

**HARVEST SPECIFICATION PROJECTIONS FOR SELECT WEST COAST GROUND FISH
STOCKS UNDER ALTERNATIVE HARVEST CONTROL RULES
FOR 2023 AND BEYOND**

The only revision relative to the original Attachment 4 is to Table 6. As noted by the [SSC](#), the wrong category designation was used in the original projections for vermilion and sunset rockfishes in California north of 34°27' N lat.

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Table 1. Projected lingcod harvest specifications under the base model in the 2021 assessment south of 40°10' N lat. under P* harvest control rules of 0.40 and 0.45, 2023-2032.

Scenario	Year	OFL (mt)	ABC (mt)	ACL (mt)	Spawning Biomass (mt)	Depletion
P* = 0.4	2023	846	644	633	9,995	0.38
	2024	865	646	634	9,897	0.37
	2025	915	671	658	9,892	0.37
	2026	963	692	681	9,924	0.38
	2027	999	706	696	9,969	0.38
	2028	1,025	710	702	10,024	0.38
	2029	1,043	709	703	10,089	0.38
	2030	1,057	705	700	10,164	0.38
	2031	1,068	699	696	10,250	0.39
	2032	1,079	693	692	10,346	0.39
P* = 0.45	2023	846	739	726	9,995	0.38
	2024	855	740	722	9,832	0.37
	2025	897	768	748	9,760	0.37
	2026	937	795	773	9,721	0.37
	2027	966	812	789	9,690	0.37
	2028	984	820	796	9,667	0.37
	2029	996	823	798	9,650	0.37
	2030	1,004	821	796	9,644	0.37
	2031	1,009	818	793	9,647	0.37
	2032	1,014	814	790	9,659	0.37

Table 2. Projected lingcod harvest specifications under the base model in the 2021 assessment north of 40°10' N lat. under P* harvest control rules of 0.40 and 0.45, 2023-2032.

Scenario	Year	OFL (mt)	ABC (mt)	Spawning Biomass (mt)	Depletion
P* = 0.4	2023	5,010	3,817	10,722	0.63
	2024	4,576	3,418	9,628	0.56
	2025	4,429	3,246	9,175	0.54
	2026	4,401	3,165	9,005	0.53
	2027	4,414	3,117	8,957	0.52
	2028	4,434	3,073	8,950	0.52
	2029	4,453	3,028	8,963	0.52
	2030	4,474	2,984	8,993	0.52
	2031	4,498	2,942	9,038	0.53
	2032	4,525	2,905	9,096	0.53
P* = 0.45	2023	5,010	4,378	10,722	0.63
	2024	4,455	3,854	9,345	0.55
	2025	4,237	3,631	8,726	0.51
	2026	4,163	3,534	8,449	0.49
	2027	4,140	3,482	8,320	0.49
	2028	4,128	3,439	8,245	0.48
	2029	4,120	3,403	8,195	0.48
	2030	4,114	3,365	8,166	0.48
	2031	4,113	3,332	8,156	0.48
	2032	4,118	3,307	8,162	0.48

Table 3. Projected sablefish harvest specifications under the base model in the 2021 update assessment under P* harvest control rules of 0.35, 0.40, and 0.45, 2023-2032.

Scenario	Year	OFL (mt)	ABC (mt)	Base (0.5)	
				SSB	Depletion
P* = 0.35	2023	11,577	9,412	99,450	0.59
	2024	10,747	8,608	96,661	0.57
	2025	10,255	8,101	94,436	0.56
	2026	10,021	7,796	92,909	0.55
	2027	9,973	7,649	91,867	0.54
	2028	10,014	7,570	91,099	0.54
	2029	10,073	7,504	90,483	0.54
	2030	10,118	7,437	89,967	0.53
	2031	10,142	7,342	89,530	0.53
	2032	10,150	7,247	89,175	0.53
P* = 0.40	2023	11,577	10,107	99,450	0.59
	2024	10,708	9,252	96,308	0.57
	2025	10,185	8,722	93,761	0.56
	2026	9,923	8,421	91,935	0.54
	2027	9,849	8,282	90,602	0.54
	2028	9,863	8,218	89,546	0.53
	2029	9,898	8,168	88,643	0.52
	2030	9,920	8,117	87,840	0.52
	2031	9,922	8,039	87,117	0.52
	2032	9,910	7,950	86,479	0.51
P* = 0.45	2023	11,577	10,825	99,450	0.59
	2024	10,669	9,923	95,935	0.57
	2025	10,117	9,372	93,014	0.55
	2026	9,829	9,070	90,821	0.54
	2027	9,731	8,934	89,130	0.53
	2028	9,720	8,888	87,727	0.52
	2029	9,731	8,860	86,483	0.51
	2030	9,729	8,810	85,346	0.51
	2031	9,709	8,753	84,304	0.50
	2032	9,675	8,684	83,351	0.49

Table 4. Projected spiny dogfish harvest specifications under the base model in the 2021 assessment under P* harvest control rules of 0.35 and 0.40, 2023-2032.

Scenario	Year	OFL (mt)	ABC (mt)	Spawning Output	Depletion
P* = 0.35	2023	1,911.16	1,263.28	13,591	0.42
	2024	1,888.05	1,212.13	13,595	0.42
	2025	1,866.74	1,164.85	13,595	0.42
	2026	1,847.23	1,119.42	13,592	0.42
	2027	1,829.54	1,077.60	13,586	0.42
	2028	1,813.65	1,037.41	13,575	0.42
	2029	1,799.54	1,000.54	13,561	0.42
	2030	1,787.14	965.06	13,542	0.42
	2031	1,776.43	930.85	13,519	0.42
	2032	1,767.34	901.34	13,493	0.41
P* = 0.40	2023	1,911.16	1,456.30	13,591	0.42
	2024	1,883.17	1,406.73	13,586	0.42
	2025	1,857.04	1,361.21	13,578	0.42
	2026	1,832.76	1,317.75	13,565	0.42
	2027	1,810.37	1,278.12	13,548	0.42
	2028	1,789.86	1,240.37	13,527	0.42
	2029	1,771.20	1,204.42	13,500	0.41
	2030	1,754.39	1,170.18	13,470	0.41
	2031	1,739.37	1,137.55	13,434	0.41
	2032	1,726.10	1,108.16	13,394	0.41

Table 5. Projected vermilion and sunset rockfishes harvest specifications under the base model in the 2021 assessment in California south of Pt. Conception under P* harvest control rules of 0.40 and 0.45, 2023-2032.

Scenario	Year	OFL (mt)	ABC (mt)	Spawning Output	Depletion
P* = 0.4	2023	159	121	477	0.49
	2024	160	119	484	0.50
	2025	161	118	490	0.50
	2026	162	116	495	0.51
	2027	163	115	499	0.51
	2028	164	114	503	0.51
	2029	165	112	506	0.52
	2030	166	111	510	0.52
	2031	167	109	515	0.53
	2032	168	108	519	0.53
P* = 0.45	2023	159	139	477	0.49
	2024	159	137	482	0.49
	2025	159	136	485	0.50
	2026	159	135	487	0.50
	2027	159	134	488	0.50
	2028	160	133	489	0.50
	2029	160	132	490	0.50
	2030	160	131	491	0.50
	2031	161	130	491	0.50
	2032	161	129	493	0.50

Table 6. Projected vermilion and sunset rockfishes harvest specifications under the base model in the 2021 assessment in California north of Pt. Conception under P* harvest control rules of 0.40 and 0.45, 2023-2032.

Scenario	Year	OFL (mt)	ABC (mt)	Spawning Output	Depletion
P* = 0.4	2023	154.2	135	497	0.434
	2024	157.8	136	516	0.451
	2025	159.5	137	533	0.466
	2026	159.9	136	547	0.478
	2027	159.5	134	558	0.487
	2028	158.7	132	566	0.495
	2029	157.8	130	572	0.500
	2030	157.0	128	577	0.504
	2031	156.4	127	580	0.507
	2032	155.9	125	583	0.509
P* = 0.45	2023	154.2	144	497	0.434
	2024	157.4	146	515	0.450
	2025	158.6	147	530	0.463
	2026	158.5	146	542	0.474
	2027	157.6	145	552	0.482
	2028	156.4	143	558	0.487
	2029	155.1	141	562	0.491
	2030	153.9	139	565	0.493
	2031	152.9	138	566	0.494
	2032	152.1	136	567	0.495

Table 7. Projected vermilion rockfish harvest specifications under the base model in the 2021 assessment in Oregon under P* harvest control rules of 0.40 and 0.45, 2023-2032.

Scenario	Year	OFL (mt)	ABC Buffer Fraction	ABC (mt)	Spawning Output	Depletion
P* = 0.4	2023	13.48	0.873	11.77	21.79	0.74
	2024	13.42	0.864	11.60	21.99	0.75
	2025	13.25	0.856	11.34	21.99	0.75
	2026	13.01	0.848	11.04	21.84	0.74
	2027	12.76	0.840	10.72	21.58	0.73
	2028	12.51	0.832	10.41	21.25	0.72
	2029	12.26	0.824	10.10	20.89	0.71
	2030	12.02	0.817	9.82	20.52	0.70
	2031	11.80	0.809	9.55	20.15	0.69
	2032	11.59	0.801	9.29	19.80	0.67
P* = 0.45	2023	13.48	0.935	12.60	21.79	0.74
	2024	13.38	0.930	12.45	21.92	0.75
	2025	13.16	0.926	12.19	21.85	0.74
	2026	12.89	0.922	11.89	21.63	0.74
	2027	12.60	0.917	11.56	21.29	0.72
	2028	12.31	0.913	11.24	20.90	0.71
	2029	12.03	0.909	10.93	20.48	0.70
	2030	11.76	0.904	10.63	20.04	0.68
	2031	11.51	0.900	10.36	19.62	0.67
	2032	11.27	0.896	10.10	19.21	0.65

Table 8. Projected vermilion rockfish harvest specifications under the base model in the 2021 assessment in Washington under P* harvest control rules of 0.40 and 0.45, 2023-2032.

Scenario	Year	OFL (mt)	ABC Buffer Fraction	ABC (mt)	Spawning Output	Depletion
P* = 0.4	2023	0.82	0.762	0.62	1.35	0.49
	2024	0.82	0.747	0.61	1.34	0.49
	2025	0.82	0.733	0.60	1.34	0.49
	2026	0.82	0.719	0.59	1.34	0.49
	2027	0.82	0.706	0.58	1.34	0.49
	2028	0.83	0.693	0.58	1.35	0.49
	2029	0.84	0.680	0.57	1.36	0.49
	2030	0.85	0.667	0.57	1.37	0.50
	2031	0.86	0.654	0.56	1.38	0.50
	2032	0.86	0.642	0.56	1.39	0.51
P* = 0.45	2023	0.82	0.874	0.72	1.35	0.49
	2024	0.81	0.865	0.70	1.33	0.49
	2025	0.81	0.857	0.69	1.32	0.48
	2026	0.81	0.849	0.68	1.31	0.48
	2027	0.81	0.841	0.68	1.31	0.48
	2028	0.81	0.833	0.68	1.31	0.48
	2029	0.82	0.826	0.67	1.31	0.48
	2030	0.82	0.818	0.67	1.32	0.48
	2031	0.82	0.810	0.67	1.32	0.48
	2032	0.83	0.803	0.67	1.33	0.48