

Appendix C

Northern Pikeminnow Management Program Augmentation Analysis of Benefits to Specific Stocks

The NPM spreadsheet model projects a within-year (i.e. 2004) survival benefit to outmigrating fall chinook stocks. The benefit results from additional pike minnow removals. It uses average consumption rates and geographical distribution of pike minnow removals within the Snake and Columbia based on historical data

The model accounts for transportation and timing of juvenile runs, and for the gradual within-season removal of NPM, since the additional NPM harvest will not occur immediately. It also accounts for the abundance of fall chinook smolts entering the FCRPS or below Bonneville Dam, and assumes that NPM feed only to satiation. In this respect, the model attempts to be “conservative” in that it under-estimates the effect of additional NPM removals based on model assumptions.

5% increase = 10,000 fish caught

11% increase = 22,000

	Total smolts	Change in survival		Change in smolts alive to BON	
		5% Exp. Rate Increase	11% Exp. Rate Increase	5% Exp. Rate Increase	11% Exp. Rate Increase
Upriver Bright					
Priest Rapids Hatchery	2,711,981	0.18%	0.40%	5,001	10,732
Hanford Natural	10,119,331	0.18%	0.40%	18,659	40,045
Yakima River Fall	283,301	0.18%	0.40%	522	1,121
Marion Drain Fall	2,805	0.18%	0.40%	5	11
Ringold Springs Hatchery	1,416,706	0.18%	0.40%	2,612	5,606
Snake River Bright					
Wild Snake River Fall	190,935	0.16%	0.36%	308	678
Lyons Ferry Hatchery	23,640	0.16%	0.36%	38	84
Lyons Ferry Hatchery		0.16%	0.36%	343	756

	212,756				
Nez Perce Tribal Hatchery	60,281	0.16%	0.36%	97	214
Oxbow & Umatilla Hatchery Releases at Hells Canyon Dam	65,009	0.16%	0.36%	105	231
Mid-Columbia Bright					
Deschutes River Fall	413,300	0.33%	0.72%	1,355	2,955
Klickitat River Fall	1,342,187	0.33%	0.72%	4,400	9,598
Umatilla River Fall	115,962	0.33%	0.72%	380	829
Little White Salmon Fall	671,094	0.33%	0.72%	2,200	4,799
Summer Chinook				0	0
Upper-Columbia summer Chinook	1,041,818	0.18%	0.40%	1,921	4,123
Dryden Ponds (Wenatchee stock)	281,303	0.18%	0.40%	519	1,113
Charlton Pond (Methow stock)	112,638	0.18%	0.40%	208	446
Turtle Rock (Wells stock)	485,677	0.18%	0.40%	896	1,922
Similkameen (Methow stock)	162,199	0.18%	0.40%	299	642