	6.5	6.2	6.2
Coos Bay-Brookings	3.6	3.6	3.4	3.4
Crescent City-Eureka	2.6	3.4	0.0	4.2
Fort Bragg - Bodega Bay	3.7	5.0	0.0	6.0
San Francisco Area	11.5	20.5	0.0	26.2
SC – Mo – MB*	12.4	19.7	0.0	25.2
SB – LA – SD*	104.2	162.5	0.0	249.2
Coastwide Total	**151.4**	**230.0**	**18.3**	**329.0**

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 15. Change in recreational fishery income impacts from No Action under the economic alternative scenarios by community group ($million)

Community Groups	No Action	Alternative 1	Alternative 2 (California Option 1)	Alternative 3 (California Option 4)
Washington Coast	*6.2*	+0.9	+0.9	+0.9
Astoria-Tillamook	*0.8*	+0.8	+0.7	+0.7
Newport	*6.5*	+0.0	-0.3	-0.3
Coos Bay-Brookings	*3.6*	+0.0	-0.1	-0.1
Crescent City-Eureka	*2.6*	+0.9	-2.6	+1.7
Fort Bragg - Bodega Bay	*3.7*	+1.3	-3.7	+2.2
San Francisco Area	*11.5*	+9.0	-11.5	+14.7
SC – Mo – MB*	*12.4*	+7.3	-12.4	+12.8
SB – LA – SD*	*104.2*	+58.3	-104.2	+145.0
Coastwide Total	*151.4*	+78.6	-133.1	+177.6

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 16. Change in recreational fishery income impacts from No Action under the economic alternative scenarios by community group (percent).

Community Groups	No Action	Alternative 1	Alternative 2 (California Option 1)	Alternative 3 (California Option 4)
Washington Coast	*6.2*	+14.8%	+14.8%	+14.8%
Astoria-Tillamook	*0.8*	+100.0%	+90.4%	+90.4%
Newport	*6.5*	+0.3%	-4.1%	-4.1%
Coos Bay-Brookings	*3.6*	+0.6%	-4.1%	-4.1%
Crescent City-Eureka	*2.6*	+33.6%	-100%	+65.6%
Fort Bragg - Bodega Bay	*3.7*	+34.5%	-100%	+60.7%
San Francisco Area	*11.5*	+78.9%	-100%	+128.5%
SC – Mo – MB*	*12.4*	+59.0%	-100%	+103.1%
SB – LA – SD*	*104.2*	+56.0%	-100%	+139.1%
Coastwide Total	*151.4*	+51.9%	-87.9%	+117.3%

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

2.4.4 Commercial Fishery Community Employment Impacts

Table 18 shows projected employment impacts due to the commercial groundfish fishery under No Action and the alternative scenarios; Table 19 and Table 20 show the change in commercial fishery employment impacts relative to No Action in terms of dollars and percentage, respectively.

As noted in Table 1, for the commercial fishery community impact analyses, the modeled economic scenarios include the following: No Action includes the No Action alternatives for Shoreside IFQ, Non-nearshore fixed gear, and Nearshore fixed gear sectors. Alternative 2A includes Shoreside IFQ Alternative 2 Low, plus Alternative 1 scenarios for Non-nearshore fixed gear, and Nearshore fixed gear sectors. Alternative 2B includes Shoreside IFQ Alternative 2 High, plus Alternative 1 scenarios for Non-nearshore fixed gear, and Nearshore fixed gear sectors. Alternative 3A includes Shoreside IFQ Alternative 3 Low, plus Alternative 1 scenarios for Non-nearshore fixed gear, and Nearshore fixed gear sectors. Alternative 3B includes Shoreside IFQ Alternative 3 High, plus Alternative 1 scenarios for Non-nearshore fixed gear, and Nearshore fixed gear sectors.

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 to 2,991 jobs under Alternatives 2B and 3B. Coastwide commercial fishing employment impacts are estimated to be 2,982 jobs under Alternatives 2A and 3A.
- 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 Alternatives 2 and 3. 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 ranging from 36 jobs (Washington Coast under Alternative 1) to 122 jobs (Newport under

Alternatives 2B and 3B). Newport under Alternatives 2B and 3B also shows the largest relative increase in income impacts among Oregon and Washington Coast ports in percentage terms (45.4 percent). No Oregon or Washington Coast port areas show decreases from No Action in projected employment impacts under any alternative. 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 Alternative 1) to 553 jobs (Santa Barbara to San Diego under all alternatives). 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). Projected landings by 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 17. Commercial fishery employment impacts under No Action and the economic alternative scenarios by community group (number of jobs).

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

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 18. Change in commercial fishery employment impacts from No Action under the economic alternative scenarios by community group (number of jobs).

	No Action	Alt 1	Alt 2A	Alt 2B	Alt 3A	Alt 3B
Puget Sound	*61*	+44	+46	+46	+46	+46
Washington Coast	*160*	+36	+41	+41	+41	+41
Astoria-Tillamook	*505*	+84	+114	+118	+114	+118
Newport	*269*	+77	+120	+122	+120	+122
Coos Bay-Brookings	*163*	+49	+53	+53	+53	+53
Crescent City-Eureka	*79*	+22	+34	+35	+34	+35
Fort Bragg – Bodega Bay	*101*	+66	+74	+74	+74	+74
San Francisco Area	*49*	+50	+50	+50	+50	+50
SC – Mo – MB*	*150*	+207	+210	+210	+210	+210
SB – LA – SD*	*151*	+553	+553	+553	+553	+553
Coastwide Total	*1,688*	+1,189	+1,294	+1,303	+1,294	+1,303

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 19. Change in commercial fishery employment impacts from No Action under the economic alternative scenarios by community group (percent).

	No Action	Alt 1	Alt 2A	Alt 2B	Alt 3A	Alt 3B
Puget Sound	*61*	+72.4%	+76.3%	+76.4%	+76.3%	+76.4%
Washington Coast	*160*	+22.7%	+25.5%	+25.8%	+25.5%	+25.8%
Astoria-Tillamook	*505*	+16.6%	+22.5%	+23.4%	+22.5%	+23.4%
Newport	*269*	+28.7%	+44.4%	+45.4%	+44.4%	+45.4%
Coos Bay-Brookings	*163*	+29.9%	+32.3%	+32.7%	+32.3%	+32.7%
Crescent City-Eureka	*79*	+28.4%	+43.2%	+44.2%	+43.2%	+44.2%
Fort Bragg – Bodega Bay	*101*	+65.6%	+73.1%	+73.4%	+73.1%	+73.4%
San Francisco Area	*49*	+102.5%	+101.9%	+102.0%	+101.9%	+102.0%
SC – Mo – MB*	*150*	+137.7%	+139.5%	+139.7%	+139.6%	+139.7%
SB – LA – SD*	*151*	+366.3%	+366.3%	+366.3%	+366.3%	+366.3%
Coastwide Total	*1,688*	+70.4%	+76.6%	+77.2%	+76.7%	+77.2%

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

2.4.5 Recreational Fishery Community Employment Impacts

Table 21 shows projected employment impacts due to the recreational groundfish fishery under No Action and the alternatives; Table 22 and Table 23 show the change in recreational fishery employment impacts relative to the No Action in terms of dollars and percentage, respectively.

Proposed management regimes for Washington's recreational fisheries do not vary between No Action and the action alternatives. Proposed management regimes for Oregon's recreational fisheries consist of Alternative 1 and 2. For the California recreational fishery there is are three action alternatives (Alternative 1, 2, and 3) plus four management options (Options 1-4) which could be selected under either of the action alternatives. Since the effects of California Option 3 cannot currently be quantified, and projected effort under Option 1 and Option 2 appear to be identical, only California Option 1 and Option 4 have been analyzed under the set of alternative scenarios.

For purposes of comparing the range of alternative California management options under consideration, Alternative 2 is associated with California Option 1 (Status Quo management including closure of the boat-based fishery), and Alternative 3 is associated with California Option 4 (year-round all depth fishing).[5] 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 1 and by 2,819 jobs (105.6 percent) under Alternative 3 (California Option 4), but to decrease by 2,091 jobs (78.3 percent) under Alternative 2 (California Option 1).

[5] Any of the four California Recreational sector options could be selected under the action alternatives. Effects of Option 3 cannot currently be quantified and so are not included in this analysis.

- 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 No Action, and also in Astoria-Tillamook under the action alternative, but to decrease by approximately 4.2 percent in both Newport and Coos Bay-Brookings regions under the action alternative. 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 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 2 (California recreational Option 1) as no fishing would be allowed in any area (i.e., -100 percent). Under Alternative 3 (California recreational Option 4), the Santa Barbara to San Diego region shows the largest increase in employment impacts, an increase of approximately 2,261 jobs (139 percent). Increases in recreational fishing employment impacts projected for the other California regions under Alternative 3 (California recreational Option 4) include: Crescent City-Eureka 29 jobs (63.8 percent), Fort Bragg-Bodega Bay 40 jobs (63.2 percent), San Francisco area 228 jobs (130.4 percent), and Santa Cruz to Morro Bay 226 jobs (102.6 percent). Combined California Coast ports account for 79.7 percent of No Action recreational fishing employment impacts.

Table 20. Recreational fishery employment impacts under No Action and the economic alternative scenarios by community group (number of jobs).

Community Groups	*No Action*	Alternative 1	Alt 2 (California Option 1)	Alt 3 (California Option 4)
Washington Coast	186	213	213	213
Astoria-Tillamook	28	52	50	50
Newport	217	217	208	208
Coos Bay-Brookings	112	113	108	108
Crescent City-Eureka	45	59	0	74
Fort Bragg - Bodega Bay	63	86	0	102
San Francisco Area	175	316	0	403
SC – Mo – MB*	220	349	0	446
SB – LA – SD*	1,624	2,534	0	3,885
Coastwide Total	2,669	3,940	578	5,488

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 21. Change in recreational fishery employment impacts from No Action under the economic alternative scenarios by community group (number of jobs).

Community Groups	*No Action*	Alternative 1	Alt 2 (California Option 1)	Alt 3 (California Option 4)
Washington Coast	*186*	+28	+28	+28
Astoria-Tillamook	*28*	+24	+22	+22
Newport	*217*	+1	-9	-9
Coos Bay-Brookings	*112*	+1	-5	-5
Crescent City-Eureka	*45*	+14	-45	+29
Fort Bragg - Bodega Bay	*63*	+23	-63	+40
San Francisco Area	*175*	+141	-175	+228
SC – Mo – MB*	*220*	+129	-220	+226
SB – LA – SD*	*1,624*	+910	-1,624	+2,261
Coastwide Total	*2,669*	+1,270	-2,091	+2,819

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 22. Change in recreational fishery employment impacts from Baseline under the economic alternative scenarios by community group (percent).

Community Groups	No Action	Alternative 1	Alt 2 (California Option 1)	Alt 3 (California Option 4)
Washington Coast	*186*	+14.9%	+14.9%	+14.9%
Astoria-Tillamook	*28*	+87.7%	+78.6%	+78.6%
Newport	*217*	+0.3%	-4.2%	-4.2%
Coos Bay-Brookings	*112*	+0.5%	-4.2%	-4.2%
Crescent City-Eureka	*45*	+32.2%	-100.0%	+63.8%
Fort Bragg - Bodega Bay	*63*	+36.7%	-100.0%	+63.2%
San Francisco Area	*175*	+80.4%	-100.0%	+130.4%
SC – Mo – MB*	*220*	+58.6%	-100.0%	+102.6%
SB – LA – SD*	*1,624*	+56.0%	-100.0%	+139.2%
Coastwide Total	*2,669*	+47.6%	-78.3%	+105.6%

* SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – 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 24 under the No Action and for all alternatives assume 2023 Pacific whiting allocations after reapportionment of the unused Tribal portion to the non-Tribal whiting sectors.[6] For that reason, there is no projected variation in estimated income or employment impacts from No Action under Alternative 1 or the action alternative scenarios.

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

Table 23. Estimated total ex-vessel revenue equivalent, income and employment impacts under No Action and the economic alternative scenarios for At-sea whiting sectors: Non-Tribal (Motherships, Catcher vessels and Catcher-Processors) and Tribal (Motherships and Catcher vessels).

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