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Economic Status of the Pacific Hake Fishery, 2009–22

September 2024

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NOAA FISHERIES

Economic Status of the Pacific Hake Fishery, 2009–22

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Plain Language Summary

The Northwest Fisheries Science Center (NWFSC) collects economic data and generates economic performance metrics for many U.S. West Coast fisheries, including the Pacific hake (a.k.a. whiting) fishery. This fishery consists of catcher vessels that deliver shoreside to shorebased processors and at sea to motherships, as well as catcher–processors that both catch and process Pacific hake. This information is used in many contexts, including the annual Pacific hake stock assessment,[1] biennial harvest specifications,[2] Regulatory Flexibility Act (RFA) reviews and regulatory impact analyses,[3] as well as Congressional briefings. This report contains time series of each of these economic performance metrics by sector, and important information about the sources of data and caveats for interpreting the information. More detailed metrics and statistics about this fishery can be found in NWFSC's interactive data explorer tool.[4]

[1] https://s3.amazonaws.com/media.fisheries.noaa.gov/2024-02/hake-assessment-2024.pdf
[2] https://www.pcouncil.org/documents/2022/08/draft-management-measure-analytical-document-the-preferred-alternative-september-2022.pdf/
[3] https://www.federalregister.gov/documents/2024/04/30/2024-09220/magnuson-stevens-act-provisions-fisheries-off-west-coast-states-pacific-coast-groundfish-fishery
[4] https://connect.fisheries.noaa.gov/Whiting/

Abstract

The Northwest Fisheries Science Center collects economic data and generates economic performance metrics for many U.S. West Coast fisheries, including the Pacific hake fishery. This fishery consists of catcher vessels that deliver shoreside to shorebased processors and at sea to motherships, as well as catcher–processors that both catch and process Pacific hake. In 2022, the fishery produced $230 million of wholesale seafood product. Many products are derived from Pacific hake, including fillets, headed-and-gutted, surimi, fishmeal, and fish oil, among others. These seafood products are consumed in the United States and also exported to other countries in North America, Europe, Africa, Asia, and the Caribbean.

Acknowledgments

We would like to thank reviewers from NOAA Fisheries' West Coast Region, the Northwest Fisheries Science Center, and industry for their comments and suggestions for improvements to this report. We look forward to building on this first publication to provide useful and timely information for use by the public.

Summary

The U.S. Pacific hake (a.k.a. Pacific whiting) commercial fishery consists of three sectors: 1) catcher vessels that deliver to shorebased processors, 2) catcher vessels that deliver to floating processors (motherships) at sea, and 3) catcher–processors. In 2022, the catcher vessel fleet consisted of 32 vessels (Table 1), of which 20 delivered catch to motherships and 26 to shorebased processors. There were seven shorebased processors, six active mothership vessels, and nine catcher–processor vessels.

The total economic contribution of the Pacific hake fishery on the U.S. West Coast in 2022 was approximately $295 million in income (Table 2) and 4,324 jobs (Table 3). Over $89.5 million in total labor costs were paid in 2022 in the Pacific hake fishery (Table 4). This includes wages paid to fishing crew, captains, and processing plant workers.

The total ex-vessel revenue received by catcher vessels was $39.1 million in 2022, including $24.3 million from the shorebased sector and $14.8 million from the mothership sector (Table 5). The estimate of the total ex-vessel value of all Pacific hake caught on the U.S. West Coast (excluding tribal catch) was $69.5 million (Table 6).

The total production value of all Pacific hake-based products in 2022 was $230 million (Table 7, Table 8). This represented 104,000 metric tons of product. The types of products produced vary by sector; headed-and-gutted made up 39% of production value in the shorebased sector, surimi made up 59% in the mothership sector, and fillets and surimi made up 66% in the catcher–processor sector. Other products included frozen-in-the-round, fish oil, and fishmeal.

The value of Pacific hake exports was $172 million in 2022, including to the Netherlands, Lithuania, and Spain, which together make up about 58% of the total (Table 9). This does not include some non-species-specific products such as fishmeal or fish oil.

Supporting Tables

Table 1. Number of catcher vessels, shorebased processors, motherships, and catcher–processors participating in the Pacific hake fishery. Catcher vessels include vessels delivering to motherships and vessels delivering to shorebased processors.

Year	Catcher vessels	Shorebased processors	Motherships	Catcher–processors
2009	41	12	6	5
2010	41	12	6	6
2011	31	9	5	9
2012	29	8	5	9
2013	29	8	5	9
2014	30	8	5	9
2015	26	8	3	9
2016	28	8	6	9
2017	29	8	4	9
2018	30	8	5	9
2019	32	7	6	9
2020	33	7	5	10
2021	30	7	5	10
2022	32	7	6	9

Table 2. Total income contributions (in millions of 2022 USD) to the U.S. West Coast economy by each component of the U.S. Pacific hake fishery. Catcher vessels include vessels delivering to motherships and vessels delivering to shorebased processors.

Year	Catcher vessels	Shorebased processors	Motherships	Catcher–processors	Total
2009	14.0	60.4	22.9	56.6	153.9
2010	27.8	40.4	34.0	100.5	202.7
2011	55.3	80.5	42.1	99.0	276.8
2012	46.4	59.2	29.5	84.2	219.3
2013	62.6	80.2	35.3	112.2	290.2
2014	57.8	70.5	45.1	168.8	342.2
2015	23.8	37.8	19.7	102.5	183.7
2016	37.8	51.6	47.8	141.2	278.4
2017	58.9	94.9	80.2	171.4	405.5
2018	51.9	97.2	50.3	165.2	364.7
2019	59.5	118.5	43.2	177.5	398.6
2020	41.0	130.9	15.6	180.1	367.6
2021	45.0	104.3	25.2	182.0	356.5
2022	47.1	61.0	50.7	136.4	295.2

Table 3. Total employment contributions (number of jobs) to the U.S. West Coast economy by each component of the U.S. Pacific hake fishery. Catcher vessels include vessels delivering to motherships and vessels delivering to shorebased processors.

Year	Catcher vessels	Shorebased processors	Motherships	Catcher–processors	Total
2009	239	1,296	877	826	3,237
2010	322	822	885	1,067	3,095
2011	415	1,343	709	1,480	3,948
2012	381	932	709	1,466	3,488
2013	443	1,391	704	1,590	4,129
2014	447	1,073	906	1,802	4,228
2015	245	694	470	1,569	2,978
2016	319	721	864	1,707	3,611
2017	419	1,411	999	1,856	4,685
2018	407	1,240	805	1,885	4,337
2019	484	1,497	923	1,920	4,825
2020	366	1,411	636	2,044	4,457
2021	390	1,221	749	2,081	4,441
2022	458	986	939	1,941	4,324

Table 4. Total direct payments (in millions of 2022 USD) to crew, captains, and processing employees within the U.S. Pacific hake fishery.

Year	Catcher vessels	Shorebased processors	Motherships	Catcher-processors	Total
2009	3.9	10.7	5.6	9.7	29.9
2010	7.1	8.5	7.5	14.2	37.3
2011	12.8	18.4	9.6	15.5	56.4
2012	12.4	14.4	7.7	14.5	49.0
2013	14.3	20.0	8.7	16.5	59.5
2014	14.9	18.2	10.8	24.5	68.5
2015	5.9	14.4	6.0	16.8	43.1
2016	9.2	17.8	12.3	23.2	62.5
2017	14.0	33.1	9.9	31.8	88.8
2018	12.6	30.6	11.8	28.3	83.3
2019	15.6	41.0	11.1	24.9	92.5
2020	12.0	39.2	7.0	26.0	84.2
2021	11.6	38.9	6.6	23.5	80.6
2022	13.8	33.8	10.4	31.6	89.5

Table 5. Reported ex-vessel revenue (in millions of 2022 USD) for catcher vessels that deliver to shorebased processors (source: Pacific Fisheries Information Network) and motherships (source: Economic Data Collection Program). Totals reflect reported total ex-vessel values of all Pacific hake catch. The catcher–processor sector is excluded because there is no ex-vessel transaction.

Year	Shorebased processors	Motherships	Total
2009	7.2	5.6	12.8
2010	13.2	11.1	24.3
2011	29.1	14.4	43.4
2012	26.5	11.3	37.8
2013	33.1	14.0	47.1
2014	29.9	15.3	45.2
2015	12.6	6.7	19.3
2016	16.4	12.8	29.2
2017	29.6	13.5	43.2
2018	25.8	14.0	39.9
2019	34.1	12.2	46.3
2020	22.5	8.8	31.4
2021	26.1	8.4	34.5
2022	24.3	14.8	39.1

Table 6. Estimated ex-vessel revenue (in millions of 2022 USD) for at-sea sectors and reported shorebased ex-vessel revenue (source: Pacific Fisheries Information Network). Totals reflect the total estimated ex-vessel values of all hake catch, valued at the ex-vessel prices of shorebased deliveries. Catcher vessels include vessels delivering to motherships and vessels delivering to shorebased processors.

Year	Shorebased processors	Motherships	Catcher–processors	Total
2009	7.2	3.6	7.0	17.8
2010	13.2	8.8	13.6	35.6
2011	29.1	17.0	23.6	69.6
2012	26.5	14.4	21.2	62.1
2013	33.1	18.4	27.7	79.1
2014	29.9	18.6	30.9	79.3
2015	12.6	5.3	13.5	31.4
2016	16.4	14.6	25.6	56.6
2017	29.6	13.4	29.1	72.1
2018	25.8	13.3	23.4	62.6
2019	34.1	12.1	27.6	73.8
2020	22.5	5.9	18.3	46.7
2021	26.1	8.2	28.6	62.9
2022	24.3	14.2	31.0	69.5

Table 7. Total production value (in millions of 2022 USD) by sector within the U.S. Pacific hake fishery. Note that the production value reflects the value when leaving the processing facility, it does not necessarily reflect the final sale value, depending on the corporate structure of the company.

Year	Shorebased processors	Motherships	Catcher–processors	Total
2009	62.1	24.0	43.3	129.5
2010	43.5	37.4	71.5	152.5
2011	90.8	49.8	76.6	217.2
2012	68.3	38.3	64.4	171.0
2013	92.5	44.3	80.8	217.5
2014	87.4	55.6	121.3	264.4
2015	43.8	24.6	77.7	146.0
2016	56.0	51.7	105.4	213.1
2017	99.6	51.3	125.6	276.5
2018	97.2	54.3	122.1	273.7
2019	121.3	46.3	127.6	295.2
2020	116.9	30.0	129.5	276.4
2021	101.2	31.7	129.2	262.2
2022	71.8	54.3	104.4	230.5

Table 8. Production value (in millions of 2022 USD) by product type within the U.S. Pacific hake fishery. Data designated as confidential are replaced with —. Note that the production value reflects the value when leaving the processing facility, it does not necessarily reflect the final sale value, depending on the corporate structure of the company.

Year	Fillet	Surimi	Frozen whole/ round	Headed-and-gutted	Fishmeal	Minced	Other
2009	38.1	23.5	—	54.4	4.2	6.2	1.0
2010	37.3	64.7	1.6	30.8	7.3	9.8	0.9
2011	55.4	65.2	14.3	60.2	8.8	9.8	3.4
2012	38.4	70.7	6.2	39.1	9.0	5.7	2.1
2013	71.1	60.7	8.6	62.6	7.0	3.5	4.0
2014	85.2	101.6	3.1	49.1	14.3	6.3	4.8
2015	42.5	61.7	5.4	22.2	9.9	3.8	0.5
2016	56.4	96.8	2.5	30.1	15.4	9.8	2.0
2017	75.2	102.1	21.7	50.8	15.7	6.4	4.6
2018	73.1	103.5	21.2	51.8	12.6	5.1	6.5
2019	90.8	104.5	21.7	50.7	9.2	5.1	13.1
2020	71.9	91.4	43.9	43.9	8.9	7.1	9.3
2021	50.7	87.0	45.1	62.0	7.9	4.1	5.2
2022	65.8	79.5	35.1	28.1	9.9	6.7	5.3

Table 9. Hake export volume (in kg) and value (in 2022 USD) to countries that imported at least half a million U.S. dollars in U.S. Pacific hake in 2022 (source: NOAA Fisheries One Stop Shop). Additional countries that imported U.S. Pacific hake: Ivory Coast, Equatorial Guinea, South Africa, Mexico, Croatia, Lebanon, Dominican Republic, Serbia, United Arab Emirates, Bulgaria, Albania, Denmark, Angola, Guinea, Bermuda, Cameroon, Azerbaijan, Jordan, Greece, Slovenia, Moldova, Curaçao, Montserrat, and Anguilla.

Country	Weight (kg)	Value (USD)
Netherlands	19,129,000	75,775,556
Lithuania	14,373,041	26,468,887
Spain	5,134,201	15,984,449
Nigeria	8,708,930	11,071,480
Ukraine	6,017,123	10,761,716
Italy	4,254,494	9,479,329
Ghana	3,044,072	3,974,123
Germany	1,681,470	3,102,372
South Korea	603,880	2,268,004
Georgia	1,000,175	1,837,862
Montenegro	797,795	1,516,896
France	833,634	1,405,202
India	229,700	953,254
Canada	336,881	822,887
Poland	594,255	808,200
Congo (Brazzaville)	693,820	802,828
Romania	322,071	573,669
Benin	486,647	554,859

Data Sources

Data for this report were obtained via the Northwest Fisheries Science Center's Economic Data Collection (EDC) Program,[1] the NOAA Fisheries One Stop Shop (FOSS),[2] and the Pacific Fisheries Information Network (PacFIN),[3] as shown in Table 10). Economic contributions were estimated using the Input–Output Model for Pacific Coast Fisheries (IO-PAC; Leonard and Watson 2011).

Table 10. Data sources for each metric.

Metric	Source	Estimated or Reported
Labor costs	EDC	Reported
Exports	FOSS	Reported
Economic contributions	IO-PAC	Estimated
Production value	EDC	Reported
Ex-vessel value (shorebased)	PacFIN	Reported
Ex-vessel value (mothership)	PacFIN/EDC	Estimated/Reported
Ex-vessel value (catcher processor)	PacFIN	Estimated
Participation	PacFIN	Reported

Expenditure data, including wage payments, and production values were obtained from the EDC Program. The Program collects annual data from catcher vessels, shorebased processors, motherships, and catcher–processors. Detailed information about the data collection and metrics reported can be found in Steiner et al. (2021).

Product export data were obtained through FOSS. This tool aggregates data obtained from the U.S. Census Bureau's Foreign Trade Data Series—Merchandise Trade (FT900). Key information contained in the trade data series includes annual exports by species or species category, port of departure, import country, volume of seafood, and value of seafood (in U.S. dollars). The two primary species-specific product types are "groundfish hake fillet frozen" and "groundfish hake, whiting frozen." There is also a small amount of Pacific hake exported as "groundfish hake fresh." "Fish NSPF surimi" is also included in these data summaries.[4] Pacific hake is also exported as fish oil and fishmeal, but those cannot be linked to Pacific hake using the Census data. Import countries are identified by the bill of lading, which does not report the final destination of the product.

The IO-PAC model was developed at the Northwest Fisheries Science Center to provide estimates of total economic contributions by the commercial and recreational fishing industries (Leonard and Watson 2011). For commercial fishing industries, it customizes the Impacts Analysis for Planning (IMPLAN) regional input–output model with revenue information obtained from PacFIN and cost data obtained through the EDC Program (among other NWFSC cost and earnings data collections).

[1] The Northwest Fisheries Science Center's Trawl Catch Share Data Exploration Tool (Fisheye) is available at https://connect.fisheries.noaa.gov/fisheye/fisheyelandingpage.html.
[2] The FOSS portal is available at https://www.fisheries.noaa.gov/foss/f?p=215). Information about the U.S. Census Bureau's Foreign Trade Data Series is available at https://www.census.gov/foreign-trade/index.html.
[3] The Pacific Fisheries Information Network is available at https://pacfin.psmfc.org/.
[4] NSPF (not specifically provided for) data from https://www.census.gov/foreign-trade/reference/definitions/index.html.

Catch data, including ex-vessel revenue, were obtained from PacFIN, which aggregates fish ticket data collected by the three U.S. West Coast states (California, Oregon, and Washington) for shorebased operations, as well as from At-Sea Hake Observer Program (A-SHOP) data for mothership and catcher–processor operations. Catcher vessels were designated as participating in the hake fishery if they delivered any fish to a mothership on the U.S. West Coast or if they made at least one shorebased delivery where midwater gear was used and Pacific hake made up the highest portion of the total value of the delivery (Steiner et al. 2021). Shorebased processors were designated as Pacific hake processors if they produce Pacific hake-specific products according to production reported on the EDC surveys. If the processor only buys small amounts of Pacific hake as bycatch, or transfers the fish to another facility for processing, it is not designated as a Pacific hake processor. Motherships and catcher–processors are designated as participants if they buy or catch any fish off the U.S. West Coast.

Ex-vessel revenue—the total payments received by catcher vessels for delivering Pacific hake—was obtained from PacFIN for the shorebased catcher vessels and from the EDC Program (Table 5) for catcher vessels delivering to motherships. In the shorebased component of the fishery, ex-vessel revenue was reported via fish tickets by processors throughout the fishing season. In contrast, mothership vessels do not submit fish tickets and therefore, no in-season ex-vessel revenue information is collected. The only reporting requirement is to submit total annual fish payments to the EDC Program. The ex-vessel revenue shown in Table 5 is the actual reported ex-vessel revenue for the shorebased and mothership components of the fishery.

Throughout the fishing season, PacFIN generated estimates of the ex-vessel value of both the catch delivered to motherships as well as the catcher–processor catch (Ames 2014). These estimates were modeled by matching the shorebased hake prices in time and space to the at-sea deliveries. The values were estimated for the mothership data because the EDC data were collected on an annual basis and are therefore only available at a two-year lag (ex-vessel revenue from 2022 was not available until the beginning of 2024). In the catcher–processor sector, there is no ex-vessel transaction because a single vessel catches and processes the fish. PacFIN used the same methods for calculating what the ex-vessel value would have been had the fish been landed on shore. These estimates were calculated to provide the total ex-vessel value of catch (regardless of whether an ex-vessel transaction occurred). The estimates for the mothership and catcher–processor sectors, as well as the reported values for the shorebased sector, are reported in Table 6.

Income, ex-vessel revenue, and production value are reported in 2022 dollars. They were adjusted for inflation using the monthly Gross Domestic Product: Implicit Price Deflator (GDPDEF) time series obtained from Federal Reserve of Economic Data (FRED), accessed via the `fredr` R package.

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