



**MAGIC VALLEY HATCHERY**

**2005 Brood Year Report**

**By**

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## ABSTRACT

The nineteenth year (May 1 to May 10, 2006) of steelhead *Oncorhynchus mykiss* production at Magic Valley Steelhead Hatchery was completed with a total of 1,547,990 smolts planted. All smolts placed in the Squaw Creek Acclimation Pond outmigrated volitionally in 2006. Therefore, all steelhead smolts were given the opportunity to migrate to the ocean. Smolt production yielded a total weight of 364,100 lbs. Fish were fed 347,512 lbs of feed for a conversion of 0.95 (lbs of feed per lb of gain).

Five different stocks of steelhead were received as eyed eggs during May and June of 2005. The Dworshak B-run eggs totaled 945,000 and contributed 735,324 smolts to the river. The Upper Salmon B-run eggs totaled 41,802 and contributed 31,015 smolts to the river. East Fork Natural eggs totaled 54,110 and resulted in 31,073 fish planted as smolts. Sawtooth A-run eggs totaled 338,448 which produced 304,301 smolts. Pahsimeroi A-run eggs totaled 624,365 and 446,277 as smolts.

For the ninth consecutive year, Hayspur strain rainbow and Kamloop trout eggs were started here to help Hagerman State Hatchery with their shortage of incubation space during the winter.

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## INTRODUCTION

Magic Valley Steelhead Hatchery (MVH) 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 US Army Corps of Engineers (USACE), is administered and funded by the US 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. When available, 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 and associated tributaries. The brood sources were Dworshak Fish Hatchery (Dworshak) B-run stock, East Fork Salmon River (East Fork Natural Stock), Upper Salmon B (Squaw Creek Pond Stock), Sawtooth Fish Hatchery (Sawtooth) A-run, and Pahsimeroi Fish Hatchery (Pahsimeroi) 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. Two incubators are placed on stainless steel stands on the floor of each raceway. There are 20 concrete tanks (4-ft x 3-ft x 40-ft, with 418 cubic ft of rearing space) and a capacity of rearing 100,000 steelhead to 200 fish per pound (fpp) size. The early rearing room currently houses four fiberglass troughs (2.5-ft x 1.5-ft x 21-ft), and 60 automatic fry feeders. The hatchery building also contains an office, fish health examination room, shop, dormitory, enclosed storage room, covered vehicle storage area, feed storage room, walk-in freezer, mechanical room for water pumps, water chiller, and domestic water supply systems.

There are 32 outside rearing raceways (10-ft x 3-ft x 200-ft, with 6,153 cuft 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 60,000-70,000 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-lb 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 in size) settles the non-cleaning wastewater. All cleaning effluent must pass through both ponds prior to discharge.

Some density and flow indices may exceed the maximum recommended levels of .30 lbs of fish per cuft of rearing space per inch of fish length, and 1.19 lbs per gal per minute (gpm) per inch of fish length at the end of the rearing cycle. Water flows continue to decrease in recent years. Appendix A shows flows over the last twelve years during early April representing flow at or near projected maximum loading. Currently, high flows during April have dropped below 80 cfs.

## **WATER SUPPLY**

The MVH 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 a control tank that degasses and distributes the water to the outside raceways through a 42-inch pipeline. 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 degassing tower. Water going to the hatchery building is degassed in packed columns above each individual raceway.

## **STAFFING**

During the 2005 brood year, MVH was staffed with the following permanent employees: Rick Lowell, Fish Hatchery Manager II; Pat Moore, Assistant Hatchery Manager; Wade Symons, Darlene Snyder, and Dan Green 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 Casey Reynolds and Nick Proost. Jeff Walker was elevated to a part time hatchery Maintenance Craftsman. Personnel from this hatchery continue to direct adipose fin clipping operations at Magic Valley. Assistance is provided to Niagara Springs and Hagerman National hatcheries as needed.

## **FISH PRODUCTION**

### **Egg Shipments and Early Rearing**

In response to decreasing spring flows during the previous brood year, a further reduction in production was implemented. Production targets were reduced from approximately 1.8 million smolts for BY 2004 to 1.6 million for BY 2005. Because of surplus rearing space, Hagerman National Hatchery picked up 100,000 Sawtooth stock production. Magic Valley Hatchery received 945,000 B-run (Dworshak) eyed eggs, 41,802 B-run eyed eggs (Upper Salmon B stock), and 54,110 East Fork Natural B stock. A-run eyed eggs included 624,365 (Pahsimeroi), and 338,448 (Sawtooth). The combined total number of steelhead eggs received this year was 2,003,725. All eggs were received during May and June 2005. 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 gpm) averaged 100,000 feeding fry until they reached from 200 to 300 per lb or almost two inches long. At that time, fish were adipose clipped then transferred to the larger outside raceways. The highest mortality rate occurred during the hatching, swim-up, and early-rearing stages. Survival was variable in most stocks of eggs. Historically, Dworshak progeny survive at a significantly lower rate than other stocks. However, for Brood Year 2005, Dworshak steelhead had the second highest survival (77.8%) of the five stocks produced. Appendix C compares the seventeen-year average of survival from the eyed egg stage to final release for all stocks cultured at Magic Valley Steelhead Hatchery.

### **Hayspur Sterile Rainbow and Kamloop Production**

For the ninth consecutive year, Hayspur strain rainbow and Kamloop trout eggs were started here to help Hagerman State Hatchery 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 8.30-inch smolt. The fish had a conversion of 0.95 lbs of feed to produce a lb 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 schedule of four days on and three days off feed was implemented in September to insure the fish met target size. The steelhead maintained an average .65 to .75-inch per month growth using this system. This schedule was used until the beginning of March at which time all fish were put on feed seven days a week. 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 below the maximum parameters set by the LSRCF 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 at 84.8 cfs (87.2 cfs, September 2004). Spring flows began their seasonal decline during the last four months of rearing. In anticipation of decreasing flow, and in order to maintain a water turnover rate of two per hour or greater only 28 raceways were used for final production rearing. Each of the outside 28 raceways had about 2.7 cfs prior to distribution in April.

Smolt distribution commenced on April 10 and continued through May 2, 2005. An average of five trucks per day was used for the transport of 364,100 lbs of fish and involved 76 truck loads (Appendix G). Transportation costs continued to escalate during 2006. Brood Year 2004 transportation costs totaled \$71,371.30 for 85 truckloads while Brood Year 2005 increased to \$95,480.00 with nine fewer truck loads than the previous year (Appendix H). Hatchery personnel continued to target 5,000 lbs per load to meet IHOT (Integrated Hatcheries Operation Team) recommendations.

### **Length Frequency Data**

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

## **FISH HEALTH**

### **Diseases Encountered and Treatment**

Infectious Hematopoietic Necrosis virus was detected at Magic Valley Steelhead Hatchery for the first time since 2002. Virus was confirmed in samples from all stocks during August and September. No viable treatments for IHN virus are currently available.

Clinical bacterial coldwater disease (CWD), caused by *Flavobacterium psychrophilum*, was diagnosed in Dworshak-B stock fish during June and August. Losses declined in June without treatment, but were severe enough in August to justify treatment with oxytetracycline-medicated feed under an Investigational New Animal Drug (INAD) protocol. Losses moderated, but were soon followed by the IHN outbreak. Two vats of Upper Salmon River B fish were also treated with oxytetracycline for CWD at the end of August, but that treatment was also compromised by IHN virus.

### **Organosomatic Index**

See Appendix J.



### **Acute Losses**

All steelhead stocks at Magic Valley Hatchery experienced losses to IHN during late August and September. The greatest percent loss was in the Upper Salmon River B group (17% or 6,400 fish for the month of September) with the greatest numerical loss in the Pahsimeroi A group (21,000 fish or 4.4% in September).

### **Other Assessments**

Fish in the outside raceways continued to experience a chronic “sore-back” condition, as reported in previous years. The Dworshak B-strain groups still seemed to be affected the worst, but other groups also showed some signs. The syndrome begins with an eroding dorsal fin, which is a common occurrence in all hatchery-reared steelhead. But instead of stopping at the base of the fin and healing, as usually happens, the erosion continues on into the dorsal musculature of the fish. Daily mortality rate is never high, but the general quality of the fish population may be compromised. Numerous therapies have been tried to date with no measurable success. The syndrome seems to be the worst during summer and fall and naturally subsides through the winter to release in the spring. It has been speculated that there may be a relationship between direct sunlight in the east/west oriented raceways. The hatchery design does not allow for practical shade structures to be tested.

### **Precocial Male Observation**

Fishery Research personnel continued a precocial steelhead smolt study on fish released into the Squaw Creek acclimation pond. Appendix K shows the results of precocial male steelhead sampled. For more detailed information regarding steelhead smolt precocity, contact Idaho Department of Fish and Game Nampa Research.

### **FISH MARKING**

A total of 80,655 Pahsimeroi A, and 62,674 Sawtooth A unmarked steelhead were produced for releases into the Lemhi River, Yankee Fork of the Salmon River, and Valley Creek, respectively. Additionally, 31,073 East Fork Natural Steelhead were marked with Coded Wire Tags (CWT) and released as non-adipose clipped smolts.

At MVH the fin clipping crew Ad-marked 1,236,640 fish during June and July. During coded-wire tagging, an additional 348,530 fish were Ad-marked as well. Fin-clipping mortality was negligible. No treatment was necessary after handling.

A total of 379,603 fish received coded-wire tags in 2005, of which 364,718 survived and were outplanted as smolts in 2006. Nine different release locations were identified by coded wire tags. See Appendix L for CWT details.

In addition, a total of 3,900 had Passive Integrated Transponder (PIT) tags inserted in them. 3,894 PIT tagged smolts were released.

## **MAINTENANCE PROJECTS**

During the year, the following projects were completed:

1. Received 100 new aluminum dam boards.
2. Purchased new washing machine, repaired the clothes dryer, and replaced the range hood in the hatchery dormitory.
3. Completion of New composite material decks for all four residences.
4. Received a new Fry transport tank fabricated by Magic Valley Heliarc.
5. Additional vinyl egress windows for all residences basements, four new dishwashers, a three-point blade for the John Deere Tractor, a new chainsaw, commercial grade weed-eater, and a new 3,500 PSI pressure washer were purchased at year's end with surplus funds.
6. Installed four new water heaters in hatchery residences.
7. All asphalt areas were repaired for cracks and resealed.
8. The primary hatchery intake water line was inspected with a robotic camera.
9. All 20 concrete early rearing vats were repainted with epoxy.
10. Received a smaller fork-lift from Sawtooth Hatchery.
11. Constructed tiered flower beds on the north side of all residences.
12. Extensive brush and debris removal at the hatchery intake spring.
13. Had new end wheels fabricated for the traveling bridge.
15. Purchased materials for residence basement improvements.
16. Repaired the old electric Cushman.
17. Had a replacement stainless steel knife gate fabricated for the north feed tower fines bin.
18. Painted interior rooms in residence D.

## LITERATURE CITED

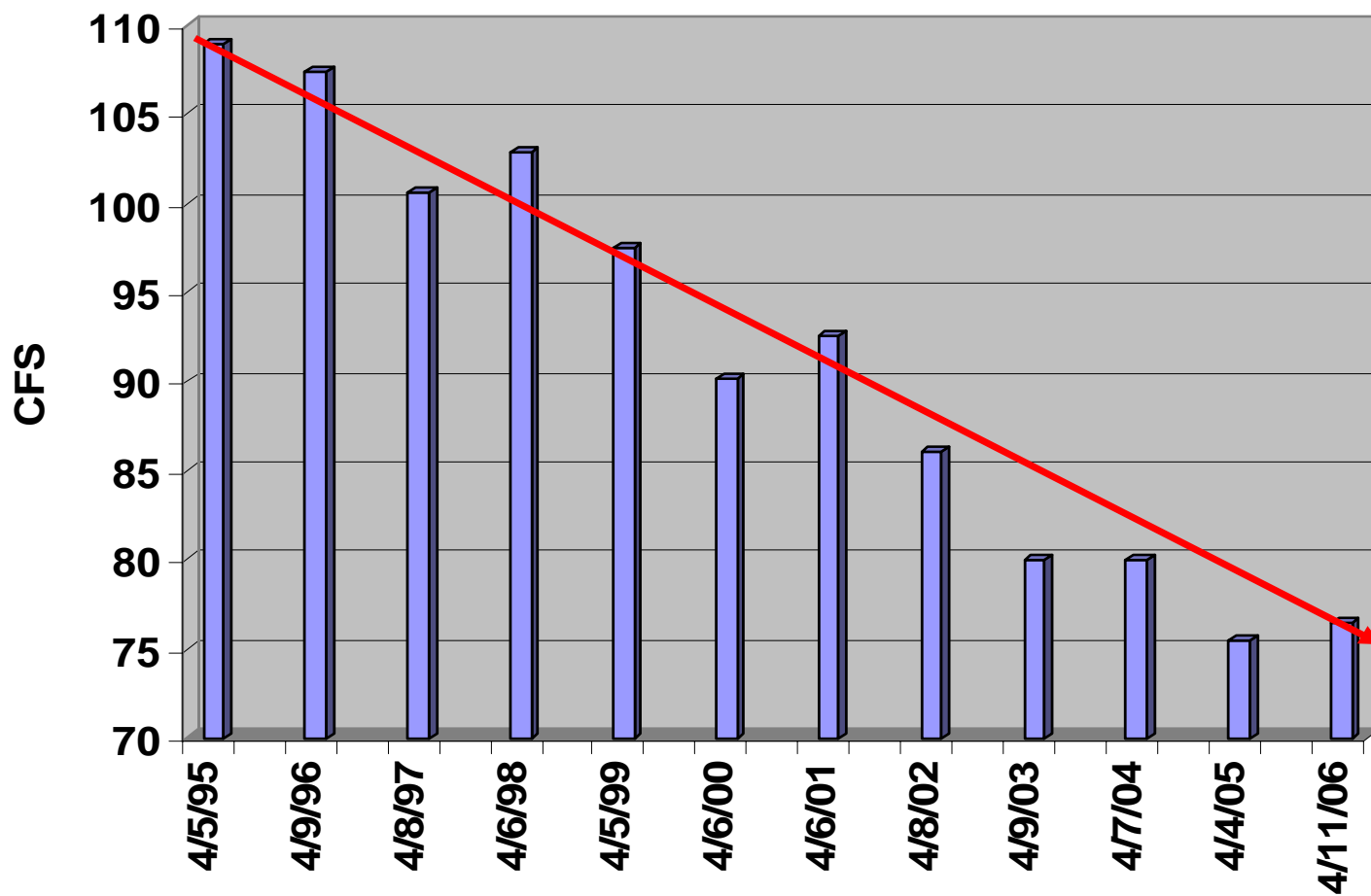
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## **APPENDICES**

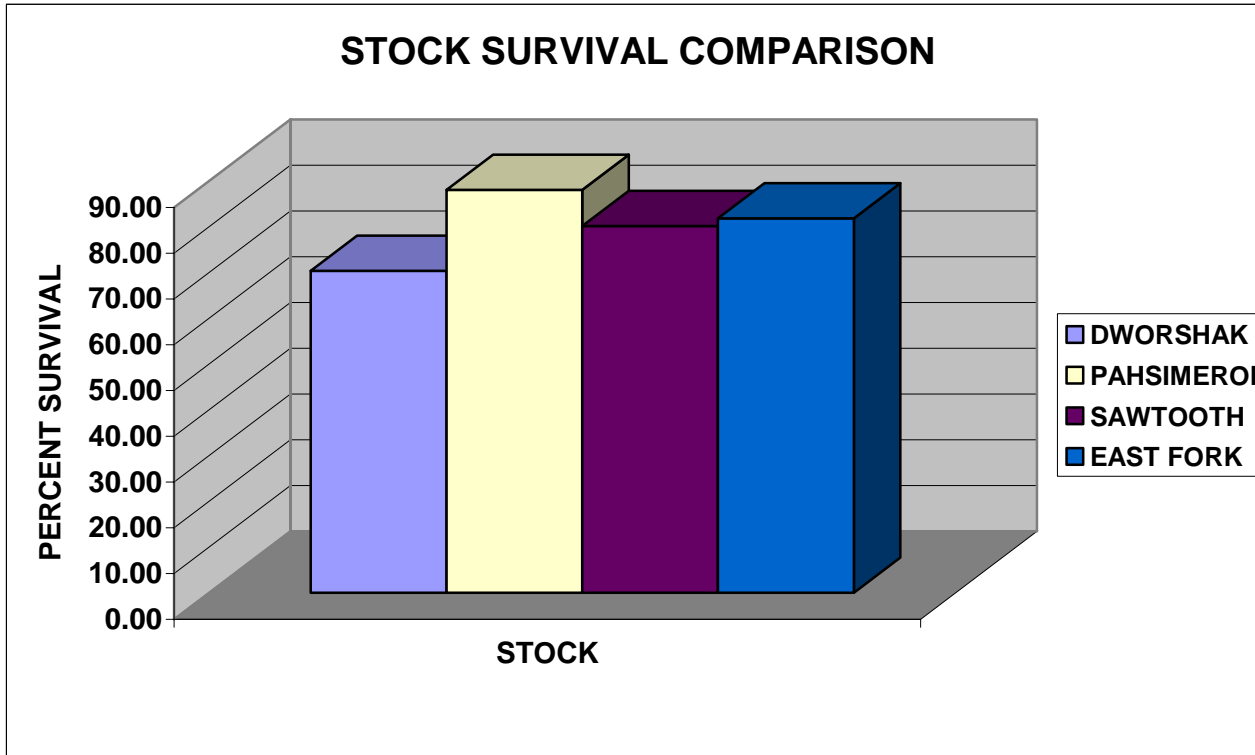
### MAGIC VALLEY HATCHERY FLOWS (1995 - 2006)



Appendix B. Brood Year 2005 Steelhead Survival Rates.

	DWORSHAK "B"	UPPER SALMON "B"	EAST FORK NATURAL "B"	PAHSIMEROI "A"	SAWTOOTH "A"	GRAND TOTAL
EGGS	945,000	41,802	54,110	624,365	338,448	2,003,725
% HATCHED	87%	97%	97%	99%	99%	96%
SMOLTS STOCKED	735,324	31,015	31,073	446,277	304,301	1,547,990
WEIGHT SMOLTS	170,982	7,097	6,967	106,252	72,802	364,100
NO./LB. % SURVIVAL	4.30	4.37	4.46	4.20	4.18	4.25
EGG/RELEASE	77.8%	74.2%	57.4%	71.5%	89.9%	77.3%
POUNDS OF FOOD	170,437	6,169	6,604	96,851	67,449	347,512
CONVERSION	1.00	0.87	0.95	0.91	0.93	0.95

Appendix C. Seventeen-Year Average of Stock Survival.



Appendix D. Hayspur Rainbow and Kamloop Trout started for Hagerman State Hatchery 2005–2006.

**Hayspur Eggs Received @ Magic  
Valley Hatchery**

**2005-2006**

Date	Vat #	Egg #	Stock	Moved to Hagerman			Number	Percent
				Date	Pounds	#/lb		Survival
22-Nov-05	11	112,523	T9	2/16/2006	900	99.4	<b>89,460</b>	<b>79.5%</b>
22-Nov-05	12	114,268	T9	2/16/2006	900	102.0	<b>91,800</b>	<b>80.3%</b>
22-Nov-05	13	116,312	KT	2/23/2006	775	94.0	<b>72,850</b>	<b>62.6%</b>
22-Nov-05	14	111,240	KT	2/16/2006	850	101.2	<b>86,020</b>	<b>77.3%</b>
22-Nov-05	15	103,706	KT	2/16/2006	850	108.0	<b>91,800</b>	<b>88.5%</b>
30-Nov-05	18	112,667	T9	2/23/2006	925	102.9	<b>95,183</b>	<b>84.5%</b>
30-Nov-05	19	112,000	T9	2/23/2006	930	101.2	<b>94,116</b>	<b>84.0%</b>
30-Nov-05	20	109,257	T9	2/23/2006	975	97.7	<b>95,258</b>	<b>87.2%</b>
6-Dec-05	10	110,000	T9	2/23/2006	930	103.6	<b>96,348</b>	<b>87.6%</b>
<b>TOTAL</b>		<b>1,001,973</b>			<b>8,035</b>	<b>101.2</b>	<b>812,835</b>	<b>81.1%</b>



Appendix E. Brood Year 2005 Production Feed Cost and Utilization.

Number Of Fish	1,547,990
Lbs Of Fish	364,100
Feed Cost	\$130,326.96
Lbs Of Feed	347,512
Conversion	0.95
Total Cost	\$714,756.00
Cost Per 1000 Fish	\$461.73
Cost Per Pound Fish	\$1.96
Feed Cost/Lb. Fish	\$0.36

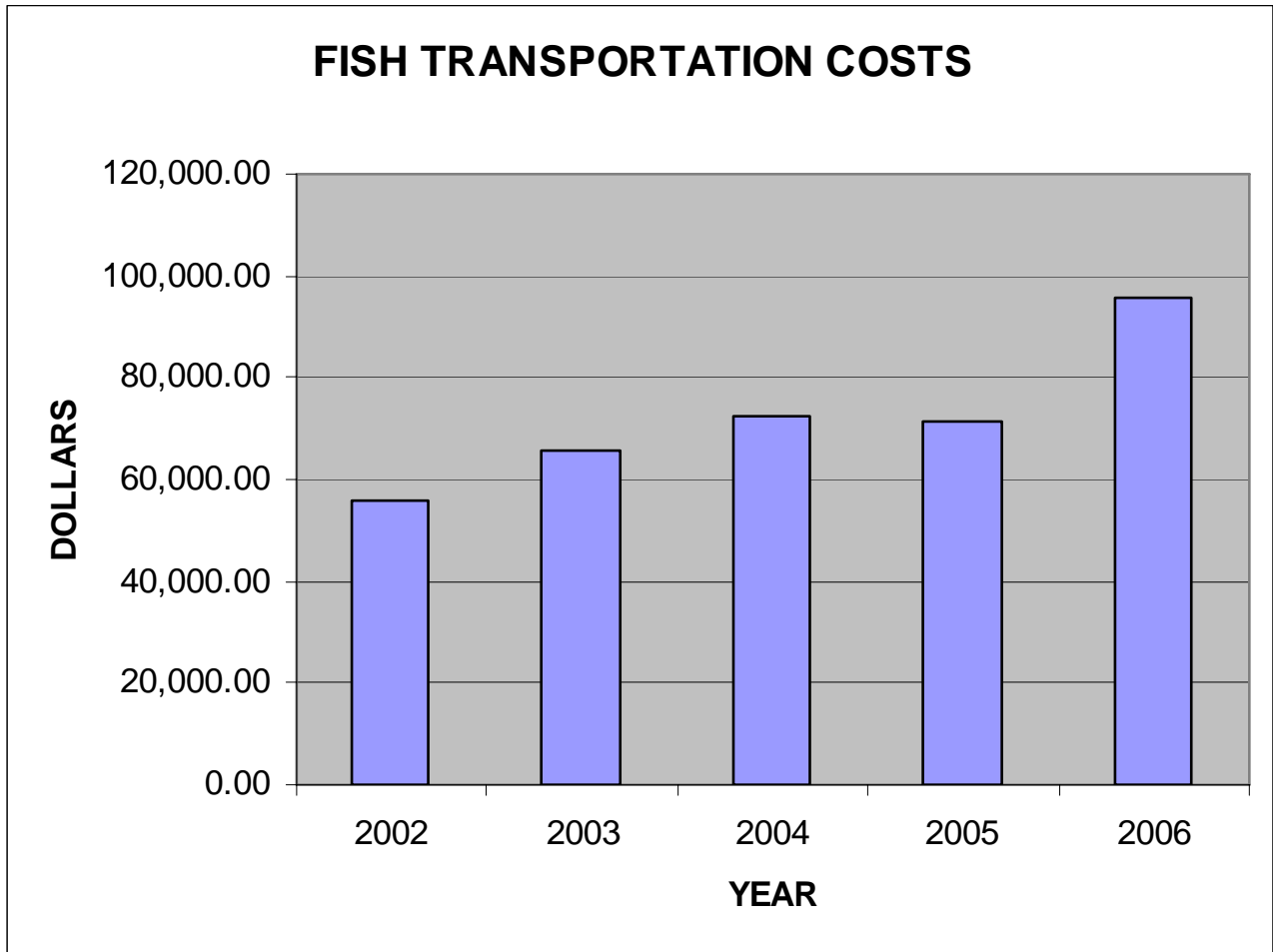
Appendix F. Brood Year 2005 Final Raceway Inventory with Flow and Density Indices.

Raceway	Stock	Number	Weight	No/lb	Length	Flow Index	Density Index
E1A	PAH A	28,706	6,200	4.63	8.25	0.70	0.28
E1B	PAH A	22,597	5,900	3.83	8.79	0.63	0.25
E2A	PAH A	29,278	7,000	4.18	8.53	0.77	0.15
E2B	PAH A	28,780	6,482	4.44	8.36	0.72	0.14
E3	PAH A	63,080	14,304	4.41	8.38	1.59	0.32
E4A	PAH A	29,756	6,399	4.65	8.24	0.72	0.29
E4B	PAH A	30,050	7,606	3.95	8.70	0.82	0.33
E5A	PAH A	30,466	7,359	4.14	8.56	0.80	0.32
E5B	DWOR B	30,448	7,463	4.08	8.60	0.81	0.32
E6	PAH A	59,439	14,251	4.17	8.54	1.56	0.31
E7	PAH A	46,219	11,311	4.09	8.60	1.23	0.24
E8	PAH A	46,148	11,833	3.90	8.73	1.26	0.25
E9	DWOR B	62,422	14,083	4.43	8.37	1.57	0.31
E10	DWOR B	62,079	14,304	4.34	8.43	1.58	0.32
E11	DWOR B	61,983	13,984	4.43	8.37	1.56	0.31
E12A	DWOR B	31,173	6,806	4.58	8.28	0.77	0.31
E12B	DWOR B	30,706	6,632	4.63	8.25	0.75	0.30
E13A	DWOR B	31,751	7,249	4.38	8.40	0.80	0.32
E13B	USB	31,015	7,097	4.37	8.41	0.79	0.31
W1A	PAH A	31,759	6,672	4.76	8.17	0.76	0.30
W1B	PAH A	30,970	7,270	4.26	8.48	0.80	0.32
W2	PAH A	62,228	14,015	4.44	8.36	1.56	0.31
W3	PAH A	60,680	13,822	4.39	8.40	1.54	0.31
W4A	PAH A	24,224	6,512	3.72	8.87	0.68	0.27
W4B	DWOR B	30,986	7,074	4.38	8.40	0.79	0.31
W5	DWOR B	62,071	14,503	4.28	8.47	1.60	0.32
W6	DWOR B	59,439	15,280	3.89	8.74	1.63	0.33
W7	DWOR B	60,168	14,967	4.02	8.65	1.62	0.32
W8	DWOR B	56,511	12,932	4.37	8.41	1.43	0.29
W9	DWOR B	62,132	14,551	4.27	8.47	1.60	0.32
W10	DWOR B	62,031	14,426	4.30	8.45	1.59	0.32
W11A	SAW A	32,075	7,529	4.26	8.48	0.83	0.33
W11B	DWOR B	31,424	7,664	4.10	8.59	0.83	0.33
W12	SAW A	63,525	15,600	4.07	8.61	1.69	0.34
W13A	SAW A	30,599	8,052	3.80	8.81	0.85	0.34
W13B	EFKNAT	31,073	6,967	4.46	8.35	0.78	0.31
Total		1,547,990	364,100	4.25	8.48	1.27	0.25

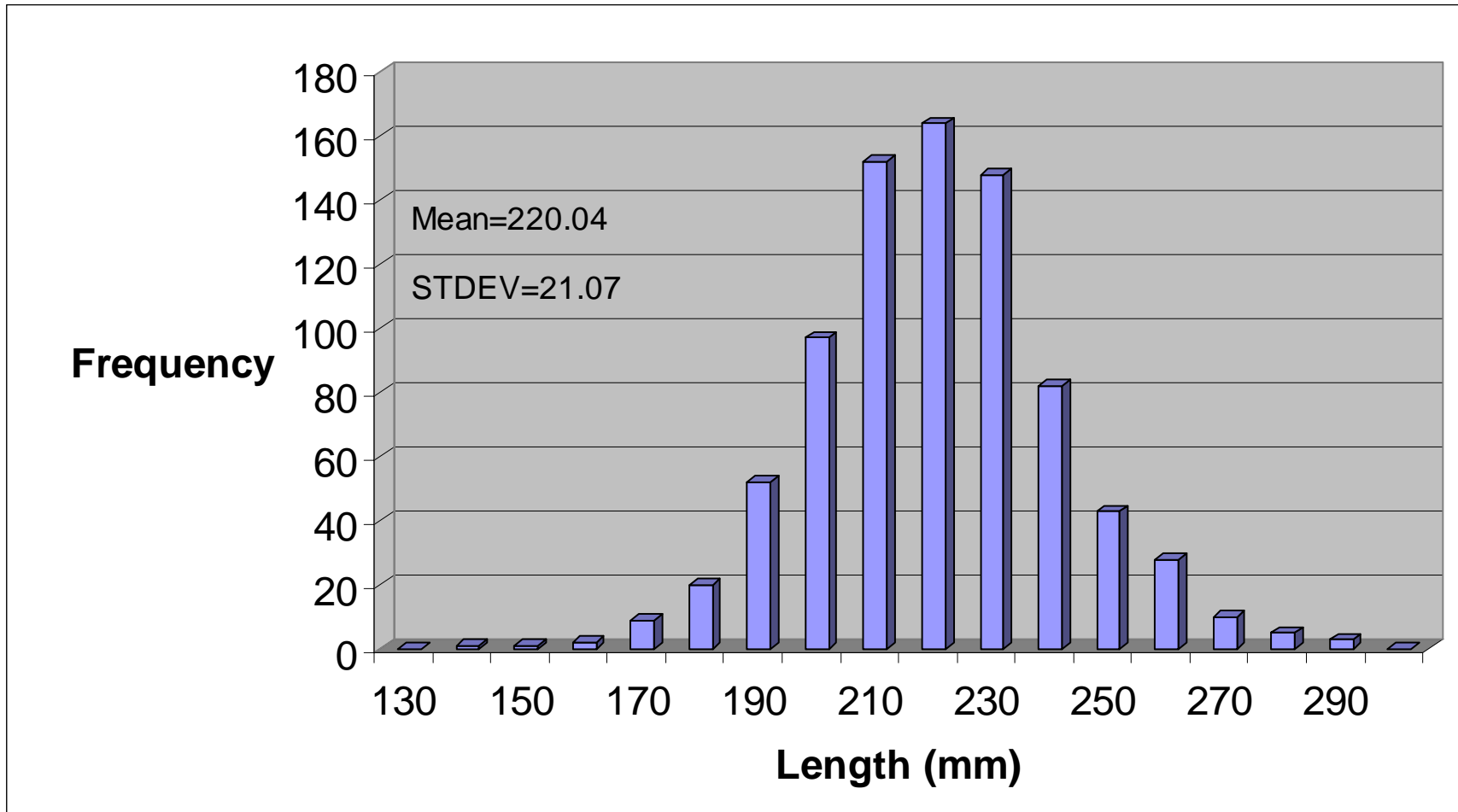
Appendix G. Brood Year 2005 Steelhead Smolt Distribution in the Salmon River and Tributaries.

<u>Site</u>	<u>Number Released</u>	<u>Stock</u>	<u>Fish/lb</u>	<u>Pounds</u>
Little Salmon R (Hazard Creek)	248,105	Dwor B	4.43	55,975
Squaw Creek Acclimation Pond (acclimated fish)	62,457	Dwor B	4.59	13,610
Squaw Creek Acclimation Pond (acclimated fish)	31,015	USB	4.37	7,097
Yankee Fork Ranger Station DWOR B (direct release into Salmon R.)	187,051	Dwor B	4.27	43,841
East Fork Salmon River (lower)	237,711	Dwor B	4.13	57,556
East Fork Salmon River (above E. Fk. Weir)	31,073	Natural B	4.46	6,967
Lemhi River (St Charles Cr. Bridge)	47,008	Pah A	4.39	10,714
Hayden Creek/Basin Creek Confluence	14,639	Pah A	4.18	3,500
Hayden Creek/Lemhi River Confluence	19,150	Pah A	3.83	5,000
Hayden Pond	46,866	Pah A	4.31	10,882
Pahsimeroi River (below weir)	31,759	Pah A	4.76	6,672
Salmon River (Section 16) Includes:				
Red Rock	102,087	Pah A	4.09	24,984
Salmon R. (Section 17) Includes:				
Colston Corner	110,235	Pah A	3.95	27,901
Lemhi Hole	74,534	Pah A	4.49	16,599
Salmon R. (Section 18) Includes:				
McNabb Point	137,098	Pah A/Saw A	4.38	31,285
Tunnel Rock	41,004	Pah A/Saw A	3.97	10,334
Valley Creek	30,599	Saw A	3.80	8,052
Yankee Fork	63,525	Saw A	4.07	15,600
Yankee Fork	32,075	Saw A	4.26	7,529
<b>Totals</b>	<b>1,547,990</b>		<b>4.25</b>	<b>364,100</b>

Appendix H. Fish Transportation Costs 2002 – 2006.



Appendix I. Brood Year 2005 Length Frequency Graph.



Appendix J. Brood Year 2005 Organosomatic Index Expressed in Percent of Normals.

<b>Date</b>	<b>Stock</b>	<b>Eyes</b>	<b>Gills</b>	<b>Pseudo-Branch</b>	<b>Thymus</b>	<b>Mesentery Fat</b>	<b>Spleen</b>	<b>Hind Gut</b>	<b>Kidney</b>	<b>Liver</b>
3/6/2006	Saw A	100	100	100	100	100	100	100	100	100
3/6/2006	Pah A	100	100	100	100	100	100	100	100	100
3/6/2006	USB	100	100	100	60	100	100	100	100	95
3/6/2006	Dwor. B	100	100	100	100	100	100	100	100	100

Appendix K. Brood Year 2005 Precocial Male Sampling Results.

<b>% Precocity (Males)</b>	<b>Sample Size</b>	<b>Date of Sample</b>
1.60%	188	5/4/06

Appendix L. Brood Year 2005 Coded-Wire and PIT Tag Releases.

CWT Code	Stock	# CWT	# Stocked	# PIT Tag	# Stocked	Site & Purpose	Raceway #
10/86/76	DWOR B	32,009	31,173	300	300	Little Salmon	E12A
10/86/76	DWOR B	31,312	31,357			Little Salmon	E11B
10/92/75	DWOR B	24,969				Squaw Pond	E12B
10/07/71	DWOR B	6,614	30,706			Squaw Pond	E12B
10/92/75	DWOR B	18,080				Squaw Pond	E13A
10/07/71	DWOR B	14,120	31,751	500	500	Squaw Pond	E13A
10/24/71	USB	22,700				Squaw Pond	E13B
10/07/73	USB	8,443	31,015	500	500	Squaw Pond	E13B
10/08/71	PAH A	19,814				Red Rock	E8B
10/48/34	PAH A	11,592	23,981	300	298	Red Rock	E8B
10/57/76	PAH A	30,674	30,466	300	300	Colston	E5A
10/76/77	PAH A	30,558	28,706	300	300	Lemhi River	E1A
10/77/77	PAH A	31,928	31,759			Pahsimeroi Trap	W1A
10/78/77	SAW A	31,080	30,970	300	299	McNabb	W1B
10/79/77	SAW A	31,994	31,761			Yankee Fork	W12B
10/25/71	EFK NAT	22,736				East Fork Weir	W13B
10/08/73	EFK NAT	10,980	31,073			East Fork Weir	W13B
	PAH A			300	300	Hayden Pond	E2B
	DWOR B			500	499	Yankee Fork Ranger Station	W11B
	SAW A			300	298	Yankee Fork	W11A
	SAW A			300	300	Valley Creek	W13A
<b>Total</b>		<b>379,603</b>	<b>364,718</b>	<b>3,900</b>	<b>3,894</b>		



Appendix M. Historical Release Data.

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	Flow(CFS)	Fish /Lb.	Lbs Released	Lbs Feed	Food Conv.
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%	120.0	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%	108.9	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%	107.4	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%	100.6	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%	102.8	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%	97.5	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%	90.1	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%	92.6	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%	86.0	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%	80.0	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%	80.0	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%	75.4	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%	76.4	4.25	364,100	347,512	0.95

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