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12 February 2003

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This letter summarizes our preliminary estimates of escapement rates for 490 radio-tagged adult spring–summer chinook salmon recorded passing Lower Granite Dam in 2001. Because telemetry coverage and other monitoring efforts varied between tributary sites and through the migration, we present three estimates using different survival/escapement criteria. We also include estimates for fin-clipped and unclipped fish and for fish PIT-tagged as juveniles in different basins.

All fish were radio-tagged at Bonneville Dam. Of the 490 that passed Lower Granite Dam, 266 (54%) had fin clips and 224 (46%) had no clips. All fish had PIT tags: 122 were PIT-tagged in Snake River tributaries as juveniles, 25 were tagged at the Snake River trap, 202 were tagged at Lower Granite Dam, 25 were tagged at dams downstream from Lower Granite, and the remaining 116 (24%) were PIT-tagged by us at Bonneville Dam as returning adults. Fixed radio receivers were the principal method used to identify the final distribution of tagged fish (Figure 1). We also located fish in tributaries using trucks with radio-tracking units, and additional distribution and fate information came with transmitters returned to us from fisheries, hatcheries and traps/weirs. Although we could approximate final locations for most fish, the fates of some were ambiguous. Spawning success was not evaluated.

**Results:** Almost all (97.8%) radio-tagged fish that passed Lower Granite Dam were subsequently recorded at receivers near the mouths of the Clearwater (CWR), Grande Ronde (GRR) or Imnaha (IMR) rivers, at the receiver in the lower Salmon River (LSR), or at Hell's Canyon Dam. This minimum measure—escapement to major tributaries—was lower for fin-clipped fish (96.6%) than for fish without fin clips (99.1%) ( $P = 0.064$ ,  $Z$  test).

The final distribution and fate of all 490 tagged salmon are summarized in Table 1. About 62% (304) entered the Salmon basin, 22% (106) entered the Clearwater basin, 9% (42) entered the Imnaha and 4% (22) entered the Grande Ronde. Eleven (2%) were last recorded in the Snake River, downstream from major tributaries, and 5 (1%) were at Hell's Canyon Dam. Proportions do not reflect the run at large, because we selected for PIT-tagged fish while radio-tagging.

Reported sport and tribal fisheries took 21% of the radio-tagged salmon, including 37% of fin-clipped fish and 3% of unclipped fish. Harvest proportions were 23% (76/304) for all salmon that returned to the Salmon basin and 27% (29/106) in the Clearwater basin. About 14% of all 490 salmon returned to hatcheries or weirs, including 18% of fin-clipped fish and 10% of unclipped fish. About 39% of the 490 fish were recorded in secondary tributaries (e.g. South Fork Clearwater, Lochsa, Selway, Little Salmon, South Fork Salmon, Middle Fork Salmon, East Fork Salmon) or in sub-basins of those tributaries. More than half (56%) of the unclipped fish were recorded in secondary tributaries, compared to 25% of clipped fish. The remaining fish (23%) were last recorded at mainstem Clearwater, Salmon, Grande Ronde or Imnaha sites. For

our first escapement estimate (Escapement 1), all salmon last recorded at mainstem sites in the four major tributaries were treated as escaped (Table 1). For the second estimate (Escapement 2), all fish recorded at mainstem Grande Ronde or Imnaha sites were designated escaped, as were fish recorded in the mainstem Clearwater upstream from the South Fork and mainstem Salmon upstream from the North Fork; fish last recorded downstream from the South Fork Clearwater and North Fork Salmon were considered pre-spawn mortalities.

Escapement 1 estimates were 76.5% for all 490 fish, 60.2% for fin-clipped fish and 96.0% for unclipped fish (Table 1). Escapement 2 estimates were 66.3% for all fish, 46.6% for fin-clipped fish and 89.7% for unclipped fish. Escapement differences between fin-clipped and unclipped fish were highly significant ( $P < 0.0001$ ,  $Z$  tests).

Escapement estimates for fish PIT-tagged as juveniles at Lower Granite Dam or in the four major tributaries are also included in Table 1. Escapement differences between PIT-tag groups appeared to be related to the proportion of fin-clipped fish in each group: 61% of those tagged at Lower Granite, 24 to 31% of those tagged at the Snake River trap or in the Salmon, Clearwater or Grande Ronde, and none of those tagged in the Imnaha had fin-clips. Two of 16 (13%) fish PIT-tagged in the Grande Ronde were last recorded in a Salmon River tributary, and 1 of 72 (1%) PIT-tagged in the Salmon was last recorded in the Grande Ronde.

**Discussion:** We want to emphasize that we did not evaluate spawning success or whether fish reached actual spawning sites. Instead, the escapement estimates we report should be reasonable indicators of how many radio-tagged fish returned to traditional spawning tributaries or to hatcheries/weirs/traps and were not harvested. The largest source of uncertainty in our estimates was the ambiguity regarding fish last recorded at mainstem sites. Some fish last recorded in the lower Clearwater or Salmon rivers may have entered secondary tributaries undetected, entered unmonitored tributaries or spawned at mainstem sites: all three scenarios would lead to Estimate 2 being an underestimate. Both Estimates 1 and 2 would be overestimates if fish last reported at any mainstem sites were harvested but not reported.

Harvest estimates were based only on transmitters that were returned to us from anglers or tribal fishers. We do not know the rate of unreported harvest.

Finally, the 2001 spring–summer chinook migration was not typical. The run was one of the largest on record, and flow was very low in the Snake River and its tributaries. Radio-tagged fish migrated very rapidly compared to other study years, both in the hydrosystem and in tributaries. As a result, we think it is likely that higher proportions reached tributary sites than would have with more normal river conditions. Fish may also have been more vulnerable to harvest with low river levels.

Please contact us if you have questions about this summary.

Sincerely,

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Table 1. Estimated final distribution and fate of radio-tagged spring–summer chinook salmon that passed Lower Granite Dam in 2001.

Last Site	Fate	Escape	All	Fin Clipped		LGr	PIT tagged as juveniles at/in:				
				Yes	No		SNR <sup>a</sup>	CWR	SAL	GRR	IMR
<b><u>Snake</u></b>											
	unknown		10	8	2	7		1			
	harvest		1	1		1					
<b><u>Hells Canyon</u></b>											
	mainstem at dam	yes	1	4							
	harvest		4	1		2					
<b><u>Clearwater</u></b>											
	mainstem < SFC	no	15	10	5	8		1			
	mainstem > SFC	yes	4	4							
	tributary		42	22	20	21		5			
	hatchery/weir		16	15	1	8		1			
	harvest		29	29		12		1			
<b><u>Salmon</u></b>											
	mainstem < USR	no	35	26	9	17	1		4		
	mainstem > USR	yes	15		15	9			3		
	tributary		147	43	104	55	17		46	2	
	hatchery/weir		36	25	11	18	2		6		
	harvest		71	64	7	29	2		12		
<b><u>Grande Ronde</u></b>											
	mainstem	yes	13	2	11	4	1		1	7	
	tributary		4	2	2					3	
	hatchery/weir		5	3	2	1				4	
<b><u>Imnaha</u></b>											
	mainstem	yes	30	3	27	6	1				19
	hatchery/weir		12	4	8	4	1				6
	<b>Total</b>		<b>490</b>	<b>266</b>	<b>224</b>	<b>202</b>	<b>25</b>	<b>9</b>	<b>72</b>	<b>16</b>	<b>25</b>
<b><u>Totals (%)</u></b>											
	harvest		21.4	36.8	3.1	21.8	8.0	11.1	16.7		
	hatchery/weir		14.1	17.7	9.8	15.3	12.0	11.1	8.3	25.0	24.0
	Secondary tribs		39.4	25.2	56.3	37.6	68.0	55.6	63.9	31.3	
	Snake, unknown		2.0	3.0	0.9	3.5		11.1			
	mainstem no		10.2	13.5	6.3	12.4	4.0	11.1	5.6		
	mainstem yes		12.9	3.8	23.7	9.4	8.0		5.6	43.8	76.0
	<b>Escapement 1<sup>b</sup></b>		<b>76.5</b>	<b>60.2</b>	<b>96.0</b>	<b>74.8</b>	<b>92.0</b>	<b>77.8</b>	<b>83.3</b>	<b>100.0</b>	<b>100.0</b>
	<b>Escapement 2<sup>c</sup></b>		<b>66.3</b>	<b>46.6</b>	<b>89.7</b>	<b>62.4</b>	<b>88.0</b>	<b>66.7</b>	<b>77.8</b>	<b>100.0</b>	<b>100.0</b>

<sup>a</sup> Snake River trap

<sup>b</sup> hatchery/weir + mainstem yes + mainstem no + secondary tributaries

<sup>c</sup> hatchery/weir + mainstem yes + secondary tributaries

