

Pacific Halibut Bycatch in U.S. West Coast Groundfish Fisheries, 2002-2023

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This report provides estimates of Pacific halibut (*Hippoglossus stenolepis*) bycatch in the U.S. West Coast groundfish fisheries monitored by the West Coast Groundfish Observer Program, the At-Sea Hake Observer Program, and the Electronic Monitoring (EM) Program. The former two programs comprise the Fisheries Observation Science Program (FOS) at the NOAA Fisheries Northwest Fisheries Science Center (NWFSC). Bycatch² is estimated from data collected by fisheries observers, fish sales information (fish tickets), logbooks, and review of EM video. For more detailed background and methods, see Jannot et al. (2022).

Table 1 shows estimated discard mortality in 2023 by sector, accounting for at-sea discard mortality rates (DMRs) where appropriate. Table 2 shows estimated gross discard by sector and year, and Table 3 shows estimated discard mortality (accounting for at-sea DMRs) by sector and year. All tables include any dockside discards in IFQ bottom trawl, midwater rockfish, and midwater hake sectors. These tables are also included as spreadsheets.

In previous years, FOS produced an extensive report on Pacific halibut bycatch that was submitted in draft form to the Pacific Fishery Management Council (PFMC) briefing book, and later published as a NOAA Technical Memorandum. Beginning in 2025, FOS will include Pacific halibut mortality estimates annually as part of the Groundfish Mortality Report (Somers et al. 2024) and in the associated Groundfish Expanded Multiyear Mortality (GEMM) product. The Groundfish Mortality Report and GEMM are submitted in draft form to the September PFMC briefing book and later published as a NOAA technical memorandum.

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² Bycatch includes at-sea discards in all sectors and the small amount discarded at the dock in IFQ bottom trawl, midwater rockfish, and midwater hake fisheries.

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Table 1: Pacific halibut mortality estimates for 2023 and the years of observation/monitoring, for fishery sectors observed by the Northwest Fisheries Science Center Fisheries Observation Science Program.

Sector	Years_Observed	2023 Total Discard Mortality (mt)
Individual Fishing Quota (IFQ) fisheries ¹	2011-2023	27.07
At-sea Pacific hake	2002-2023	0.28
Non-nearshore fixed gear targeting groundfish	2002-2023	7.62
P. halibut directed	2017-2023	1.92
Nearshore fixed gear	2003-2023	0.98
Pink shrimp trawl	2004-2023	0
California halibut trawl	2002-2023	0

¹Includes estimates from IFQ vessels with Electronic Monitoring, includes all gears

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Table 2: Pacific halibut gross discard estimates (mt, including a small amount discarded at the dock in IFQ Bottom Trawl, Midwater Rockfish, and Midwater Hake fisheries) for all sectors observed by the NWFSC FOS. No discard mortality rates were applied to these estimates. Rounding of values might mask very small weights in some categories and are presented here as zero (0). All landed weights are estimated based on whole fish (a.k.a. ‘round weight,’ not head-and-gut). No effort occurred in the IFQ H&L fishery during 2020–2023. Total discards in sectors with and without PFMC-approved discard mortality rates are shown (confidential sectors excluded). * = confidential data, fewer than 3 vessels observed; - = no observer coverage or no fishing; n/a = not applicable because fishery did not exist.

Year	Total discards (mt), mortality rates not applied																
	LE BT 2002-10	IFQ BT ^{abc}	IFQ H&L	IFQ Pot ^c	IFQ MW hake ^{bcd}	IFQ MW rf ^{bcd}	A-S hake ^d	LE sable. end.	LE sable. non- end.	Phal. directed	OA FG ^a	NS FG ^d	Pink shrimp ^d	CA hal. ^{df}	All sectors	All w/ <1.0 mort. ^g	All w/ 1.0 mort. ^h
2002	524.41	n/a	n/a	n/a	n/a	n/a	1.14	146.90	0.01	-	-	-	-	0.00	672.46	671.32	1.14
2003	186.65	n/a	n/a	n/a	n/a	n/a	2.65	198.89	0.18	-	-	0.00	-	0.00	388.38	385.73	2.65
2004	212.43	n/a	n/a	n/a	n/a	n/a	1.13	239.01	0.01	-	-	1.00	0.00	0.70	454.28	451.45	2.83
2005	460.35	n/a	n/a	n/a	n/a	n/a	1.96	240.47	0.01	-	-	2.21	0.04	0.03	705.07	700.83	4.24
2006	390.91	n/a	n/a	n/a	n/a	n/a	0.83	677.68	0.00	-	-	0.53	-	0.02	1069.98	1068.60	1.39
2007	294.38	n/a	n/a	n/a	n/a	n/a	1.18	132.81	1.72	-	21.69	0.09	0.21	0.03	452.11	450.60	1.50
2008	305.21	n/a	n/a	n/a	n/a	n/a	3.98	260.74	2.95	-	40.35	0.35	0.00	0.22	613.80	609.25	4.55
2009	385.24	n/a	n/a	n/a	n/a	n/a	0.33	322.91	0.24	-	35.25	1.27	0.00	0.00	745.24	743.64	1.60
2010	265.08	n/a	n/a	n/a	n/a	n/a	1.57	138.07	0.39	-	32.57	0.08	0.00	0.00	437.76	436.11	1.65
2011	n/a	64.25	6.13	3.36	0.36	*	0.61	137.45	21.27	-	13.03	3.05	0.19	0.00	249.68	245.48	4.20
2012	n/a	66.47	14.79	1.90	0.62	0.62	0.64	163.41	16.26	-	23.60	2.24	0.00	0.00	290.54	286.42	4.12
2013	n/a	66.30	3.00	0.99	1.31	0.00	1.06	22.27	0.01	-	1.78	1.35	0.00	0.00	98.08	94.35	3.73
2014	n/a	55.96	3.95	0.32	1.36	0.00	0.37	179.86	0.00	-	3.59	0.95	0.00	0.00	246.36	243.68	2.69
2015	n/a	69.38	9.81	2.23	0.70	0.00	0.06	124.41	0.46	-	10.14	1.44	0.01	0.00	218.63	216.42	2.21
2016	n/a	59.41	6.95	1.78	0.68	0.00	0.15	179.06	5.16	-	42.67	3.04	0.00	0.00	298.90	295.03	3.87
2017	n/a	64.84	4.25	1.84	0.50	0.04	0.55	304.32	0.73	25.27	48.41	1.76	0.00	0.00	452.51	449.65	2.86
2018	n/a	51.99	4.93	2.64	1.34	0.03	0.66	231.48	12.84	15.67	41.09	1.57	0.01	0.00	364.25	360.64	3.61
2019	n/a	53.08	3.56	4.23	*	0.04	0.54	232.19	76.51	29.32	39.78	0.57	0.00	0.00	439.83	438.68	1.15
2020	n/a	44.56	-	*	*	0.00	0.39	127.16	0.00	47.88	9.99	1.37	0.00	0.00	231.36	229.60	1.77
2021	n/a	54.56	-	3.34	*	0.00	0.67	139.03	1.61	43.83	3.95	1.87	0.00	0.00	248.85	246.31	2.54
2022	n/a	57.45	-	1.71	*	0.03	1.76	47.29	0.00	14.32	3.02	4.23	0.19	0.00	130.00	123.79	6.20
2023	n/a	44.39	-	1.14	0.68	0.04	0.28	57.45	0.00	10.21	1.97	0.98	0.00	0.00	117.14	115.16	1.98

^aStarting in 2011, LE CA halibut estimates are combined with IFQ BT estimates.

^bIncludes a small amount landed and discarded at the dock.

^cIncludes P. halibut catch from IFQ EM EFP.

^d100% mortality rate.

^eA coastwide discard ratio and coastwide discard estimate could not be computed in the OA FG sector for 2002–06, because WCGOP only covered OA vessels in CA during this time

^fStarting in 2011, this sector only includes OA CA halibut.

^gLE BT, IFQ BT, IFQ H&L, IFQ Pot, LE sable end., LE sable non-end., P. hal. directed, and OA FG.

^hIFQ MW hake, IFQ MW rf, A-S hake, NS FG, pink shrimp, and CA halibut.

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Table 3: Pacific halibut discard mortality estimates (mt, including a small amount discarded at the dock in IFQ Bottom Trawl, Midwater Rockfish, and Midwater Hake fisheries) for all sectors observed by the Northwest Fisheries Science Center Fisheries Observation Science Program. Mortality rates of less than 100% were applied in the bottom trawl fisheries (LE and IFQ), IFQ hook and line, IFQ pot, and non-IFQ, non-nearshore fixed gear sectors, for which some information regarding gear-specific survivorship was available. For all other sectors, a 100% mortality rate was applied because gear-specific survivorship information is not available. Rounding of values might mask very small weights in some categories and are presented here as zero (0). All weights are estimated based on whole fish (a.k.a. ‘round weight,’ not head and gut). There was no fishing in the IFQ H&L fishery during 2020–2023. Total discards in sectors with and without PFMC-approved discard mortality rates are shown (confidential sectors excluded). * = confidential data; - = no observer coverage or no fishing; n/a = not applicable because fishery did not exist.

Year	Total mortality (mt), mortality rates applied																
	LE BT 2002-10	IFQ BT ^{abc}	IFQ H&L	IFQ Pot ^c	IFQ MW hake ^{bcd}	IFQ MW rf ^{bcd}	A-S hake ^d	LE sable. end.	LE sable. non- end.	P.hal. directed	OA FG ^e	NS FG ^d	Pink shrimp ^d	CA hal. ^{df}	All sectors	All w/ <1.0 mort. ^g	All w/ 1.0 mort. ^h
2002	344.82	n/a	n/a	n/a	n/a	n/a	1.14	23.59	0.00	-	-	-	-	0.00	369.55	368.41	1.14
2003	124.43	n/a	n/a	n/a	n/a	n/a	2.65	31.83	0.03	-	-	0.00	-	0.00	158.94	156.29	2.65
2004	133.12	n/a	n/a	n/a	n/a	n/a	1.13	38.90	0.00	-	-	1.00	0.00	0.70	174.85	172.02	2.83
2005	286.52	n/a	n/a	n/a	n/a	n/a	1.96	38.53	0.00	-	-	2.21	0.04	0.03	329.29	325.05	4.24
2006	242.47	n/a	n/a	n/a	n/a	n/a	0.83	108.76	0.00	-	-	0.53	-	0.02	352.62	351.23	1.39
2007	208.81	n/a	n/a	n/a	n/a	n/a	1.18	21.33	0.28	-	3.49	0.09	0.21	0.03	235.41	233.90	1.50
2008	207.81	n/a	n/a	n/a	n/a	n/a	3.98	41.85	0.47	-	6.46	0.35	0.00	0.22	261.15	256.59	4.55
2009	251.10	n/a	n/a	n/a	n/a	n/a	0.33	51.68	0.04	-	5.64	1.27	0.00	0.00	310.07	308.47	1.60
2010	180.97	n/a	n/a	n/a	n/a	n/a	1.57	22.19	0.06	-	5.22	0.08	0.00	0.00	210.10	208.45	1.65
2011	n/a	31.32	0.98	0.60	0.36	*	0.61	11.83	3.04	-	1.93	3.05	0.19	0.00	53.92	49.72	4.20
2012	n/a	35.59	2.37	0.34	0.62	0.62	0.64	29.68	0.76	-	1.51	2.24	0.00	0.00	74.37	70.25	4.12
2013	n/a	32.35	0.48	0.18	1.31	0.00	1.06	2.86	0.00	-	0.07	1.35	0.00	0.00	39.67	35.94	3.73
2014	n/a	26.22	0.63	0.06	1.36	0.00	0.37	28.70	0.00	-	0.29	0.95	0.00	0.00	58.59	55.91	2.69
2015	n/a	33.34	1.57	0.41	0.70	0.00	0.06	10.40	0.02	-	0.40	1.44	0.01	0.00	48.34	46.13	2.21
2016	n/a	33.47	1.11	0.32	0.68	0.00	0.15	17.22	1.07	-	2.70	3.04	0.00	0.00	59.76	55.89	3.87
2017	n/a	34.96	0.68	0.33	0.50	0.04	0.55	43.45	0.04	2.22	3.48	1.76	0.00	0.00	88.01	85.15	2.86
2018	n/a	30.49	0.79	0.47	1.34	0.03	0.66	26.96	0.58	2.50	4.35	1.57	0.01	0.00	69.75	66.14	3.61
2019	n/a	29.93	0.57	0.76	*	0.04	0.54	24.36	2.68	3.56	2.87	0.57	0.00	0.00	65.89	64.74	1.15
2020	n/a	27.22	-	*	*	0.00	0.39	10.92	0.00	9.27	0.35	1.37	0.00	0.00	49.52	47.76	1.77
2021	n/a	32.90	-	0.60	*	0.00	0.67	16.47	0.19	9.04	0.53	1.87	0.00	0.00	62.28	59.74	2.54
2022	n/a	34.67	-	0.31	*	0.03	1.76	7.06	0.00	1.67	0.11	4.23	0.19	0.00	50.02	43.82	6.20
2023	n/a	26.15	-	0.20	0.68	0.04	0.28	7.56	0.00	1.92	0.07	0.98	0.00	0.00	37.87	35.90	1.98

^aStarting in 2011, LE CA halibut estimates are combined with IFQ BT estimates.

^bIncludes a small amount landed and discarded at the dock.

^cIncludes P. halibut catch from IFQ EM EFP.

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References

Jannot, J. E., K. E. Richerson, K. A. Somers, V. J. Tuttle, C. M. Colway, and J. T. McVeigh. 2022. Pacific Halibut Bycatch in U.S. West Coast Groundfish Fisheries, 2002–20. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-173.

Somers, K.A., K.E. Richerson, V.J. Tuttle, N.B. Riley, and J.T. McVeigh. 2024. Estimated discard and catch of groundfish species in the 2023 U.S. west coast fisheries. Available at <https://www.pcouncil.org/documents/2024/08/i-1-b-nwfsc-report-1-groundfish-mortality-report-2023-electronic-only.pdf/>

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