

Appendix C

Analysis of Recreational Angler Trips and Ex-Vessel Value of Mainstem and Off-Channel Commercial Fisheries Under the Current Management Policy and the Alternative Management Framework Being Considered by the Columbia River Fishery Management Workgroup.

Mainstem Recreational and Commercial Fisheries Downstream from Bonneville Dam

The analyses summarized below do not include mainstem coho fisheries because the drivers for fall-season recreational fisheries are ESA impacts for Chinook and there has been limited opportunity in recent years for significant commercial fishing for coho in the mainstem. As selective harvest techniques are developed in the future, the management intent is to provide increased opportunity for commercial fishing for hatchery coho in the mainstem.

Spring Chinook

The catches of upriver and all stocks of spring Chinook in the recreational fishery downstream from Bonneville Dam and in mainstem commercial fisheries were estimated for a base-case run size of 225,000 upriver spring Chinook and 65,000 Willamette hatchery spring Chinook. Under the current policy, the base case is defined as a forecasted run-size for upriver spring Chinook ranging from 55,000 to 271,000 and for Willamette hatchery spring Chinook greater than 50,000. Analyses compared catches under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Under the alternative management framework, the percentage of the available ESA-impact for upriver spring Chinook allocated to recreational fisheries downstream from Priest Rapids and Lower Granite dams would increase to 70% during the transition period (2013-2016) and 80% in the long term (2017 and beyond).

Once the catches were estimated, the corresponding number of recreational fishing days and associated angler trips were calculated (Table C.1), as was the ex-vessel value of spring Chinook landed in mainstem commercial fisheries (Table C.2).

It is important to note that in the period after the run-size update (May and June) the analysis indicates that the recreational fishery would not be able to catch all the spring Chinook available to them under the management guideline because they run out of fishing days. This is due to the fact that catch rates during this time are generally low. Under the “current” scenario the unused catch would total about 475 spring Chinook. In the transition period and long term, these numbers would be about 830 and about 2,750, respectively. This picture would change if the recent trend in recreational fisheries of increasing catch rates held true during May and June. The upriver spring Chinook that go uncaught in the recreational fishery downstream from Bonneville Dam could be reassigned to recreational fisheries upstream of Bonneville Dam, to the commercial fishery, or to conservation.

The analysis indicates that the mainstem commercial fishery also would not be able to catch all the spring Chinook available to them in May and June under the management

guideline. However, this is because fishers most likely would have to fish with large-mesh gill nets. As such they would likely use up all their available ESA-impacts before they reach the guideline. Under the “current” scenario, the mainstem commercial fishery would be unable to land about 1,500 spring Chinook, which have an ex-vessel value of about \$100,000. During the transition period, the mainstem commercial fishery would be unable to land about 1,100 spring Chinook, which have an ex-vessel value of about \$75,000.

Table C.1. Comparisons of upriver spring Chinook catch, kept catch of all spring Chinook stocks, number of fishing days, and number of angler trips for the recreational fishery downstream from Bonneville Dam, under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Analyses assume forecasted runs sizes of 225,000 for upriver spring Chinook and 65,000 for Willamette spring Chinook, a mark rate of 75%, and that the run-size forecast would be updated on May 10.

Management period	Time frame	Catch of upriver stocks before May 10 (number landed + release mortality)	Kept catch of all stocks before May 10 (number landed)	Number of consecutive fishing days (beginning March 1)	Number of angler trips before May 10
Before the run-size update	Current	9,447	12,312	42	109,840
	Transition	10,600	13,763	44	119,854
	Long term	11,189	14,504	45	124,931
		Catch of upriver stocks after May 10 (number landed + release mortality)	Kept catch of all stocks after May 10 (number landed)	Number of consecutive fishing days (beginning May 10)	Number of angler trips after May 10
After the run-size update (May 10)	Current	3,450	3,938	37	55,522
	Transition	3,450	3,938	37	55,522
	Long term	3,450	3,938	37	55,522

Summer Chinook

The catches of upper-Columbia summer Chinook in the recreational fishery downstream from Bonneville Dam and in mainstem commercial fisheries were estimated for a run size of 75,000 summer Chinook. As with spring Chinook, analyses compared catches under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Under the alternative management framework, the percentage of harvestable surplus of summer Chinook allocated to recreational fisheries downstream from Priest Rapids Dam would increase to 70% during the transition period (2013-2016) and 80% in the long term (2017 and beyond).

Once the catches were estimated, the corresponding number of recreational fishing days and associated angler trips were calculated (Table C.3), as was the ex-vessel value of summer Chinook landed in mainstem commercial fisheries (Table C.4).

Table C.2. Comparisons of upriver spring Chinook catch, kept catch of all spring Chinook stocks, and ex-vessel value of kept catch for the mainstem commercial fishery downstream from Bonneville Dam, under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Average weights of kept fish in pounds (lbs) and average price per pound (\$) are 2011 values. Analyses assume forecasted runs sizes of 225,000 for upriver spring Chinook and 65,000 for Willamette spring Chinook, a mark rate of 75%, and that the run-size forecast would be updated on May 10.

Management period	Time frame	Catch of upriver stocks before May 10 (number landed + release mortality)	Kept catch of all stocks before May 10 (number landed)	Average weight (lbs) of kept catch before May 10	Average price (\$) per lb of kept catch before May 10	Ex-vessel value (\$) of kept catch before May 10
Before the run-size update	Current	2,433	3,131	14.1	\$6.00	\$264,842
	Transition	947	1,218	14.1	\$6.00	\$103,043
	Long term	0 ¹	0 ¹	14.1	\$6.00	\$0
		Catch of upriver stocks after May 10 (number landed + release mortality)	Kept catch of all stocks after May 10 (number landed)	Average weight (lbs) of kept catch after May 10	Average price (\$) per lb of kept catch after May 10	Ex-vessel value (\$) of kept catch after May 10
After the run-size update (May 10)	Current	1,664	1,920	14.1	\$4.84	\$131,035
	Transition	1,297	1,496	14.1	\$4.84	\$102,093
	Long term	0 ¹	0 ¹	14.1	\$4.84	\$0

¹ assumes all of ESA-impacts allocated to commercial fisheries are used in off-channel areas

Table C.3. Comparisons of upper-Columbia summer Chinook catch, kept catch, number of fishing days, and number of angler trips for the recreational fishery downstream from Bonneville Dam, under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Analyses assume a forecasted run size of 75,000 summer Chinook, a mark rate of 66%, an allocation of 600 summer Chinook to recreational fisheries in the Columbia River between Bonneville and Priest Rapids dams, and no contribution from the Colville Tribes.

Time frame	Catch (number landed + release mortality)	Kept catch (number landed)	Number of consecutive fishing days (beginning June 16)	Number of angler trips
Current	2,239	2,078	13	25,000
Transition	3,385	3,142	26	45,047
Long term	3,935	3,652	40	62,189

Table C.4. Comparisons of upper Columbia summer management guideline, kept catch, and ex-vessel value of kept catch for the mainstem commercial fishery downstream from Bonneville Dam, under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Average weights of kept fish in pounds (lbs) and average price per pound (\$) are 2011 values. Analyses assume a forecasted run size of 75,000 summer Chinook and an allocation of 600 summer Chinook to recreational fisheries in the Columbia River between Bonneville and Priest Rapids dams, and no contribution from the Colville Tribes.

Time frame	Management guideline	Kept catch (number landed)	Average weight (lbs) of kept catch	Average price (\$) per lb of kept catch	Ex-vessel value (\$) of kept catch
Current	2,831	2,831	17.4	\$3.08	\$151,719
Transition	1,698	1,698	17.4	\$3.08	\$90,999
Long term	1,132	1,132	17.4	\$3.08	\$60,666

Fall Chinook

Two management scenarios were used to model the catch of tule and Bright fall Chinook in the recreational fishery downstream from Bonneville Dam and in mainstem commercial fisheries. In one scenario, the ESA-impact level was 7.28% for lower river hatchery (LRH) tule fall Chinook (38% including ocean fisheries) and 11% for Snake River wild (Bright) fall Chinook. The run sizes for all Chinook stocks encountered by fisheries under this scenario were actual numbers observed in 2006. In the other scenario, the ESA-impact level was 7.8% for lower river hatchery tule fall Chinook (41% including ocean fisheries) and 15% for Snake River wild (Bright) fall Chinook. The run sizes for all Chinook stocks encountered by fisheries under this scenario were actual numbers observed in 2011. As with spring and summer Chinook, analyses compared catches under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Under the alternative management framework, the percentage of the ESA-impact for tule fall Chinook allocated to recreational fisheries downstream from Bonneville Dam would increase to 70% during the transition period (2013-2016) and 80% in the long term (2017 and beyond). The percentage of ESA-impacts for Bright fall Chinook allocated to recreational fisheries downstream from Bonneville Dam would vary depending on the number of days the recreational fishery was open before reaching its tule fall Chinook impact limit.

Once the catches were estimated, the corresponding number of recreational fishing days and associated angler trips were calculated (Table C.5), as was the ex-vessel value of fall Chinook landed in mainstem commercial fisheries (Table C.6).

It is important to note that for the higher ESA-impact scenario (7.8% for lower river hatchery tule fall Chinook (LRH) and 15% for Snake River wild (Bright) fall Chinook) the analysis indicates that the recreational and commercial fisheries would not be able to catch all the upriver Bright fall Chinook available to them because of constraints imposed by the LRH impacts. Under the “current” scenario the unused catch would total about 5,500 upriver Bright fall Chinook. In the transition period and long term, these numbers would be about 7,400 and about 8,700, respectively. If the mainstem

commercial fishery could access these fish in their September and October fisheries, the ex-vessel value would be about \$143,000 under the “current” scenario, \$193,000 in the transition period, and \$227,000 in the long term.

Table C.5. Comparisons of tule and Bright fall Chinook catch, number of fishing days and angler trips for recreational fisheries downstream from Bonneville Dam, under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. The “current” scenario set the recreational fishery’s share of the in-river ESA impact for lower river hatchery tule equal to 57% (recent three-year pre-season average). Analyses assumed the same stock-specific harvest rates as in 2012 pre-season model, that the in-river share of the total available LRH impacts (ocean + river) was 19% (recent three-year pre-season average) and that the Snake River recreational fishery used 0.5% of the Snake River wild (Bright) ESA-impact.

In-river ESA Impact Level	Time frame	Catch of tule stocks (number landed)	Catch of Bright stocks (number landed)	Number of consecutive fishing days (beginning August 1 and ending no later than October 31, when fishing for fall Chinook essentially ends)			Number of angler trips
				Buoy 10	Tongue Point to Warrior Rock	Warrior Rock to Bonneville Dam	
Lower river hatchery tule fall Chinook = 7.2%	Current	4,700	16,100	34	37	92	125,000
	Transition	5,600	21,400	34	45	92	145,000
Snake River wild (Bright) fall Chinook = 11%	Long term	6,300	25,600	34	75	92	160,000
Lower river hatchery tule fall Chinook = 7.8%	Current	10,400	25,100	34	42	92	160,000
	Transition	12,300	32,400	34	61	92	190,000
Snake River wild (Bright) fall Chinook = 15%	Long term	13,500	36,700	65	92	92	200,000

Commercial Fisheries in Existing Off-Channel Areas

For the transition period analyses assumed “current” production was enhanced by 1.0 million spring Chinook, 500,000 Select Area Bright fall Chinook, and 920,000 coho. For the long term, off-channel fisheries were modeled assuming enhancements totaled 1,250,000 spring Chinook, 750,000 Select Area Bright fall Chinook and 4,700,000 coho. Under the “current” scenario, off-channel fisheries were modeled assuming returns from a base production of 950,000 spring Chinook, 1.45 million Select Area Bright Chinook and 4.17 million coho. All scenarios assumed that survival of smolts to adults harvested at each site was 0.5% for spring Chinook, 0.3% for Select Area Bright fall Chinook, and 1.4% for coho. Catch estimates do not include incidental harvest of non-local stocks. Results are summarized in Table C.7.

Table C.6. Comparisons of tulle and Bright fall Chinook kept catch, and ex-vessel value of kept catch for the mainstem commercial fishery downstream from Bonneville Dam, under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. The “current” scenario set the recreational fishery’s share of the in-river ESA impact for lower river hatchery tulle equal to 57% (recent three-year pre-season average). Analyses assumed the same stock-specific harvest rates as in 2012 pre-season model, that the in-river share of available LRH impacts was 19% (recent three-year pre-season average) and that the Snake River recreational fishery used 0.5% of the Snake River wild (Bright) ESA-impact.

In-river ESA Impact Level	Time frame	Season	Kept catch (number landed)		Average weight (lbs) of kept catch	Average price (\$) per lb of kept catch		Ex-vessel value (\$) of kept catch (tulle + Bright)
			Tulle	Bright		Tulle	Bright	
Lower river hatchery tulle fall Chinook = 7.2% Snake River wild (Bright) fall Chinook = 11%	Current	Late Aug	4,726	9,163	21.0	\$0.54	\$2.31	\$860,672
		Sep/Oct	1,368	13,499	15.6	\$0.52	\$1.67	
	Transition	Late Aug	3,530	6,819	21.0	\$0.54	\$2.31	\$658,309
		Sep/Oct	1,073	10,708	15.6	\$0.52	\$1.67	
	Long term	Late Aug	2,300	4,427	21.0	\$0.54	\$2.31	\$449,842
		Sep/Oct	752	7,792	15.6	\$0.52	\$1.67	
Lower river hatchery tulle fall Chinook = 7.8% Snake River wild (Bright) fall Chinook = 15%	Current	Late Aug	11,739	13,079	21.0	\$0.54	\$2.31	\$1,349,269
		Sep/Oct	4,431	20,973	15.6	\$0.52	\$1.67	
	Transition	Late Aug	8,151	9,032	21.0	\$0.54	\$2.31	\$959,113
		Sep/Oct	3,265	15,499	15.6	\$0.52	\$1.67	
	Long term	Late Aug	6,088	6,729	21.0	\$0.54	\$2.31	\$722,000
		Sep/Oct	2,451	11,782	15.6	\$0.52	\$1.67	

Summary

The changes in angler trips and ex-vessel values described below are based on the modeled analyses described above and are relative to values calculated for the “current” scenario.

With respect to mainstem recreational fisheries in the spring, summer and fall, the total number of angler trips in the transition period would increase by 51,000 (16%) under the medium fall Chinook ESA-impact scenario and by 61,000 (17%) under the high fall Chinook ESA-impact scenario. In the long term, the number of angler trips would increase by 87,000 (28%) under the medium fall Chinook ESA-impact scenario and by 92,000 (26%) under the high fall Chinook ESA-impact scenario.

With respect to mainstem and off-channel commercial fisheries, the average annual ex-vessel value in the transition period would decrease by about \$143,000 (5%) under the medium fall Chinook ESA-impact scenario and \$331,000 (11%) under the high fall Chinook ESA-impact scenario.

For the period 2017 through 2020, the average annual ex-vessel value of commercial fisheries would increase by \$195,000 (7%) under the medium fall Chinook ESA-impact scenario, but would decrease by about \$21,000 (or 0.7%) under the high fall Chinook ESA-impact scenario.

For the period after 2020, the average annual ex-vessel value of commercial fisheries would increase by \$431,000 (17%) under the medium fall Chinook ESA-impact scenario and by \$215,000 (7%) under the high fall Chinook ESA-impact scenario.

Table C.7. Comparisons of average annual kept catch, and average annual ex-vessel value of kept catch for spring Chinook, Select Area Bright fall Chinook, and coho for commercial fisheries in existing off-channel areas downstream from Bonneville Dam, under the current management policy and under the alternative management framework being considered by the Columbia River Fishery Management Workgroup. Assumed survival of smolts to adults harvested at each site was 0.5% for spring Chinook, 0.3% for Select Area Bright fall Chinook, and 1.4% for coho. Catch estimates do not include incidental harvest of non-local stocks. Production numbers for the “current” scenario were 950,000 spring Chinook, 1,450,000 Select Area Bright fall Chinook and 4,170,000 coho. The transition period includes additional releases of spring Chinook (250,000) and coho (120,000) that began in 2010. The transition period also assumes additional releases of spring Chinook beginning in 2013 (500,000) and 2014 (250,000); Select Area Bright fall Chinook beginning in 2014 (500,000), and coho beginning in 2013 (800,000). For the long term, additional releases (above those released during the transition period) of all stocks (250,000 spring Chinook, 250,000 Select Area Bright fall Chinook and 3,780,000 coho) were assumed to begin in 2017, with full returns from all releases occurring in 2021.

Time frame	Stock	Kept catch (number landed)	Average weight (lbs) of kept catch	Average price (\$) per lb of kept catch	Ex-vessel value (\$) of kept catch
Current	Spring Chinook	4,750	12.1	\$5.23	\$300,594
	Select Area Bright Fall Chinook	4,350	13.8	\$2.28	\$136,868
	Coho	58,380	9.5	\$1.38	\$765,362
Transition (2013-2016)	Spring Chinook	7,251	12.1	\$5.23	\$458,865
	Select Area Bright Fall Chinook	4,995	13.8	\$2.28	\$157,163
	Coho	68,460	9.5	\$1.38	\$897,511
Long term (2017-2020)	Spring Chinook	10,268	12.1	\$5.23	\$649,790
	Select Area Bright Fall Chinook	6,090	13.8	\$2.28	\$191,696
	Coho	110,950	9.5	\$1.38	\$1,454,555
Long term (2021 & beyond)	Spring Chinook	11,000	12.1	\$5.23	\$696,113
	Select Area Bright Fall Chinook	6,600	13.8	\$2.28	\$207,622
	Coho	124,180	9.5	\$1.38	\$1,628,000

As pointed out above, under the higher tule and upriver Bright fall Chinook ESA-impact scenario the analysis indicates that the recreational and commercial fisheries would not be able to catch all the upriver Bright fall Chinook available to them because of constraints imposed by the LRH impacts. The management intent under the alternative management framework is to enable the commercial fishery to harvest these upriver Bright fall Chinook by fishing in the mainstem upstream of the Sandy River. If commercial fishers were to harvest all the Bright fall Chinook not used in recreational or lower-river commercial fisheries, their harvest would increase by about 7,400 in the transition period and about 8,700 in the long term. If these fish were harvested in September and October fisheries, the ex-vessel value of this additional harvest would be about \$193,000 in the transition period and \$227,000 in the long term. The net economic affect would be to reduce the \$331,000 reduction in ex-vessel value during the transition period to about \$138,000. In the long term, the ex-vessel value would increase from a reduction of about \$21,000 from 2017 through 2020 to an increase of about \$206,000.