Catch only Projection: Status of Widow Rockfish (*Sebastes entomelas*) Along the U.S. West Coast in 2023

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August 1, 2023

This document provides the first catch-only projection of the 2019 update assessment that updated the 2015 benchmark assessment of the Widow Rockfish (Sebastes *entomelas*) that reside in the waters off California, Oregon, and Washington from the U.S.-Canadian border in the north to the U.S.-Mexico border in the south. Updated total catches for years 2017 − 2021 were derived from GEMM reports (Table 1). Estimated 2022 catch data is an aggregation of data from PacFIN, RecFIN, and NORPAC. The projected 2023 and 2024 catches were provided by the Groundfish Management Team (GMT). For years 2025 and beyond, model projected ABC catches were assumed.

Note that the 'Hake' column in Table 1, was previously labeled 'At-Sea Hake' in Table a of both the 2015 and 2019 assessments. However, this catch (now and previously) contains all Hake fishery sectors in WCGOP's groundfish mortality (GEMM) landings (including Shoreside), and not just the At-Sea Catcher Processor (CP) and At-Sea Mothership Catcher Vessel (MSCV) sectors. Also, the legend of Table a of the 2019 update assessment claims that the numbers for the fisheries listed are for recent landings, but they are total mortality and sum to the 'Total Mortality' column.

In the projections, the split of catches among fleets was based upon the average split in the final three years. Scientific Uncertainty Buffer Fractions are based upon the number of years since the last assessment was conducted in 2019, based upon a Category-1 assessment with P* = 0.45. Those Buffer Fractions, along with previous and updated Catches, OFLs and Depletions and updated Biomass, Spawning output, and ABCs are given in Table 2.

Table 1: Recent total mortality (discards + landings; mt) for the bottom trawl, midwater trawl, at-sea hake, net, and hook-and-line fisheries and their cumulative total mortality plus modeled total landings. One hundred percent mortality is assumed for discards. The GMT projections of total mortality for 2023-24 are shown at the bottom.

Year	Trawl	Midwater Trawl	Hake	Net	Hook & Line	Total Mortality	Total Landings
2013	51.27	241.1	176.4	0	0.98	472.7	469.8
2014	71.28	306.6	342.2	0.03	1.84	725.8	721.9
2015	12.18	479.2	386.2	0	2.04	884.8	879.6
2016	9.62	588.0	440.8	0	0.82	1,045.4	1,039.2
2017	35.93	4,852.1	1,455.2	0	2.66	6,395.4	6,345.9
2018	35.93	9,374.3	1,081.3	0	1.50	10,588.1	10,493.0
2019	53.60	8,378.7	1106.00	0.00	30.05	9,568.3	9,4823.0
2020	83.70	7,581.2	754.20	0.00	10.03	8,429.1	8,352.2
2021	107.20	10,139.3	620.90	0.00	12.50	10,879.9	10,777.1
2022	120.08	10,876.7	1,136.68	0.05	9.20	12,142.7	12,032.4
2023	*90.33*	*10,788.9*	*837.26*	*0.00*	*67.20*	*11,783.7*	*11,672.4*
2024	*81.86*	*9,714.5*	*778.12*	*0.00*	*67.20*	*10,641.7*	*10,541.1*

Table 2. Catch only projections through 2034.

Year	OFLs from 2019 (mt)	Updated OFL Projection (mt)	Updated ABC Projection (mt)	Buffer	Assumed ABC Catch in 2019 (mt)	Actualized Total Mortality	Summary 4+ Biomass (mt)	Spawning Biomass (mt)	Fraction Unfished	Fraction Unfished from 2019
2019	14,670	-	-	-	10,868	9,568	180,855	80,910	0.919	0.919
2020	15,633	-	-	-	10,868	8,429	180,976	83,691	0.951	0.944
2021	15,749	-	-	-	14,725	10,880	177,351	85,511	0.972	0.951
2022	14,826	-	-	-	13,788	12,143	168,698	84,028	0.955	0.912
2023	13,633	-	-	-	12,625	11,784*	159,117	80,183	0.911	0.861
2024	12,453	-	-	-	11,481	10,642*	149,814	75,595	0.859	0.806
2025	11,487	12,254	11,237	0.917	10,533	-	141,975	71,324	0.811	0.756
2026	10,769	11,382	10,392	0.913	9,832	-	134,080	66,887	0.760	0.714
2027	10,240	10,731	9,754	0.909	9,308	-	127,625	63,199	0.718	0.679
2028	9,842	10,238	9,255	0.904	8,897	-	122,338	60,153	0.684	0.651
2029	9,534	9,857	8,872	0.900	8,580	-	118,001	57,635	0.655	0.627
2030	9,288	9,557	8,563	0.896	8,322	-	114,410	55,540	0.631	0.608
2031	-	9,314	8,308	0.892	-	-	111,419	53,787	0.611	-
2032	-	9,115	8,085	0.887	-	-	108,914	52,312	0.594	-
2033	-	8,949	7,902	0.883	-	-	106,817	51,072	0.580	-
2034	-	8,810	7,744	0.879	-	-	105,047	50,021	0.568	-

* GMT projections of total mortality as seen in Table 1