MAGIC VALLEY HATCHERY

2009 Brood Year Report

By:

Rick Lowell
Fish Hatchery Manager II

Tom Tighe
Assistant Fish Hatchery Manager

Wade Symons
Fish Culturist

Brandon Filloon
Fish Culturist

Jeff Walker
Maintenance Craftsman

IDFG
10-109

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ABSTRACT

The Twenty-second year (May 1, 2009 to May 10, 2010) of steelhead *Oncorhynchus mykiss* production at Magic Valley Steelhead Hatchery (MVSH) was completed with a total of 1,599,775 smolts planted. Smolt and surplus fingerling production yielded a total weight of 330,396 pounds. Fish were fed 313,065 pounds of feed for a conversion of 0.99 (pounds of feed per pound of gain).

Four different stocks of steelhead were received as eyed eggs or swim-up fry during May and June of 2009. The Dworshak B-run eggs (Dwor B) totaled 1,000,000 and contributed 864,160 smolts to the river. The Upper Salmon B-run eggs (USB) totaled 117,677 and contributed 95,023 smolts to the river. The Sawtooth A-run eggs (Saw A) totaled 139,809 which produced 117,883 smolts. The Pahsimeroi A-run eggs (Pah A) totaled 622,942 and yielded 522,709 smolts. Better than predicted early rearing survival in all steelhead stocks resulted in a total of 106,905 surplus fry being stocked into Salmon Falls Creek Reservoir.

For the thirteenth consecutive year, Hayspur strain sterile rainbow and kamloop trout eggs were started here to help Hagerman State Fish Hatchery (HSFH) with their shortage of incubation space during the winter.

Authors:

Rick Lowell
Fish Hatchery Manager II

Tom Tighe
Fish Hatchery Assistant Manager

Wade Symons
Fish Culturist

Brandon Filloon
Fish Culturist

Jeff Walker
Maintenance Craftsman

INTRODUCTION

MVSH is part of the Lower Snake River Fish and Wildlife Compensation Plan (LSRCP), compensating for losses of steelhead, *Oncorhynchus mykiss* caused by the Lower Snake River Dams. The hatchery was constructed by the Army Corps Of Engineers (ACOE), is administered and funded by the U.S. Fish and Wildlife Service (USFWS), and operated by the Idaho Department of Fish and Game (IDFG).

The hatchery is located in Twin Falls County, seven miles Northwest of Filer in the Snake River Canyon. The hatchery has a water right for 125.47 cubic foot per second (cfs) of 59°F water from Crystal Springs, located on the North shore of the Snake River.

All smolts were transported by truck to the Salmon River, associated tributaries, or acclimation ponds. The brood sources were Dworshak National Fish Hatchery (Dwor B-run stock), Upper Salmon B (Squaw Creek Pond Stock), Sawtooth Fish Hatchery (Saw A-run), and Pahsimeroi Fish Hatchery (Pah A-run stock).

OBJECTIVES

1. To hatch and rear an appropriate number of A-run and B-run steelhead smolts for stocking in the Salmon River and its tributaries to achieve the mitigation goal of 11,660 adult steelhead back to Idaho waters.

2. Provide smolts and consequently, returning adults that could be utilized for harvest, broodstock, supplementation, reintroduction, and research purposes.

3. Mark hatchery smolts prior to release to avoid mixed stock harvest and to maximize harvest and natural production management options.

FACILITIES

The hatchery building houses the incubation and early rearing room with 40 upwelling 12 gal capacity incubators. Each incubator is capable of handling and hatching 50,000-75,000 eyed eggs. During Brood Year 2005, two incubators were placed on stainless steel stands on the floor of each raceway. During Brood Year 2006, hatchery personnel began to replace the heavy stainless steel stands (60 lbs. each) with three pieces of 8” X 8” X16” aluminum square stock tubing (9.4 lbs. each). There are 20 concrete tanks (4 ft x 3 ft x 40 ft, 418 cubic ft of rearing space) with a capacity of rearing 100,000 steelhead fingerlings to 200 fish per pound size. During May, 2006, four fiberglass, rectangular “Canadian Troughs” (2.5 ft x 1.5 ft x 21 ft) were added to the hatchery building. Sixty automatic fry feeders are included in the hatchery building as well. The hatchery building also contains an office, fish health examination room, shop, dormitory, enclosed storage room, covered vehicle storage area, feed storage room, mechanical room for water pumps, and a water chiller.

There are 32 outside rearing raceways (10 ft x 3 ft x 200 ft, with 6,153 cu ft of rearing space). These raceways slope in opposite directions resulting in 16 East raceways and 16 West raceways. Each raceway has the capacity to raise 60,000-64,000 smolt-size steelhead. The raceways may be further divided to result in a total of 64 individual rearing subunits. A moveable bridge equipped with 16 automatic Neilsen fish feeders spans the outdoor raceways. Two 40,000-pound bulk feed bins, equipped with fish feed fines shakers and a feed conveyor, complete the outside feeding system.

There are two tailraces outside located on opposite ends of the facility. Each flows to the north where they join in a common 54-inch pipe before entering the flow-through settling pond. The hatchery effluent water is treated by opening valves in the bottom of quiescent zones and sweeping wastes into a cleaning wastewater pond (approximately 2.5 surface acres). A hatchery flow-through wastewater pond (about 1.5 surface acres i[illegible]es the non-cleaning wastewater. All cleaning effluent must pass through both ponds prior [illegible].

Some density and flow indices may exceed the maximum recommended levels of .30 lbs of fish per cubic foot of rearing space per inch of fish length, and 1.19 lbs per gal per minute per inch of fish length at the end of the rearing cycle. Appendix A shows flows over the last sixteen years during early April representing flow at or near projected maximum loading. As a result of the cancellation of a verbal water exchange agreement with Clear Springs Foods, 4 cfs of flow was not diverted to MVSH this year. Consequently, high flows during April dropped to 73.1 cfs.

WATER SUPPLY

The MVSH water supply collection facility is located on the north wall of the Snake River canyon. It collects the 59°F spring water from Crystal Springs in a covered concrete channel system, which consolidates the flow in a metal building. A 42-inch pipeline has the capacity to deliver 125.47 cfs of water via gravity flow to the outside raceways. Water may be diverted from the headrace supply line for use in the auxiliary supply waterlines. The auxiliary supply line allows supplemental water usage between raceway sections to improve water quality in the lower sections and to clean upper quiescent zones without dewatering the bottom section. The hatchery building receives water through a 14-inch pipeline, which branches off prior to going through the outside raceways. Water going to the hatchery building is degassed in packed columns above each individual raceway.

STAFFING

During the 2009 brood year, MVSH was staffed with the following permanent employees: Rick Lowell, Fish Hatchery Manager II; Tom Tighe, Assistant Hatchery Manager; Wade Symons, and Brandon Filloon Fish Culturists. In addition, temporary Bio-aides or Laborers are hired to assist with essential fish culture duties during peak production, smolt transportation, and adipose fin clipping. Our Bio-aides during this brood year were, Eric Sharp and Jake Wheeler. Jeff Walker continues as a part time Hatchery Maintenance Craftsman. All fish marking was coordinated and completed by Pacific States Marine Fisheries Commission (PSMFC) fish marking personnel.

FISH PRODUCTION

Egg Shipments and Early Rearing

As a result of the continued depletion of the Eastern Snake River Plain Aquifer (ESRPA), production targets remained at approximately 1.6 million smolts for BY 2009. MVSH received 1,000,000 Dwor B eyed eggs and 117,677 USB eyed eggs. A-run eyed eggs included 622,942 Pah A, and 139,809 SAW A. The combined total number of steelhead eggs and swim-up fry received this year was 1,880,428. All eggs were received during May and June 2009. The survival of eyed eggs to smolts is found in Appendix B.

All eggs received were treated with Povidone Iodine at 100-ppm for ten minutes, and put into the upwelling incubators (50,000-75,000 eggs per incubator, 15 gals/min). The eggs hatched within five days and emerged from the incubators into the hatchery tanks twelve days after hatching. Each of the 20 hatchery tanks (with a flow of 100-250 gals/min) averaged 100,000 feeding fry until they reached between 100 and 200 per pound or approximately 2.5 inches long. At that time, fish were adipose clipped then transferred to the larger outdoor raceways. The highest mortality rate occurred during the hatching, swim-up, and early-rearing [illegible] Historically, Dwor B progeny survive at a significantly lower rate than other stocks. Recent changes in incubation techniques continue to influence higher early rearing survival for Dwor B Stock Steelhead. Appendix C compares the 21 year average of survival from the eyed egg stage to final release for all stocks cultured at MVSH.

Surplus Steelhead Fry Distribution

As a result of better than predicted survival, surplus steelhead fry were transported and released into Salmon Falls Creek Reservoir. With the assistance of HSFH, a total of 50,034 Dwor B (435 lbs.), 47,489 Pah A (454 lbs) and 9,382 Saw A (122 lbs.) were stocked into Salmon Falls Creek Reservoir in early September 2009.

Hayspur Sterile Rainbow and Kamloop Production

For the thirteenth consecutive year, Hayspur strain rainbow and Kamloop trout eggs were started here to help HSFH with their shortage of incubation space during the winter. Appendix D summarizes Hayspur egg to fry survival.

Final Production Rearing

Fish were primarily fed Rangen 470 extruded salmon diet using Haskell's (1967) feeding rate formula. The feeding rate was calculated using a 10.0 hatchery constant. Fish are started on feed as one-inch swim-up fry and hatchery growth ends with an approximate 8.10-inch smolt. The fish had a conversion of 0.99 pounds of feed to produce a pound of fish.

Generally, an inch of growth per month for the first three months is achieved when the fish are fed every day. An intermittent feeding schedule of four days on and three days off was implemented from early December to late January, then shifting to a five days on and two days off schedule until the end of March, and finally shifting to a seven days a week feeding regime for most raceways until release, bolstering fat reserves prior to migration. The intermittent feeding schedules were implemented to insure that the fish met the target size at release. The steelhead maintained an average of a 0.50 inch per month growth increase during the four months that this intermittent feeding regime was administered. See Appendix E for feed and total costs for the year.

Piper's (1970) formulas for density and flow indices were used to calculate the densities and flows for each tank or raceway. The maximum recommended density index of .30 or 1.19 flow index was not reached until the end of March in some raceways. Cumulative average density and flow indices at time of release remained close to the maximum parameters set by the LSRCP performance indicator program. Final pond inventories and indices for the individual raceway numbers, densities, and flows are found in Appendix F.

Maximum flow for the year occurred during October and November at 87.2 cfs as compared to (89.7 cfs, October, 2008). Spring flows began their seasonal decline during the last four months of rearing. Only 26 raceways were used for final production in order to maintain a water turnover rate of two per hour or greater. Each of the outside 26 raceways maintained approximately 2.8 cfs of flow prior to smolt distribution in April.

Smolt distribution commenced on Ap 4 ntinued through April 29th. Three or four trucks were used daily for the transportatio lbs. of smolts and involved 67 truckloads (Appendix G). Transportation costs continued to decrease during 2010. Brood Year 2008 transportation costs totaled $109,463.48 for 76 truckloads while brood year 2009 was $101,363.50 with 9 less truck loads than the previous year (Appendix H). Hatchery personnel continued to target 5,000 lbs. per load to meet the Integrated Hatcheries Operation Team (IHOT) recommendations.

Length Frequency Data

Combined length frequencies were taken from all stocks this year and are shown in Appendix I.

FISH HEALTH

Diseases Encountered and Treatment

No major losses were experienced in any of the four steelhead stocks at MVSH during BY09. The Dwor B experienced light mortality from a sore back condition. When the ulcers were examined, *Flavobacterium psychrophilum* and *Aeromonas hydrophila* were cultured. Losses were not high enough to warrant medicated feed treatments. The sore back problem corrected itself without treatment.

Bacterial coldwater disease (CWD), caused by *Flavobacterium psychrophilum*, was the primary pathogen detected at MVSH for the majority of the BY09 rearing season. Clinical CWD was first detected in the vat building (vat 15) from the Dwor B fish in June, 2009 and was treated successfully with a 10-day Aquaflor-medicated feed treatment. In late August, 2009 (shortly after fish marking), raceways W7,8,9,10B and E1,2,3,4 and 5B experienced elevated mortality and were treated successfully with a 10-day Aquaflor-medicated feed treatment.

There were no known cases of *Nucleospora salmonis* (NS) detected in kidney samples taken from any of the four stocks of steelhead reared at MVSH in 2009-2010.

Organosomatic Index

See Appendix J.

Acute / Chronic Losses

The only acute losses of steelhead at MVSH in the BY09 fish occurred in random raceways during April, when the fish were near smolting and the poundage/densities were nearing maximum. Total mortally per raceway was about 100 fish or less. The duration of each event was 24-36 hours

with no apparent residual losses, and no obvious explanation could be determined. It has been suggested that high dissolved gasses (up to 104% saturation) may be a factor, but that should be true for the entire hatchery, not just random raceways. No evidence of nocturnal predators (mink, otters, etc.) could be found. It is the pathologist's opinion that some single, random stress event combined with the factors listed above to cause these losses.

Other acute losses were not experienced at this hatchery during the rearing of this brood year. Losses from *Flavobacterium* and *Aeromonas* were not high enough to be considered chronic.

Other Assessments

Fish in the outside raceways experienced the annual chronic "sore-back" condition, in which dorsal fin erosion continues on into the dorsal musculature of the fish. Daily mortality rate was never high, but the general quality of the fish population may have been compromised. This was the third consecutive year that the severity of this syndrome has been greatly reduced in response to changes in fish culture techniques (increasing the feed rate during September and holding the fish at higher densities during the early outdoor portion of the rearing cycle).

Precocial males were not noticed during preliberation sampling. Two hundred forty fish were examined (60 per stock). This is quite an improvement and the hatchery staff should strive to maintain this quality of product.

Prior to release, storms cells (low barometric pressure) came through the Magic Valley area, which most likely elevated total gas pressure and caused mortality in several raceways by causing gas bubble trauma. Before there is a major catastrophe, renovation of the degassing tower, possibly placing a series of degassing towers (similar to Clearwater Hatchery) should be considered.

As drought, urban sprawl, and agricultural needs reduce flows at MVSH, it will be more difficult to raise the current production levels of steelhead to full term smolts. Evaluation of the mission of this hatchery and mitigation should be revisited.

FISH MARKING

As a result of a cooperative agreement with Hagerman National Fish Hatchery (HNFH) and MVSH, a production exchange was initiated for the BY 2009 fish. MVSH received all of HNFH's Dwor B production and in return, HNFH received MVSH's East Fork Natural (EFN) program, the unmarked Saw A's for the Yankee Fork and Valley Creek, and Saw A's for the Tunnel rock release location. An added benefit to both hatcheries from the production exchange was an increase in fish quality. HNFH has smaller early rearing tanks that accommodated the EFN program better and MVSH is better able to rear Dwor B's.

In BY08, MVSH had a total of 13 sites for spring smolts releases, while BY09 only had a total of 8 sites, because of the exchanges made with HNFH and a reduction in sites initiated by the Nampa Research Staff.

In response to recommendations from various hatchery reviews and recommendations, a decision was made by Fisheries Management to release all of the BY09 USB smolts below the Pahsimeroi Weir this year, instead of releasing them into Squaw Creek. This change is intended to increase the probability of capturing a larger proportion of USB adults returning and strengthening the transition from Dwor B releases in the upper Salmon River to the locally adapted USB stock.

At MVSH the fin clipping crew Ad-marked 1,550,141 fish during July, August, and September. Fin-clipping mortality was negligible; however, raceways W7,8,9 A&B, W10B, E1,2,3,4 A&B and E5B showed elevated mortality after the first round of fin clipping and were treated with a 10-day Aquaflor regime for CWD.

A total of 586,681 fish received Coded-Wire Tags (CWT) in 2009, of which 569,181 survived and were out-planted as smolts in 2010. Eight different release locations were identified by CWT's. See Appendix K for CWT details.

In addition to the fish with CWT's injected into them, a total of 32,817 also had Passive Integrated Transponder Tags (PIT) inserted in them. There were 32,742 PIT tagged smolt's that were released in spring, 2010. See Appendix L for PIT details.

MAINTENANCE PROJECTS

During the year, the following projects were completed:

1. Repainted walls and installed vent fa… … guest bathroom of residence C.
2. Repaired three intake raceway valves.
3. A local contractor pumped all four residences septic tanks.
4. Completed installing topsoil and grass seeding in front of residence “C” driveway.
5. Removed over-grown shrubs from in front of the Hatchery Dormitory.
6. Worked on the remodeling of Residence “A” basement Bathroom.
7. Received new Pressure Washer from LSRCP.
8. Removed over-grown sagebrush from the hatchery perimeter fence.
9. Coordinated Fish Transport Tanker repairs with Steve Money from Hagerman National Hatchery.
10. Rick received training from Steve Money in how to inspect trailer sub-frames for rust and damage.
11. Received a new YSI Oxygen meter from LSRCP.
12. Provided personnel to assist with vaccinating rainbow broodstock at Hayspur Hatchery.
13. Provided personnel to assist Hagerman State Hatchery with stocking catchable rainbow in the South Fork Boise River.
14. LSRCP replaced the hatchery heat / irrigation system pumps. Our new pumps are variable frequency drive (VFD) and are superior to the old system.
15. LSRCP provided funding to purchase approximately 130 new aluminum dam boards, 10 new Eagar upwelling incubators, and 5 pairs of new neoprene waders.
16. Had a local fencing contractor install new access gates to the feed loading area and traveling bridge.
17. Completed installing chicken wire to the hatchery perimeter chain link fence to prevent smaller predators from entering the raceways.
18. Received 80 new incubator filter pads for BY 2010 incubation.
19. Picked up 6 low head oxygen (LHO) boxes from Nampa Hatchery to test at Magic Valley Hatchery.
20. A local HVAC contractor replaced an electronic actuating valve for our water chilling unit.
21. Performed dissolved oxygen and saturation monitoring.
22. New Carpet was installed in all 4 residences.
23. A local contractor completed work on finishing taping and texturing the basements in residences A, B, and D.
24. Purchased a new break room refrigerator and mortality disposal upright freezer.
25. A local contractor completed the installation of two new frost-free hydrants on the south side of the raceways.
26. With the assistance of Jerry Chapman, we installed an LHO box in raceway W10B. After a little fine tuning, the LHO was functioning correctly and increased the dissolved oxygen by one to two parts per million.

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Piper, R.G. 1970a. Know the proper carrying capacities of your farm. American Fishes and U.S. Trout News 15 (1):

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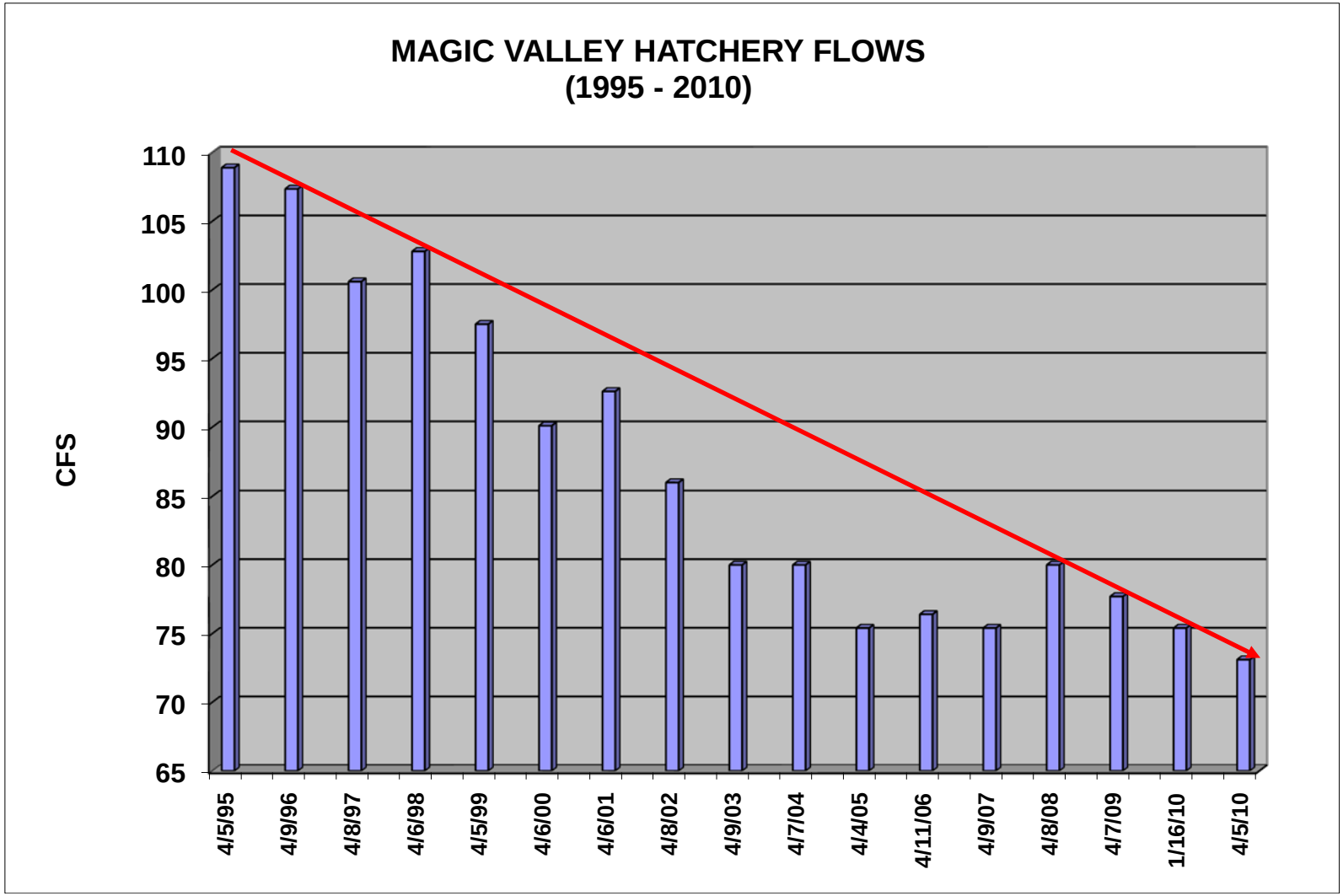
APPENDICES

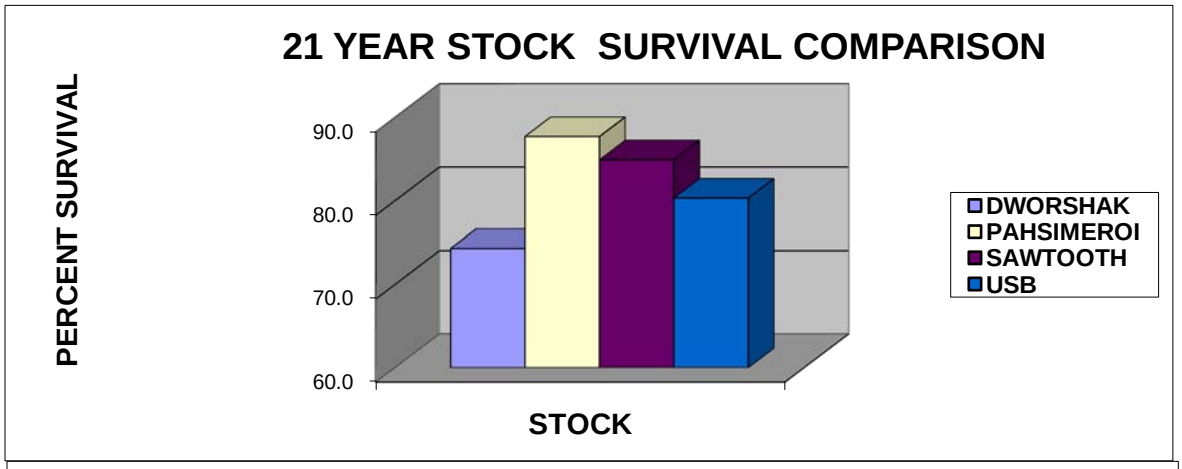
Appendix A. Hatchery Water Flows 1995 - 2010.

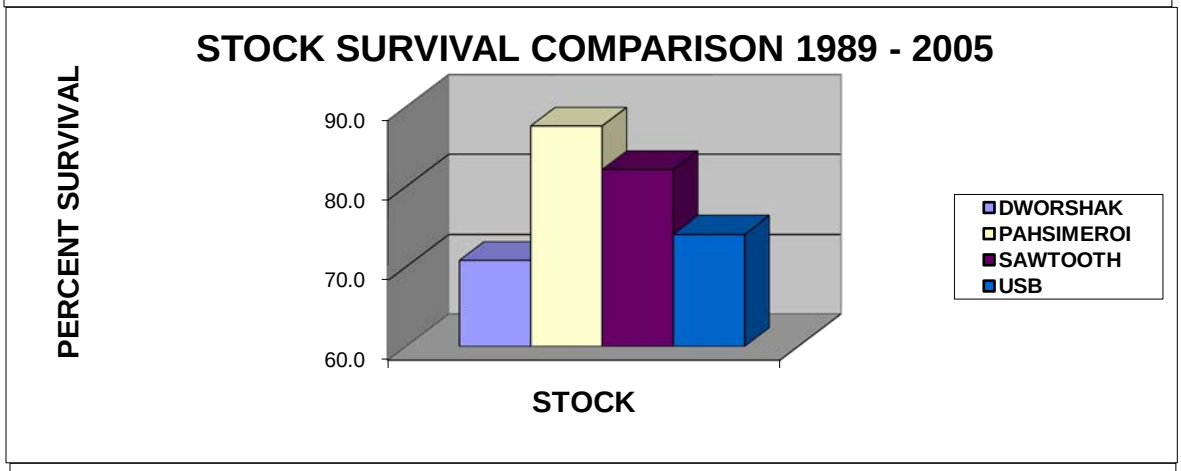


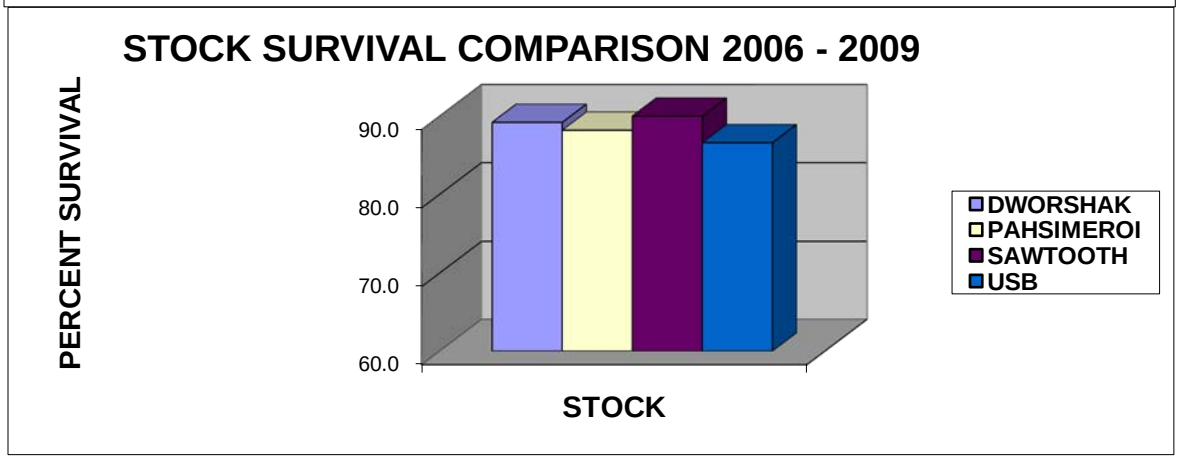
Appendix B. Brood Year 2009 Steelhead Survival Rates.

	DWORSHAK "B"	UPPER SALMON "B"	EAST FORK NATURAL "B"	PAHSIMEROI "A"	SAWTOOTH "A"	GRAND TOTAL
TOTAL EGGS RECEIVED	1,000,000	117,677	0	622,942	139,809	1,880,428
SMOLTS STOCKED	864,160	95,023	0	522,709	117,883	1,599,775
WEIGHT SMOLTS	174,016	20,500	0	108,969	25,900	329,385
NO./LB.	4.97	4.64	0	4.80	4.55	4.86
FALL FRY RELEASES	50,034	0	0	47,489	9,382	106,905
WEIGHT FRY	435	0	0	454	122	1,011
TOTAL NUMBER	914,194	95,023	0	570,198	127,265	1,706,680
TOTAL WEIGHT	174,451	20,500	0	109,423	26,022	330,396
% SURVIVAL EGG/RELEASE	91.4%	80.7%	0.0%	91.5%	91.0%	90.8%
POUNDS OF FOOD	169,608.2	18,648.1	0.0	102,026.6	22,782.2	313,065.1
CONVERSION	1.01	0.97	0.00	0.96	0.93	0.99

Appendix C. Twenty-one - Year Average of Stock Survival.







Appendix D. Hayspur Rainbow and Kamloop Trout started for Hagerman State Hatchery 2009 - 2010.

Hayspur Eggs Received @ Magic Valley Hatchery 2009-2010

Date	Vat #	Egg #	Stock	Moved to Date	Hagerman Pounds	#/lb	Number	Percent Survival Eggs
12/8/2009	11	101,875	T9	2/2/2010	235	385	90,475	88.8%
12/8/2009	12	100,054	T9	2/2/2010	258	345	89,010	89.0%
12/8/2009	13	100,000	T9	2/2/2010	221	401	88,621	88.6%
12/8/2009	14	104,297	KT	2/2/2010	229	405	92,745	88.9%
12/15/2009	15	110,000	T9	2/2/2010	207	471	97,497	88.6%
12/15/2009	16	104,926	T9	2/2/2010	171	542	92,682	88.3%
12/15/2009	17	109,908	T9	2/2/2010	150	644	96,600	87.9%
12/22/2009	18	110,000	T9	2/9/2010	181	539	97,296	88.5%
12/22/2009	19	110,000	T9	2/9/2010	176	551	96,918	88.1%
12/22/2009	20	110,000	KT&T9	2/9/2010	174	558	96,938	88.1%
TOTALS:		**1,061,060**			**2,002**	**484.1**	**938,782**	**88.5%**

Appendix E. Brood Year 2005-2009 Steelhead Production Feed Cost and Utilization.

	BY 2009	BY 2008	BY 2007	BY 2006	BY 2005
Number Of Fish	1,706,680	1,704,700	1,840,092	1,906,279	1,547,990
Lbs Of Fish	330,396	346,005	355,134	377,924	364,100
Feed Cost	$164,290.71	$175,826.94	$168,119.49	$152,347.56	$130,326.96
Lbs Of Feed	313,065	327,936	354,745	360,000	347,512
Conversion	0.99	0.95	1.00	0.95	0.95
Total Cost	$650,124.33	$595,116.15	$662,067.69	$667,125.46	$714,756.00
Cost Per 1000 Fish	$380.93	$349.10	$359.80	$349.96	$461.73
Cost Per Pound Fish	$1.97	$1.72	$1.86	$1.77	$1.96
Feed Cost/Lb. Fish	$0.50	$0.51	$0.47	$0.40	$0.36

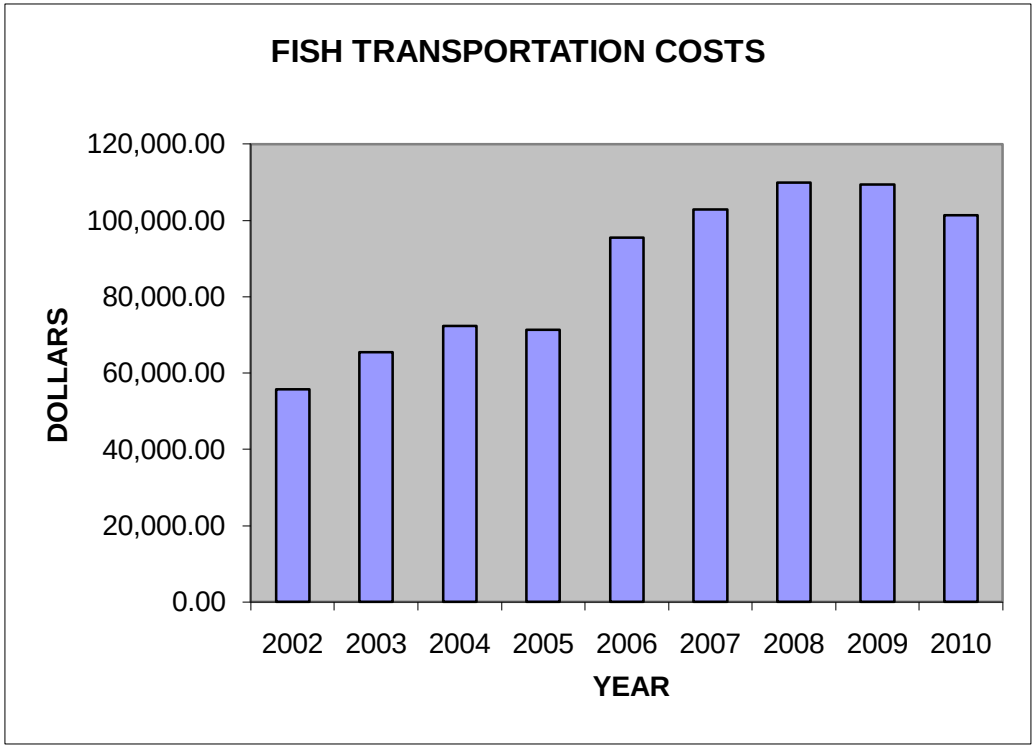
Appendix F. Brood Year 2009 Smolts Final Raceway Inventory with Flow and Density Indices.

Raceway	Stock	Number	Weight	No/lb	Length	Flow Index	Density Index
E1A	DWOR B	30,733	7,130	4.31	8.45	1.31	0.31
E1B	DWOR B	30,674	5,700	5.38	7.84	1.15	0.27
E2	DWOR B	62,242	12,700	4.90	8.09	1.24	0.29
E3A	DWOR B	31,160	6,800	4.58	8.28	1.30	0.31
E3B	DWOR B	30,776	5,999	5.13	7.97	1.19	0.28
E4	DWOR B	62,366	12,800	4.87	8.11	1.25	0.29
E5A	PAH A	30,711	5,658	5.43	7.82	1.15	0.27
E5B	DWOR B	31,163	5,742	5.43	7.82	1.16	0.27
E6	PAH A	60,052	12,550	4.79	8.16	1.22	0.29
E7	PAH A	61,422	13,100	4.69	8.21	1.26	0.30
E8A	PAH A	30,717	6,400	4.80	8.15	1.24	0.29
E8B	PAH A	30,724	6,000	5.12	7.98	1.19	0.28
E9	PAH A	61,494	12,700	4.84	8.13	1.24	0.29
E10	PAH A	61,575	13,300	4.63	8.25	1.28	0.30
E11	PAH A	61,562	12,654	4.87	8.11	1.24	0.29
E12	PAH A	62,984	13,545	4.65	8.24	1.30	0.31
E13	PAH A	61,389	13,062	4.70	8.21	1.26	0.30
W1	DWOR B	62,450	12,221	5.11	7.98	1.21	0.29
W2	DWOR B	61,536	12,198	5.04	8.01	1.21	0.28
W3	DWOR B	61,496	12,082	5.09	7.99	1.20	0.28
W4	DWOR B	62,342	12,394	5.03	8.02	1.22	0.29
W5	DWOR B	60,057	12,070	4.98	8.05	1.19	0.28
W6	DWOR B	61,518	13,030	4.72	8.19	1.26	0.30
W7	DWOR B	62,013	11,600	5.35	7.86	1.17	0.27
W8	DWOR B	61,161	12,650	4.83	8.13	1.23	0.29
W9	DWOR B	61,915	12,700	4.88	8.11	1.24	0.29
W10A	SAW A	29,185	6,300	4.63	8.25	1.21	0.28
W10B	DWOR B	30,637	6,200	4.94	8.07	1.22	0.29
W11	SAW A	58,963	13,200	4.47	8.35	1.25	0.29
W12A	USB	31,703	6,900	4.59	8.27	1.32	0.31
W12B	SAW A	29,735	6,400	4.65	8.24	1.23	0.29
W13	USB	63,320	13,600	4.66	8.23	1.31	0.31
Total		1,599,775	329,385	4.86	8.12	1.16	0.28

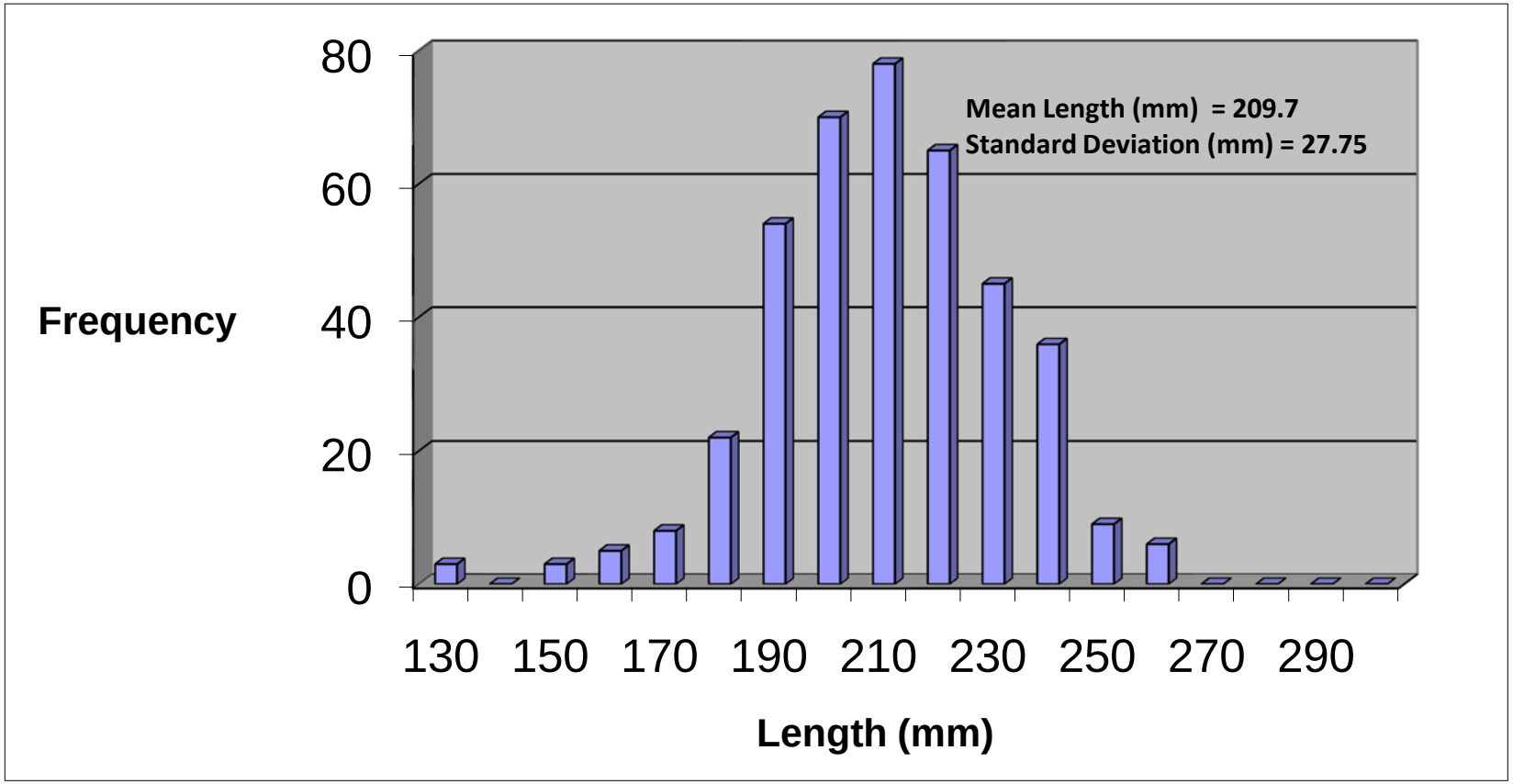
Appendix G. Brood Year 2009 Steelhead Smolt Distribution in the Salmon River and Tributaries.

Facility/Date	Site	Number Released	Stock	Fish/lb	Pounds	Marks
Magic Valley						
*4/13- 4/15/2010	Little Salmon R (Stinky Springs)	279,671	Dwor B	5.07	55,162	100% AD, 116,244 CWT, 5,565 PIT
*4/9-4/13/2010	Little Salmon R (Stinky Springs)	182,902	Pah A	4.85	37,708	100% AD, 19,072 CWT, 3,386 PIT
*4/29/2010	Pahsimeroi River (below weir)	95,023	USB	4.64	20,500	100% No Clip, 100% CWT, 7,174 PIT
*4/16-4/21/2010	East Fork Salmon River (lower)	306,949	Dwor B	4.97	61,774	100% AD, 61,241 CWT, 5,575 PIT
*4/21-27/2010	Squaw Creek	277,619	Dwor B	4.86	57,080	100% AD, 61,915 CWT, 3,285 PIT
*4/5-4/7/2010	Salmon River (Section 16) Includes: (Red Rock)	124,373	Pah A	4.67	26,607	100% AD, 78,478 CWT, 2,082 PIT
*4/7-4/9/2010	Salmon R. (Section 17) Includes: (Colston Corner)	153,793	Pah A	4.81	32,000	100% AD, 58,698 CWT, 2,590 PIT
*4/6/2010	(Shoup Bridge)	61,562	Pah A	4.87	12,654	100% AD, 19,590 CWT, 989 PIT
*4/27 -28/2010	Salmon R. (Section 18) Includes: (McNabb Point)	117,883	Saw A	4.55	25,900	100% AD, 58,920 CWT, 2096 PIT
	Totals	**1,599,775**		**4.86**	**329,385**	

Appendix H. Fish Transportation Costs 2002 – 2010.



Appendix I. Brood Year 2009 Length Frequency Graph



Appendix J. Brood Year 2009 Organosomatic Index Expressed in Percent of Normals.

Date	Stock	Eyes	Gills	Pseudo-Branch	Thymus	Fat Index	Spleen	Hind Gut	Kidney	Liver
2/9/2010	**Saw A**	60	60	60	0.00	3.91	60	60	60	60
COMMENTS:										
FINS:	Active erosion observed primarily in dorsal and pectoral fins									
SKIN:	No abnormalities observed.									
GONADS:	No precocial males observed in the sample.									
2/9/2010	**Pah A**	60	60	60	0.00	3.81	60	60	60	60
COMMENTS:										
FINS:	Active erosion observed primarily in dorsal and pectoral fins									
SKIN:	No abnormalities observed.									
GONADS:	No precocial males observed in the sample.									
2/9/2010	**USB**	60	60	60	0.00	3.65	60	60	60	60
COMMENTS:										
FINS:	Active erosion observed primarily in dorsal and pectoral fins									
SKIN:	No abnormalities observed.									
GONADS:	No precocial males observed in the sample.									
2/9/2010	**Dwor. B**	60	60	60	0.00	3.83	60	60	60	60
COMMENTS:										
FINS:	Active erosion observed primarily in dorsal and pectoral fins									
SKIN:	No abnormalities observed.									
GONADS:	No precocial males observed in the sample.									

Appendix K. Brood Year 2009 Coded - Wire Tag Releases.

Raceway #	CWT Code	Stock	Total # CWT	Total CWT Stocked	Site
W1B	10/51/82	DWOR B	16,541		Little Salmon River
W1B	10/52/82	DWOR B	15,438	31,228	Little Salmon River
W4A	10/54/82	DWOR B	17,047		Lower East Fork
W4A	10/53/82	DWOR B	15,416	31,604	Lower East Fork
W5B	10/54/82	DWOR B	16,080		Lower East Fork
W5B	10/53/82	DWOR B	15,464	29,637	Lower East Fork
W9A	10/42/83	DWOR B	31,954	31,083	Squaw Creek
W9B	10/42/83	DWOR B	32,190	30,832	Squaw Creek
E1B	10/52/82	DWOR B	11,905		Little Salmon River
E1B	10/51/82	DWOR B	15,554		Little Salmon River
E1B	10/66/82	DWOR B	4,581	30,674	Little Salmon River
E2A	10/51/82	DWOR B	150		Little Salmon River
E2A	10/52/82	DWOR B	5,661		Little Salmon River
E2A	10/66/82	DWOR B	26,194	31,003	Little Salmon River
E3B	10/52/82	DWOR B	1,300		Little Salmon River
E3B	10/66/82	DWOR B	22,969	23,339	Little Salmon River
E13A	10/29/71	PAH A	5,405		Red Rock
E13A	10/65/82	PAH A	11,590	16,556	Red Rock
E13B	10/29/71	PAH A	5,516		Red Rock
E13B	10/65/82	PAH A	25,986	30,699	Red Rock
E6A	10/11/71	PAH A	19,545	19,072	Little Salmon River
E10A	10/44/83	PAH A	28,560	27,908	Colston Corner
E10B	10/44/83	PAH A	31,502	30,790	Colston Corner
E11B	10/12/71	PAH A	20,037	19,590	Shoup Bridge
E12A	10/29/71	PAH A	3,964		Red Rock
E12A	10/65/82	PAH A	28,047	31,223	Red Rock
W13A	10/39/83	USB	32,000		Pahsimeroi Trap
W13A	10/75/03	USB	511	31,664	Pahsimeroi Trap
W12A	10/39/83	USB	21,451		Pahsimeroi Trap
W12A	10/75/03	USB	11,054	31,703	Pahsimeroi Trap
W13B	10/39/83	USB	3,011		Pahsimeroi Trap
W13B	10/75/03	USB	29,489	31,656	Pahsimeroi Trap

		W12B		10/71/82		Saw A		30,561		29,735			McNabb	
		W10A		10/71/82		Saw A		30,008		29,185			McNabb	
		TOTAL						586,681		569,181				
Year	Combined A-run Eggs	Upper Salmon B-run Eggs	East Fork Natural Eggs	Dworshak B-run Eggs	Total Eggs	Spring/Smolt Releases	Fall/Fry Releases	Total Fish Released	% Survival	Fish /Lb.	Total Lbs Released	Lbs Feed	Food Conv.	

Appendix L. Brood Year 2009 PIT Tag Releases.

Stock	# PIT Tagged	Raceway #	# Stocked	Site
DWOR B	1,495	E2A	1,494	Little Salmon
DWOR B	1,499	E3B	1,478	Little Salmon
DWOR B	1,496	E4A	1,495	Little Salmon
DWOR B	1,099	W1A	1,098	Little Salmon
DWOR B	1,398	W2B	1,390	Lower East Fork
DWOR B	1,399	W3A	1,398	Lower East Fork
DWOR B	1,396	W4B	1,394	Lower East Fork
DWOR B	1,398	W5A	1,393	Lower East Fork
DWOR B	2,093	W8A	2,091	Squaw Creek
DWOR B	1,201	W9B	1,194	Squaw Creek
PAH A	1,295	E10A	1,293	Colston Corner
PAH A	990	E11B	989	Shoup Bridge
PAH A	992	E12A	991	Red Rock
PAH A	1,092	E12B	1,091	Red Rock
PAH A	1,695	E5A	1,692	Little Salmon
PAH A	1,694	E7B	1,694	Little Salmon
PAH A	1,297	E9B	1,297	Colston Corner
SAW A	1,000	W10A	998	McNabb
SAW A	1,099	W11B	1,098	McNabb
USB	2,397	W12A	2,392	Pahsimeroi Trap
USB	2,394	W13A	2,388	Pahsimeroi Trap
USB	2,398	W13B	2,394	Pahsimeroi Trap
TOTAL	**32,817**		**32,742**	

Appendix M. Historical release Data

1982-83					145,206	135,361		135,361	93.22%	4.23	32,000	57,700	2.24
1983-84	238,000			68,000	306,000	264,574		264,574	86.46%	2.77	95,430	154,120	1.62
1984-85					NONE	231,991		231,991		4.37	52,990	HNFH	
1985-86					NONE	NONE							
1986-87					NONE	264,415		264,415		4.39	60,215	HNFH	
1987-88		FRY			2,109,780	2,064,661		2,064,661	97.86%	4.54	454,500	554,000	1.32
1988-89	2,047,748	357,506			2,405,254	2,202,800		2,202,800	91.58%	4.32	509,100	703,373	1.38
1989-90	1,306,674	333,537		1,212,066	2,852,277	2,285,800		2,285,800	80.14%	4.67	489,430	687,077	1.40
1990-91	1,269,000	463,730		900,000	2,632,730	2,062,000		2,062,000	78.32%	4.11	501,100	662,326	1.32
1991-92	1,127,928	91,317		1,207,699	2,426,944	2,160,400		2,160,400	89.02%	4.21	513,000	624,573	1.22
1992-93	1,031,274	133,826		1,322,740	2,487,840	1,925,700		1,925,700	77.40%	5.75	334,500	529,936	1.58
1993-94	1,081,500	179,080		1,507,033	2,767,613	1,919,250	392,300	2,311,550	83.52%	4.73	405,450	654,693	1.61
1994-95	800,785	75,395		1,520,160	2,396,340	1,731,355	26,531	1,757,886	73.36%	4.41	391,825	548,400	1.49
1995-96	803,000	40,000		1,502,200	2,345,200	1,868,085		1,868,085	79.66%	4.63	402,926	453,662	1.13
1996-97	947,796	139,400		940,391	2,027,587	1,643,210		1,643,210	81.04%	4.50	364,775	380,647	1.03
1997-98	855,000	356,340		1,403,900	2,615,240	1,658,825		1,658,825	63.43%	4.47	370,900	419,222	1.14
1998-99	1,010,540	7,700		1,287,712	2,305,952	1,962,624	106,950	2,069,574	89.75%	4.12	471,608	574,392	1.20
1999-00	1,052,109	57,954		1,340,756	2,450,819	2,050,039	111,820	2,164,859	88.33%	4.22	490,850	589,434	1.20
2000-01	1,937,984	51,384		544,006	2,533,374	2,022,017		2,022,017	79.82%	4.63	436,150	509,927	1.17
2001-02	1,305,282	81,622		1,131,772	2,518,676	1,899,530		1,899,530	75.42%	4.12	461,460	519,982	1.13
2002-03	1,309,249	81,206	32,382	1,019,468	2,442,305	1,970,121		1,970,121	80.67%	4.60	432,292	501,956	1.16
2003-04	1,334,718	78,006	57,876	932,191	2,402,791	1,796,408		1,796,408	74.76%	4.35	413,419	437,032	1.06
2004-05	1,329,491	53,722	15,918	1,145,829	2,544,960	1,805,293		1,805,293	70.94%	4.54	397,300	448,992	1.13
2005-06	962,813	41,802	54,110	945,000	2,003,725	1,547,990	40,000	1,587,990	79.25%	4.25	364,100	347,512	0.95
2006-07	1,085,629	149,260	66,543	932,190	2,233,622	1,624,649	281,630	1,906,279	85.34%	4.32	377,924	360,000	0.95
2007-08	905,675	80,148	185,100	863,651	2,034,574	1,620,920	219,172	1,840,092	90.44%	4.60	355,134	354,745	1.00
2008-09	935,804	65,171	92,086	834,242	1,927,303	1,652,197	52,503	1,704,700	88.45%	4.79	346,005	327,936	0.95
2009-10	762,751	117,677	0	1,000,000	1,880,428	1,599,775	106,905	1,706,680	90.76%	4.86	330,396	313,065	0.99

Submitted by:

Rick Lowell
Fish Hatchery Manager II

Tom Tighe
Assistant Fish Hatchery Manager

Wade Symons
Fish Culturist

Brandon Filloon
Fish Culturist

Jeff Walker
Maintenance Craftsman

Approved by:

_____
Edward B. Schriever, Chief
Fisheries Bureau

_____
Tom Rogers
Anadromous Fish Hatcheries Supervisor