

Catch Only Projection for Canary Rockfish (*Sebastes pinniger*) in 2021

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This document provides the third catch-only projection of the 2015 assessment of canary rockfish (*Sebastes pinniger*), with updated catch data through 2020. Updated total catches for each fleet for years 2015 – 2019 were derived from Groundfish Expanded Multi-year Mortality (GEMM) report. During updating and issue was identified in the 2019 catch-only update where the input removals between 2016 – 2018 did not match the actual removals from the population in the model. This issue was corrected in this year's catch-only update while also updating the removals between 2015 – 2019. Estimated 2020 removals and the projected removals for 2021 and 2022 were provided by the Groundfish Management Team (GMT). For years 2023 and beyond, ABC catches were assumed. In the projections, the split of catches among fleets was based upon the split in 2022, which differed from that used in the previous projection. Scientific time-varying uncertainty buffers are based upon the number of years since the last assessment, conducted in 2015, using a Category-1 $\sigma = 1.0$ and a of $P^* = 0.45$. The time-varying buffers, along with updated removals (2015-2022), Overfishing Limits (OFLs), Acceptable Biological Catches (ABCs), summary biomass 5+, spawning output (SSB), and the fraction unfished are given in Table 1. A comparison between the removals, OFLs, ABCs, and fraction unfished from the 2019 and 2021 catch-only updates are provided in Table 2.

Table 1. Catch only projections through 2032.

Year	Removals (mt)	OFL (mt)	ABC (mt)	Buffer	Summary Biomass (5+)	Spawning Output	Fraction Unfished
2015	114.15	1,439	-	-	35,224	4,074	0.547
2016	75.13	1,470	-	-	35,899	4,144	0.556
2017	402.92	1,488	-	-	36,419	4,220	0.566
2018	601.13	1,475	-	-	36,434	4,266	0.572
2019	585.43	1,463	-	-	36,310	4,280	0.574
2020	481.9	1,464	-	-	36,441	4,273	0.573
2021	867.4	1,485	-	-	36,732	4,255	0.571
2022	881.8	1,477	-	-	36,698	4,191	0.562
2023	-	1,472	1,338	0.909	36,707	4,134	0.555
2024	-	1,434	1,296	0.904	36,313	4,042	0.542
2025	-	1,399	1,259	0.900	36,004	3,973	0.533
2026	-	1,365	1,223	0.896	35,776	3,924	0.527
2027	-	1,334	1,190	0.892	35,617	3,891	0.522
2028	-	1,303	1,156	0.887	35,515	3,872	0.520
2029	-	1,274	1,125	0.883	35,459	3,862	0.518
2030	-	1,246	1,095	0.879	35,438	3,859	0.518
2031	-	1,217	1,065	0.875	35,445	3,863	0.518
2032	-	1,187	1,034	0.871	35,471	3,873	0.520

Table 2. Comparison of removals, OFLs, ABCs, and fraction unfished from the 2019 and the 2021 catch-only update.

2019					2021			
Year	Removals (mt)	OFL (mt)	ABC (mt)	Fraction Unfished	Removals (mt)	OFL (mt)	ABC (mt)	Fraction Unfished
2015	112.21	-	-	0.547	114.15	-	-	0.547
2016	53.60	-	-	0.556	75.13	-	-	0.556
2017	397.60	-	-	0.567	402.92	-	-	0.566
2018	592.30	-	-	0.573	601.13	-	-	0.572
2019	633.20	-	-	0.575	585.43	-	-	0.574
2020	695.00	-	-	0.573	481.90	-	-	0.573
2021	-	1,450	1,338	0.567	867.40	-	-	0.571
2022	-	1,424	1,308	0.552	881.80	-	-	0.562
2023	-	1,407	1,285	0.537	-	1,472	1,338	0.555
2024	-	1,395	1,266	0.524	-	1,434	1,296	0.542
2025	-	1,387	1,253	0.513	-	1,399	1,259	0.533
2026	-	1,378	1,239	0.505	-	1,365	1,223	0.527
2027	-	1,368	1,225	0.499	-	1,334	1,190	0.522
2028	-	1,357	1,209	0.494	-	1,303	1,156	0.520
2029	-	1,345	1,193	0.490	-	1,274	1,125	0.518
2030	-	1,333	1,172	0.488	-	1,246	1,095	0.518
2031	-	-	-	-	-	1,217	1,065	0.518
2032	-	-	-	-	-	1,187	1,034	0.520