Lower Columbia Natural Coho Model Runs highlighted during the September 3rd meeting of the Salmon Advisory Subpanel and the ad hoc Lower Columbia River Natural Coho Workgroup

Model	No.	Structure	Exploitation Rates (%)[a]	Frequencies (%)	Seeding categories	Effective ER[b]	Risk 5 high[c]
actual	--	Current (Sandy/Clack)	8/15/20/22.5	10/60/20/10	--	16.0%	--
3	a	Current (all pops)	8/11/15/20/25/30/38+	24/0/48/20/0/8/1	0/0.10/0.20/0.50/0.75	15.7%	0.346
4	b	1 x 4	10/15/20/25	10/25/60/5	--	18.0%	0.364
5	b	1 x 5	10/15/20/25/30	10/35/45/5/5	--	18.0%	0.364
6	b	Continuous	10/10-15/15-20/20-25/25-30	5/10/58/27/0	--	18.0%	0.363
6	c	Continuous	10/10-15/15-20/20-25/25-30	5/10/50/30/5	--	18.6%	0.368
7	5b1	2 x 5	10/15/20/25/30	= 10/35/45/5/5	--	18.0%	0.364
			10/10/15/20/25	0/100 =	0/.3		
8	a	1 x 3 (new)[d]	10/19/22.5	15/60/25	--	18.5%	0.365
9	a	2 x 5 (new) [d]	10/15/20/22/30	= 7/17/52/21/3	--	18.0%	0.369
		(weak strata)	10/10/15/20/22	12/88 =	0/.4		

[a] *Exploitation rates include only ocean and Columbia River mainstem fisheries – tributary fishery impacts are in addition.*

[b] *Effective exploitation rate is the weighted average in all years.*

[c] *5-high risk is the average for the 5 highest risk and most sensitive model populations.*

[d] *Identified in 09/03/14 SAS/LRC WG meeting.*

Selected Model Run Description

"Actual" describes current exploitation rates and frequencies for the last 10 years under the current harvest matrix which is based on Sandy and Clackamas population seeding levels.

Model 3a is the current matrix based on an average seeding by all primary populations in the dataset rather than just Sandy and Clackamas.

Model 4b is a simplified matrix based only on marine survival with annual exploitation rates from 10% to 25% and an effective average exploitation rate of 18% (based on preliminary NMFS discussions). Note that moving from an effective exploitation rate of 16% to 18% produces only a 1.8% increase in low population risk for the weak populations in the dataset.

Model 5b is similar to 4a but includes 30% as the top end. Frequencies were adjusted to maintain effective exploitation rate at 18%. Adding higher annual rates on the top end requires increasing frequencies in the low range to stay even.

Model 6b is a continuous variation on 5b which graduates changes in allowable rates across steps. This version is consistent with an effective average exploitation rate of 18%.

Model 6c is similar to 6b but allows for higher annual exploitation rates on the top end. This version produces an effective average exploitation rate of 18.6%. It highlights marginal risk impacts of small increases in effective exploitation rates.

Model 7-5b1 is similar to 5b but also identifies reduced annual exploitation rates under conditions of low seeding. In this example, the seeding level was selected as a contingency in the event that substantially-lower marine survival rates occur in the future. Note that a comparable low-seeding row can be added to any of the 0ne-row matrix alternatives.

Model 8a is a new model run discussed at the SAS meeting. It is a simple 1x3 model topping out at 22.5%. This version produces an effective average exploitation rate of 18.5%.

Model 9a is a new model run discussed at the SAS meeting. It includes seeding level based on the weakest of the Cascade and Coast strata when considered separately. This alternative produces similar outcomes to the other models but includes a more-detailed and explicit treatment of weak-stock management in the design.[1]

[1] *This alternative uses strata-specific seeding criteria rather than average population seeding criteria reflected in Model 7-5b1. This alternative uses average seeding among the populations in each strata to determine their fraction of full seeding. The row in the matrix would be determined by the lesser stratum. This alternative also suggests a definition of "critical" marine survival based approximately upon the lowest observed marine survival rate, seen in brood year 1991.*