



ADULT STEELHEAD RETURNS TO DWORSHAK NFH IN 2007-2008 AND PROGNOSIS FOR 2008-2009

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Introduction

Dworshak National Fish Hatchery (NFH) is located at the confluence of the North Fork and the main stem of the Clearwater River near Ahsahka, Idaho approximately 811 km from the Pacific Ocean. Construction of the hatchery was included in the authorization for Dworshak Dam and Reservoir (Public Law 87-847, October 23, 1962) to mitigate for losses of steelhead (*Oncorhynchus mykiss*) from the North Fork Clearwater River caused by the dam and reservoir.

The hatchery was designed and constructed by the U.S. Army Corps of Engineers and was administered and operated by the U.S. Fish and Wildlife Service following completion of the first phase of construction in 1969 until 2007. Since 2007, DNFH has been co-managed by U.S. Fish and Wildlife Service and the Nez Perce Tribe. In addition to steelhead, DNFH also rears spring Chinook salmon (*O. tshawytscha*) for the Lower Snake River Compensation Program and coho salmon (*O. kisutch*) for a Nez Perce Tribal program, these programs are not included in this report.

Starting in 1969, the hatchery had 25 Burrows ponds on a single reuse system and 59 other Burrows ponds on single-pass water. In 1972, a second phase of construction placed all these ponds on three reuse systems with the option of operating on either reuse or single-pass. In 1986, the oldest system (25 ponds) was taken off reuse and put on single-pass. In 2004, a rehabilitation project was completed that will again allowed reuse in this system.

The North Fork Clearwater River steelhead stock maintained by Dworshak NFH is unique. At maturity, males and females of this particular stock of "B" run steelhead average about 91 cm (36 inches) and 82 cm (33 inches) in length, respectively. Spawning stock is comprised of three age classes; I-, II-, and III-"salt" (ocean) fish. This nomenclature refers to the number of complete years fish have spent rearing in salt water. Fish are actually two years older than this system indicates, as they are reared for one year in the hatchery and spend another year migrating to and from the ocean.

Most adult "B" run steelhead leave the ocean to return to the Columbia River in August through September. This is usually later than the smaller "A" run steelhead. "A" run steelhead are destined for the Salmon River. Some of the Clearwater "B" run steelhead actually arrive at Dworshak NFH in the fall (same year they entered freshwater). The remainder of the run may reach the Snake and Clearwater rivers in the fall where they over-winter until their final run into the hatchery in late winter and early spring of the following year. The Dworshak NFH trap is operated during the fall to ensure inclusion of adequate numbers of early arriving steelhead (~500 adults) into the hatchery brood stock. The trap is again operated, intermittently, from February through April to capture brood stock from the mid and late portions of the run. Steelhead are also trapped at Kooskia NFH located about 1.5 miles east of Kooskia, Idaho, near the confluence of Clear Creek and the Middle Fork Clearwater River. In low return years these steelhead are available for broodstock use at Dworshak NFH, although this has not occurred since 1995 and normally they are recycled to the South Fork Clearwater fishery.

Summer steelhead smolt releases from Dworshak NFH began in 1970. The first adults returned to the hatchery in 1972. The 2007-2008 return marked the 36th year that artificially spawned North Fork Clearwater River steelhead have returned to Dworshak NFH. Table 1 summarizes the Dworshak NFH steelhead returns to the Clearwater River from 1972-2007. This report reviews the 2007-2008 run and lists projections for 2008-2009.

2007-2008 Adult Returns

A total of 3,374 steelhead were collected at the DNFH trap during fall of 2007 and spring 2008 (Table 1). We collected 13 adult steelhead that were not adipose fin clipped (one was a radio-tagged fish). All 13 of these fish were immediately transported and released upstream in the main stem Clearwater River just upstream from the North Fork, in accordance with the NMFS Biological Opinion on wild steelhead. There were another 18 mortalities of the fish collected, resulting in a total of 3,343 adult steelhead available for the 2007-2008 broodstock. Following is a description of the adult group (excludes unclipped fish).

The Dworshak NFH ladder was opened 1 to 4 October, and then again 18 to 19 October 2007 for the fall steelhead collection. A total of 504 (15% of total broodstock) steelhead were collected during the 103 hrs of trap operation (Figure 1), a catch rate of 4.9 fish per hour (Figure 2). The fish ladder was re-opened for steelhead collection on 21 February 2008 and operated intermittently during 23 days until 25 April 2008. A total of 2,839 adult steelhead entered the ladder during almost 100 hrs of operation. By month, we collected 626 (19%) steelhead in February, 1,663 (50%) in March, and 550 (16%) in April. Trapping rates ranged from a high of 337.9/hr on 27-28 February to 12.6/hr during 19-21 March, and averaged a little over 74 fish/hr during the spring. This mean was skewed by the February trapping period (mean = 261 fish/hr versus 28 fish/hr average during March and April).

Ladder operation was intermittent during the spring season to avoid collecting fish excess to that needed for broodstock, thereby allowing us to spawn fish that have not been held in the hatchery for more than a few days and to incorporate fish throughout the run.

A total of 62 adult steelheads were collected at Kooskia National Fish Hatchery (Table 2). These 62 fish were 33 (53.2%) females and 29 males. Ages were 10 (34.5%) 1-ocean and 19 2-ocean fish for males and 2 (6.1%) 1-ocean and 33 2-ocean fish for females. There were no 3-ocean aged fish collected at Kooskia NFH in 2008. All fish collected at Kooskia were released into the south Fork Clearwater River (see pg. 11).

Table 1. Number of steelhead returning to Dworshak NFH, estimates of hatchery fish harvested, and total hatchery returns to the Clearwater River, Idaho, 1972-2008 (1972-73 to 1983-84 data based on Pettit (1985)).

Return year ¹	Number Back to Dworshak NFH	Estimated Clearwater Sport Harvest ²	Estimated North Fork Tribal Harvest ³	Unharvested Dworshak Hatchery Fish ⁴	Total Returning to Clearwater River
1972-73	9,938	2,068	-	0	12,006
1973-74	7,910	2,320	-	0	10,230
1974-75	1,698	N.S. ⁵	290	0	1,988
1975-76	1,858	N.S. ⁵	430	0	2,288
1976-77	3,100	N.S. ⁵	410	0	3,510
1978-79	4,939	4,610	(500) ⁶	0	10,049
1977-78	12,272	14,000	(1,000) ⁶	0	27,272

Table 1. (continued) Number of steelhead returning to Dworshak NFH, estimates of hatchery fish harvested, and total hatchery returns to the Clearwater River, Idaho, 1972-2008 (data from 1972-73 to 1983-84 based on report from Pettit (1985)).

Return ¹	Number Back to Dworshak NFH	Estimated Clearwater Sport Harvest ²	Estimated North Fork Tribal Harvest ³	Unharvested Dworshak Hatchery Fish ⁴	Total Dworshak Fish Returning to Clearwater River
1979-80	2,519	N.S. ⁵	1,250	300	4,069
1980-81	1,968	4,510	(1,000) ⁶	500	7,978
1981-82	3,054	1,665	(1,000) ⁶	0	5,719
1982-83	7,672	13,967 ⁷	(1,500) ⁶	0	23,139
1983-84	3,284	6,500	(500) ⁶	100	11,384
1984-85	14,018	19,410	(1,500) ⁶	2,700	37,628
1985-86	4,462	7,240	1,471	1,800	15,002
1986-87	5,286 ⁸	15,679	4,210	3,000	28,175
1987-88	3,764	8,766	1,478	2,000	16,008
1988-89	6,041	11,332	1,242	3,700	22,315
1989-90	10,630	27,953	1,710	3,650	43,944 ⁹
1990-91	7,876	12,974	1,211	2,250	24,311
1991-92	3,700	10,415	1,326	1,650	17,091
1992-93	7,900	19,351	1,184	3,368	31,803
1993-94	3,757	11,538	675	1,457	17,427
1994-95	1,394	5,954	730	1,307	9,385
1995-96	4,480	2,319	992	1,315	9,106
1996-97	2,980	4,926	513	779	9,198
1997-98	3,601	7,611	145	479	11,836
1998-99	5,419	8,774	1,007	1,137	16,337
1999-00	2,882	7,177	1,000	720	11,779
2000-01	6,411	12,230	(1,000) ⁶	513	20,154
2001-02	7,733	22,774 ¹⁰	(1,000) ⁶	774	32,281 ¹⁰
2002-03	5,244 ⁸	25,030 ¹⁰	1,118	830	32,222 ¹⁰
2003-04	3,767 ⁸	20,806 ¹⁰	(1,336) ⁶	855	26,764 ¹⁰
2004-05	4,362 ⁸	19,252 ¹⁰	1,331	280	25,225 ¹⁰
2005-06	3,243 ⁸	14,916 ¹⁰	1,470	457	20,086 ¹⁰
2006-07	3,514 ⁸	13,301 ¹⁰	(1,000) ⁶	840	18,655
2007-08	3,374 ⁸	13,515	(1,470) ⁶	71	18,730

Table 1. Footnotes;

¹Return year is from October through May.

²Estimates of sport harvest in the Clearwater River provided by Idaho Department of Fish and Game.

³Estimates of tribal harvest in the Clearwater River provided by Nez Perce Tribe Department of Fishery, except as noted by Footnote 6.

⁴Estimated by using the return percentage to Kooskia NFH, applied to returning II-salts from offsite releases.

⁵N.S. = no sport fishing season.

⁶() guesstimate on tribal harvest by authors.

⁷Pettit, IDFG, Lewiston, Idaho (personal communication) included an additional 2,000 fish in harvest from Snake River for a total of 15,967.

⁸Ladder was operated intermittently for broodstock management.

⁹We believe the sport estimate of 27,953 is about 8,000 too high and the total number of Dworshak steelhead to the Clearwater River was in the range of 32,000 to 35,000.

¹⁰Sport harvest estimates have been modified from previous year's reports to account for only Dworshak's contribution to the steelhead harvest in the Clearwater River.

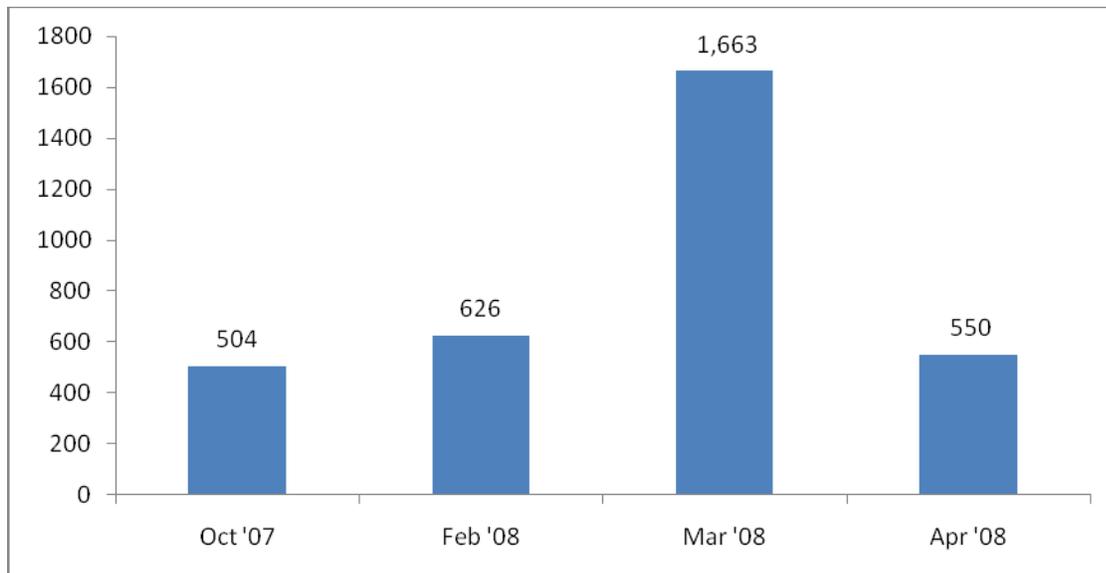


Figure 1. Numbers of adult steelhead collected at the DNFH ladder by month of operation.

Age and Sex Composition

Age class of adult steelhead were estimated using a fork length classification developed previously using known-aged (coded-wire tagged) fish that returned to Dworshak NFH. Based on our length model, the 2007-08 brood was 17.1% 1-ocean fish ("jacks"), 82.0% 2-ocean, and 1.0% 3-ocean fish. Three fish were not measured. Fish collected were 37.6% male and 62.4% female. By sex, the breakdown was 39.8% 1-ocean, 58.3 2-ocean, and 1.9% 3-ocean for males, and 3.3% 1-ocean, 96.3% 2-ocean, and 0.4% 3-ocean returns (Table 3).

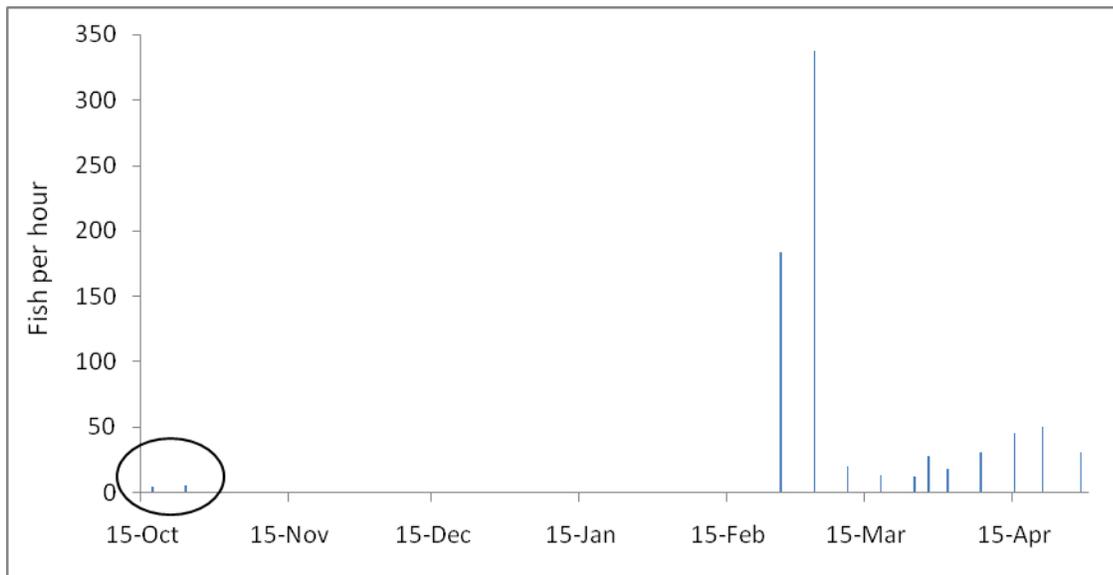


Figure 2. Trapping rate (fish/hr) for adult steelhead collected at Dworshak National Fish Hatchery for broodstock during fall 2007 (circled) and spring 2008. Each line represents one to three days trapping effort. Dates represent date fish collected in trap were processed, which varied from times trap was operated.

Table 2. Rack returns and age class structure for hatchery steelhead and naturals captured at Kooskia NFH, 1995-2008.

Return year	I-Salt	II-Salt	III-Salt	Total Hatchery	Naturals
1995	20	381	20	421	48
1996	72	307	6	385	24
1997	26	420	4	450	61
1998	18	217	0	235	18
1999	36	685	1	722	53
2000	83	232	5	320	17
2001	12	253	1	266	10
2002	75	367	2	444	8
2003	40	350	4	394	16
2004	14	361	5	380	22
2005	2	100	2	104	4
2006	13	131	1	145	7
2007	21	368	3	392	0
2008	12	50	0	62	0

Table 3. Adult steelhead broodstock returns by sex, age, and return time at Dworshak National Fish Hatchery rack, 2007-2008. Three fish were unmeasured.

Ocean Age Class by Run Time	Males	Females	Total
Fall Collection (10/2 to 10/13)			
I-Salt	52	12	64
II-Salt	174	261	436
<u>III-Salt</u>	<u>4</u>	<u>1</u>	<u>5</u>
Total	230	274	504
Spring Collection (2/28 to 5/02)*			
I-Salt	451	59	510
II-Salt	563	1,754	2,317
<u>III-Salt</u>	<u>20</u>	<u>7</u>	<u>27</u>
Total	1,034	1,820	2,854
Combined Total*			
I-Salt	503	71	574
II-Salt	737	2,015	2,752
<u>III-Salt</u>	<u>24</u>	<u>8</u>	<u>32</u>
Total Measured Rack Return*	1,264	2,094	3,358

* Intermittent ladder operation during Spring Run for broodstock management.

Survival

It is difficult to estimate the number of adult steelhead returning to the Clearwater River as a result of hatchery reared steelhead released from DNFH. In the past, an estimated return to the river has been generated using a combination of sources. In addition to the fish collected at the hatchery trap, an estimated 17,486 clipped steelhead were harvested in the sport fishery within the Clearwater River (Jon Hansen, IDFG, unpublished data). This harvest would be from a combination of DNFH and CFH releases. Over the three release years (2004, 2005, 2006), fish released directly to the Clearwater River from DNFH have made up around 51% (range 50 to 52%) of the marked hatchery steelhead released in the Clearwater basin (Table 4). Using this proportion results in an estimated harvest of 9,385 DNFH direct released steelhead. Using a proportional breakdown by year class produces a similar number. If harvest is location specific, then we would assume about 51% of the fish harvest downstream from DNFH, all fish harvest in the North Fork Clearwater, and none of the fish harvested upstream from North Fork would be the returning adults from fish released directly from DNFH. This approach yields an estimated harvest of 6,443 steelhead from DNFH direct releases. Including marked outplanted fish, DNFH steelhead made up 76% of all marked steelhead released to the Clearwater River (Table 4), or approximately

13,515 of the estimated CWR steelhead harvest during 2007-2008 (Table 1). An inherent source of error in this estimate is the assumption that all steelhead harvest in the Clearwater River are B-run Clearwater River fish, when it is likely that an unknown portion are hatchery A-run steelhead that have dipped into the Clearwater River and are then caught in the sport fishery.

The Nez Perce Tribal harvest estimate is not yet available. The highest estimated Tribal harvest from recent years was 1,470 adult steelhead during 2005-2006 period. This value was used as a place-holder for our calculations.

The number of DNFH fish that are not harvested and did not return to a hatchery is also difficult to determine. In the past this value was estimated from the number of steelhead collected at Kooskia trap as a proportion of juveniles outplanted to Clear Creek, and extrapolating that proportion to all DNFH outplanted fish. As only 62 steelhead were collected for 2008 broodstock, using this method produced an unlikely estimate of only 71 unharvested DNFH steelhead in this system. Combining these sources, the number of marked adult steelhead released from DNFH that returned to the Clearwater River range from 11,358 to 18,730 during the 2007-08 migration season (Table 1). There is no way to place bounds on these estimates or verify the veracity of any of the component values except the number of fish collected at adult traps.

We attempted to make a separate estimate of hatchery steelhead returning to the Clearwater River based on previous radio telemetry evaluations (Keefer et al. 2007). Four years of telemetry information are available, from 2000-01 to 2003-04 migration years. During those four years the percent of marked radio-tagged steelhead that passed Lower Granite Dam that were last detected in the Clearwater River ranged from high of 36% in 2000-01 to low of 19% during 2003-04, and averaged 27.4% (Table 5). Applying this percentage to the 121,253 clipped steelhead counted at Lower Granite Dam during the 2007-08 migration season (<http://www.cbr.washington.edu/dart/dart.html>), produced an estimated return to the Clearwater River of 33,223 clipped steelhead, of which about 79%, or 26,246 fish, could potentially be from DNFH. Again, the error associated with this estimate is unknown.

Table 4. Numbers of marked steelhead juveniles released from Dworshak National Fish Hatchery (DNFH) and IDFG Clearwater Fish Hatchery (CFH) during 2004, 2005, and 2006, and the proportion that were from Dworshak.

Release year	DNFH outplants	DNFH direct rel	CFH releases	Total released	DNFH % of all
2004	423,632	1,202,055	675,981	2,301,668	70.6%
2005	599,394	1,220,064	514,747	2,334,205	77.9%
2006	689,940	1,206,565	537,632	2,431,137	77.9%
Total	1,712,966	3,628,684	1,447,446	7,067,010	75.6%

Table 5. Number of marked steelhead counted at Lower Granite Dam during four migration seasons that coincided with radiotelemetry monitoring, the proportion of radio-tagged steelhead that passed Lower Granite Dam that were subsequently detected in the Clearwater River, and an estimate of marked adult steelhead that entered the Clearwater River during those four migration seasons and during the 2007-2008 migration season based on the average percentage of radiotagged steelhead in the Clearwater River.

Migration year	Lower Granite marked steelhead	% RT steelhead to Clearwater River	Estimated marked steelhead in Clearwater River
2000-01	94,953	36.1%	34,278
2001-02	219,811	32.3%	70,999
2002-03	164,455	22.0%	36,180
2003-04	128,341	<u>19.2%</u>	24,641
	Average	27.4%	
2007-08	121,253	27.4%	33,223

The III-salt returns in 2008 complete the returns from the 1,202,055 smolts directly released from Dworshak NFH in 2004. Total rack returns to Dworshak NFH for each age class in that brood year were 372 (11%) I-salt, 3,003 (88%) II-salt, and 32 (1%) III-salt fish (Table 6). The ten-year average return rate (1995-2004 release groups) was 0.362%. The mean hatchery rack return rate for the 1980-1999 is 0.480% (Table 6). Relative to all marked steelhead released to the Clearwater River (including CFH releases), 3,407 adults collected at the DNFH trap represent a 0.148% return.

Table 6. Rack return vs. direct release numbers for summer steelhead at Dworshak NFH, release years 1980-2006. Beginning in 2001 we operated the ladder intermittently to manage for broodstock collection, since the rack return is manipulated the total and percent return is displayed for comparison purposes only.

Release Year	Smolts Released	I-Salt	II-Salt	Returns		Total	Rack Return %
				III-Salt			
1980	2,666,085	400	6,613	652		7,665	0.2875
1981	1,930,047	124	1,538	1,219		2,881	0.1493
1982	2,108,319	1,094	12,679	403		14,176	0.6724
1983	1,259,110	120	3,359	239		3,718	0.2953
1984	1,208,319	700	8,318	119		9,137	0.7562
1985	1,035,573	431	3,487	317		4,235	0.4090
1986	1,239,541	168	5,296	215		5,679	0.4582
1987	1,206,580	428	9,896	314		10,638	0.8817
1988	1,432,125	487	7,339	250		8,076	0.5639
1989	1,073,900	218	3,132	162		3,512	0.3270
1990	1,466,664	313	7,349	153		7,815	0.6699
1991	1,192,503	389	3,543	76		4,008	0.3361
1992	1,224,101	61	1,270	71		1,402	0.115
1993	1,217,990	48	4,005 ¹	83		4,136 ¹	0.3396
1994	1,153,417	384	2,537	38		2,959	0.2565
1995	1,213,577	349	3,308	87		3,744	0.3085
1996	1,377,435	253	4,976	69		5,298	0.3846
1997	1,361,034	356	2,225	96		2,677	0.1967
1998	1,228,944	588	5,745	177		6,510	0.5297
1999	1,249,237	570	6,226	129 ²		6,925	0.5543
2000	1,311,447	1,330	4,555 ²	101 ²		5,986	0.4564
2001	1,247,550	560 ²	2,988 ²	78 ²		3,626	0.2906
2002	1,365,823	678 ²	3,876 ²	34 ²		4,588	0.3359
2003	1,210,919	408 ²	2,837 ²	157 ²		3,402	0.2809
2004	1,202,055	372 ²	3,003 ²	32 ²		3,407	0.2834
2005	1,122,064	354 ²	2,754 ²			1-ocean	0.003%
2006	1,206,565	574 ²				2-ocean	0.245%
2007	1,312,486					3-ocean	0.049%

¹Does not include twenty unmeasured fish.

² Intermittent ladder operation for broodstock management.

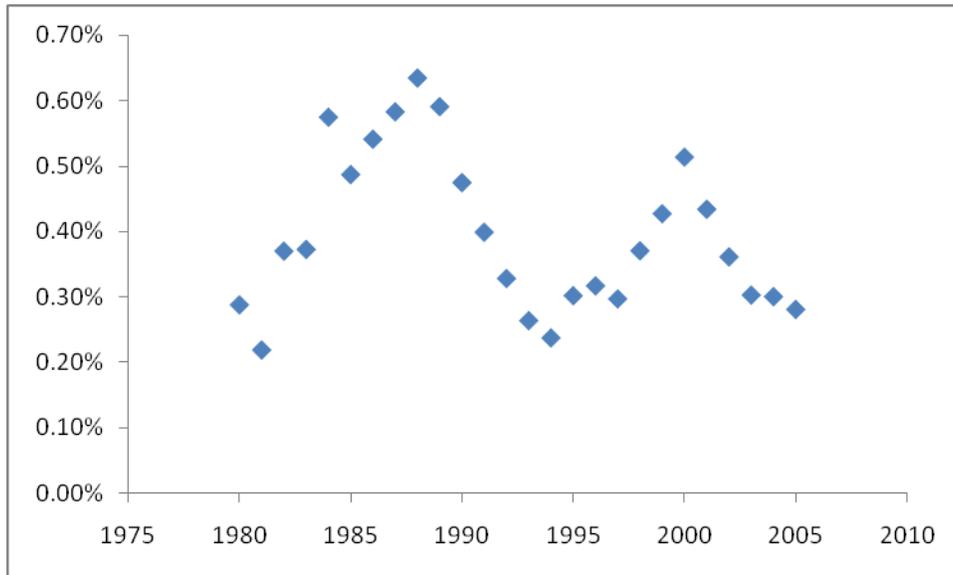


Figure 3. Three average of smolt-to-adult returns for steelhead returning to DNFH. Year (x-axis) is year of release. Returns (y-axis) are cumulative 1, 2, and 3-ocean adults.

Adult Outplanting

When we trap more adult steelhead at the hatcheries than are necessary for brood stock, they are transported and released into various streams throughout the Clearwater River basin. A total of 1,144 adults were outplanted from Dworshak and Kooskia NFHs in March 2008 and April 2008 for both supplementation and fishery recycle (Table 7).

Table 7. Number, location, and purpose of summer steelhead outplanted from Dworshak and Kooskia NFHs for supplementation in 2008.

Source	Release Location	Total
Dworshak NFH	Peasley Creek	657
	Mill Creek	225
	Yakus Creek	162
	Total	1,044
Kooskia NFH*	SF Clearwater R	60
Total		1,104

*Total steelhead collected at KNFH was 62; 2 were sacrificed for CWT recovery

PIT Tag Recoveries

Ten fish with PIT tags were collected from the 2008 broodstock during spawning. Of these 10 fish, one was a 2-ocean steelhead tagged as a juvenile at Clearwater FH. The remaining nine fish were PIT tagged as juveniles at Lower Granite Dam as part of the NOAA Fisheries transport and survival studies; two 2-ocean and seven 1-ocean fish (the latter were potentially straying A-run fish). Returning adult PIT-tagged steelhead from DNFH and CFH were detected at downstream Columbia and Snake River dams. Overall, seven DNFH and 41 CFH steelhead were detected at Bonneville Dam, which represents 0.13% of the PIT-tagged fish released during the 2004-2006 migration years from the two facilities. Three of these DNFH fish and 33 of the CFH fish were detected at Lower Granite Dam, or a little less than 0.1% of release groups from both facilities. The detections by release year are shown in Table 8. These PIT-derived return rates are noticeably lower than what would be indicated from previous estimates for Clearwater River steelhead (see Tables 1 and 6). Potential reasons are that PIT-tagged steelhead experience tag loss and lower survival than untagged fish (e.g. Knudsen et al. 2009), or that component estimates in Table 1 (i.e. harvest estimates) are inflated from out-of-basin (A-run) steelhead that stray into the Clearwater River.

Table 8. Numbers of Dworshak National Fish Hatchery (DNFH) and Clearwater Fish Hatchery (CFH) PIT-tagged juvenile steelhead released and subsequently detected at Bonneville (BON) and Lower Granite (GRA) dams as returning migrating adults.

Release year	DNFH				CFH				Combined Adults % at GRA
	PITs released	Adults at BON	Adults at GRA	% at GRA	PITS released	Adults at BON	Adults at GRA	% at GRA	
2004	1496	0	0	-	11170	1	0	-	-
2005	1498	4	2	0.134%	11276	23	19	0.168%	0.164%
2006	1494	3	1	0.067%	11032	17	14	0.127%	0.120%

Coded-Wire Tag Recoveries

A total of 301 (9%) adult steelhead collected at DNFH in 2008 contained coded-wire tags (CWT). Of these, 247 originated from DNFH, 33 originated from other known location(s) and 22 have yet to be identified to origin. Of the 247 DNFH fish, one was released as a smolt in 2003, none were from 2004, 144 were released in 2005, 35 were released in 2006 and for 67 the release year could not be determined. Of the fish from other known locations, 28 originated from Crooked River and Trap (28) and one each came from the SFCR, Tucannon River, Walla Walla River, and Snake River. Two of the 62 steelhead collected at Kooskia NFH contained a CWT. A summary of adult steelhead coded-wire tag recoveries in the Dworshak and Kooskia NFHs racks are shown in Table 9.

Evaluation of Run Projection for 2008 and Forecast for 2009

2008 Prediction. The 2008 run prediction and actual rack return by age class is listed in Table 10. Our 2008 prediction was a slight underestimate of the expanded return. The prediction of II-Salts is based on the number of jacks the previous year. The predictions for I-salts and III-salts are based on average return rates. The hatchery fish return to the Clearwater River (see Table 1) was up from the previous year and still well above average.

Table 9. Summary of coded-wire tag recoveries for adult summer steelhead in the Dworshak and Kooskia NFH racks, 1987-2008.

Year	Total Recoveries	Recoveries of Dworshak Stock	Recoveries of Marks from Strays
1987 ⁴	397	388 ¹	9
1988	50	44	6
1989	284	279 ¹	5
1990	587	571 ¹	16
1991	738	738	0
1992	325	322 ¹	3
1993	511	508	3
1994	238	234	4
1995	108	108 ¹	0
1996	330	326 ²	4
1997	342	341 ²	1
1998	378	368 ³	10
1999	446	445 ³	1
2000	378	375	3
2001	405	403	2
2002	637	630	7
2003 ⁴	1012	1011	1
2004 ⁴	713	708	5
2005 ⁴	285	277	8
2006 ⁴	577	574	3
2007 ⁴	229	225 ³	4
2008 ⁴	301	247 ³	32

¹Includes NMFS transportation study marks.

²Includes NMFS transportation study marks and Clearwater

Hatchery marks from the South Fork Clearwater River releases.

³Includes Clearwater Hatchery marks from

South Fork Clearwater and Clear Creek releases.

⁴Intermittent ladder operation for broodstock management.

Table 10. Comparison of predicted, expanded, and actual adult rack returns for summer steelhead at Dworshak NFH, 2007-2008.

Ocean Age Class	Predicted	Expanded Return	Actual Rack*
I-Salt	430	1,041	574
II-Salt	6,247	8,832	2,768
III-Salt	218	462	32
Total	6,895	10,335	3,374

*Ladder was operated intermittently for broodstock management.

2009 Steelhead Run Prediction. Based on the 574 I-salt rack returns (expanded) the predicted steelhead return to Dworshak NFH for 2008-2009 is shown in **Table 8**. The return should be about average, even though the current in-season hatchery “B” steelhead counts at Bonneville are slightly lower than the 10-year average the Lower Granite counts are above the 10-year average. Based on this prediction we will continue with intermittent ladder operation to prevent excess fish collection. As mentioned intermittent ladder operation keeps steelhead in the river where they are available for sport and tribal harvest and allows us to spawn fish that have not been held in the hatchery for more than a few days.

Table 8. Predicted steelhead returns to Dworshak NFH rack, 2008-2009.

Ocean Age Class	2008-09 Prediction
I-Salt	482
II-Salt	2934
III-Salt	68
Total	3483

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