

**ADDITIONAL PROJECTIONS OF HARVEST SPECIFICATIONS FOR WEST COAST
 GROUND FISH STOCKS IN 2021 AND BEYOND INFORMED BY THE NEW SIGMA
 VALUES FOR DETERMINING ABCS**

The following harvest projections are provided for stocks without new assessments or catch-only projections (see Agenda Item H.5). These projections are based on the most recent assessments (both full and update assessments) and assume default harvest control rules for 2021 and beyond.

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Table 1. Scientific uncertainty buffers recommended by the SSC in 2019.

Year since assessment	Category 1 (baseline $\sigma = 0.5$)				
	P*				
	0.45	0.4	0.35	0.3	0.25
1	6.1%	11.9%	17.5%	23.1%	28.6%
2	6.5%	12.7%	18.7%	24.6%	30.4%
3	7.0%	13.6%	19.9%	26.0%	32.1%
4	7.4%	14.4%	21.0%	27.5%	33.8%
5	7.8%	15.2%	22.2%	28.9%	35.5%
6	8.3%	16.0%	23.3%	30.3%	37.1%
7	8.7%	16.8%	24.4%	31.6%	38.7%
8	9.1%	17.6%	25.5%	33.0%	40.2%
9	9.6%	18.3%	26.5%	34.3%	41.7%
10	10.0%	19.1%	27.6%	35.5%	43.2%
11	10.4%	19.9%	28.6%	36.8%	44.6%
12	10.8%	20.6%	29.6%	38.0%	46.0%
13	11.3%	21.4%	30.7%	39.2%	47.3%
14	11.7%	22.1%	31.6%	40.4%	48.6%
15	12.1%	22.9%	32.6%	41.6%	49.9%
Year since assessment	Category 2 (baseline $\sigma = 1.0$)				
	P*				
	0.45	0.4	0.35	0.3	0.25
1	11.8%	22.4%	32.0%	40.8%	49.1%
2	12.6%	23.8%	33.9%	43.1%	51.6%
3	13.5%	25.3%	35.8%	45.3%	54.0%
4	14.3%	26.7%	37.6%	47.4%	56.2%
5	15.1%	28.1%	39.4%	49.4%	58.4%
6	15.9%	29.4%	41.1%	51.4%	60.4%
7	16.7%	30.7%	42.8%	53.3%	62.4%
8	17.4%	32.0%	44.4%	55.1%	64.2%
9	18.2%	33.3%	46.0%	56.8%	66.0%
10	19.0%	34.6%	47.6%	58.5%	67.7%
11	19.7%	35.8%	49.0%	60.1%	69.3%
12	20.5%	37.0%	50.5%	61.6%	70.8%
13	21.2%	38.2%	51.9%	63.1%	72.2%
14	22.0%	39.4%	53.3%	64.5%	73.6%
15	22.7%	40.5%	54.6%	65.9%	74.9%
	Category 3 (constant $\sigma = 2.0$)				
	P*				
	0.45	0.4	0.35	0.3	0.25
	22.2%	39.8%	53.7%	65.0%	74.0%

Table 2. Aurora rockfish - based on the 2013 assessment. The portion of the coastwide stock north (19%) and south (81%) of 40°10' N lat. is based on average survey biomass.

Year	Buffer	Coastwide		N of 40°10' N lat.		S of 40°10' N lat.		Depletion
		OFL	ABC	OFL	ABC	OFL	ABC	
2021	0.909	92.0	83.6	17.5	15.9	74.5	67.7	0.638
2022	0.904	91.8	83.0	17.4	15.8	74.4	67.2	0.639

Table 3. Arrowtooth flounder - based on the 2017 update assessment.

Year	Buffer	OFL	ABC	Depletion
2021	0.733	13,551	9,933	0.541
2022	0.719	11,764	8,458	0.474

Table 4. Blue and deacon rockfishes in Oregon - based on the 2017 assessment.

Year	Buffer	OFL	ABC	SSB	Depletion
2021	0.857	105.7	90.6	278.7	0.647
2022	0.849	103.1	87.5	269.3	0.625

Table 5. Bocaccio S of 40°10' N lat. – based on the 2017 stock assessment update. 7.4% of the assessed area (Conception area N to Cape Blanco) OFL is deducted to account for the portion of the stock north of 40°10' N lat.

Year	OFL	ABC	S of 40°10' N lat.		Depletion
			OFL	ABC	
2021	2,038	1,887	1,887	1,748	0.532
2022	2,019	1,862	1,870	1,724	0.518
2023	2,009	1,842	1,861	1,706	0.508
2024	2,002	1,828	1,854	1,693	0.501
2025	1,997	1,815	1,849	1,681	0.496
2026	1,993	1,802	1,846	1,668	0.493
2027	1,990	1,791	1,843	1,659	0.490
2028	1,989	1,782	1,842	1,650	0.489
2029	1,988	1,774	1,841	1,642	0.488
2030	1,989	1,764	1,842	1,633	0.487

Table 6. California scorpionfish - based on the 2017 assessment.

Year	Buffer	OFL	ABC	Depletion
2021	0.914	318.57	291.17	0.594
2022	0.909	303.07	275.49	0.561
2023	0.904	290.09	262.24	0.537
2024	0.899	280.17	251.87	0.520
2025	0.894	272.82	243.90	0.509
2026	0.890	267.43	238.01	0.500
2027	0.885	263.46	233.16	0.494
2028	0.880	260.61	229.34	0.490
2029	0.875	258.61	226.28	0.487
2030	0.870	257.25	223.81	0.486

Table 7. Chilipepper rockfish S of 40°10' N lat. - based on the 2015 stock assessment update. OFLs are apportioned to the north (7%) and south (93%) of 40°10' N lat. based on average historical landings.

Year	OFL	ABC	Depletion	N of 40°10' N lat.		S of 40°10' N lat.	
				OFL	ABC	OFL	ABC
2021	2,765	2,535	0.535	193.55	177.45	2,571	2,358
2022	2,660	2,428	0.512	186.20	169.96	2,474	2,258
2023	2,582	2,347	0.494	180.74	164.29	2,401	2,183
2024	2,523	2,281	0.480	176.61	159.67	2,346	2,121
2025	2,475	2,228	0.469	173.25	155.96	2,302	2,072
2026	2,434	2,181	0.460	170.38	152.67	2,264	2,028
2027	2,399	2,140	0.452	167.93	149.80	2,231	1,990
2028	2,367	2,099	0.445	165.69	146.93	2,201	1,952
2029	2,338	2,065	0.439	163.66	144.55	2,174	1,920
2030	2,313	2,033	0.434	161.91	142.31	2,151	1,891

Table 8. Copper rockfish - based on the 2013 data-moderate assessment. 7.3% of the Northern Model OFL is apportioned north of 40°10' N lat. based on the proportion of cumulative removals by area during 1916-2012.

Northern Model (34°27' N lat. to U.S./Canada border)				
Year	Buffer	OFL	ABC	Depletion
2021	0.826	134.49	111.09	0.476
2022	0.818	135.06	110.48	0.478
Southern Model (S of 34°27' N lat.)				
2021	0.826	122.76	101.4	0.576
2022	0.818	121.78	99.61	0.571
Projected 2021 and 2022 OFLs and ABCs for Copper Rockfish by Management Area				
Year	N of 40°10' N lat.		S of 40°10' N lat.	
	OFL	ABC	OFL	ABC
2021	9.82	8.11	247.43	204.38
2022	9.86	8.07	246.98	202.02

Table 9. English sole - based on the 2013 data-moderate assessment.

Year	Buffer	OFL	ABC	Depletion
2021	0.826	4,783.93	3,951.04	0.826
2022	0.818	4,748.81	3,883.18	0.818
2023	0.810	4,720.62	3,823.31	0.810
2024	0.803	4,696.36	3,770.09	0.803
2025	0.795	4,678.06	3,718.32	0.795
2026	0.788	4,681.16	3,688.73	0.788
2027	0.780	4,685.30	3,653.49	0.780
2028	0.773	4,700.81	3,633.45	0.773
2029	0.766	4,714.08	3,609.76	0.766
2030	0.758	4,729.90	3,581.46	0.758

Table 10. Greenspotted rockfish - based on the 2011 assessment. The OFLs projected from the Northern California Model are apportioned north (22.2%) and south (77.8%) of 40°10' N lat. based on average historical (1978-2001) landings.

Northern California Model (N of 34°27' N lat.)						CA N of 40°10' N lat.			CA S of 40°10' N lat.		
Year	Buffer	OFL	ABC	ACL	Depletion	OFL	ABC	ACL	OFL	ABC	ACL
2021	0.810	41.88	33.93	33.05	0.367	9.30	7.53	7.34	32.58	26.40	25.71
2022	0.803	42.06	33.77	33.04	0.372	9.34	7.50	7.33	32.72	26.27	25.71
Southern California Model (S of 34°27' N lat.)											
Year	Buffer	OFL	ABC	ACL	Depletion						
2021	0.810	45.43	36.80	36.80	0.427						
2022	0.803	45.54	36.57	36.57	0.431						
Projected 2021 and 2022 OFLs and ABCs for Greenspotted Rockfish by Management Area											
Area	2021			2022							
	OFL	ABC	ACL	OFL	ABC	ACL					
OR and WA	6.10	3.67	3.67	6.08	3.66	3.66					
CA N of 40°10' N lat.	9.30	7.53	7.34	9.34	7.50	7.33					
Total N of 40°10' N lat.	15.40	11.20	11.01	15.42	11.16	10.99					
34°27' N lat. to 40°10' N lat.	32.58	26.40	25.71	32.72	26.27	25.71					
S of 34°27' N lat.	45.43	36.80	36.80	45.54	36.57	36.57					
Total S of 40°10' N lat.	78.01	63.20	62.51	78.26	62.84	62.28					

Table 11. Greenstriped rockfish - based on the 2009 assessment. The coastwide OFL is apportioned north (84.5%) and south (15.5%) of 40°10' N lat. based on average historical (1916-2008) landings.

Year	Buffer	Coastwide		Depletion	N of 40°10' N lat.		S of 40°10' N lat.	
		OFL	ABC		OFL	ABC	OFL	ABC
2021	0.795	1,060.5	843.1	0.634	896.1	712.4	164.4	130.7
2022	0.788	990.2	780.3	0.583	836.7	659.3	153.5	120.9

Table 12. Kelp greenling in Oregon - based on the 2015 assessment.

Year	Buffer	OFL	ABC	SSB	Depletion
2021	0.917	157.0	144.0	187.6	0.473
2022	0.913	151.4	138.2	180.4	0.455

Table 13. Pacific ocean perch - based on the 2017 assessment.

Years	OFL	ABC	Buffer	Spawning Output	Depletion
2019	4,753	4,340	0.913	5,741	0.833
2020	4,631	4,229	0.913	5,745	0.834
2021	4,497	3,854	0.857	5,723	0.831
2022	4,371	3,711	0.849	5,676	0.824
2023	4,248	3,573	0.841	5,608	0.814
2024	4,133	3,443	0.833	5,527	0.802
2025	4,029	3,328	0.826	5,441	0.790
2026	3,937	3,221	0.818	5,351	0.777
2027	3,856	3,123	0.810	5,261	0.764
2028	3,781	3,036	0.803	5,172	0.751
2029	3,712	2,951	0.795	5,081	0.738
2030	3,648	2,875	0.788	4,994	0.725

Table 14. Rex sole - based on the 2013 data-moderate assessment.

Year	Buffer	OFL	ABC	Depletion
2021	0.679	2,026	1,376	0.329
2022	0.666	2,120	1,412	0.347
2023	0.654	2,198	1,437	0.362
2024	0.642	2,257	1,449	0.372
2025	0.630	2,307	1,454	0.380
2026	0.618	2,349	1,452	0.387
2027	0.606	2,381	1,443	0.393
2028	0.595	2,418	1,439	0.399
2029	0.584	2,452	1,432	0.405
2030	0.573	2,490	1,427	0.410

Table 15. Sharpchin rockfish - based on the 2013 data-moderate assessment. The coastwide OFL is apportioned north (80%) and south (20%) of 40°10' N lat. based on average swept area biomass estimates from the triennial survey.

Year	Buffer	Coastwide		Depletion	N of 40°10' N lat.		S of 40°10' N lat.	
		OFL	ABC		OFL	ABC	OFL	ABC
2021	0.824	365	301	0.611	292	241	73	60
2022	0.818	361	295	0.603	289	236	72	59
2023	0.809	357	288	0.595	285	231	71	58
2024	0.799	353	282	0.588	283	226	71	56
2025	0.795	350	278	0.583	280	223	70	56
2026	0.783	348	272	0.578	278	218	70	54
2027	0.776	345	268	0.573	276	214	69	54
2028	0.773	341	264	0.570	273	211	68	53
2029	0.766	339	260	0.567	271	208	68	52
2030	0.758	338	256	0.564	270	205	68	51

Table 16. Spiny dogfish - based on the 2011 assessment.

Year	Buffer	OFL	ABC	Depletion
2021	0.654	2,479	1,621	0.610
2022	0.642	2,469	1,585	0.610

Table 17. Splitnose rockfish - based on the 2009 assessment. The portion of the coastwide splitnose OFL north (35.8%) and south (64.2%) of 40°10' N. lat. is based on average historical (1916-2008) landings.

Year	Buffer	Coastwide		Depletion	N of 40°10' N lat.		S of 40°10' N lat.	
		OFL	ABC		OFL	ABC	OFL	ABC
2021	0.892	2,910	2,596	0.930	1,042	929	1,868	1,666
2022	0.887	2,862	2,538	0.920	1,025	909	1,837	1,630

Table 18. Yelloweye rockfish - based on the 2017 stock assessment.

Year	Buffer	OFL	ABC	Depletion
2021	0.856	97.49	83.45	0.330
2022	0.848	98.14	83.22	0.340

Table 19. Yellowtail rockfish N of 40°10' N lat. - based on the 2017 assessment.

Year	Buffer	OFL	ABC	Depletion
2021	0.926	6,534	6,050	0.624
2022	0.922	6,324	5,831	0.593