

**Preliminary Draft Socioeconomic Analyses for the 2023-2024 Harvest
Specifications and Management Measures**

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Executive Summary: Economic Impacts Analysis of the 2023-24 Groundfish Harvest Specifications and Management Measures

The coastwide economic impact analyses in support of the 2023-2024 groundfish harvest specifications and management measures are detailed in the text of the main document and are summarized below. The Pacific Fishery Management Council (Council) adopted the Preliminary Preferred Alternative (PPA) for management measures and the Final Preferred Alternative (FPA) for harvest specifications in April 2022. This document focuses on the impacts from the routine measures (e.g., trip limits, season structures, etc.). In this analysis, we make the assumption that the economic impacts under the PPA are equivalent to under No Action as the management measures are substantially similar and for purposes of quantifying economic impacts, any differences are considered to be negligible, minimal, or unquantifiable. We note that while there are differences between management actions PPA and No Action, especially with the ‘new’ management measures, ex-vessel revenue, recreational effort and resulting income and employment effects under these measures are highly uncertain. The estimated impacts from the new management measures are largely described in a qualitative manner within the Analytical document ([F.6. Attachment 2, June 2022](#)). This analysis examines four modeled Scenarios (Table ES-1), and associated options within the action alternatives to derive the estimated impacts. We use the term Scenario to avoid confusion with the use of Alternative or Action Alternative as those terms have different meaning in terms of Council management measures

Table ES-1. Summary of modeled scenarios in this analysis.

Modeled Scenarios	Summary
No Action Scenario	Default harvest control rules and routine management measures, assumes a quillback and rockfishes trip limit of 75 lbs. per 2 months [nearshore Option 1] California recreational season and area restrictions are the same as those analyzed for 2021-22 (CA Recreational Option 1).
Scenario 1	Same as No Action, except alternative harvest control rules for Oregon black rockfish, lingcod, sablefish, spiny dogfish, and vermilion/sunset, as articulated for Action Alternative 1, Table 1-1, F.3 Attachment 1, April 2022 and a quillback rockfish trip limit of 75 lbs. per 2 months (i.e. nearshore fishery Option 1) and California Recreational Fishery Option 1
Scenario 2	Same as No Action, except alternative harvest control rule for sablefish (the lowest P* alternative), a quillback rockfish trip limit of 50 lbs. per 2 months (nearshore fishery Option 2) and California recreational groundfish season is closed, at all depths, all year (CA Recreational Option 2).
Scenario 3	Same as No Action, except alternative harvest control rule for sablefish (the lowest P* alternative), a quillback rockfish trip limit of 25 lbs. per 2 months (nearshore fishery Option 3) and California recreational groundfish season is open, at all depths, all year (CA Recreational Option 4).
Preliminary Preferred Scenario ^{d/}	Same as No Action, with the exceptions for the Oregon black rockfish harvest control rule for and the PPA “new” management measures described in Section 2.13 of F.6 Attachment 2, June 2022

Commercial Fisheries

Estimated Coastwide Commercial Fishery Ex-Vessel Revenue

Under the Scenarios, annual average coastwide ex-vessel revenue is projected to exceed the Baseline by from \$6.2 million to \$9.3 million. Estimated ex-vessel revenue in the shoreside IFQ non-Pacific whiting fishery under the Scenarios ranges from a decrease from the Baseline of \$1.2 million under No Action and PPA to a decrease of \$2.6 million under Scenarios 3. Estimated increases in the limited entry fixed gear sector range from \$3.5 million under Scenarios 2 and 3 to \$4.8 million under No Action and the PPA. Annual ex-vessel revenues in the nearshore open access sector relative to the Baseline are estimated to increase by from \$1.3 million under Scenarios 3 (Option 3) to \$1.5 million under No Action (Option 1) and the PPA. Shoreside Tribal sector revenues (including Pacific whiting) are projected to increase relative to the Baseline by from \$2.7 million under Scenarios 2 and 3 to \$3.0 million under

Estimated Coastwide Commercial Fishery Net Revenue

Net revenues under the Council's PPA are assumed to be equivalent to under the No Action Scenario. While many estimates of net revenue appear similar across Scenarios, we note the 2021 Baseline specification for the Non-Pacific whiting Non-trawl IFQ and Limited Entry Fixed Gear sectors appears to be less profitable than other Scenarios. Increases in revenue, resulting from potential increases in other groundfish catches, could outpace corresponding increases in costs. Conversely, the 2021 Baseline for Non-Pacific whiting trawl IFQ appears more profitable than its other Scenarios, which is likely a result of the increase in other groundfish catch under the Baseline

Estimated Coastwide Commercial Fishery Income Impacts

The highest coastwide total and the highest level of income impacts for each community occur under No Action and the PPA and the lowest occur under Scenario 3. Coastwide estimated personal income impacts from commercial groundfish fishing are estimated to be \$158.3 million under the Baseline and are projected to increase to between \$162.6 million and \$167.6 million under the range of Scenarios.

Estimated Coastwide Commercial Fishery Key employment impacts

Coastwide estimated employment impacts from commercial groundfish fishing are estimated to be 2,302 jobs under the Baseline and are projected to increase to between 2,496 and 2,576 jobs under the range of Scenarios. The highest coastwide total and the highest level of employment impacts for each community among the Scenarios occur under No Action and PPA, and the lowest occur under Scenario 3.

Recreational Fishery

Estimated Coastwide Recreational Fishery Effort Impacts

Recreational effort for Washington, California, and Oregon is projected to be similar, if not the same as, Baseline under No Action, Scenario 1, and the PPA. Under Scenario 2 (California Option 2) coastwide recreational fishing effort is projected to decrease from Baseline by 679,300 trips (81.1 percent) due to closure of the recreational fishery in California. Under Scenario 3 (California Option 4) coastwide recreational fishing effort is projected to increase from Baseline by 209,100 trips (24.9 percent) due to relaxation of depth management measures in California.

Estimated Coastwide Recreational Fishery Income Impacts

Coastwide recreational fishing income impacts are projected not to change from Baseline under No Action, Scenario 1 (California Option 1) and PPA, to decrease by 89.3 percent (\$143.4 million) under Scenario 2 (California Option 2), and to increase by 28.5 percent (\$45.7 million) under Scenario 3 (California Option 4).

Estimated Coastwide Recreational Fishery

Coastwide recreational fishing employment impacts are projected not to change under No Action, Scenario 1 (California Option 1) and PPA; to decrease by 81.1 percent (2,271 jobs) under Scenario 2 (California Option 2); and to increase by 25.8 percent (721 jobs) under Scenario 3 (California Option 4).

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Landings from 2004 to 2009 excluded due to data confidentiality requirements. Landings from 1994-2021 are from the non-whiting trawl sector and EFPs. Data for 2021 should be considered preliminary. (Source: PacFIN Comprehensive_FT, 1/11/2018 and 1/18/2022). 1-4

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1. Socioeconomic Environment

Previous Council (e.g., [Groundfish 2022 SAFE](#)) for the biennial groundfish fishery harvest specifications and management measures have presented detailed characterizations of the Pacific coast groundfish fishery. That information is incorporated by reference and summarized here.

1.1 *Groundfish Fishery Sectors*

The groundfish 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; whereas, the shoreside fishery delivers to processing plants on land.
- **Non-whiting trawl/shorebased IFQ** catches a variety of other species, although sablefish and some rockfish and flatfish are the main revenue earners. This fishery is now usually referred to as “shorebased IFQ. In addition, landings of sablefish by gear types other than trawl (e.g., pot gear, hook and line, etc.) have emerged as an important part of the revenue earned by permitted vessels in this sector (i.e., gear switchers).
- **Fixed gear (longline and pot) fisheries** are divided into limited entry fixed gear (LEFG) 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 (e.g., salmon troll, directed Pacific halibut, etc.) 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.

Table 1-1. Numbers of federally permitted vessels, by sector, -as of April 20, 2022

Sector	Permit totals a/
Mothership	5
Mothership Catcher Vessels	17
Catcher Processors	10
IFQ	78
LEFG	112
OA	567

a/ not all permitted vessels may participate in a given year

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 1-2, 2003-2021, the top three species groups ranked by revenue [sablefish, Pacific whiting (hake), and Dover sole] accounted for 71 percent of total inflation adjusted groundfish ex-vessel revenue. Adding in the next two most important species groups, Rockfish not elsewhere identified (NEI) and petrale sole,

accounts for another 16 percent of total inflation adjusted groundfish ex-vessel revenue during the 2003-2021 period. Data during the 2011-2012 biennial period show the highest average annual inflation-adjusted landings revenue over the period shown. Revenues from Pacific whiting and Rockfish NEI have been particularly strong in the more recent years shown.

Table 1-2. Average annual inflation adjusted ex-vessel revenue, \$1,000s by select groundfish species from 2011 through 2021, averaged by biennia (Source: Groundfish SAFE Table 2b and PacFIN comprehensive ft 04/26/2022).

	2011-2012		2013-2014		2015-2016	
	Revenue	Percent	Revenue	Percent	Revenue	Percent
Sablefish	\$49,726	43%	\$27,608	29%	\$36,233	41%
P. Whiting	\$29,962	26%	\$32,545	34%	\$13,815	16%
Dover Sole	\$9,324	8%	\$8,931	9%	\$7,936	9%
Rockfish NEI*	\$7,414	6%	\$7,226	7%	\$7,612	9%
Petrale Sole	\$4,401	4%	\$7,670	8%	\$8,495	10%
Thornyheads	\$5,293	5%	\$5,064	5%	\$4,583	5%
Roundfish NEI*	\$3,495	3%	\$3,110	3%	\$3,833	4%
Flatfish NEI*	\$2,003	2%	\$1,810	2%	\$1,546	2%
Lingcod	\$1,186	1%	\$1,436	1%	\$1,864	2%
Other	\$1,513	1%	\$1,439	1%	\$1,587	2%
Total	\$114,317	100%	\$96,839	100%	\$87,504	100%
	2017-2018		2019-2020		2021	
	Revenue	Percent	Revenue	Percent	Revenue	Percent
Sablefish	\$33,139	33%	\$16,899	23%	\$15,283	23%
P. Whiting	\$25,982	26%	\$25,726	36%	\$24,395	36%
Dover Sole	\$7,641	8%	\$4,863	7%	\$3,471	5%
Rockfish NEI*	\$12,731	13%	\$12,510	17%	\$12,291	18%
Petrale Sole	\$8,546	8%	\$6,338	9%	\$6,806	10%
Thornyheads	\$5,439	5%	\$2,392	3%	\$1,454	2%
Roundfish NEI*	\$3,602	4%	\$686	1%	\$684	1%
Lingcod	\$2,534	2%	\$2,038	3%	\$1,799	3%
Flatfish NEI*	\$1,152	1%	\$420	1%	\$362	1%
Other	\$929	1%	\$514	1%	\$534	1%
Total	\$101,695	100%	\$72,386	100%	\$67,079	100%

*/NEI indicates species not elsewhere identified.

1.3 Landings and Revenue by Commercial Fishery Sector

1.3.1 Non-whiting Fishery Sectors

Table 1-3 reports ex-vessel revenue for the main non-whiting fishery sectors. In aggregate, during 2013-2019 the IFQ fishery (trawl and non-trawl) accounted for 52 percent of non-Pacific whiting ex-vessel revenue, followed by the non-nearshore fixed gear fishery (LEFG and OA, targeting mostly sablefish) which accounted for 31 percent.

Table 1-3. Non-whiting groundfish ex-vessel revenue in inflation-adjusted \$1,000s, by non-whiting commercial fishery sectors, 2013-2021, showing percentages total and annual (Ann.) average ex-vessel revenue. (Source: SAFE Table 12b, 4/26/2022).

Year	Shoreside IFQ Trawl (Non-whiting)	Shoreside IFQ Non-trawl	Non-Nearshore Fixed Gear	Nearshore Fixed Gear	Grand Total	Pct. of Annual Average
2013	\$29,117	\$3,195	\$14,043	\$4,202	\$50,558	65%
2014	\$28,061	\$5,138	\$15,443	\$4,134	\$52,776	68%
2015	\$30,091	\$5,932	\$18,399	\$4,941	\$59,364	76%
2016	\$29,844	\$7,235	\$20,090	\$3,996	\$61,165	78%
2017	\$34,594	\$6,896	\$23,338	\$4,476	\$69,304	89%
2018	\$29,010	\$4,577	\$18,997	\$4,434	\$57,018	73%
2019	\$27,635	\$4,324	\$15,744	\$4,600	\$52,303	67%
2020	\$18,831	\$1,986	\$10,559	\$3,816	\$35,191	45%
2021	\$22,007	\$2,074	\$11,664	\$4,134	\$39,877	51%
Grand Total	\$249,189	\$41,357	\$148,277	\$38,733	\$477,556	-
Pct. of Total	52%	9%	31%	8%	100%	-
Ann. Average	\$27,688	\$4,595	\$16,475	\$4,304	\$77,928	-

1.3.2 Whiting Fishery Sectors

Table 1-4 reports Pacific whiting catch for non-tribal whiting sectors during 2013 to 2021. Although varying year to year, total catch since 2016 has been above the 7-year annual average in four of five years. Total non-Tribal whiting catch was lowest during the period in 2015.

Table 1-4. Pacific whiting catch, mt, by whiting commercial fishery sectors, 2013-2021. (Source: Groundfish SAFE Table 14a , 4/26/2022 and GMT).

Year	Catcher-Processor Total	Mothership Total	Shoreside Whiting Trawl Total	Grand Total	Percent of Annual Average
2013	78,041	52,522	97,634	228,198	84%
2014	103,266	62,038	98,717	264,021	98%
2015	68,484	27,664	58,357	154,505	57%
2016	108,804	65,018	86,176	259,997	96%
2017	137,130	66,257	146,568	349,954	129%
2018	116,050	67,163	130,052	313,265	116%
2019	116,379	52,417	144,083	312,879	116%
2020	111,014	38,110	138,598	287,722	106%
2021 ^{a/}	103,971	35,209	126,558	265,739	98%
Grand Total	943,139	466,398	1,026,742	2,436,279	
Pct. of Total	39%	19%	42%	100%	
Ann. Average	104,793	51,822	114,083	270,698	

a/ 2021 data is considered preliminary.

1.3.3 Midwater Trawl Fishery for Rockfish

The rebuilding of canary and widow rockfishes has stimulated the reemergence of a fishery using midwater trawl gear to target midwater rockfish, principally widow and yellowtail rockfishes. Widow rockfish was declared overfished in 2001 and declared rebuilt in 2011. Canary rockfish 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 rockfishes 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 non-whiting species landings tended 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 the late 1980s, with the exception of 2000 and 2001. The non-whiting midwater trawl fishery essentially ceased while widow rockfish was rebuilding between 2001 and 2011, but has shown notable growth since.

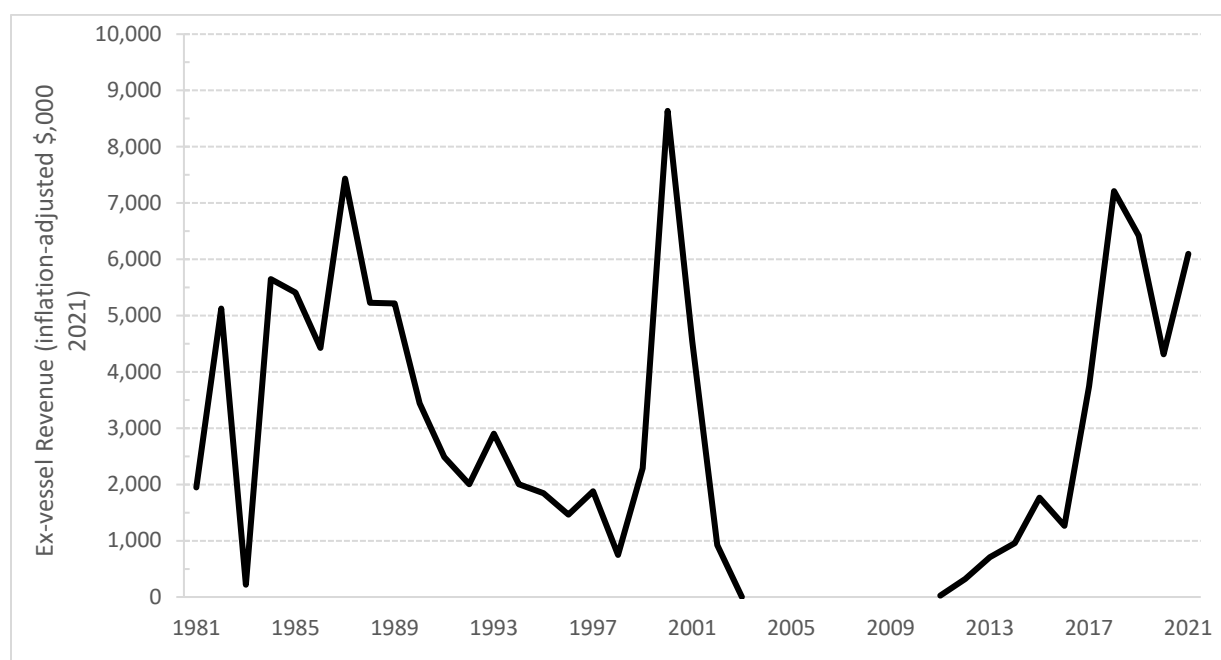


Figure 1-1. Inflation adjusted ex-vessel revenue (\$1,000s) from landings of midwater rockfish (widow, yellowtail, chilipepper), by midwater trawl gear in the non-whiting groundfish trawl sector, 1981-2021. Landings from 2004 to 2009 excluded due to data confidentiality requirements. Landings from 1994-2021 are from the non-whiting trawl sector and EFPs. Data for 2021 should be considered preliminary. (Source: PacFIN Comprehensive_FT, 1/11/2018 and 1/18/2022).

Table 1-5 provides a snapshot of the midwater rockfish fishery over the past 10 years (2021 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 and preliminary ex-vessel revenue in 2021 exceeded \$6 million.

Table 1-5. Landings (mt), inflation adjusted ex-vessel revenue, and number of vessels making landings of pelagic rockfish (chilipepper, widow, and yellowtail rockfish) with midwater trawl gear, 2012-2021. (Source: PacFIN Comprehensive_FT, 1/11/2018 and 1/18/2022).

Values	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021^{a/}
Metric tons	249	606	836	1674	1,138	5,257	11,291	9,732	8,989	11,481
\$,000	\$321	\$705	\$956	\$1,762	\$1,263	\$3,745	\$7,214	\$6,423	\$4,314	\$6,094
# of vessels	17	12	24	37	10	16	24	25	29	27

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 annual catch limits (ACL) along with certain other sources of catch to determine the fishery harvest guidelines (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 Pacific 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 1-6 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 2013-2018. Hook-and-line gear accounted for 64 percent of revenue reported in the table. Excluding 2020, when the fishery was disrupted due to covid-19, and 2021, for which data is incomplete, revenue from tribal groundfish hook-and-line and trawl landings has generally exceeded \$4 million, reaching nearly \$6 million in 2016 and 2017.

Table 1-6. Treaty non-whiting groundfish ex-vessel revenue for hook-and-line and trawl gear (from groundfish only) 2013-2021, in inflation-adjusted \$1,000s. (Source: Groundfish SAFE Table 13b and PacFIN comprehensive ft, 4/26/2022).

Year	Hook-and-Line	Trawl	Total	Pct. of Annual Average
2013	\$2,183	\$1,981	\$4,164	103%
2014	\$3,409	\$1,232	\$4,641	114%
2015	\$3,443	\$2,001	\$5,444	134%
2016	\$3,766	\$1,866	\$5,632	139%
2017	\$3,952	\$2,025	\$5,977	147%
2018	\$2,665	\$1,770	\$4,435	109%
2019	\$1,599	\$1,687	\$3,286	81%
2020	\$663	\$130	\$793	20%
2021^{a/}	\$1,569	\$619	\$2,188	54%
Grand Total	\$27,001	\$13,309	\$37,290	
Pct. of total	64%	36%	100%	
Ann. Average	\$2,583	\$1,479	\$4,062	

a/ 2021 data is considered preliminary.

1.3.5 Recreational Groundfish Fishery

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 or from pleasure boats, while charter vessels take paying passengers. Recreational fisheries are an important part of fishery-related economic activity. However, it is more difficult to quantify 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 from Input-Output for Pacific Coast Fisheries (IOPAC) impact coefficients applied to Groundfish Management Team's (GMT) estimates of effort under the draft 2023-2024 groundfish management measures ([F.6, Attachment 2, June 2022](#)) are reported in section 2.1.1. Table 1-7 shows annual average numbers of bottomfish/halibut angler trips by mode compared to trips targeting other species. Private and charter trips targeting bottomfish/Pacific halibut comprised 27 percent of all trips and modes during the 2012-2020 period.

Table 1-7. Total coastwide recreational angler trips by type and mode, annual averages during 2012-2020.
(Source: GMT state reps, RecFIN).

Type:	Bottomfish + P. 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%	859,009	24%	859,009	24%
Man-made	88,223	2%	1,104,431	31%	1,192,654	34%
Charter	560,783	16%	137,323	4%	698,016	20%
Private	308,798	9%	501,471	14%	810,269	23%
Total	957,804	27%	2,602,144	73%	3,559,948	100%

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

Table 1-8 shows the annual average counts of bottomfish/halibut and other trip type marine angler trips by state and reporting area. California accounted for 82 percent of bottomfish/halibut angler trips, with the southern California region accounting for 47 percent of coastwide trips due to its large coastal population and potential year-round fishery. Figure 1-2 shows bottomfish/halibut trips by state and year. The number of coastwide bottomfish/Pacific halibut marine angler trips peaked in 2014 at more than 1 million trips. The 914,000 trips taken in 2019 exceeded the 14-year (2007-2020) average of 817,800 trips by 12 percent. The 645,000 trips taken in 2020 was the lowest during the period, although this is at least partly the result of closures of some facilities and businesses and an undercount of anglers due to the absence of port samplers during several months of 2020 due to covid-19 restrictions.

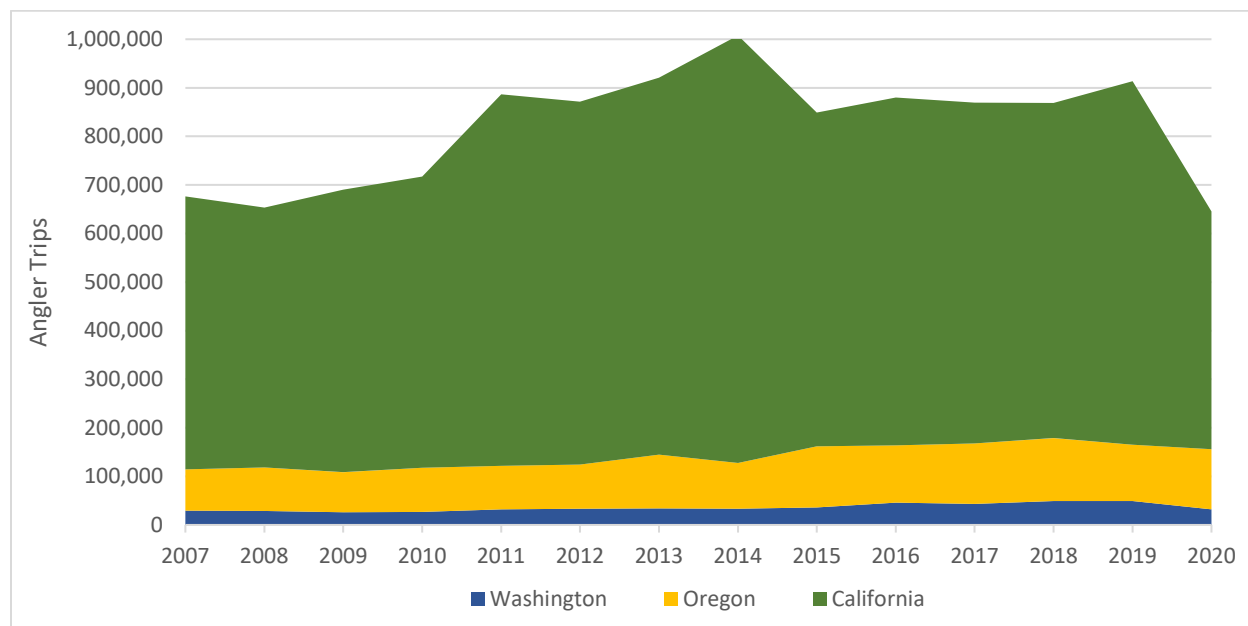


Figure 1-2. Total bottomfish plus Pacific halibut marine angler boat trips (private and charter) by state, 2007 to 2020. (Source: GMT state reps, RecFIN).

Table 1-8. 2012–2020 average annual bottomfish plus Pacific halibut marine angler boat trips (private and charter) by reporting area. (Source: GMT state reps, RecFIN).

State/Region	Bottomfish + P. Halibut		Other Trip Types ^{a/}		Total	
	Annual Average	Percent of Bottomfish + P. Halibut Trips	Annual Average	Percent of Other Trips	Annual Average	Percent of All Trips
Washington Subtotal	39,605	5%	101,449	16%	141,054	9%
La Push-Neah Bay	14,990	2%	9,604	2%	24,593	2%
Westport	20,792	2%	37,641	6%	58,433	4%
Ilwaco-Chinook	3,823	0%	54,204	8%	58,027	4%
Oregon Subtotal	114,895	13%	92,379	14%	207,273	14%
Astoria	725	0%	8,154	1%	8,879	1%
Tillamook	18,031	2%	18,690	3%	36,720	2%
Newport	55,124	6%	28,469	4%	83,593	6%
Coos Bay	17,996	2%	24,356	4%	42,351	3%
Brookings	23,019	3%	12,711	2%	35,731	2%
California Subtotal	715,081	82%	444,876	70%	1,159,957	77%
North Coast: Humboldt and Del Norte	28,799	3%	21,903	3%	50,702	3%
Wine District: Mendocino	16,371	2%	11,321	2%	27,692	2%
SF District: San Mateo through Sonoma	69,466	8%	82,984	13%	152,450	10%
Central Coast: San Luis Obispo through Santa Cruz	104,393	12%	35,466	6%	139,860	9%
Channel: Ventura and Santa Barbara	87,640	10%	23,737	4%	111,377	7%
South Coast: San Diego, Orange, and Los Angeles	408,413	47%	269,464	42%	677,878	45%
Grand Total	869,581	100%	638,704	100%	1,508,285	100%

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

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 IOPAC West Coast port group.¹ IOPAC is also used to evaluate personal income and employment impacts of proposed management measures.

Table 1-9 shows inflation-adjusted ex-vessel revenue from non-tribal groundfish landings in aggregate over 2013-2021 by port group and groundfish fishery sector. Note that in some cases adjacent port groups were aggregated to avoid disclosure of confidential data. Landings and revenue tend to be concentrated in relatively few ports. The four top-ranked port areas of the 11 shown accounted for approximately 77 percent of coastwide revenue during the period. All four

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.

are north of the Oregon/California border. Astoria-Tillamook is the top-ranked port overall, accounting for 28 percent of coastwide groundfish revenue shown. Newport ranks second at 22 percent of coastwide revenue, and the combined Washington port groups come third at 17 percent. Pacific 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 Coos Bay-Brookings ranks third by this measure. The combined Washington ports rank first for revenues from the non-nearshore (sablefish) fixed gear sector, followed by Newport, Morro Bay-Santa Barbara, and Coos Bay-Brookings, respectively. Morro Bay-Santa Barbara is the top port area for the nearshore fixed gear sector followed by Coos Bay-Brookings, Crescent City-Eureka, Monterey, and Fort Bragg.

Focusing on the shoreside non-whiting IFQ sector, Table 1-10 shows revenues from fixed gear landings (often referred to as gear-switching) increasing from approximately 10 percent of the sector total in 2013 to 30 percent in 2017. The fixed-gear share of IFQ landings since declined to approximately 28 percent of the IFQ non-whiting sector total in 2018, 13 percent in 2019, and less than 10 percent in 2020 and 2021. 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, Morro Bay-Santa Barbara, and the Washington ports. Coastwide IFQ non-whiting sector fixed gear landings totaled approximately \$58 million ex-vessel revenue in inflation-adjusted terms during 2013-2021. Combined ports in the state of Oregon recorded approximately 69 percent of this revenue, and Washington ports approximately 19 percent, with the California ports accounting for the remainder (12 percent) led by Morro Bay-Santa Barbara.

Table 1-9. Total ex-vessel revenue (inflation-adjusted \$1,000s) from groundfish landings, 2013-2021, by IOPAC port group and fishery sector. (Port groups have been aggregated to avoid disclosing confidential data, 2021 data is preliminary). a/ Includes non-trawl IFQ.

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	24,666	55,119	45,565	0	632	125,982	13,998
Astoria-Tillamook	109,151	86,499	9,732	1,542	3,659	210,583	23,398
Newport	59,514	72,455	36,770	768	1,989	171,497	19,055
Coos Bay-Brookings	39,128	-	26,603	10,928	943	77,602	8,622
Crescent City-	37,283	-	8,522	3,260	128	49,193	5,466
Fort Bragg	18,322	-	12,764	2,283	258	33,627	3,736
San Francisco (incl. Bodega Bay)	5,149	-	9,775	1,552	519	16,995	1,888
Monterey	2,319	-	8,319	2,924	173	13,736	1,526
Morro Bay-Santa Barbara	7,722	-	29,721	13,486	1,330	52,258	5,806
Los Angeles	-	-	4,414	519	206	5,139	571
San Diego	-	-	5,603	186	136	5,926	658

Table 1-10. Annual ex-vessel revenue (inflation-adjusted \$1,000s) from non-whiting IFQ groundfish landings by gear type (trawl and fixed gear), 2013-2021.

Year	Shoreside Non- whiting Trawl	Shoreside Non- whiting Fixed Gear
2013	29,001	3,164
2014	27,928	4,612
2015	26,544	5,395
2016	29,829	9,765
2017	34,624	15,187
2018	28,976	11,439
2019	27,613	4,257
2020	18,824	1,985
2021^{a/}	22,037	2,074

a/ 2021 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 Action Alternatives**

This section evaluates the effects of the Action Alternatives on fishery participants and fishing communities. Baseline represents the environmental baseline using actual totals and projections based on regulations in place towards the end of 2021. In this analysis, we make the assumption that the economic impacts under the PPA are equivalent to under No Action. The rationale for this assumption is No Action management measures, notably the routine measures, are, for the most part, similar to, if not, the same as the routine measures in the PPA: therefore, . We contend, therefore, for purposes of quantifying economic impacts, any differences are considered to be negligible, minimal, or unquantifiable. However, we do model multiple Options that are under consideration for the nearshore fixed gear fishery and the California recreational fishery that can be quantifiably modeled. Of the new management measures), we note that while quantifiable impacts are difficult to model as they have not been implemented, and therefore resulting ex-vessel revenue, recreational effort and resulting income and employment effects under these measures are highly uncertain, are qualitatively described in [Attachment 2](#). Those details are incorporated by reference, though summarized within the following text where appropriate.

We model the estimated socioeconomic impacts of Action Alternatives through five scenarios. These scenarios (Table 2-1) are akin Baseline, No Action, Alternative 1, and Alternative 2 management measures; however, under No Action and Alternative 1 there are trip limit options for quillback rockfish and copper rockfish to consider in conjunction with sablefish harvest control rule alternatives.

Under No Action, the nearshore fixed gear sectors are associated with three trip limit options for quillback rockfish and copper rockfish (see Section 4.8 of [Attachment 2](#) for detail) Option 1 reflects the status quo trip limits for quillback rockfish and copper rockfish of 75 lbs. per two months. Option 2 and Option 3 reduce the status quo trip limits to 50lbs and 25 lbs. per two months, respectively. Under Alternative 1, trip limit Options apply to quillback rockfish as there are no changes proposed to the harvest control rule for copper rockfish.

Under No Action and Alternative 1, there are four California recreational fishery Options which address season and depth change options (see Section 4.11 of [Attachment 2](#) for detail). Option 1 is the current, or status quo, recreational season structure. Option 2 would close all depths year round in California's five recreational management areas. Option 3 would allow recreational groundfish fishing seaward of a 'to-be-determined' Rockfish Conservation Area boundary line. We note that Option 3 cannot be quantitatively analyzed as there is not enough information to adequately provide the model. However, we assume that allowing some fishing would generate a positive benefit as compared to Option 2, but would likely be less than Option 1 and Option 4. Option 4 would open all depths year round to recreational groundfish fishing.

Table 2-1. Summary of Scenarios

Modeled Scenarios	Summary
No Action Scenario	Default harvest control rules and routine management measures, assumes a quillback and rockfishes trip limit of 75 lbs. per 2 months [nearshore Option 1] California recreational season and area restrictions are the same as those analyzed for 2021-22 (CA Recreational Option 1).
Scenario 1	Same as No Action, except alternative harvest control rules for Oregon black rockfish, lingcod, sablefish, spiny dogfish, and vermilion/sunset, as articulated for Action Alternative 1, Table 1-1, F.3 Attachment 1, April 2022 and a quillback rockfish trip limit of 75 lbs. per 2 months (nearshore fishery Alternative 1, Option 1) and Alternative 1, CA Recreational Fishery Option 1
Scenario 2	Same as No Action, except alternative harvest control rule for sablefish (the lowest P* alternative), a quillback rockfish trip limit of 50 lbs. per 2 months (nearshore fishery Alternative 1, Option 2) and California recreational groundfish season is closed, at all depths, all year (Alternative 1, CA Recreational Option 2).
Scenario 3	Same as No Action, except alternative harvest control rule for sablefish (the lowest P* alternative), a quillback rockfish trip limit of 25 lbs. per 2 months (nearshore fishery Alternative 1, Option 3) and California recreational groundfish season is open, at all depths, all year (Alternative 1, CA Recreational Option 4).
Preliminary Preferred Scenario ^{d/}	Same as No Action, with the exceptions for the Oregon black rockfish harvest control rule for and the PPA “new” management measures described in Section 2.13 of F.6 Attachment 2, June 2022

The scenarios were constructed to illustrate how conditions may change both by applying harvest specifications based on default HCRs and compliant management measures (i.e., the No Action Alternative), and varying ACLs and management measures for certain stocks [e.g., black rockfish and vermilion rockfish, and annual catch targets for quillback rockfish and copper rockfish off California], catch control mechanisms (such as block area closures for Pacific spiny dogfish), and proposed revisions to the Non-trawl Rockfish Conservation Area boundaries and allowed gear types under certain action alternatives. The ACLs for all remaining stocks are consistent across all alternatives. Under each alternative, including No Action, there are multiple options available corresponding to alternative assumptions about regulation of the nearshore commercial fishery and California recreational fishery.

Table 2-2. is an attempt to display and describe what is modeled in the Scenarios. For example, each sector displayed in the top row is modeled under the Alternative 1 management measures. Both nearshore fixed gear sector and California recreational fishery have multiple options under Alternative 1, therefore we model Alternative 1, Option 1. For both of these sectors, Alternative 2 is the same as Alternative 1; therefore, we model Alternative 1, Option 2 under Scenario 2 and model Alternative 1, Option 3 for the nearshore fixed gear sector and Alternative 1, Option 4 for the California recreational fishery (see above for rationale not to model Option 3 for the California recreational fishery). Another example is that under all Scenarios, only No Action management measures for the Washington and Oregon recreational fisheries are modeled as Alternative 1 and Alternative 2 are the same as No Action.

Table 2-2. Range of scenarios and options modeled for IFQ, non-nearshore, nearshore, and recreational fisheries sectors' economic impacts analysis

Modeled Scenarios	Shoreside IFQ Sector	Non-nearshore Fixed gear Sector	Nearshore Fixed gear Sector ^{a/}	California Recreational ^{b/}	Washington and Oregon Recreational ^{c/}
No Action Scenario	No Action	No Action	No Action (Options 1-3)	No Action	No Action
Scenario 1	Alternative 1	Alternative 1	Alternative 1 Option 1	Option 1	No Action
Scenario 2	Alternative 2	Alternative 2	Alternative 1 Option 2	Option 2	No Action
Scenario 3	Alternative 2	Alternative 2	Alternative 1 Option 3	Option 4	No Action
PPA Scenario	No Action	No Action	No Action Option 1	Option 1	No Action

a/ There are three quillback rockfish trip limit options for the Nearshore fixed gear sector under No Action and Action Alternative 1.

b/ There are four California Recreational sector options any of which could be selected under any alternative (including No Action). The effects of Option 3 cannot currently be quantified so it has been omitted from the analysis of quantitative impacts under the alternatives.

c/ There is only a single option under consideration for Washington and Oregon recreational fisheries under all alternatives.

We compare the results of these modeled scenario outcomes to both baseline and one another. We include a comparison to the Baseline to provide the reader with an idea of how socioeconomic effects of the potential future state (Alternatives) are different from the current state (Baseline) estimated future state of the fishery is predicted to be in comparison to the current state. As described in Draft Management Measure Analytical Document (i.e., [Attachment 2](#)), the Baseline scenario characterizes catch, ex-vessel revenue, and recreational fishing effort in 2021 using the same GMT catch projection methods that were applied under the alternatives. (Section 1.1 above supplements this characterization for the commercial fishery sectors with historical landings and ex-vessel revenue amounts recorded in the PacFIN database.)

For simplicity, fishery and community economic impacts in the following sections are displayed for 2023, the first year of the two-year management cycle, only. Although the totals may be somewhat different in some cases during the second year of the management cycle in 2024, the relative distribution of economic effects and inferences regarding rankings of the alternatives would look very similar. Also, for simplicity, the range of scenarios modeled was encapsulated in a set of alternatives containing the alternatives for the IFQ and non-nearshore fixed gear sectors as well as the range of options for the nearshore commercial fishery and California recreational fishery (Table 2-2).

One caveat to consider the following analyses is Pacific whiting fisheries are not part of these proposed actions due to the way this stock is managed. 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 2021, where 368,500 mt of Pacific whiting were allocated to whiting fisheries sectors. This amount includes 338,650 mt for the combined non-tribal sectors and 30,000 mt for tribal sectors following reapportionment of 34,645 mt of unused tribal fishery quota to the non-tribal commercial fishery. When Pacific whiting

reapportionment has occurred, as it did in 2021, Pacific 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. In this analysis the shift in Pacific whiting quota is assumed to affect potential catch and revenue in the at-sea tribal sector and the at-sea non-tribal mothership and catcher-processor sectors. Since impacts to the tribal and at-sea Pacific whiting sectors are not traced through to shorebased communities, any projected effects of Pacific whiting quota reapportionment on the at-sea tribal and non-tribal commercial sectors under the alternatives do not extend to estimated community income or employment impacts. The Baseline, No Action and Action alternative scenarios all assume post-reapportionment 2021 Pacific 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 Groundfish biennial specifications EIS included detailed descriptions of the models and data used to project socioeconomic impacts. These projection models include:

- GMT catch projection models for different sectors of the commercial groundfish fishery,
- GMT fishing effort (angler trips) projections for the recreational groundfish fishery,
- 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,
- Net revenue in commercial fishery operations based on projected 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.

2.1.2 Commercial Fisheries

Revenue estimates are based on projected landings estimates from the GMT models referenced above. All projections assume average ex-vessel prices observed in 2021.

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 region. 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 increases in ACLs for species that main be constraining to the fishery (i.e.,

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. The TAC for Pacific whiting is set annually outside of this harvest specifications process. In this analysis the 2023-2024 TAC and allocations are assumed to be the same as 2021: the Baseline scenario (hereafter Baseline), No Action Scenario (hereafter No Action) and alternative scenarios all assume post-reapportionment 2021 Pacific whiting allocations and catch levels. Projections for the shorebased non-tribal Pacific whiting fishery do not vary under the No Action and Action Alternatives. Since the TAC and resulting allocation is not determined during the harvest specifications process, a historical TAC (2021) is used to estimate socioeconomic impacts. The actual TACs for 2023 and 2024 could be higher or lower than the assumed value.

Under all Scenarios, annual average coastwide ex-vessel revenue, including the at-sea sectors, is projected to exceed the Baseline by from \$6.2 million to \$9.3 million. The relatively small difference (\$3.1 million) in projected overall ex-vessel revenue between the alternatives is likely to be within the margin of error for these estimates. Most of the differences between the commercial fishery Scenarios are due to projected effects in the non-Pacific whiting IFQ and Non-nearshore limited entry fixed gear sectors.

Impacts

The PPA provides the largest ex-vessel revenue when compared to all other modeled Scenarios. Estimated ex-vessel revenue impacts by fishery sector are shown in Table 2-3, Table 2-4. Key findings from the analysis are as follows:

Shoreside IFQ (non-Pacific Whiting)

Estimated ex-vessel revenue in the shoreside IFQ non-Pacific whiting fishery under the Scenarios ranges from a decrease from the Baseline of \$1.2 million under No Action and PPA to a decrease of \$2.6 million under Scenario 3. Ex-vessel revenue from shoreside non-tribal Pacific whiting landings is estimated to be \$23.8 million under the Baseline and all Scenarios.

Tribal Shoreside

Shoreside Tribal sector revenues (including Pacific whiting) are projected to increase relative to the Baseline by from \$2.7 million under Scenario 2 and 3 to \$3.0 million under No Action and the PPA. The differences are due to variation in the assumed allocation of sablefish among the Scenarios.

At-sea Pacific Whiting

In the at-sea non-tribal and Tribal fisheries, ex-vessel revenue equivalents are projected to be \$37.2 million and \$3.1 million, respectively, under the Baseline and all Scenarios.

LEFG/OA Non-Nearshore

Sablefish landings accounting for approximately 87 percent of sector ex-vessel revenue in the LEFG and non-nearshore OA sectors (see Groundfish SAFE Table 8b). Compared with Baseline both sectors show increased ex-vessel revenue under the No Action and the modeled Scenarios. Estimated increases in the limited entry fixed gear sector range from \$3.5 million under Alternatives 2 and 3 to \$4.8 million under No Action and the PPA. Revenues in the non-nearshore OA sector are projected to be \$1.3 million greater than Baseline under No Action and the action alternatives.

OA Nearshore

The nearshore OA sector annual ex-vessel revenues relative to the Baseline are estimated to increase by from \$1.3 million under Scenario 3 (Alternative 1, Option 3) to \$1.5 million under No Action (Alternative 1, Option 1) and the PPA. While the nearshore OA sector contributes a relatively small portion of coastwide shoreside revenue, it is especially important in Southern Oregon, Northern California, and Central California fishing communities.

Table 2-3. Estimated ex-vessel revenues by groundfish harvest sector under the Baseline, Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) in \$million.

	<i>Baseline</i>	No Action	SC 1	SC 2	SC 3	PPA
Shoreside Sectors:						
Pacific whiting	23.8	23.8	23.8	23.8	23.8	23.8
Non-Pacific whiting Trawl+Non-trawl IFQ	24.8	23.6	23.2	22.9	22.2	23.6
Limited Entry Fixed Gear	9.7	14.5	13.9	13.3	13.3	14.5
Nearshore Open Access	3.7	5.2	5.1	5.1	5.0	5.2
Non-nearshore Open Access	2.5	3.8	3.8	3.8	3.8	3.8
Incidental Open Access	0.1	0.1	0.1	0.1	0.1	0.1
Tribal (incl. Pacific whiting)	3.2	6.2	6.0	5.9	5.9	6.2
Shoreside sectors' Totals	67.9	77.2	75.9	74.8	74.1	77.2
At-sea Sectors:						
Non-Tribal Pacific whiting	37.2	37.2	37.2	37.2	37.2	37.2
Tribal Pacific whiting	3.1	3.1	3.1	3.1	3.1	3.1
At-sea sectors' Totals	40.3	40.3	40.3	40.3	40.3	40.3
TOTAL Groundfish Revenue	108.2	117.5	116.2	115.1	114.4	117.5

Table 2-4. Change in groundfish ex-vessel revenues under the Baseline, Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) by groundfish harvest sector under the Alternatives (Alt) in \$million.

	<i>Baseline</i>	No Action	SC 1	SC 2	SC 3	PPA
Shoreside Sectors:						
Pacific whiting	23.8	+0.0	+0.0	+0.0	+0.0	+0.0
Non-Pacific whiting Trawl+Non-trawl IFQ	24.8	-1.2	-1.7	-1.9	-2.6	-1.2
Limited Entry Fixed Gear	9.7	+4.8	+4.2	+3.5	+3.5	+4.8
Nearshore Open Access	3.7	+1.5	+1.4	+1.4	+1.3	+1.5
Non-nearshore Open Access	2.5	+1.3	+1.3	+1.3	+1.3	+1.3
Incidental Open Access	0.1	+0.0	+0.0	+0.0	+0.0	+0.0
Tribal (incl. Pacific whiting)	3.2	+3.0	+2.8	+2.7	+2.7	+3.0
Shoreside sectors' Totals	67.9	+9.3	+8.0	+6.9	+6.2	+9.3
At-sea Sectors:						
Non-Tribal Pacific whiting	37.2	+0.0	+0.0	+0.0	+0.0	+0.0
Tribal Pacific whiting	3.1	+0.0	+0.0	+0.0	+0.0	+0.0
At-sea sectors' Totals	40.3	+0.0	+0.0	+0.0	+0.0	+0.0
TOTAL Groundfish Revenue	108.2	+9.3	+8.0	+6.9	+6.2	+9.3

Table 2-5. Change in groundfish ex-vessel revenues under the Baseline, Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) by groundfish harvest sector under the Alternatives (Alt) in \$million.

	<i>Baseline</i>	No Action	SC 1	SC 2	SC 3	PPA
Shoreside Sectors:						
Pacific whiting	23.8	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%
Non-Pacific whiting Trawl+Non-trawl IFQ	24.8	-5.0%	-6.7%	-7.8%	-10.5%	-5.0%
Limited Entry Fixed Gear	9.7	+49.4%	+42.7%	+36.2%	+36.2%	+49.4%
Nearshore Open Access	3.7	+39.5%	+37.9%	+37.3%	+36.3%	+39.5%
Non-nearshore Open Access	2.5	+51.3%	+51.3%	+51.3%	+51.3%	+51.3%
Incidental Open Access	0.1	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%
Tribal (incl. Pacific whiting)	3.2	+94.3%	+89.1%	+84.1%	+84.1%	+94.3%
Shoreside sectors' Totals	67.9	+13.7%	+11.8%	+10.2%	+9.1%	+13.7%
At-sea Sectors:						
Non-Tribal Pacific whiting	37.2	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%
Tribal Pacific whiting	3.1	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%
At-sea sectors' Totals	40.3	+0.0%	+0.0%	+0.0%	+0.0%	+0.0%
TOTAL Groundfish Revenue	108.2	+8.6%	+7.4%	+6.4%	+5.7%	+8.6%

2.1.3 Recreational Fisheries

For recreational fisheries, projected marine angler boat trips taken in groundfish plus Pacific halibut recreational fisheries are compared to Baseline fishing effort under the modeled Scenarios.

Table 2-6, Table 2-7, and Table 2-8 compare projected recreational angler trips under the No Action and Action alternatives to Baseline average annual angler effort. Results are shown by coastal regions that are aggregated from statistical reporting regions²

To produce a tractable number of economic impact projections that cover the range of possible outcomes, in addition to No Action, three Scenarios 1-3 were constructed from the range of management alternatives and/or options proposed by each state. Proposed management regimes for Washington's and Oregon's recreational fisheries do not vary under Baseline, No Action, and the Scenarios. There are four management options (Options 1-4) for the California recreational fishery. Any of the four options can be selected under any of the Action Alternatives (i.e., No Action, Alternative 1, etc.). Since the effects of California Option 3 cannot currently be quantified it has been omitted from the following analysis of quantitative impacts under the alternatives.³

For purposes of comparing the range of alternative management options under consideration, No Action, Scenario 1 and PPA are associated with California Option 1 (Baseline management), Scenarios 2 is associated with California Option 2 (closure of the boat-based fishery), and Scenarios 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 options see [Agenda Item F.4, Attachment 2, April 2022](#) for descriptions of the California recreational Options.

Impacts

Coastwide

Coastwide recreational effort is projected to be the same as Baseline under No Action, Scenario 1 and PPA (Action Alternative 1, California Option 1). Under Scenario 2 (Action Alternative 1, California Option 2) coastwide recreational fishing effort is projected to decrease from Baseline by 679,300 trips (81.1 percent) due to closure of the recreational fishery in California. Under Alternative 3 (Action Alternative 1, California Option 4) coastwide recreational fishing effort is projected to increase from Baseline by 209,100 trips (24.9 percent) due to relaxation of depth management measures in California.

Washington

Washington Coast recreational fishing effort is projected to be the same as Baseline under all the modeled Scenarios. The harvest control rules under consideration for 2023 and 2024 include sub-bag limits for species such as vermilion, quillback, and copper rockfishes, which are not expected to affect effort. Washington Coast ports accounted for 6.5 percent of coastwide Baseline fishing effort.

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

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

Oregon

Oregon Recreational fishing effort is projected to be the same as Baseline under all the Scenarios. The management options under consideration for 2023 and 2024 are not expected to affect effort. The combined three coastal regions of Oregon account for 12.4 percent of coastwide Baseline fishing effort.

California

California recreational fishing effort is projected not to change from Baseline under No Action, Scenario 1 and PPA (Action Alternative 1, California recreational Option 1), but is projected to be zero in all regions under Scenario 2 (Action Alternative 1, California recreational Option 2), and to increase from Baseline under Scenario 3 (California recreational Option 4) in all California regions by at least 19.4 percent. Note that under Scenario 2 (California recreational Option 2) no fishing would be allowed, while under Scenario 3 (Action Alternative 1, California recreational Option 4) fishing would be allowed at all depths throughout the year. The Santa Barbara to San Diego region accounts for more than half (55.7 percent) of coastwide Baseline recreational angler effort, and this region also shows the largest change in effort under Scenario 3 (Action Alternative 1, California recreational Option 4), an increase of 162,300 trips (34.8 percent). Increases projected for the other California regions under Scenario 3 (Action Alternative 1, California recreational Option 4) are: Crescent City-Eureka 19.4 percent, Fort Bragg-Bodega Bay 19.4 percent, San Francisco area 22.7 percent, and Santa Cruz to Morro Bay 22.7 percent. The combined five California regions shown account for 81.1 percent of coastwide Baseline fishing effort.

Table 2-6. Estimated Recreational Effort (bottomfish + P. halibut) under Baseline, the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) in thousands of angler trips.

Community Groups	Baseline	No Action a/	SC 1 b/	SC 2 c/	SC 3 d/	PPA e/
Washington Coast	54.8	54.8	54.8	54.8	54.8	54.8
Astoria-Tillamook	18.5	18.5	18.5	18.5	18.5	18.5
Newport	44.0	44.0	44.0	44.0	44.0	44.0
Coos Bay-Brookings	41.4	41.4	41.4	41.4	41.4	41.4
Crescent City-Eureka	25.0	25.0	25.0	0.0	29.8	25.0
Fort Bragg - Bodega Bay	18.6	18.6	18.6	0.0	22.2	18.6
San Francisco Area	74.2	74.2	74.2	0.0	91.0	74.2
SC – Mo – MB*	94.6	94.6	94.6	0.0	116.1	94.6
SB – LA – SD*	466.9	466.9	466.9	0.0	629.2	466.9
Coastwide Total	838.1	838.1	838.1	158.8	1,047.2	838.1

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

a/ Oregon & Washington No Action alternative and California No Action, Option 1.

b/ Oregon & Washington No Action alternative and California, Alternative 1, Option 1

c/ Oregon & Washington No Action alternative and California, Alternative 1, Option 2

d/ Oregon & Washington No Action alternative and California, Alternative 1, Option 4

e/ PPA = No Action

Table 2-7. Estimated change from Baseline Recreational Effort (bottomfish + P. halibut) under the Scenarios 1-3 (SC) and Preliminary Preferred Alternative (PPA) in thousands of angler trips.

Community Groups	Baseline	No Action a/	SC 1 b/	SC 2 c/	SC 3 d/	PPA e/
Washington Coast	54.8	-	-	-	-	-
Astoria-Tillamook	18.5	-	-	-	-	-
Newport	44.0	-	-	-	-	-
Coos Bay-Brookings	41.4	-	-	-	-	-
Crescent City-Eureka	25.0	-	-	-25.0	+4.8	-
Fort Bragg - Bodega Bay	18.6	-	-	-18.6	+3.6	-
San Francisco Area	74.2	-	-	-74.2	+16.8	-
SC – Mo – MB*	94.6	-	-	-94.6	+21.5	-
SB – LA – SD*	466.9	-	-	-466.9	+162.3	-
Coastwide Total	838.1	-	-	-679.3	+209.1	-

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

a/ Oregon & Washington No Action alternative and California No Action, Option 1.

b/ Oregon & Washington No Action alternative and California, Alternative 1, Option 1

c/ Oregon & Washington No Action alternative and California, Alternative 1, Option 2

d/ Oregon & Washington No Action alternative and California, Alternative 1, Option 4

e/ PPA = No Action

Table 2-8. Estimated change from Baseline Recreational Effort (bottomfish + P. halibut) under the Scenarios 1-3 (SC) and Preliminary Preferred Alternative (PPA) in precents (%).

Community Groups	Baseline	No Action a/	SC 1 b/	SC 2 c/	SC 3 d/	PPA e/
Washington Coast	54.8	-	-	-	-	-
Astoria-Tillamook	18.5	-	-	-	-	-
Newport	44.0	-	-	-	-	-
Coos Bay-Brookings	41.4	-	-	-	-	-
Crescent City-Eureka	25.0	-	-	-100%	+19.4%	-
Fort Bragg - Bodega Bay	18.6	-	-	-100%	+19.4%	-
San Francisco Area	74.2	-	-	-100%	+22.7%	-
SC – Mo – MB*	94.6	-	-	-100%	+22.7%	-
SB – LA – SD*	466.9	-	-	-100%	+34.8%	-
Coastwide Total	838.1	-	-	-81.1%	+24.9%	-

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

a/ Oregon & Washington No Action alternative and California No Action, Option 1.

b/ Oregon & Washington No Action alternative and California, Alternative 1, Option 1

c/ Oregon & Washington No Action alternative and California, Alternative 1, Option 2

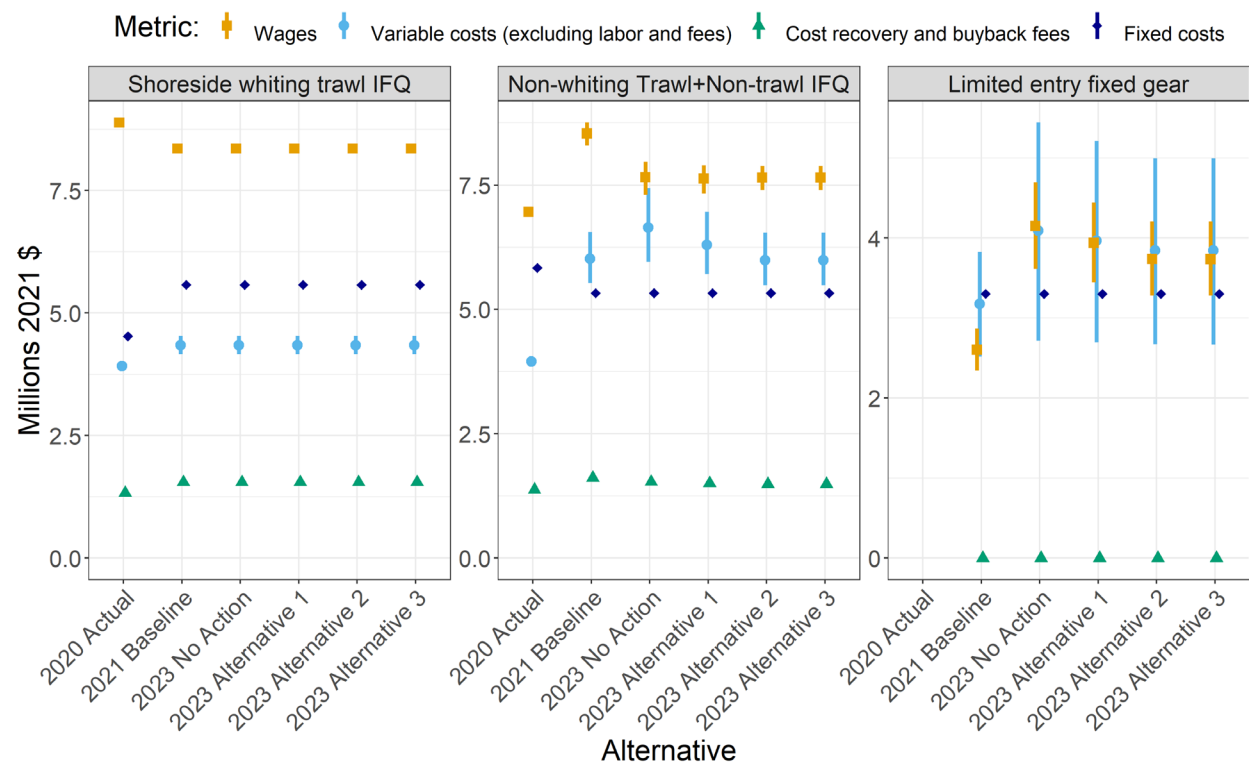
d/ Oregon & Washington No Action alternative and California, Alternative 1, Option 4

e/ PPA = No Action

2.1.4 Estimated Commercial Vessel Net Revenue Impacts of the Alternatives

Table 2-2 provides estimates of net revenues for the 1) Shoreside Pacific whiting, 2) Non-Pacific whiting Trawl and Non-Pacific whiting Non-trawl IFQ, and 3) LEFG sectors. These are based on the estimated gross revenues (Table 2-2) 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 (NWFSC), 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 Pacific whiting and Non-Pacific whiting + Trawl + Non-trawl IFQ sectors compared to the LEFG sector. This model is described in Appendix A to the 2023-2024 harvest specifications and management measures

As shown in Figure 2-1, wages, variable costs, and fees vary with changes in LDM forecasts, whereas fixed costs remain constant.⁴



⁴ Note: The term “alternative” in Figure 2-1 is synonymous with ‘Scenario’

Figure 2-1. Figure 2-1. Sector-wide wages, variable costs (excluding labor and fees), cost recovery and buyback fees, and fixed costs by groundfish harvesting sector, actual reported costs for 2020 and estimated for the 2021 Baseline, 2023 No Action and three alternatives. The 5th and 95th percentile intervals are calculated for wages and variable costs (some are too small to see). (2021 \$ million)

The revenue from Table 2-2 as well as actual observed values from 2020 are shown in Figure 2-2 for context with respect to variable cost net revenue and total cost net revenue.⁵

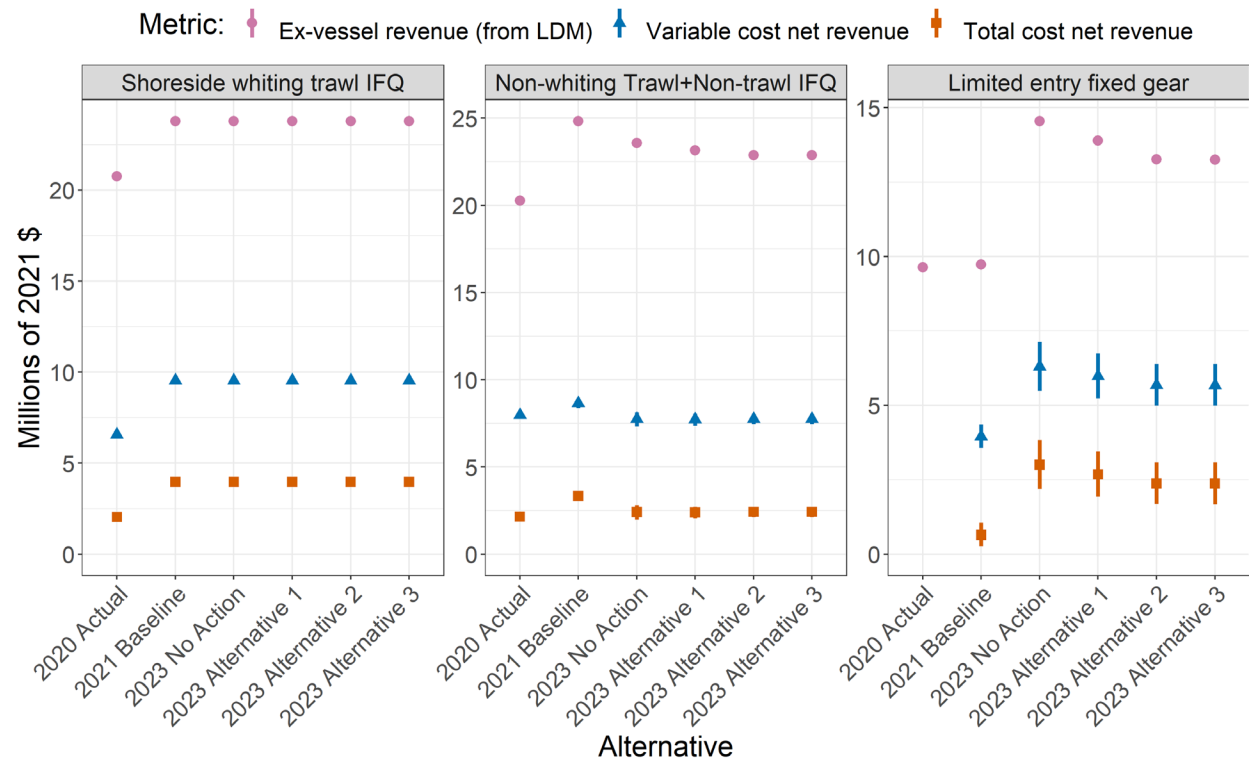


Figure 2-2. Ex-vessel revenue from LDM model and estimated sector-wide variable cost net revenue and total cost net revenue by groundfish harvesting sector under the alternatives, 5th and 95th percentile intervals (2021 \$ million). The 2020 ex-vessel revenue was obtained from fish tickets, and 2020 net revenue for trawl sectors was calculated using EDC data. The 5th and 95th percentile intervals are calculated for variable cost net revenue and total cost net revenue (some are too small to see). (2021 \$ million)

The examined potential differences between the proposed alternatives are shown in Table 2-9, Table 2-10, and Table 2-11. 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. Figures 2-1 and 2-2 then represent projected wages across forecasted alternatives, between the 5th and 95th percentiles of our sampling distribution.
- We also examine the proportion of variable and fixed costs to revenue, and find that wages tend to be larger for the Shoreside Pacific whiting sector, while non-labor variable costs are larger for the Non-Pacific whiting Non-trawl IFQ sector.

⁵ *Id.*

- Shoreside Pacific whiting net revenue is estimated at \$4.7 million. Note that Pacific 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.
- While many estimates of net revenue appear similar across alternatives, we note the 2021 Baseline specification for the Non-Pacific whiting Non-trawl IFQ and Limited Entry Fixed Gear sectors appears to be less profitable than other alternatives. Figure 2-2 suggests that increases in revenue, resulting from potential increases in other groundfish catches, could outpace corresponding increases in costs.
- Conversely, the 2021 Baseline for Non-Pacific whiting trawl IFQ appears more profitable than its other alternatives. This is due to the increase in other groundfish catch under the 2021 Baseline alternative. Estimated costs for the Non-Pacific whiting trawl IFQ sector are largely driven by sablefish catches, such that the increase in revenues from additional other groundfish catch largely outpaces additional costs.

Note that for purposes of this analysis, net revenues under the Council's PPA are assumed to be equivalent to under the No Action alternative.

Table 2-9. Estimated vessel net revenues by shoreside groundfish harvesting sectors under the Scenarios 1-3 (SC) and Preliminary Preferred Alternative (PPA) in \$ million for the shoreside Pacific whiting sector, shorebased non-whiting IFQ trawl sector, and limited entry fixed gear (LEFG) sector.

Shoreside Sectors:	Baseline	No Action	SC 1	SC 2	SC 3	PPA
Pacific whiting	4.7	4.7	4.7	4.7	4.7	4.7
Non-whiting Trawl+ Non-trawl IFQ	4.1	3.2	3.1	3.1	3.1	3.2
LEFG	0.7	3.0	2.7	2.4	2.4	3.0
Shoreside Sector Total	9.5	10.9	10.5	10.2	10.2	10.9

Table 2-10. Estimated change from Baseline in vessel net revenues by groundfish harvesting sector (\$ million) and Scenarios 1-3 (SC) and Preliminary Preferred Alternative (PPA) for the shoreside Pacific whiting sector, shorebased non-whiting IFQ trawl sector, and limited entry fixed gear (LEFG) sector..

Shoreside Sectors:	<i>Baseline</i>	No Action	SC 1	SC 2	SC 3	PPA
Pacific whiting	4.7	+ 0.0	+ 0.0	+ 0.0	+ 0.0	+ 0.0
Non-whiting Trawl +Non-trawl IFQ	4.1	-0.9	-1.0	-1.0	-1.0	-0.9
LEFG	0.7	+ 2.4	+ 2.0	+ 1.7	+ 1.7	+ 2.4
Shoreside Sector Total	9.5	+1.4	+1.0	+0.7	+0.7	+1.4

Table 2-11. Estimated change from Baseline in vessel net revenues by groundfish harvesting sector in percent (%) and Action Alternatives (SC) and Preliminary Preferred Alternative (PPA) for the shoreside Pacific whiting sector, shorebased non-whiting IFQ trawl sector, and limited entry fixed gear (LEFG) sector.

Shoreside Sectors:	<i>Baseline</i>	No Action	SC 1	SC 2	SC 3	PPA
Pacific whiting	4.7	+ 0.0%	+ 0.0%	+ 0.0%	+ 0.0%	+ 0.0%
Non-whiting Trawl +Non-trawl IFQ	4.1	-23.0%	-23.9%	-23.5%	-23.5%	-23.0%
LEFG	0.7	+359.3%	+310.4%	+263.6%	+263.2%	+359.3%
Shoreside Sector Total	9.5	+14.7%	+10.5%	+7.4%	+7.4%	+14.7%

2.2 Estimated Change in Income and Employment Impacts by Community

Socioeconomic impacts to fishing communities engaged in groundfish fisheries are evaluated based on the changes in personal income (dollar income impacts) and employment (number of jobs) under the Scenarios. These effects are functions of the projected changes in commercial landings and recreational effort described above. Comparisons are presented with respect to the Baseline Scenario under No Action Scenario 1 (No Action, California Option 1), Scenario 1 (Action Alternative 1, California Option 1), Scenario 2 (Action Alternative 1, California Option 2) and Scenario 3 (Action Alternative 1, California Option 4). 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 Baseline and the Scenarios.

Income and employment impacts from Tribal fisheries and also 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 Pacific 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 Pacific whiting fisheries would likely accrue in the Seattle region; while corresponding 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 Baseline may, therefore, result in biased impact estimates.

2.2.1 Commercial Fishery Community Income Impacts

Table 2-12 presents estimates of community personal income impacts by region due to projected commercial groundfish fishing activity under the range of Scenarios. Table 2-13 and Table 2-14

compare commercial groundfish fishery impact estimates under the Scenarios against the Baseline. Table 2-15 presents estimated income impacts resulting from recreational groundfish fisheries, with Table 2-16 and Table 2-17 comparing the recreational estimates relative to the Baseline.

Coastwide

The highest coastwide total and the highest level of income impacts for each community occur under No Action and the PPA and the lowest occur under Scenario 3. Coastwide estimated personal income impacts from commercial groundfish fishing are estimated to be \$158.3 million under the Baseline and are projected to increase to between \$162.6 million and \$167.6 million under the range of Scenarios.

Washington and Oregon

Oregon and Washington Coast port areas show personal income changes ranging from a decrease of \$2.7 million (Astoria-Tillamook under Scenario 3) to an increase of \$1.7 million (Coos Bay-Brookings under No Action and PPA). Those two port areas also show the largest percentage changes in income impacts among Oregon and Washington Coast ports under the Scenarios: -3.9 percent for Astoria-Tillamook under Scenario 3 and +23.7 percent in Coos Bay-Brookings under No Action and PPA. Astoria-Tillamook is the only port area showing decreases from Baseline in projected income impacts under all Scenarios. Combined Oregon and Washington Coast ports account for 84.7 percent of estimated coastwide Baseline personal income impacts from commercial fishing. Puget Sound ports show increases ranging from \$1.6 million (Scenario 3) to \$2.2 million (No Action and PPA) over Baseline, or 48.6 percent to 67.3 percent, respectively. Puget Sound ports account for 2.0 percent of estimated coastwide Baseline personal income impacts from commercial fishing.

California

All California port groups are projected to see increases from Baseline under all Scenarios, ranging from \$0.3 million (San Francisco under Action Alternative 1, Scenario 3) to \$1.4 million (Santa Barbara-San Diego under all Scenarios). The largest relative increases in personal income impacts compared to Baseline are projected for the Santa Cruz to Morro Bay region, ranging from 34.8 percent under Scenario 3 to 41.4 percent under No Action and PPA. Projected landings by fixed gear fisheries in those ports account for much of the increased income impacts. California ports account for 13.3 percent of coastwide Baseline income impacts from commercial fishing.

Table 2-12. Commercial fishery income impacts under Baseline, the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) by community group (\$million).

Community Groups	<i>Baseline</i>	No Action	SC 1	SC2	SC 3	PPA
Puget Sound	3.2	5.4	5.1	4.8	4.8	5.4
Washington Coast	32.1	32.4	32.3	32.2	32.1	32.4
Astoria-Tillamook	68.4	67.2	66.8	66.6	65.7	67.2
Newport	26.1	27.4	27.0	26.7	26.4	27.4
Coos Bay-Brookings	7.3	9.0	8.6	8.4	8.3	9.0
Crescent City-Eureka	5.7	6.6	6.4	6.3	6.2	6.6
Fort Bragg – Bodega Bay	3.7	4.8	4.7	4.6	4.6	4.8
San Francisco Area	3.0	3.5	3.5	3.4	3.4	3.5
SC – Mo – MB*	3.1	4.4	4.3	4.2	4.2	4.4
SB – LA – SD*	5.5	6.9	6.9	6.9	6.9	6.9
Coastwide Total	158.3	167.6	165.6	164.0	162.6	167.6

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

Table 2-13. Change in commercial fishery income impacts (from Baseline), the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) in \$ million.

Community Groups	<i>Baseline</i>	No Action	SC 1	SC2	SC 3	PPA
Puget Sound	3.2	+2.2	+1.9	+1.6	+1.6	+2.2
Washington Coast	32.1	+0.2	+0.1	+0.1	-0.1	+0.2
Astoria-Tillamook	68.4	-1.2	-1.6	-1.8	-2.7	-1.2
Newport	26.1	+1.3	+0.9	+0.5	+0.2	+1.3
Coos Bay-Brookings	7.3	+1.7	+1.3	+1.1	+1.1	+1.7
Crescent City-Eureka	5.7	+0.9	+0.7	+0.6	+0.5	+0.9
Fort Bragg – Bodega Bay	3.7	+1.1	+1.0	+0.9	+0.9	+1.1
San Francisco Area	3.0	+0.5	+0.4	+0.4	+0.3	+0.5
SC – Mo – MB*	3.1	+1.3	+1.2	+1.1	+1.1	+1.3
SB – LA – SD*	5.5	+1.4	+1.4	+1.4	+1.4	+1.4
Coastwide Total	158.3	+9.3	+7.4	+5.8	+4.3	+9.3

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

Table 2-14. Change in commercial fishery income impacts (from Baseline), the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) by community group in percent (%).

Community Groups	Baseline	No Action	SC 1	SC2	SC 3	PPA
Puget Sound	3.2	+67.3%	+57.6%	+48.3%	+48.6%	+67.3%
Washington Coast	32.1	+0.6%	+0.4%	+0.2%	-0.2%	+0.6%
Astoria-Tillamook	68.4	-1.8%	-2.3%	-2.6%	-3.9%	-1.8%
Newport	26.1	+4.9%	+3.3%	+1.9%	+0.8%	+4.9%
Coos Bay-Brookings	7.3	+23.7%	+18.5%	+14.7%	+14.6%	+23.7%
Crescent City-Eureka	5.7	+16.2%	+13.2%	+11.4%	+9.7%	+16.2%
Fort Bragg – Bodega Bay	3.7	+29.8%	+27.0%	+24.7%	+23.8%	+29.8%
San Francisco Area	3.0	+15.2%	+13.6%	+12.1%	+11.1%	+15.2%
SC – Mo – MB*	3.1	+41.4%	+38.3%	+34.9%	+34.8%	+41.4%
SB – LA – SD*	5.5	+24.7%	+24.7%	+24.6%	+24.5%	+24.7%
Coastwide Total	158.3	+5.9%	+4.6%	+3.7%	+2.7%	+5.9%

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

2.2.2 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 2-15 shows estimated recreational income impacts under Baseline and the Scenarios; Table 2-16 shows the incremental change with respect to the Baseline; Table 2-17 shows the percentage change.

For purposes of comparing recreational impacts, No Action, Alternative 1 and PPA are associated with California Option 1 (Baseline management), Alternative 2 is associated with California Option 2 (closure of the boat-based fishery), and Alternative 3 is associated with California Option 4 (year-round all depth fishing).⁶ Economic effects under the Council’s Preliminary Preferred Alternative (PPA) are assumed to be equivalent to under No Action. Key points regarding estimated income impacts from recreational groundfish fisheries by coastal region are as follows:

Coastwide

Coastwide recreational fishing income impacts are projected not to change from Baseline under No Action, Scenario 1 (Action Alternative 1, California Option 1) and PPA, to decrease by 89.3 percent (\$143.4 million) under Scenario 2 (California Option 2), and to increase by 28.5 percent (\$45.7 million) under Scenario 3 (California Option 4).

Washington

The Washington Coast shows no change relative to the Baseline in estimated recreational fishing income impacts under the Scenarios. Washington Coast ports account for 4.5 percent of Baseline recreational fishing income impacts.

⁶ Any of the four California Recreational sector options could be selected under any alternative including No Action. Effects of Option 3 cannot currently be quantified so it has been omitted from this analysis.

Oregon

Recreational fishing income impacts are projected to be the same as Baseline in all regions in Oregon across all Scenarios. Combined Oregon Coast ports account for 6.1 percent of Baseline recreational fishing income impacts.

California

California recreational fishing income impacts are projected not to change from Baseline under No Action, Scenario 1 (California recreational Option 1) and PPA. Under Scenario 2 (Action Alternative 1, California recreational Option 2) no fishing would be allowed, while under Scenario 3 (Action Alternative 1, California recreational Option 4) fishing would be allowed at all depths throughout the year. Income impacts are projected to be zero in all California regions under Scenario 2 --i.e., -100 percent (Action Alternative 1, California recreational Option 2), and to increase from Baseline under Scenario 3 (Action Alternative 1, California recreational Option 4) in all California regions by at least 19.4 percent. The Santa Barbara to San Diego region shows the largest change in income impacts under Scenario 3 (Action Alternative 1, California recreational Option 4), an increase of \$38.5 million (34.8 percent). Increases in recreational fishing impacts projected for the other California regions under Scenario 3 (Action Alternative 1, California recreational Option 4) include: Crescent City-Eureka \$0.4 million (19.4 percent), Fort Bragg-Bodega Bay \$0.5 million (19.4 percent), San Francisco area \$3.1 million (22.7 percent), and Santa Cruz to Morro Bay \$3.1 million (22.7 percent). Combined California Coast ports account for 89.3 percent of Baseline recreational fishing income impacts.

Table 2-15. Recreational fishery income impacts under Baseline, the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) by community group (\$million).

Community Groups	Baseline	No Action a/	SC 1 b/	SC 2 c/	SC 3 d/	PPA e/
Washington Coast	7.3	7.3	7.3	7.3	7.3	7.3
Astoria-Tillamook	1.4	1.4	1.4	1.4	1.4	1.4
Newport	5.8	5.8	5.8	5.8	5.8	5.8
Coos Bay-Brookings	2.7	2.7	2.7	2.7	2.7	2.7
Crescent City-Eureka	2.3	2.3	2.3	0.0	2.7	2.3
Fort Bragg – Bodega Bay	2.8	2.8	2.8	0.0	3.4	2.8
San Francisco Area	13.5	13.5	13.5	0.0	16.5	13.5
SC – Mo – MB*	13.9	13.9	13.9	0.0	17.0	13.9
SB – LA – SD*	110.9	110.9	110.9	0.0	149.4	110.9
Coastwide Total	160.5	160.5	160.5	17.2	206.3	160.5

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

a/ Oregon & Washington No Action alternative and California No Action, Option 1.

b/ Oregon & Washington No Action alternative and California, Alternative 1, Option 1

c/ Oregon & Washington No Action alternative and California, Alternative 1, Option 2

d/ Oregon & Washington No Action alternative and California, Alternative 1, Option 4

e/ PPA = No Action

Table 2-16. Change in recreational fishery income impacts from Baseline, the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) by community group (\$million)

Community Groups	<i>Baseline</i>	No Action a/	SC 1 b/	SC 2 c/	SC 3 d/	PPA e/
Washington Coast	7.3	-	-	-	-	-
Astoria-Tillamook	1.4	-	-	-	-	-
Newport	5.8	-	-	-	-	-
Coos Bay-Brookings	2.7	-	-	-	-	-
Crescent City-Eureka	2.3	-	-	-2.3	+0.4	-
Fort Bragg – Bodega Bay	2.8	-	-	-2.8	+0.5	-
San Francisco Area	13.5	-	-	-13.5	+3.1	-
SC – Mo – MB*	13.9	-	-	-13.9	+3.1	-
SB – LA – SD*	110.9	-	-	-110.9	+38.5	-
Coastwide Total	<i>160.5</i>	-	-	-143.4	+45.7	-

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

a/ Oregon & Washington No Action alternative and California No Action, Option 1.

b/ Oregon & Washington No Action alternative and California, Alternative 1, Option 1

c/ Oregon & Washington No Action alternative and California, Alternative 1, Option 2

d/ Oregon & Washington No Action alternative and California, Alternative 1, Option 4

e/ PPA = No Action

Table 2-17. Change in recreational fishery income impacts from Baseline, the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) by community group in percents (%).

Community Groups	<i>Baseline</i>	No Action a/	SC 1 b/	SC 2 c/	SC 3 d/	PPA e/
Washington Coast	7.3	-	-	-	-	-
Astoria-Tillamook	1.4	-	-	-	-	-
Newport	5.8	-	-	-	-	-
Coos Bay-Brookings	2.7	-	-	-	-	-
Crescent City-Eureka	2.3	-	-	-100%	+19.4%	-
Fort Bragg – Bodega Bay	2.8	-	-	-100%	+19.4%	-
San Francisco Area	13.5	-	-	-100%	+22.7%	-
SC – Mo – MB*	13.9	-	-	-100%	+22.7%	-
SB – LA – SD*	110.9	-	-	-100%	+34.8%	-
Coastwide Total	<i>160.5</i>	-	-	-89.3%	+28.5%	-

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

a/ Oregon & Washington No Action alternative and California No Action, Option 1.

b/ Oregon & Washington No Action alternative and California, Alternative 1, Option 1

c/ Oregon & Washington No Action alternative and California, Alternative 1, Option 2

d/ Oregon & Washington No Action alternative and California, Alternative 1, Option 4

e/ PPA = No Action

2.2.3 Commercial Fishery Community Employment Impacts

Table 2-18 shows projected employment impacts due to the commercial groundfish fishery under Baseline and the Scenarios; Table 2-19 and Table 2-20 show the change in commercial fishery impacts relative to Baseline in terms of dollars and percentage, respectively.

Coastwide

Coastwide estimated employment impacts from commercial groundfish fishing are estimated to be 2,302 jobs under the Baseline and are projected to increase to between 2,496 and 2,576 jobs under the range of Scenarios. The highest coastwide total and the highest level of employment impacts for each community among the Scenarios occur under No Action and PPA, and the lowest occur under Scenario 3.

Washington and Oregon

Oregon and Washington Coast port areas show employment impact changes ranging from a decrease of 24 jobs (Astoria-Tillamook under Scenario 3) to an increase of 35 jobs (Coos Bay-Brookings under No Action and PPA). Those two port areas also show the largest percentage changes in income impacts among Oregon and Washington Coast ports under the Scenarios: -3.1 percent for Astoria-Tillamook under Scenario 3, and +18.4 percent in Coos Bay-Brookings under No Action and PPA. Astoria-Tillamook is the only port area showing decreases from Baseline in projected employment impacts under all Scenarios. Combined Oregon and Washington Coast ports account for 74.1 percent of estimated coastwide Baseline employment impacts from commercial fishing. Puget Sound ports show increases in employment over Baseline ranging from 20 jobs (Scenario 3) to 28 jobs (No Action and PPA), or increases of 48.7 percent and 67.4 percent, respectively. Puget Sound ports account for 1.8 percent of estimated coastwide employment impacts from commercial fishing.

California

All California port groups are projected to see increases from Baseline under all Scenarios, ranging from 8 jobs (San Francisco under Scenario 3) to 61 jobs (Santa Cruz to Morro Bay under No Action and PPA). The largest relative increases in employment impacts compared to Baseline are projected for the Fort Bragg-Bodega Bay region, ranging from 43 percent under Scenario 3 to 48.6 percent under No Action and PPA. Projected landings by fixed gear fisheries in those ports account for much of the increased employment impacts. Combined California ports account for 24.1 percent of coastwide Baseline employment impacts from commercial fishing.

Table 2-18. Commercial fishery employment impacts under Baseline, the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) by community group (number of jobs).

Community Group	Baseline	No Action	SC 1	SC2	SC3	PPA
Puget Sound	41	69	65	61	62	69
Washington Coast	382	392	390	388	387	392
Astoria-Tillamook	774	765	761	759	750	765
Newport	361	385	379	373	369	385
Coos Bay-Brookings	190	225	215	210	210	225
Crescent City-Eureka	100	129	126	124	123	129
Fort Bragg – Bodega Bay	119	178	175	172	171	178
San Francisco Area	65	75	74	73	73	75
SC – Mo – MB*	132	193	190	187	186	193
SB – LA – SD*	137	166	166	166	166	166
Coastwide Total	2,302	2,576	2,542	2,515	2,496	2,576

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

Table 2-19. Change in commercial fishery employment impacts from Baseline, the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) by community group (number of jobs).

Community Groups	Baseline	No Action	SC 1	SC2	SC3	PPA
Puget Sound	41	+28	+24	+20	+20	+28
Washington Coast	382	+10	+8	+6	+5	+10
Astoria-Tillamook	774	-9	-12	-15	-24	-9
Newport	361	+24	+18	+12	+9	+24
Coos Bay-Brookings	190	+35	+25	+20	+20	+35
Crescent City-Eureka	100	+29	+26	+24	+23	+29
Fort Bragg – Bodega Bay	119	+58	+55	+52	+51	+58
San Francisco Area	65	+10	+9	+8	+8	+10
SC – Mo – MB*	132	+61	+58	+55	+54	+61
SB – LA – SD*	137	+29	+29	+29	+29	+29
Coastwide Total	2,302	+275	+240	+213	+195	+275

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

Table 2-20. Change in commercial fishery employment impacts from Baseline, the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) by community group in percents (%).

Community Groups	Baseline	No Action	SC 1	SC2	SC3	PPA
Puget Sound	41	+67.4%	+57.7%	+48.3%	+48.7%	+67.4%
Washington Coast	382	+2.6%	+2.1%	+1.6%	+1.3%	+2.6%
Astoria-Tillamook	774	-1.1%	-1.6%	-1.9%	-3.1%	-1.1%
Newport	361	+6.6%	+4.9%	+3.4%	+2.4%	+6.6%
Coos Bay-Brookings	190	+18.4%	+13.0%	+10.6%	+10.6%	+18.4%
Crescent City-Eureka	100	+28.7%	+26.3%	+24.5%	+23.2%	+28.7%
Fort Bragg – Bodega Bay	119	+48.6%	+46.3%	+43.9%	+43.0%	+48.6%
San Francisco Area	65	+15.5%	+14.2%	+13.0%	+12.1%	+15.5%
SC – Mo – MB*	132	+45.8%	+44.0%	+41.5%	+40.6%	+45.8%
SB – LA – SD*	137	+21.4%	+21.4%	+21.3%	+21.2%	+21.4%
Coastwide Total	2,302	+11.9%	+10.4%	+9.3%	+8.5%	+11.9%

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

2.2.4 Recreational Fishery Community Employment Impacts

Table 2-21 shows projected employment impacts due to the recreational groundfish fishery under Baseline and the Scenarios; Table 2-22 and Table 2-23 show the change in recreational fishery impacts relative to the Baseline in terms of dollars and percentage, respectively.

For purposes of comparing recreational impacts, No Action, Scenario 1 and PPA are associated with California Option 1 (Baseline management), Scenario 2 is associated with California Option 2 (closure of the boat-based fishery), and Scenario 3 is associated with California Option 4 (year-

round all depth fishing).⁷ Economic effects under the Council's PPA are assumed to be equivalent to under No Action. Key points regarding estimated employment impacts from recreational groundfish fisheries by coastal region are as follows:

Coastwide

Coastwide recreational fishing employment impacts are projected not to change under No Action, Scenario 1 (California Option 1) and PPA, to decrease by 81.1 percent (2,271 jobs) under Scenario 2 (California Option 2), and to increase by 25.8 percent (721 jobs) under Scenario 3 (California Option 4).

Washington

The Washington Coast shows no change relative to the Baseline in estimated employment impacts under the Scenarios. Washington Coast ports account for 7.8 percent of Baseline recreational fishing employment impacts.

Oregon

Recreational fishing employment impacts are projected to be the same as Baseline in all regions in Oregon across all Scenarios. Combined Oregon Coast ports account for 11.0 percent of Baseline recreational fishing employment impacts.

California

California recreational fishing employment impacts are projected not to change from Baseline under No Action, Scenario 1 (Action Alternative 1, California recreational Option 1) and PPA. Under Scenario 2 (Action Alternative 1, California recreational Option 2) no fishing would be allowed, while under Scenario 3 (Action Alternative 1, California recreational Option 4) fishing would be allowed at all depths throughout the year. Employment impacts are projected to be zero in all regions under Scenario 2 (Action Alternative 1, California recreational Option 2) (i.e., -100 percent), and to increase from Baseline under Scenario 3 (Action Alternative 1, California recreational Option 4) in all California regions by at least 19.4 percent. The Santa Barbara to San Diego region shows the largest change in employment under Scenario 3 (California recreational Option 4), an increase of 601 jobs (34.8 percent). Increases projected for the other California regions under Scenario 3 (Action Alternative 1, California recreational Option 4) are: Crescent City-Eureka 8 jobs (19.4 percent), Fort Bragg-Bodega Bay 10 jobs (19.4 percent), San Francisco area 47 jobs (22.7 percent), and Santa Cruz to Morro Bay 56 jobs (22.7 percent). Combined California Coast ports account for 81.1 percent of Baseline recreational fishing employment impacts.

⁷ Any of the four California Recreational sector options could be selected under any alternative including No Action. Effects of Option 3 cannot currently be quantified so it has been omitted from this analysis.

Table 2-21. Recreational fishery employment impacts under Baseline, the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) by community group (number of jobs).

Community Groups	Baseline	No Action a/	SC 1 b/	SC 2 c/	SC 3 d/	PPA e/
Washington Coast	219	219	219	219	219	219
Astoria-Tillamook	53	53	53	53	53	53
Newport	173	173	173	173	173	173
Coos Bay-Brookings	82	82	82	82	82	82
Crescent City-Eureka	39	39	39	0	47	39
Fort Bragg - Bodega Bay	49	49	49	0	59	49
San Francisco Area	208	208	208	0	255	208
SC – Mo – MB*	246	246	246	0	301	246
SB – LA – SD*	1,729	1,729	1,729	0	2,330	1,729
Coastwide Total	2,800	2,800	2,800	528	3,521	2,800

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

a/ Oregon & Washington No Action alternative and California No Action, Option 1.

b/ Oregon & Washington No Action alternative and California, Alternative 1, Option 1

c/ Oregon & Washington No Action alternative and California, Alternative 1, Option 2

d/ Oregon & Washington No Action alternative and California, Alternative 1, Option 4

e/ PPA = No Action

Table 2-22. Change in recreational fishery employment impacts from Baseline, the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) by community group (number of jobs). Dashes indicate no change

Community Groups	Baseline	No Action a/	SC 1 b/	SC 2 c/	SC 3 d/	PPA e/
Washington Coast	219	-	-	-	-	-
Astoria-Tillamook	53	-	-	-	-	-
Newport	173	-	-	-	-	-
Coos Bay-Brookings	82	-	-	-	-	-
Crescent City-Eureka	39	-	-	-39	+8	-
Fort Bragg - Bodega Bay	49	-	-	-49	+10	-
San Francisco Area	208	-	-	-208	+47	-
SC – Mo – MB*	246	-	-	-246	+56	-
Coastwide Total		-	-	-542	+121	-
SB – LA – SD*	1,729	-	-	-1,729	+601	-
Coastwide Total	2,800	-	-	-2,271	+721	-

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

a/ Oregon & Washington No Action alternative and California No Action, Option 1.

b/ Oregon & Washington No Action alternative and California, Alternative 1, Option 1

c/ Oregon & Washington No Action alternative and California, Alternative 1, Option 2

d/ Oregon & Washington No Action alternative and California, Alternative 1, Option 4

e/ PPA = No Action

Table 2-23. Change in recreational fishery employment impacts from Baseline, the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) by community group in percent(%). Dashes indicate no change

Community Groups	Baseline	No Action a/	SC 1 b/	SC 2 c/	SC 3 d/	PPA e/
Washington Coast	219	-	-	-	-	-
Astoria-Tillamook	53	-	-	-	-	-
Newport	173	-	-	-	-	-
Coos Bay-Brookings	82	-	-	-	-	-
Crescent City-Eureka	39	-	-	-100%	+19.4%	-
Fort Bragg - Bodega Bay	49	-	-	-100%	+19.4%	-
San Francisco Area	208	-	-	-100%	+22.7%	-
SC – Mo – MB*	246	-	-	-100%	+22.7%	-
SB – LA – SD*	1,729	-	-	-100%	+34.8%	-
Coastwide Total	2,800	-	-	-81.1%	+25.8%	-

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

a/ Oregon & Washington No Action alternative and California No Action, Option 1.

b/ Oregon & Washington No Action alternative and California, Alternative 1, Option 1

c/ Oregon & Washington No Action alternative and California, Alternative 1, Option 2

d/ Oregon & Washington No Action alternative and California, Alternative 1, Option 4

e/ PPA = No Action

2.2.5 At-sea Pacific whiting Fishery Income and Employment Impacts

Economic impacts contributed by the at-sea Pacific whiting fishery are not assigned to coastal communities. That being said, presumably most of the income and employment impacts associated with at-sea Pacific whiting fisheries are associated with the participating vessels themselves and would likely accrue in the Seattle region. Impacts shown in Table 2-24 and Table 2-25 assume 2021 Pacific whiting allocations after reapportionment of the unused Tribal portion to the non-Tribal Pacific whiting sectors under the Baseline and all Scenarios. For that reason, there is no projected variation in estimated income or employment impacts from Baseline under the Scenario scenarios.

Table 2-24. Estimated total ex-vessel revenue equivalent, income and employment impacts Baseline, the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) for At-sea Pacific whiting sectors: Non-Tribal (Motherships, Catcher vessels and Catcher-Processors) and Tribal (Motherships and Catcher vessels).

	Baseline	No Action	SC 1	SC 2	SC 3	PPA
Ex-vessel Revenue Equivalent (\$mil)						
Non-Tribal Pacific whiting	37.2	37.2	37.2	37.2	37.2	37.2
Tribal Pacific whiting	3.1	3.1	3.1	3.1	3.1	3.1
Income Impacts (\$mil)						
Non-Tribal Pacific whiting	244.7	244.7	244.7	244.7	244.7	244.7
Tribal Pacific whiting	15.0	15.0	15.0	15.0	15.0	15.0
Employment Impacts (jobs)						
Non-Tribal Pacific whiting	3,693	3,693	3,693	3,693	3,693	3,693
Tribal Pacific whiting	323	323	323	323	323	323

Table 2-25. Change in ex-vessel revenue equivalent, income and employment impacts from Baseline, the Scenarios 1-3 (SC), and Preliminary Preferred Alternative (PPA) for At-sea Pacific whiting sectors: Non-Tribal (Motherships, Catcher vessels and Catcher-Processors) and Tribal (Motherships and Catcher vessels).

	<i>Baseline</i>	No Action	SC 1	SC 2	SC 3	PPA
Ex-vessel Revenue Equivalent (\$mil)						
Non-Tribal Pacific whiting	37.2	-	-	-	-	-
Tribal Pacific whiting	3.1	-	-	-	-	-
Income Impacts (\$mil)						
Non-Tribal Pacific whiting	244.7	-	-	-	-	-
Tribal Pacific whiting	15.0	-	-	-	-	-
Employment Impacts (jobs)						
Non-Tribal Pacific whiting	3,693	-	-	-	-	-
Tribal Pacific whiting	323	-	-	-	-	-