

# **Snake River Spring Chinook Salmon Final Fishery Report, 2006**

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This 2006 harvest monitoring summary is for the sixth consecutive year of spring chinook fisheries in the Snake River in southeast Washington (first year was 2001). The Snake River recreational chinook fishery opened May 17 and ran through June 30, 2006. The Snake River was open from the Texas Rapids boat launch upstream to the Corps of Engineers boat launch (approximately one mile) upstream of Little Goose Dam on the south bank of the river; referred to as the Little Goose (LGO) fishery in this report. The fishery was open seven days per week, with daily fishing hours set from one hour before sunrise to one hour after sunset. The daily limit consisted of one hatchery (adipose fin-clipped) chinook salmon (adult or jack) per day, with a minimum size of 12 inches. Anglers were required to use barbless hooks, with hooks of no more than 5/8-inch from point to shank.

The pre-season forecast for upriver spring chinook was estimated (entering the mouth of the Columbia River) at 88,400 spring/summer Chinook. The Pre-season plans for the Snake River recreational chinook fishery was to harvest up to 876 hatchery adult spring chinook, with an allowable Endangered Species Act (ESA) impact of 29 wild fish mortalities (0.2% ESA impact on wild chinook estimated at Columbia River mouth). Assuming a 10% mortality rate on released fish, this allowed for 292 wild adult encounters. ESA impacts for this fishery are included as part of the non-Indian rate of 2.0% allowable impact which also includes recreational and commercial fisheries downstream. However, the run came in at a higher rate than expected from pre-season estimates. An in-season estimate on May 22<sup>nd</sup> updated the adult upriver spring chinook forecast to 125,000 fish based primarily on counts at Bonneville Dam. Another estimate in the middle of June again increased the number to 130,000, with 67,864 of these fish entering the Snake River. This increased the amount for a harvest (at 0.2% ESA impact on wild chinook estimated at Columbia River mouth) to 1,287 hatchery chinook adults and increased the number of encounters (or “handle”) of wild chinook adults to 429. Total ESA impact for this fishery was expected to be 43 wild adult mortalities or an impact rate of approximately 0.20%.

The Washington Department of Fish and Wildlife monitored the fishery using a roving creel survey which included: boat ramp and shore interviews to collect catch rate, completed trip and biological information; and effort counts of shore anglers, boat anglers, and the number of boats (angler effort counts were conducted five times a day). Monitoring was conducted at least one weekday and one weekend day per 7 day period, utilizing a dawn to dusk survey format. Creel surveys were conducted on 15 days (6 weekend days and 9 weekdays) of the season. The 45-day fishery had 32 weekdays and 13 weekend days available. We included Monday May 29<sup>th</sup> (Memorial Day) as a weekend since it was a holiday. We sampled 46.2% of weekend days and 28.1% of weekdays. Survey data were summarized weekly to estimate number of fish harvested, released, and total encounters (harvested and fish released), and to assure compliance with the ESA impact level that had been set for the fishery.

## Creel Interviews

Interviews at LGO were conducted with 686 anglers with a total of 4,488 hours of fishing effort, but only 474 (69.1%) of these anglers were targeting chinook (3,207 angler hours). Other anglers interviewed were targeting sturgeon (13.1%), catfish (9.8%), smallmouth bass (7.0%), and northern pikeminnow (1.0%). Data collected during the creel surveys were entered into a spreadsheet that was used to calculate angler hours, total fish kept, catch rate (hours/fish kept and hours/fish encountered), total fish released, release rate (hours/fish released), and fish size (min, max, and mean) (Appendix A, Table 1).

**Table 1.** Data summaries from chinook anglers interviewed during the Snake River spring chinook fishery, 2006.

			Catch Rate		Chinook Released	Release Rate	Harvested Fish Size Fork Length (cm)		
	Angler Hours	Chinook Harvested	Hrs/Chinook Harvested	Hrs/Chinook Caught		Hrs/Chinook Released	Min	Max	Mean
Weekday Shore	1,297.3	41	31.6	20.3	23	56.4	51.0	90.5	73.9
Weekday Boat	31.0	1	31.0	31.0	0	0.0	66.0	66.0	66.0
Weekend Shore	1,817.5	23	79.0	42.3	20	90.9	51.0	94.0	77.1
Weekend Boat	61.3	0	0.0	0.0	0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>3,207.1</b>	<b>65</b>	<b>49.3</b>	<b>29.7</b>	<b>43</b>	<b>74.6</b>	<b>51.0</b>	<b>94.0</b>	<b>74.9</b>

Creel interview data documented that 65 spring chinook were kept and 43 spring chinook were released at LGO. Fishery regulations identified that jacks were <24 inches or 61 cm total length and we estimated that jacks were <57cm fork length (creel measurement). Of the 65 hatchery chinook kept, 63 were sampled, consisting of 57 (90.5%) adults and 6 (9.5%) jacks. Interviews documented that 43 chinook were released; comprised of 33 (76.7%) wild adults, 5 (11.6%) wild jacks, 4 (9.3%) hatchery jacks, and 1 (2.3%) hatchery adult.

Fishery regulations allowed for harvest of hatchery adipose (Ad) clipped chinook. We confirmed that 57 adults and 6 jacks had “Ad” clips. The other two fish caught were not seen by the creel clerk (Table 2). We also recovered 1 radio tag (from University of Idaho) and 14 coded wire tags (Table 3). Seven of the CWT’s had been released in Idaho and seven had been released in Eastern Oregon.

**Table 2.** Mark types observed during Snake River spring chinook creel surveys, 2006.

Marks	Adults	Jacks	Unknown	Total
Ad	57	6	0	<b>63</b>
Unknown	0	0	2	<b>2</b>
<b>Totals</b>	<b>57</b>	<b>6</b>	<b>2</b>	<b>65</b>

**Table 3.** Tags recovered during spring chinook creel surveys on the Snake River, 2006.

Tag Type <sup>a</sup>	Tag Code	Date	Length	Other Marks	Release Location	Stock/Hatchery
CWT	093860	05/18/06	70.0	Ad	Umatilla River	Umatilla River
Radio <sup>b</sup>	Code 40	05/20/06	69.0	Ad, CWT	Clear Creek (Clearwater River)	Kooskia
CWT <sup>b</sup>	054137	05/20/06	69.0	Ad, Radio	Clear Creek (Clearwater River)	Kooskia
CWT	107675	05/20/06	69.5	Ad	Rapid River Hatchery	Rapid River
CWT	093840	06/01/06	75.0	Ad	Catherine Creek (Grande Ronde)	Catherine Creek
CWT	107775	06/01/06	58.0	Ad	Rapid River Hatchery	Rapid River
CWT	093827	06/01/06	61.0	Ad	Lostine River	Lostine River Endemic
CWT	093507	06/10/06	86.5	Ad	Lostine River	Lostine River Endemic
CWT	093642	06/16/06	90.5	Ad	Imnaha River	Imnaha River and Tribs.
CWT	103475	06/17/06	79.0	Ad	Knox Bridge, SF Salmon River, ID	McCall
CWT	103275	06/22/06	84.0	Ad		
CWT	103175	06/25/06	84.0	Ad		
CWT	107775	06/25/06	71.0	Ad	Rapid River Hatchery	Rapid River
CWT	093831	06/25/06	86.0	Ad	Lostine River	Lostine River Endemic
CWT	093822	06/27/06	86.5	Ad	Imnaha River	Imnaha River and Tribs.

<sup>a</sup> CWT=coded wire tag  
<sup>b</sup> Radio tag and CWT were from the same fish.

## Expanded Fishery Results

Total calculated angler effort for spring chinook anglers for the season was 9,337.5 hrs ( $\pm$  1,419.4 – Table 4). Effort was calculated separately for boat and shore anglers, by strata (weekend or weekday), using the following formula:

$$\text{Effort} = \# \text{ of hours/day} \times \# \text{ of days available} \times \text{mean} \# \text{ of chinook anglers (from the counts)}.$$

We used 15 hours/day as the available fishing time (# of hours/day) for the entire season. Since the data were stratified by weekend or weekday and boat or shore we first calculated effort in each of these categories and then summed them to estimate total effort (Table 4, Appendix A). Completed angler days (for chinook fishermen) were calculated by averaging the number of hours in a complete trip from creel surveys. The 90 % confidence limits were  $\pm$ 15.3% of the season angler effort (calculated by stratum and summed for the total by K. Ryding, 2007, personal communication on 5/25/07, Variance Estimation Report). The completed angler day at LGO averaged 5.79 hrs/day on weekdays and 6.32 hrs/day on weekends. Dividing effort by the hours in an angler day provides the number of angler days for the season (Table 4).

**Table 4.** Calculated expanded effort<sup>a</sup> for spring chinook anglers in the Snake River spring chinook fishery, 2006.

	Number of Fishing Days	Average Number of Anglers/Day	Angler Effort (hrs)	90 % CL Angler Effort (hrs)	Angler Days
Weekday Shore	32	10.26 <sup>b</sup>	4,922.4 <sup>b</sup>	$\pm 1,250.2^b$	850
Weekday Boat	32	0.45	216.0	$\pm 398.4$	37
Weekend Shore	13	19.79	3,859.1	$\pm 750.6$	611
Weekend Boat	13	1.74	340.0	$\pm 228.3$	54
		<b>Total</b>	<b>9,337.5<sup>b</sup></b>	<b><math>\pm 1,419.4^b</math></b>	<b>1,552</b>

<sup>a</sup> We used 15 hours as the available fishing day length. Shore anglers could only fish at the “Wall” at Little Goose Dam from 6:00 a.m. to 5:00 p.m. by U.S. Army Corp of Engineers rules. Our angler counts ranged from 7:00 a.m. to 8:00 p.m.

<sup>b</sup> Confidence limits calculated by K. Ryding (2007, personal communication) used 10.15. The 90% CL is based on the 10.15 average angler effort for WD Shore, while the other numbers in the table are based on 10.26 average angler effort for Weekday Shore. Using 10.15 her calculated angler effort for Weekday Shore was 4,973.2 hours and Total effort of all categories was 9,287.9 hours.

Angler interview information (Table 1 and Appendix B) and count data from Little Goose were expanded to estimate total chinook kept, the number of fish released and angler effort for the fishery. By multiplying harvest and release rates and angler effort we estimated that 186 adult spring chinook were kept and 100 wild adult spring chinook were released (Appendix A, Table 5). While the overall totals in Table 5 are correct, due to a rounding error accumulating numbers of fish may not equal the total. Multiplying the original estimates by the proportions of sampled adults, jacks and unknown fish enabled us to estimate the number of adults, jacks, and unknown spring chinook harvested, as well as the number of wild adults, wild jacks, hatchery jacks, and hatchery adults released (Table 5). Confidence limits (90%) were  $\pm 15.1\%$  for total chinook harvested and  $\pm 23.1\%$  for total released (K. Ryding, 2007, personal communication on 5/25/07, Variance Estimation Report). By applying a 10% mortality rate to the number of wild adults released we estimate that our ESA impact level was a total of 10 adult spring chinook (13 total including jacks), below the allowable preseason impact of 29 wild adults, or the updated impact of 43 wild adults. The harvest of 193 adult spring chinook (this includes adults and unknowns, but not jacks) was well under the expected preseason harvest of 876 adult spring chinook or the updated harvest of 1,287 adult spring chinook.

Our harvest monitoring sampling rate was about 30% for both hatchery adults and jacks during the full spring chinook fishery in the Snake River (30.65% of the adult chinook harvested [57 observed of 186 in the expanded harvest estimate without the 7 unknowns] and 30.0% for jacks [6 observed of 20 expanded harvest estimate]). Therefore, each CWT in Table 3 would need to be multiplied by 3.26 to expand the estimate for the entire season harvest, based solely on the fishery sampling rate. They should also be expanded by the mark rate for each group.

<b>Table 5.</b> Estimated number of spring chinook harvested and released during the Snake River fishery, 2006.											
	Estimated Number of Fish Harvested					Estimated Number of Fish Released					
	Adults	Jacks	Unknown	Total *	90% CL	Wild Adults	Wild Jacks	Hatchery Jacks	Hatchery Adults	Total *	90 % CL
Weekday Shore	137	14	5	156	+ 62	67	10	8	2	87	+ 23
Weekday Boat	6	1	0	7	+ 12	0	0	0	0	0	+ 0
Weekend Shore	43	5	2	49	+ 24	33	5	4	1	43	+ 23
Weekend Boat	0	0	0	0	+ 0	0	0	0	0	0	+ 0
<b>Totals</b>	<b>186</b>	<b>20</b>	<b>7</b>	<b>212</b>	<b>+ 32</b>	<b>100</b>	<b>15</b>	<b>12</b>	<b>3</b>	<b>130</b>	<b>+ 30</b>

\* The total was taken from Appendix A, and due to rounding errors may not equal the sum of the fish in that row.

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**Appendix A. Angler effort and harvest of spring chinook during the Snake River fishery, 2006**

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																					Totals				
				Angler Counts			Daily Averages of Angler Counts					Average Harvest Rates (hrs/fish kept)		Average Release Rates (hrs/fish released)		Angler Effort (hours)		Harvest of Chinook		Release of Chinook		Angler	Chinook		
Month	Day	Day Type	Time	Number of Shore Anglers	Number of Boats	Number of Boat Anglers	Shore Anglers	Shore Chinook Anglers	Boats	Boat Anglers	Boat Chinook Anglers	Shore Anglers	Boat Anglers	Shore Anglers	Boat Anglers	Shore	Boat	Shore	Boat	Shore	Boat	Effort (hrs)	Harvested	Released	
<b>Weekday Totals</b>				<b>578</b>	<b>34</b>	<b>54</b>	<b>12.84</b>	<b>10.26</b>	<b>0.76</b>	<b>1.20</b>	<b>0.45</b>	<b>31.640</b>	<b>31.000</b>	<b>56.402</b>	<b>0.000</b>	<b>4,922.40</b>	<b>216.00</b>	<b>155.6</b>	<b>7.0</b>	<b>87.3</b>	<b>0.0</b>	<b>5,138.4</b>	<b>163</b>	<b>87</b>	
5	18	WD	8:00	23	2	2																			
			11:00	31	3	6																			
			14:00	12	1	1																			
			17:00	8	0	0																			
			20:00	4	0	0																			
5	23	WD	8:00	12	0	0																			
			11:00	14	0	0																			
			14:00	8	0	0																			
			17:00	5	0	0																			
			20:00	1	0	0																			
5	26	WD	7:00	21	1	2																			
			10:00	23	1	2																			
			13:00	23	0	0																			
			16:00	30	0	0																			
			19:00	35	0	0																			
6	1	WD	7:00	16	1	2																			
			10:00	16	4	6																			
			13:00	8	4	9																			
			16:00	6	0	0																			
			19:00	4	0	0																			
6	6	WD	8:00	9	1	1																			
			11:00	16	3	3																			
			14:00	13	4	7																			
			17:00	2	1	1																			
			20:00	2	0	0																			
6	12	WD	7:00	15	0	0																			
			10:00	19	2	3																			
			13:00	16	0	0																			
			16:00	10	0	0																			
			19:00	3	0	0																			
6	16	WD	8:00	20	0	0																			
			11:00	22	1	2																			
			14:00	23	1	2																			
			17:00	4	1	2																			
			20:00	4	0	0																			
6	22	WD	8:00	16	2	2																			
			11:00	13	1	1																			
			14:00	16	0	0																			
			17:00	7	0	0																			
			20:00	4	0	0																			
6	27	WD	7:00	16	0	0																			
			10:00	15	0	0																			
			13:00	10	0	0																			
			16:00	2	0	0																			
			19:00	1	0	0																			

**Appendix A. Angler effort and harvest of spring chinook during the Snake River fishery, 2006.**

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				Angler Counts			Daily Averages of Angler Counts					Average Harvest Rates (hrs/fish kept)		Average Release Rates (hrs/fish released)		Angler Effort (hours)		Harvest of Chinook		Release of Chinook		Angler	Chinook		
Month	Day	Day Type	Time	Number of Shore Anglers	Number of Boats	Number of Boat Anglers	Shore Anglers	Shore Chinook Anglers	Boats	Boat Anglers	Boat Chinook Anglers	Shore Anglers	Boat Anglers	Shore Anglers	Boat Anglers	Shore	Boat	Shore	Boat	Shore	Boat	Effort (hrs)	Harvested	Released	
<b>Weekend Totals</b>				<b>940</b>	<b>36</b>	<b>68</b>	<b>31.33</b>	<b>19.79</b>	<b>1.20</b>	<b>2.27</b>	<b>1.74</b>	<b>79.022</b>	<b>0.000</b>	<b>90.875</b>	<b>0.000</b>	<b>3,859.08</b>	<b>339.99</b>	<b>48.8</b>	<b>0.0</b>	<b>42.5</b>	<b>0.0</b>	<b>4,199.1</b>	<b>49</b>	<b>43</b>	
5	20	WE	7:00	46	4	10																			
			10:00	52	5	11																			
			13:00	53	1	3																			
			16:00	33	2	4																			
			19:00	16	0	0																			
5	28	WE	7:00	22	1	2																			
			10:00	42	2	4																			
			13:00	52	3	3																			
			16:00	41	0	0																			
			19:00	39	0	0																			
6	4	WE	8:00	36	4	9																			
			11:00	38	3	7																			
			14:00	38	0	0																			
			17:00	9	0	0																			
			20:00	6	0	0																			
6	10	WE	7:00	37	0	0																			
			10:00	40	2	2																			
			13:00	42	2	3																			
			16:00	34	0	0																			
			19:00	16	2	3																			
6	17	WE	7:00	27	0	0																			
			10:00	34	0	0																			
			13:00	34	0	0																			
			16:00	27	2	3																			
			19:00	8	1	2																			
6	25	WE	7:00	35	0	0																			
			10:00	42	1	1																			
			13:00	29	1	1																			
			16:00	11	0	0																			
			19:00	1	0	0																			
<b>Season Totals</b>				<b>2,458</b>	<b>106</b>	<b>190</b>										<b>8,781.48</b>	<b>555.99</b>	<b>204.4</b>	<b>7.0</b>	<b>129.7</b>	<b>0.0</b>	<b>9,337.5</b>	<b>212</b>	<b>130</b>	



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**Appendix B. Daily creel summaries of interview data  
and harvest and release rates, for spring chinook  
anglers during the Snake River fishery, 2006**

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<b>Appendix B. Daily creel summaries of interview data and harvest and release rates, for spring chinook anglers during the Snake River fishery, 2006.</b>														
			Interview Data								Harvest/Release Rates			
			Shore				Boat				Shore		Boat	
Month	Day	Day Type	# of Anglers	Effort (hrs)	chinook kept	chinook released	# of Anglers	Effort (hrs)	chinook kept	chinook released	hrs/fish kept	hrs/fish released	hrs/fish kept	hrs/fish released
5	18	WD	29	143.74	10	2	2	11.00	1	0	14.374	71.870	11.000	0.000
5	23	WD	16	91.75	0	0	0	0.00	0	0	0.000	0.000	0.000	0.000
5	26	WD	25	203.75	0	0	0	0.00	0	0	0.000	0.000	0.000	0.000
6	1	WD	24	108.43	11	2	2	11.00	0	0	12.766	70.215	0.000	0.000
6	6	WD	20	125.33	4	7	0	0.00	0	0	31.333	17.904	0.000	0.000
6	12	WD	24	165.00	2	1	0	0.00	0	0	82.500	165.000	0.000	0.000
6	16	WD	33	210.60	7	5	2	9.00	0	0	30.086	42.120	0.000	0.000
6	22	WD	21	152.40	4	1	0	0.00	0	0	38.101	152.400	0.000	0.000
6	27	WD	14	96.25	3	5	0	0.00	0	0	32.083	19.250	0.000	0.000
<b>Weekday Totals</b>			<b>206</b>	<b>1,297.25</b>	<b>41</b>	<b>23</b>	<b>6</b>	<b>31.00</b>	<b>1</b>	<b>0</b>	<b>31.640</b>	<b>56.402</b>	<b>31.000</b>	<b>0.000</b>
5	20	WE	65	442.36	5	0	4	31.32	0	0	88.472	0.000	0.000	0.000
5	28	WE	39	393.66	1	1	4	15.00	0	0	393.660	393.660	0.000	0.000
6	4	WE	31	216.75	4	9	2	15.00	0	0	54.188	24.083	0.000	0.000
6	10	WE	51	327.64	2	3	0	0.00	0	0	163.820	109.213	0.000	0.000
6	17	WE	32	252.50	4	2	0	0.00	0	0	63.125	126.250	0.000	0.000
6	25	WE	34	184.59	7	5	0	0.00	0	0	26.370	36.918	0.000	0.000
<b>Weekend Totals</b>			<b>252</b>	<b>1,817.50</b>	<b>23</b>	<b>20</b>	<b>10</b>	<b>61.32</b>	<b>0</b>	<b>0</b>	<b>79.022</b>	<b>90.875</b>	<b>0.000</b>	<b>0.000</b>