SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON SCIENCE IMPROVEMENTS AND METHODOLOGY REVIEW REPORT

Four items were discussed by the Scientific and Statistical Committee (SSC): 1) Rockfish Steepness Prior Update, 2) Accepted Practices Guidelines for Groundfish Stock Assessments, 3) Further Sigma Considerations, and 4) Recent Groundfish Workshops.

1. Rockfish Steepness Prior Update

At the March Council meeting, Dr. Chantel Wetzel (NWFSC) presented an update of the meta-analysis used to derive a prior distribution for steepness (recruitment productivity) of West Coast rockfish stocks. This was an update to previous analyses by Dr. Martin Dorn, Dr. Jim Thorson, and Dr. Wetzel and followed Dr. Wetzel's presentation to the Groundfish Subcommittee in November 2018. The SSC identified several concerns with the statistical behavior of sequential updates to the analysis and with some of the assumptions underlying the meta-analytical approach.

There was a discussion about various technical aspects of the meta-analysis. Of particular note was the implausible result that showed a very high estimated posterior predictive mean steepness for rockfish (> 0.9). This estimated value is notably larger than estimates from previous meta-analyses (estimated steepness of 0.72 in 2017; 0.58 in 2007) and appears to conflict with the fundamental biology of long-lived, live-bearing rockfish species. The changes in estimated steepness are concerning to the SSC as they are not consistent with the expected statistical behavior of estimators with increasing amounts of information.

A further concern was that there is non-independence among rockfish stocks in recruitment. Rockfish appear to share good and bad years of recruitment and, as such, the assumption of independence of rockfish included in the analysis is likely inappropriate. The effect of such non-independence for inference about steepness is unclear.

As a result of these concerns, the SSC does not endorse the updated analysis as best available science. Therefore in the near term (i.e., for the 2019 assessment cycle) the SSC recommends using the same prior distribution and default values as were endorsed for use in the 2017 assessment cycle (steepness = 0.72(0.16); mean(se)). The SSC also identified potential improvements that should be investigated further to inform the 2021 assessment cycle.

2. Accepted Practices Guidelines for Groundfish Stock Assessments

The 2019 Accepted Practices Guidelines were discussed by the Groundfish Subcommittee via webinar in December 2018 and subsequently in March 2019. The full SSC provided modifications to the Accepted Practices Guidelines revised in March during the pre-assessment workshop. These guidelines will be posted on the Council website.

3. Further Sigma Considerations

The SSC discussed issues of category 2 sigmas exceeding the static category 3 sigmas. Long-term projections are not advised, and the SSC-preferred approach in such cases would be to set the overfishing limit using an equilibrium maximum sustained yield or a data-poor approach. However, buffers in Table 1 apply if long-term projections are undertaken. The SSC highlighted for groundfish assessments conducted in 2019, the baseline sigma would theoretically apply in 2020 if the groundfish management cycle was annual rather than biennial. However, for the first year of application (2021) the sigma will be 7.5% larger and the resulting buffer will increase accordingly (e.g., to 6.5% rather than 6.1%) (Tables 1 and 2). Therefore, under the biennial groundfish management cycle, these sigmas will apply in year 2 (2021) onwards.

4. Recent Groundfish Workshops

The SSC was briefed on the pre-assessment and skates catch reconstruction workshops by Dr. Dave Sampson, who served as the chair of these workshops held in March 2019. Workshop reports will be available and posted on the Council website soon.

Table1: Scientific Uncertainty Buffers (years in parentheses indicate appropriate application for groundfish assessments conducted in 2019).

	Category 1 (baseline σ = 0.5)						Category 2 (baseline σ = 1.0)				
Year since assessment P*	0.45	0.40	0.35	0.30	0.25	Year P*	0.45	0.40	0.35	0.30	0.25
1 (2020)	6.1%	11.9%	17.5%	23.1%	28.6%	1	11.8%	22.4%	32.0%	40.8%	49.1%
2 (2021)	6.5%	12.7%	18.7%	24.6%	30.4%	2	12.6%	23.8%	33.9%	43.1%	51.6%
3 (2022)	7.0%	13.6%	19.9%	26.0%	32.1%	3	13.5%	25.3%	35.8%	45.3%	54.0%
4 (2023)	7.4%	14.4%	21.0%	27.5%	33.8%	4	14.3%	26.7%	37.6%	47.4%	56.2%
5 (2024)	7.8%	15.2%	22.2%	28.9%	35.5%	5	15.1%	28.1%	39.4%	49.4%	58.4%
6 (2025)	8.3%	16.0%	23.3%	30.3%	37.1%	6	15.9%	29.4%	41.1%	51.4%	60.4%
7 (2026)	8.7%	16.8%	24.4%	31.6%	38.7%	7	16.7%	30.7%	42.8%	53.3%	62.4%
8 (2027)	9.1%	17.6%	25.5%	33.0%	40.2%	8	17.4%	32.0%	44.4%	55.1%	64.2%
9 (2028)	9.6%	18.3%	26.5%	34.3%	41.7%	9	18.2%	33.3%	46.0%	56.8%	66.0%
10 (2029)	10.0%	19.1%	27.6%	35.5%	43.2%	10	19.0%	34.6%	47.6%	58.5%	67.7%
11 (2030)	10.4%	19.9%	28.6%	36.8%	44.6%	11	19.7%	35.8%	49.0%	60.1%	69.3%
12 (2031)	10.8%	20.6%	29.6%	38.0%	46.0%	12	20.5%	37.0%	50.5%	61.6%	70.8%
13 (2032)	11.3%	21.4%	30.7%	39.2%	47.3%	13	21.2%	38.2%	51.9%	63.1%	72.2%
14 (2033)	11.7%	22.1%	31.6%	40.4%	48.6%	14	22.0%	39.4%	53.3%	64.5%	73.6%
15 (2034)	12.1%	22.9%	32.6%	41.6%	49.9%	15	22.7%	40.5%	54.6%	65.9%	74.9%

	Category 3 (constant σ = 2.0)				
P*	0.45	0.40	0.35	0.30	0.25
	22.2%	39.8%	53.7%	65.0%	74.0%

Table 2: Multiplicative factors for implementing buffers (years in parentheses indicate appropriate application for groundfish assessments conducted in 2019).

	Category 1 (baseline σ = 0.5)						Category 2 (baseline σ = 1.0)				
Year since assessment P*	0.45	0.40	0.35	0.30	0.25	Year P*	0.45	0.40	0.35	0.30	0.25
1 (2020)	0.939	0.881	0.825	0.769	0.714	1	0.882	0.776	0.680	0.592	0.509
2 (2021)	0.935	0.873	0.813	0.754	0.696	2	0.874	0.762	0.661	0.569	0.484
3 (2022)	0.930	0.864	0.801	0.740	0.679	3	0.865	0.747	0.642	0.547	0.460
4 (2023)	0.926	0.856	0.790	0.725	0.662	4	0.857	0.733	0.624	0.526	0.438
5 (2024)	0.922	0.848	0.778	0.711	0.645	5	0.849	0.719	0.606	0.506	0.416
6 (2025)	0.917	0.840	0.767	0.697	0.629	6	0.841	0.706	0.589	0.486	0.396
7 (2026)	0.913	0.832	0.756	0.684	0.613	7	0.833	0.693	0.572	0.467	0.376
8 (2027)	0.909	0.824	0.745	0.670	0.598	8	0.826	0.680	0.556	0.449	0.358
9 (2028)	0.904	0.817	0.735	0.657	0.583	9	0.818	0.667	0.540	0.432	0.340
10 (2029)	0.900	0.809	0.724	0.645	0.568	10	0.810	0.654	0.524	0.415	0.323
11 (2030)	0.896	0.801	0.714	0.632	0.554	11	0.803	0.642	0.510	0.399	0.307
12 (2031)	0.892	0.794	0.704	0.620	0.540	12	0.795	0.630	0.495	0.384	0.292
13 (2032)	0.887	0.786	0.693	0.608	0.527	13	0.788	0.618	0.481	0.369	0.278
14 (2033)	0.883	0.779	0.684	0.596	0.514	14	0.780	0.606	0.467	0.355	0.264
15 (2034)	0.879	0.771	0.674	0.584	0.501	15	0.773	0.595	0.454	0.341	0.251
	Category 3 (constant σ = 2.0)										
P*	0.45	0.40	0.35	0.30	0.25						
	0.778	0.602	0.463	0.350	0.260						

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04/13/19