Agenda Item B.1.b
Supplemental Open Public Comments
June 2019

6/06/19

Mr. Phil Anderson
Chairman, Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Mr. Chairman,

After hearing recently that Pacific Ocean perch stock off Washington and Oregon had been rebuilt to levels that prevailed before the 1966-1968 "mining" of the stock by Soviet and Japanese fleets, I was prompted to review the 2017 stock assessment document.

Despite the high quality of the analysis, I was shocked at how sensitive the results were to the recruitment "steepness" (h), and natural mortality (M) parameters used (Figures 83 and 85). Part of the problem here is that the NWFSC shelf/slope survey index shows no significant trend from 2003-2016 (Figure 40). The "base model" conclusion that the stock has been rebuilt to 1962 levels isn't very well supported by survey data. It seems highly unlikely that the surveys would fail to reflect the 63% increase (2003-2016) in biomass estimated from the base model (Table 26) if such an increase actually occurred.

It is difficult to reject an alternative conclusion that the stock has yet rebuilt to the management target level of 40% unexploited spawning biomass (Figure 33). A precautionary approach would have been to carry out a survey similar to the 1979 and 1985 Pacific Ocean perch (POP) surveys, then update the stock assessment rather than acting on the results from the 2017 assessment. The "POP" surveys employed a different statistical design than the multispecies NWFSC shelf-slope surveys, a high-opening trawl with ground gear capable of operating on rougher bottom, and yielded higher precision as a result (Table 6).

Instead, the Council chose to take the "base model" results from the 2017 assessment at face value, and to "fish down" the stock until it reached the MSY level (40% of unexploited biomass). The harvest guideline was set at 4,318 mt, while the estimated MSY is only 1,825 mt.

This is a highly aggressive approach, since setting the harvest guideline at 1,825 mt would also serve to reduce the biomass to the MSY level—it would just take longer. Little would be lost with this more cautious approach, since natural mortality is extremely low, and sustainable yields very close to MSY can be achieved when the stock is at 50% (or even 60%) of unexploited biomass (Figure g).

Since the 2017 assessment has been taken at face value, the Council is implicitly accepting that the multispecies survey is hyperstable with respect to stock abundance. As such, the Council has undertaken an overfishing experiment without a reliable means of measuring the results

When the Council initiated the Pacific Ocean perch rebuilding plan in 1981, industry questioned the reliability of the 1977 survey and asked that the stock be re-surveyed. The 1979 POP survey was undertaken in response. The resulting survey (Wilkins and Golden, 1983 , N. American Journ. Fish. Mgt.) showed only a 1,400 mt difference between the biomass estimates for the 1977 Triennial and 1979 POP surveys, with greater precision in 1979. It seems only reasonable that a similar survey be carried out now.

Sincerely,

Donald R. Gunderson

Emeritus Professor, University of Washington

Cc Dr. John Field, Chairman Scientific and Statistical Committee

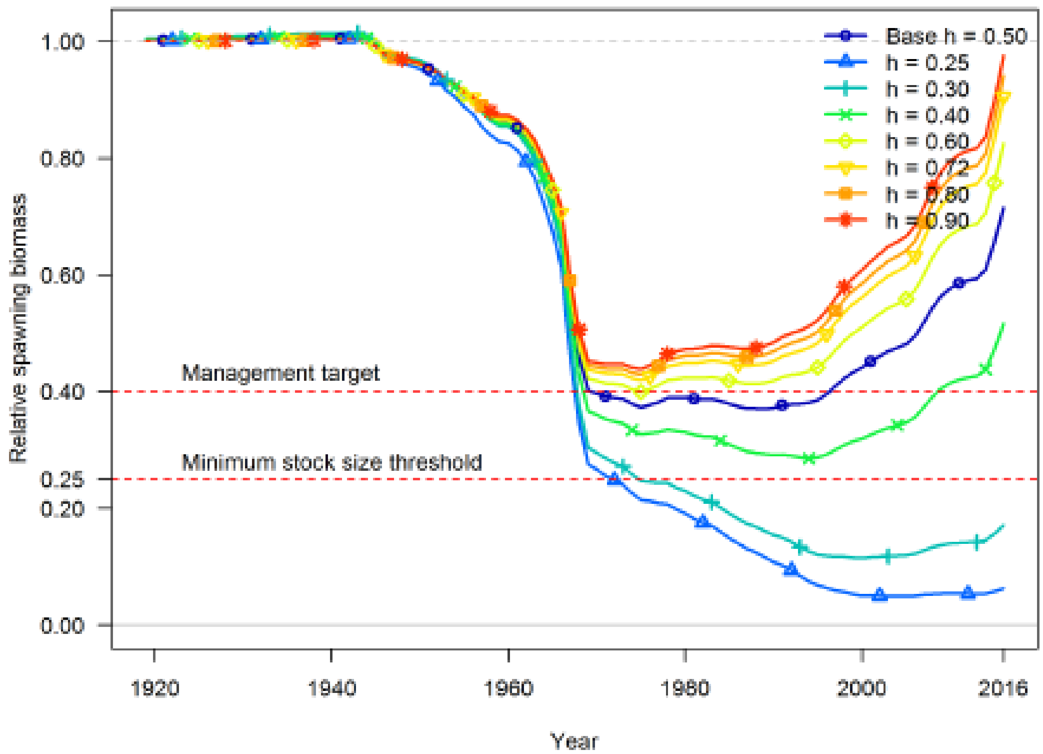

Figure 83: Trajectories of relative spawning output (depletion) across values of steepness.

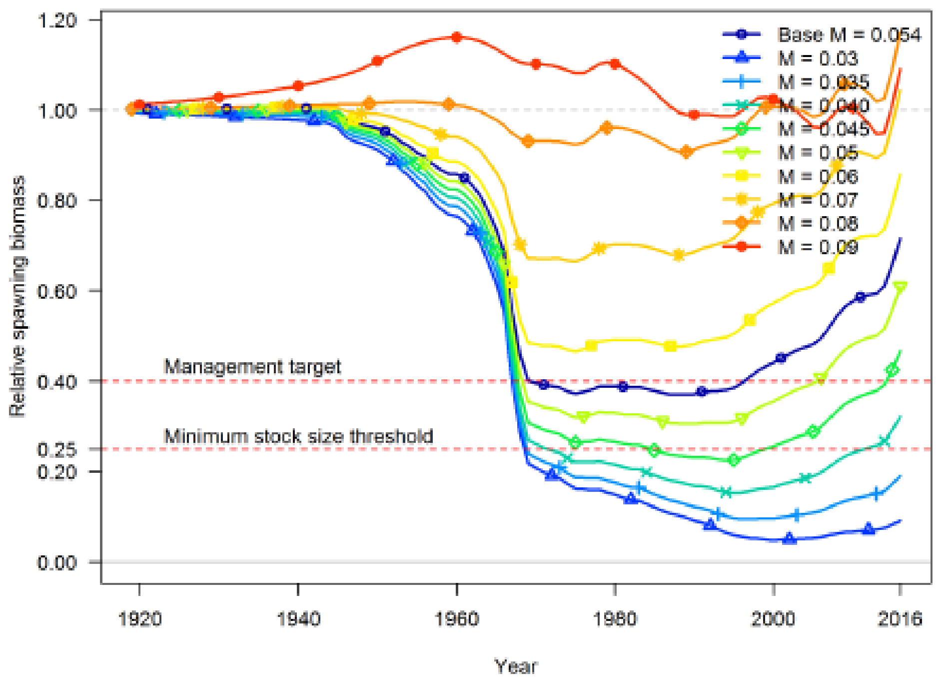

Figure 85: Trajectories of relative spawning output (depletion) across values of natural mortality.

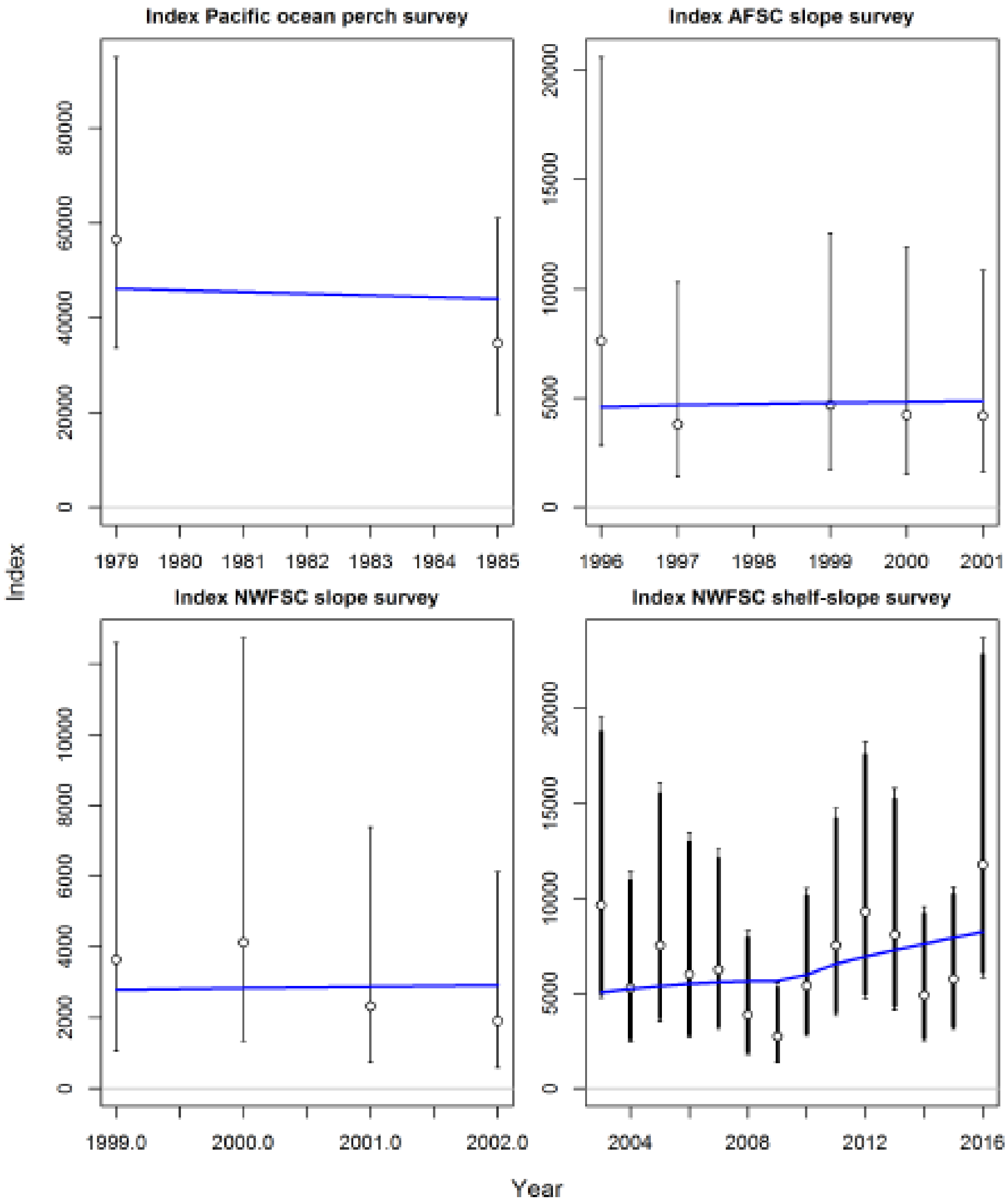

Figure 40: Estimated fits to the survey indices for Pacific ocean perch.

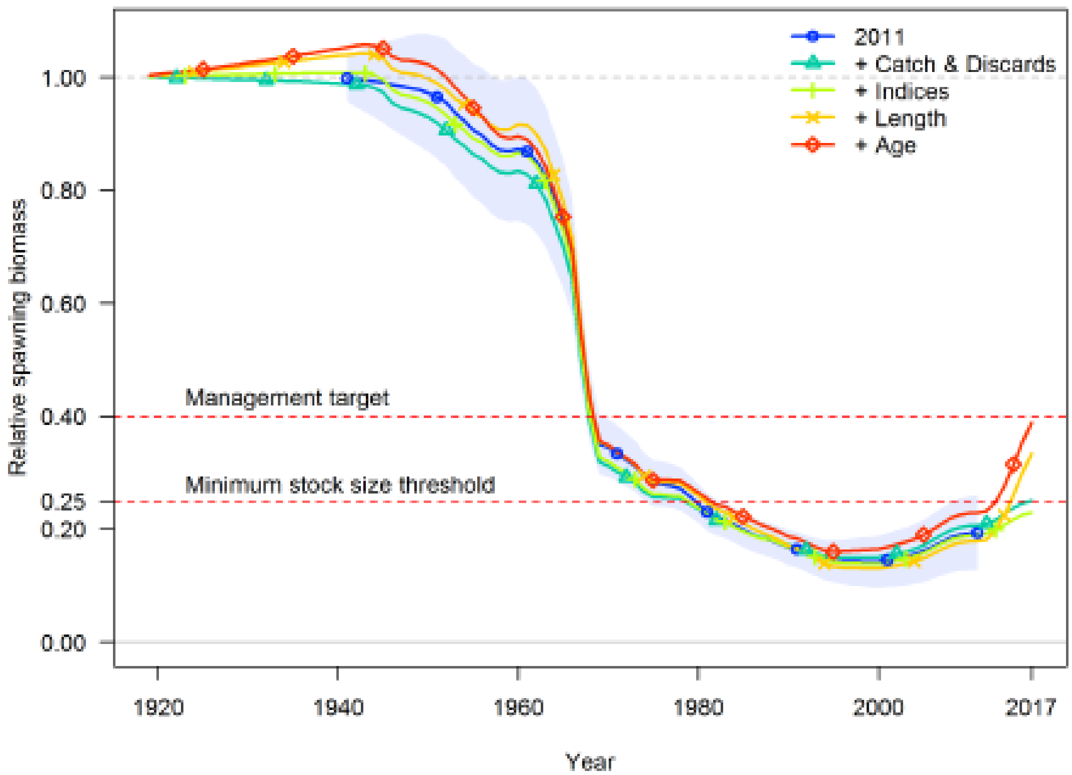

Figure 33: Estimated of relative spawning output when each of the data sets used in the current assessment was added to the 2011 model without updating model assumptions. Each data source was included in an additive fashion where the final model "+ Age" is the 2011 model with all data sources updated.

Table 26: Time-series of population estimates from the base model.

Year	Total biomass (mt)	Spawning output (million eggs)	Summary biomass 3+	Relative biomass	Age-0 recruits	Estimated total catch (mt)	1-SPR	Exploit. rate
1989	60,922	2,550	60,411	0.37	16,275	1478	0.415	0.024
1990	61,254	2,561	60,568	0.37	15,636	1127	0.345	0.019
1991	62,209	2,592	61,241	0.38	6,924	1483	0.41	0.024
1992	63,156	2,604	62,343	0.38	4,464	1571	0.425	0.025
1993	64,118	2,608	63,732	0.38	4,778	1417	0.395	0.022
1994	65,023	2,621	64,732	0.38	9,705	1180	0.345	0.018
1995	65,959	2,656	65,585	0.39	9,946	956	0.29	0.015
1996	66,969	2,725	66,381	0.40	5,164	883	0.265	0.013
1997	67,979	2,819	67,446	0.41	4,736	718	0.22	0.011
1998	68,964	2,913	68,656	0.42	3,507	725	0.22	0.011
1999	69,666	2,982	69,351	0.43	21,662	563	0.175	0.008
2000	70,446	3,037	69,912	0.44	32,360	161	0.05	0.002
2001	71,921	3,107	70,473	0.45	9,819	297	0.09	0.004
2002	74,097	3,171	72,483	0.46	5,377	179	0.055	0.002
2003	76,945	3,230	76,420	0.47	2,676	158	0.05	0.002
2004	79,589	3,274	79,292	0.47	6,757	149	0.045	0.002
2005	81,950	3,318	81,728	0.48	3,265	78	0.025	0.001
2006	83,973	3,412	83,613	0.49	3,592	86	0.025	0.001
2007	85,564	3,571	85,358	0.52	3,462	159	0.045	0.002
2008	86,802	3,745	86,308	0.54	116,128	135	0.035	0.002
2009	88,561	3,885	86,803	0.56	4,731	194	0.05	0.002
2010	92,115	3,976	86,769	0.58	7,499	183	0.045	0.002
2011	98,527	4,032	98,173	0.58	15,198	62	0.015	0.001
2012	104,262	4,067	103,709	0.59	2,101	60	0.015	0.001
2013	110,043	4,091	109,254	0.59	29,027	58	0.015	0.001
2014	115,579	4,197	115,075	0.61	4,630	56	0.015	0
2015	120,592	4,516	119,187	0.65	10,661	61	0.015	0.001
2016	125,377	4,931	124,995	0.72	11,016	68	0.015	0.001
2017	129,191	5,280	128,529	0.77	11,253	-	-	-

Table 6: Summary of the design-based estimates of fishery-independent biomass/abundance time-series.

	POP		AFSC Slope		NWFSC Slope		NWFSC Shelf-Slope	
Year	Obs	SE	Obs	SE	Obs	SE	Obs	SE
1979	34135	0.25	-	-	-	-	-	-
1985	16675	0.18	-	-	-	-	-	-
1996	-	-	6472	0.29	-	-	-	-
1997	-	-	2965	0.43	-	-	-	-
1999	-	-	19063	0.48	6472	0.45	-	-
2000	-	-	4438	0.50	2965	0.48	-	-
2001	-	-	14570	0.69	19063	0.40	-	-
2002	-	-	-	-	4438	0.45	-	-
2003	-	-	-	-	-	-	21055	0.36
2004	-	-	-	-	-	-	4623	0.55
2005	-	-	-	-	-	-	9674	0.60
2006	-	-	-	-	-	-	9609	0.53
2007	-	-	-	-	-	-	3769	0.57
2008	-	-	-	-	-	-	5723	0.59
2009	-	-	-	-	-	-	14790	0.78
2010	-	-	-	-	-	-	11133	0.47
2011	-	-	-	-	-	-	6186	0.46
2012	-	-	-	-	-	-	10208	0.46
2013	-	-	-	-	-	-	14306	0.58
2014	-	-	-	-	-	-	4040	0.29
2015	-	-	-	-	-	-	9766	0.56
2016	-	-	-	-	-	-	19859	0.52

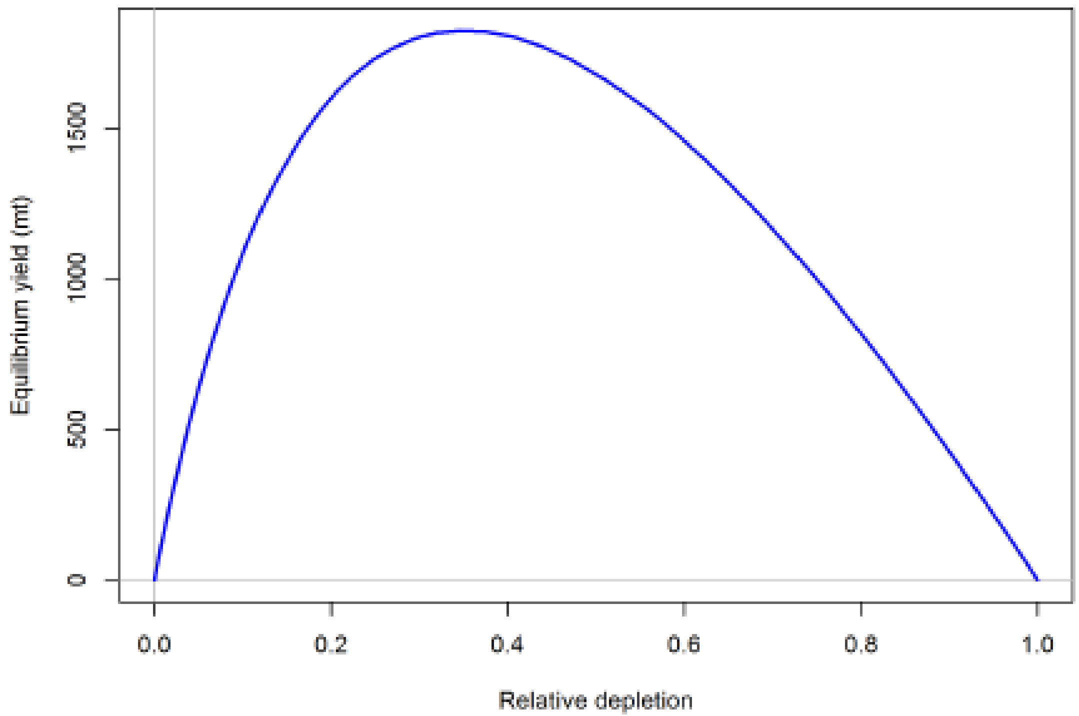

Figure g: Equilibrium yield curve for the base case model. Values are based on the 2016 fishery selectivity and with steepness fixed at 0.50.