

MAGIC VALLEY HATCHERY

2004 Brood Year Report

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ABSTRACT

The Eighteenth year (May 1, 2004 to May 10, 2005) of steelhead *Oncorhynchus mykiss* production at Magic Valley Steelhead Hatchery was completed with a total of 1,805,293 smolts planted. All smolts placed in the Squaw Creek Acclimation Pond out-migrated volitionally in 2005. Therefore, all steelhead smolts were given the opportunity to migrate to the ocean. Smolt production yielded a total weight of 397,300 pounds. Fish were fed 429,490 pounds of feed for a conversion of 1.08 (pounds of feed per pound of gain).

Five different stocks of steelhead were received as eyed eggs during May and June of 2004. The Dworshak B-run eggs totaled 1,145,829 and contributed 747,157 smolts to the river. The Upper Salmon B-run eggs totaled 53,722 and contributed 35,448 smolts to the river. East Fork Natural eggs totaled 15,918 and resulted in 11,116 fish planted as smolts. Sawtooth A-run eggs totaled 483,081 which produced 364,549 smolts. Pahsimeroi Fish Hatchery contributed 846,410 A-run steelhead eggs, and 647,023 as smolts. Further stocking information is located in Appendix A.

For the eighth 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 I. summarizes Hayspur egg to fry survival.

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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 Army Corps of Engineers, is administered and funded by the U.S. Fish and Wildlife Service, 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 up to 2.0 million 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 over each raceway. There are 20 concrete tanks (4 ft x 3 ft x 40 ft, 418 cubic ft of rearing space) with a capacity of rearing 115,000 -125,000 steelhead to 200 fish per pound size. The early rearing room also houses two fiberglass troughs (2 ft x 1 ft x 12 ft), six plastic (4ft x 4ft x 2ft) semi-square tanks, 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, and 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 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 60,000-70,000 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 30,000-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 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 cubic foot of rearing space per inch of fish length, and 1.25 lbs per gal per minute per inch of fish length at the end of the rearing cycle. Water flows continue to decrease in recent years. Appendix J shows flows over the last eleven years during early April representing flow at or near projected maximum loading. Currently, high flows 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 2004 brood year, MVH was staffed with the following permanent employees: Rick Lowell, Fish Hatchery Manager II; Pat Moore, Assistant Hatchery Manager; Wade Symons and Darlene Snyder 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 Jeff Walker and Casey Reynolds. 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

The hatchery received 1,145,829 B-run (Dworshak) eyed eggs, 53,722 B-run eyed eggs (Upper Salmon B stock), and 15,918 East Fork Natural B stock. A-run eyed eggs included 846,410 (Pahsimeroi), and 483,081 (Sawtooth). The combined total number of steelhead eggs received this year was 2,544,960. All eggs were received in April, May, and June 2004. The survival of eyed eggs to smolts is found in Appendix A.

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 122,000 feeding fry until they reached 300 per pound or almost two inches long. At that time, fish were transferred to the larger outside raceways. The highest mortality rate occurred during the hatching, swim-up, and early-rearing stages. Survival was comparable in most stocks of eggs. Historically, Dworshak progeny survive at a significantly lower rate than other stocks. Appendix L compares the sixteen-year average of survival from the eyed egg stage to final release for all stocks cultured at Magic Valley Steelhead Hatchery.

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 1.08 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 schedule of five days on and two 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 through the middle of March at which time all fish were put on feed seven days a week. See Appendix B 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 LSRCP performance indicator program. Final pond inventories and indices for the individual raceway numbers, densities, and flows are found in Appendix D.

Maximum flows for the year occurred during September at 87.2 cfs. Significant reduction in hatchery flows began during the last four months of rearing. Each of the outside 32 raceways had about 2.34 cfs prior to distribution in April.

In response to decreasing spring flows, steelhead smolt distribution began on March 16th, 2004. Steelhead in four raceways were transported for the purpose of increasing flows to the remainder of the hatchery. Typical smolt distribution resumed on April 4, 2005 and continued through April 26, 2005. An average of five trucks per day were used for the transportation of 397,300 lbs. of fish and involved 85 truckloads (Appendix C). This year we continued to haul 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 H.

FISH HEALTH

Diseases Encountered and Treatment

Bacterial coldwater disease (CWD), caused by *Flavobacterium psychrophilum*, was the only significant cause of losses in the BY04 steelhead at Magic Valley Hatchery. A systemic infection was diagnosed in one vat of Dworshak-stock fish. The bacterium was again isolated in association with external lesions (“sore-back”) from juvenile fish in the outside raceways. No replicating viral agents or reportable pathogens were detected in any BY04 fish.

ORGANOSOMATIC INDEX.

See Appendix E.

Acute Losses

The only acute disease losses were in a single vat of Dworshak-stock fry. Treatment with oxytetracycline-medicated feed was ineffective, and the limited number of survivors were destroyed rather than mixing them with other healthier groups of fish. The poor response to the antibiotic may have been due to the difficulty in getting small fish to ingest a therapeutic dose, to an advanced stage of the disease episode when many fish were sick and not feeding, or to the fact that the inventory was about 25% greater than anticipated so the feed rate was not great enough.

Other Assessments

Fish in the outside raceways experienced a chronic “sore-back” condition, similar to what hatchery personnel report seeing in previous years. The Dworshak-strain groups seemed to be affected the worst, but other groups also showed some signs. The syndrome is typified by

eroding dorsal fins, with the lesion progressing into the dorsal sinus and the musculature. Bacteriology sampling isolated near pure cultures of *F. psychrophilum* from affected individuals. Daily mortality never exceeded single digits, but significant numbers of fish with lesions could be seen from the traveling bridge. External treatments using Chloramine-T and systemic treatments with oxytetracycline-medicated feed did not seem to be effective. The only objective means of evaluation (daily mortality rate) did not change, nor did the subjective visual number of affected fish per raceway. It has been speculated that this syndrome may be initiated by sunburn due to lack of shade cover over the east/west oriented raceways. The Dworshak-strain fish may be more susceptible in that they are already stressed by rearing in water chemistry that is different from that of their indigenous environment in the Clearwater drainage.

Precocial Male Observation

Fishery Research personnel continued a precocial steelhead smolt study on fish released into the Squaw Creek acclimation pond. Results continue to indicate a higher occurrence of precocity in non-migrant fish compared to direct release fish. Appendix K shows the results of precocial male steelhead sampled in each group. For more detailed information regarding steelhead smolt precocity, contact Idaho Department of Fish and Game Nampa Research.

FISH MARKING

A total of 90,508 Pahsimeroi A, and 60,551 Sawtooth A unmarked steelhead were produced for releases into the Lemhi River, Yankee Fork of the Salmon River, and Valley Creek respectively. Additionally, 11,116 East Fork Natural Steelhead were marked with blank Coded Wire Tags and released as unmarked smolts.

At MVH the fin clipping crew Ad-marked 1,447,830 fish during June and July. During coded-wire tagging, an additional 359,755 fish were Ad-marked as well. Fin-clipping mortality was negligible. No treatment was necessary after handling.

A total of 373,342 fish received coded-wire tags in 2004, of which 324,398 survived and were out-planted as smolts in 2005. Ten different release locations were identified by coded wire tags. See (Appendix F) for CWT details.

In addition, a total of 2,896 had Passive Integrated Transponder (PIT) tags inserted in them. 2,889 PIT tagged smolts were released.

Upon completion of BY - 04 Releases, hatchery personnel documented the following observations:

- All inventory combined revealed a 6% shortage below current production summary inventories.
- All coded-wire tagged raceway inventories combined revealed a 13% shortage below current production summary inventories.
- Inventory without including coded-wire tag numbers was 4% short below current production summary inventories.

MAINTENANCE PROJECTS

During the year, the following projects were completed:

1. Installed new storm doors on all four residences.
2. Contractors excavated and inspected the hatchery 42" pipeline valve. Apparently the valve had not been adjusted since original installation. Successful adjustment was accomplished.
3. Received and installed a portable eyewash station and spill containment pallets in the chemical storage container.
4. Received 132 new aluminum dam boards.
5. Completed improvements and modifications to the hatchery domestic water system.
6. Work was completed on improving the landscaping for residences A & C.
7. Decks on residences A & D were pressure washed, repaired and painted.
8. Additional vinyl windows for all residences and a gas powered hedge trimmer were purchased at year's end with surplus funds.
9. Replaced transmission pan on the traveling bridge.
10. Sealed cracks on the large raceway walls.
11. Converted our gasoline powered cushman into a mini-flat bed.
12. Repainted Hatchery entrance sign
13. Completed installation of sod at Residences 1 & 3.
14. Fencing contractor installed a security fence around residence "D".
15. Fabricated and installed a new support bracket for the truck-fill water spout.
16. Received seventeen Eagar up-welling incubators and fourteen stainless steel Incubator stands from Clearwater Hatchery

LITERATURE CITED

Haskell, D.C. 1967. Calculations of amounts to feed trout in hatcheries. *Progressive Fish Culturist* 19 (4).

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

Burton, Doug 2005. Preliberation necropsy report.

APPENDICES

Appendix A. Brood Year 2004 Steelhead Survival Rates.

05-39

	DWORSHAK "B"	UPPER SALMON "B"	EAST FORK NATURAL "B"	PAHSIMEROI "A"	SAWTOOTH "A"	GRAND TOTAL
EGGS	1,145,829	53,722	15,918	846,410	483,081	2,544,960
% HATCHED	87%	97%	97%	99%	99%	96%
SMOLTS STOCKED WEIGHT	747,157	35,448	11,116	647,023	364,549	1,805,293
SMOLTS NO./LB.	164,500	8,400	2,350	137,507	84,543	397,300
% SURVIVAL	4.57	4.22	4.73	4.71	4.31	4.54
EGG/RELEASE POUNDS OF FOOD	65%	66%	70%	76%	75%	71%
CONVERSION	192,337	8,594	2,794	140,857	84,909	429,490
	1.17	1.02	1.19	1.02	1.00	1.08

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Appendix B. Brood Year 2004 Production Feed Cost and Utilization.

Number Of Fish	1,805,293
Lbs Of Fish	397,300
Feed Cost	\$170,161.31
Lbs Of Feed	429,490
Conversion	1.08
Total Cost	\$750,169.74
Cost Per 1000 Fish	\$415.54
Cost Per Pound Fish	\$1.89
Feed Cost/Lb. Fish	\$0.43

Appendix C. Brood Year 2004 Steelhead Smolt Distribution in the Salmon River and Tributaries.

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Destination	Number	Stock	Fish/lb.	Pounds
Little Salmon R (Hazard Creek)	214,443	B	5.39	39,800
Little Salmon R (Hazard Creek)	84,828	A	5.24	16,200
Squaw Creek Acclimation Pond (acclimated fish) DWORB	51,660	B	4.20	12,300
Squaw Creek Acclimation Pond (acclimated fish) USB	35,448	B	4.22	8,400
Squaw Creek DWOR B (direct release into Squaw Cr.)	244,237	B	4.26	57,350
East Fork Salmon River (lower)	236,818	B	4.30	55,050
East Fork Salmon River (above E. Fk. Weir) (no clip)	11,116	B	4.73	2,350
Lemhi River	42,285	A	4.75	8,900
Lemhi River (no clip)	90,508	A	4.46	20,300
Yankee Fork	160,000	A	4.14	38,623
Yankee Fork (no clip)	30,451	A	4.10	7,427
(Red Rock)	125,873	A	4.54	27,700
(Colston Corner)	142,840	A	4.76	30,000
(Lemhi Hole)	93,647	A	4.68	20,000
(Pahsimeroi Trap)	27,342	A	4.41	6,200
(McNabb Point)	114,444	A	4.63	24,700
(Tunnel Rock)	69,254	A	4.62	15,000
(Valley Creek) (no clip)	30,100	A	4.30	7,000
Totals	1,805,293		4.54	397,300

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Appendix D. Brood Year 2004 Final Raceway Inventory with Flow and Density Indices.

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Raceway	Stock	Number	Weight	No/lb	Length	Flow Index	Density Index
E1	DWOR B	63,435	14,650	4.33	8.43	1.65	0.32
E2	DWOR B	49,392	12,600	3.92	8.72	1.37	0.27
E3	DWOR B	57,400	14,000	4.10	8.59	1.55	0.30
E4	DWOR B	55,718	12,750	4.37	8.41	1.44	0.28
E5	DWOR B	55,993	13,300	4.21	8.51	1.48	0.29
E6	DWOR B	52,374	12,900	4.06	8.62	1.42	0.28
E7	DWOR B	56,940	13,000	4.38	8.40	1.47	0.29
E8	DWOR B	56,803	11,700	4.86	8.12	1.37	0.27
E9	DWOR B	61,728	13,100	4.71	8.20	1.51	0.30
E10	DWOR B	59,040	12,000	4.92	8.08	1.41	0.28
E11	DWOR B	63,625	12,500	5.09	7.99	1.48	0.29
E12	DWOR B	63,050	9,700	6.50	7.37	1.25	0.25
E13	DWOR B	51,660	12,300	4.20	8.52	1.37	0.27
E14A	EFK NAT	11,116	2,350	4.73	8.19	0.27	0.05
E14B	USB	35,448	8,400	4.22	8.51	0.94	0.18
E15	SAW A	35,939	8,300	4.33	8.43	0.93	0.18
E16*	SAW A	72,301	17,100	4.23	8.50	1.91	0.37
W1	PAH A	60,428	13,400	4.51	8.32	1.53	0.30
W2	PAH A	53,572	11,800	4.54	8.30	1.35	0.26
W3	PAH A	57,915	11,700	4.95	8.07	1.37	0.27
W4	PAH A	57,204	12,600	4.54	8.30	1.44	0.28
W5	PAH A	58,456	12,000	4.87	8.11	1.40	0.28
W6	PAH A	55,016	10,400	5.29	7.89	1.25	0.25
W7	PAH A	64,680	14,000	4.62	8.25	1.61	0.32
W8	PAH A	45,600	10,000	4.56	8.29	1.14	0.22
W9	PAH A	44,908	10,300	4.36	8.41	1.16	0.23
W10	PAH A	61,491	12,500	5.33	7.87	1.51	0.30
W11	PAH A	60,393	13,100	4.61	8.26	1.50	0.30
W12	PAH A	54,720	12,000	4.56	8.29	1.37	0.27
W13	SAW A	62,712	13,400	4.68	8.22	1.55	0.30
W14	SAW A	53,926	11,800	4.57	8.28	1.35	0.27
W15A	SAW A	30,100	7,000	4.30	8.45	0.78	0.15
W15B	SAW A	15,048	3,800	3.96	8.69	0.41	0.08
W16*	SAW A	67,163	16,850	4.55	8.30	1.92	0.38
Total		1,805,293	397,300	4.54	8.30	1.42	0.28

* Flow indices were artificially high due to transfer of fish to raceway prior to release.

Appendix E. Brood Year 2004 Organosomatic Index Expressed in Percent of Normals.

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Date	Stock	Eyes	Gills	Pseudo-Branch	Thymus	Mesentery Fat	Spleen	Hind Gut	Kidney	Liver
3/10/2005	Saw A	100	85	95	65	100	100	100	100	100
3/10/2005	Pah A	100	100	95	85	100	100	100	100	100
3/10/2005	USB	100	100	100	60	100	100	100	100	100
3/10/2005	Dwor. B	90	100	100	65	100	100	100	100	100

Appendix F. Brood Year 2004 Coded-Wire and PIT Tag Releases.

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CWT Code	Stock	# CWT	# Stocked	# PIT Tag	# Stocked	Site & Purpose	Raceway #
10/55/76	PAH A	31,266	26,660	298	298	Red Rock	1WB
10/84/76	DWOR B	32,550		300	299	Little Salmon	10EA
10/84/76	DWOR B	33,574	59,040			Little Salmon	10EB
10/54/76	PAH A	33,007	29,583	300	298	Colston Corner	1WA
10/85/76	DWOR B	64,325	51,660			Squaw Pond	13E
10/51/76	PAH A	30,771	27,342			Pahsimeroi Trap	11WB
10/50/76	PAH A	29,966	27,435	300	300	Lemhi River	10WB
10/78/73	USB	39,773	35,448			Squaw Pond	14EB
Blank Wire	EFK NAT	13,587	11,116				
10/52/76	PAH A	32,138	28,845	300	300	Mcnabb	12WB
10/53/76	SAW A	32,385	27,269	0		Yankee Fork	16EB
	PAH A			300	300	Lemhi River	6WA
	DWOR B			500	499	Squaw Creek	E6A
	SAW A			299	297	Yankee Fork	W16A
	SAW A			299	298	Valley Creek	W15A
Total		373,342	324,398	2,896	2,889		

Appendix G. Historical Release Data.

05-39

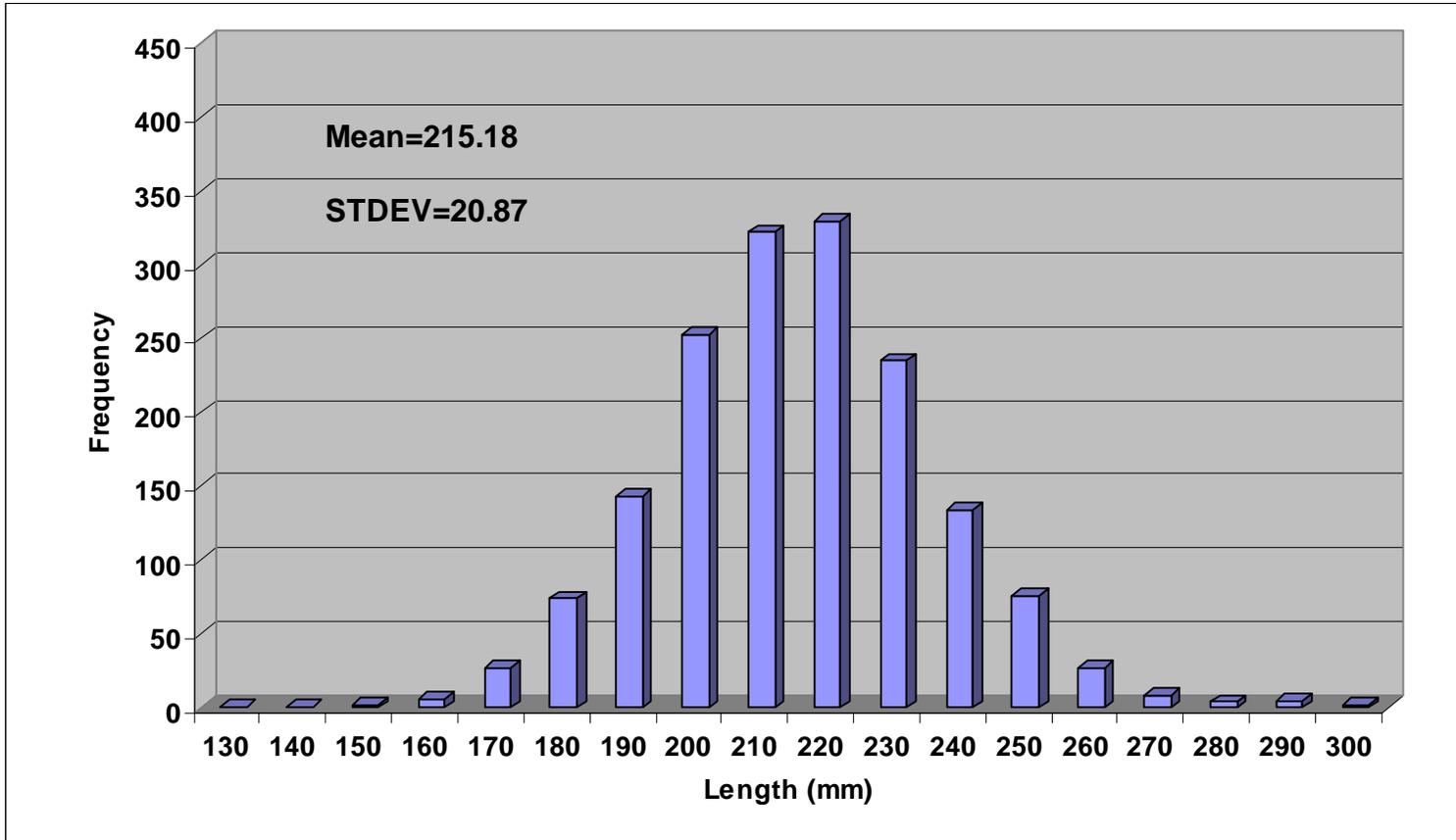
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Year	Combined A-run Eggs	Upper Salmon B-run Eggs	East For Natural Eggs	Dworshak B-run Eggs	Total Eggs	Spring/Smolt Releases	Fall/Fry Releases	Total Fish Released	Fish /Lb.	Lbs Released	Lbs Feed	Food Conv.
1982-83					145,206	135,361		135,361	4.23	32,000	57,700	2.24
1983-84	238,000			68,000		264,574		264,574	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	4.54	454,500	554,000	1.32
1988-89	2,047,748	357,506			2,405,254	2,202,800		2,202,800	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	4.54	397,300	429,490	1.08

Appendix H. Brood Year 2004 Length Frequency Graph.

05-39

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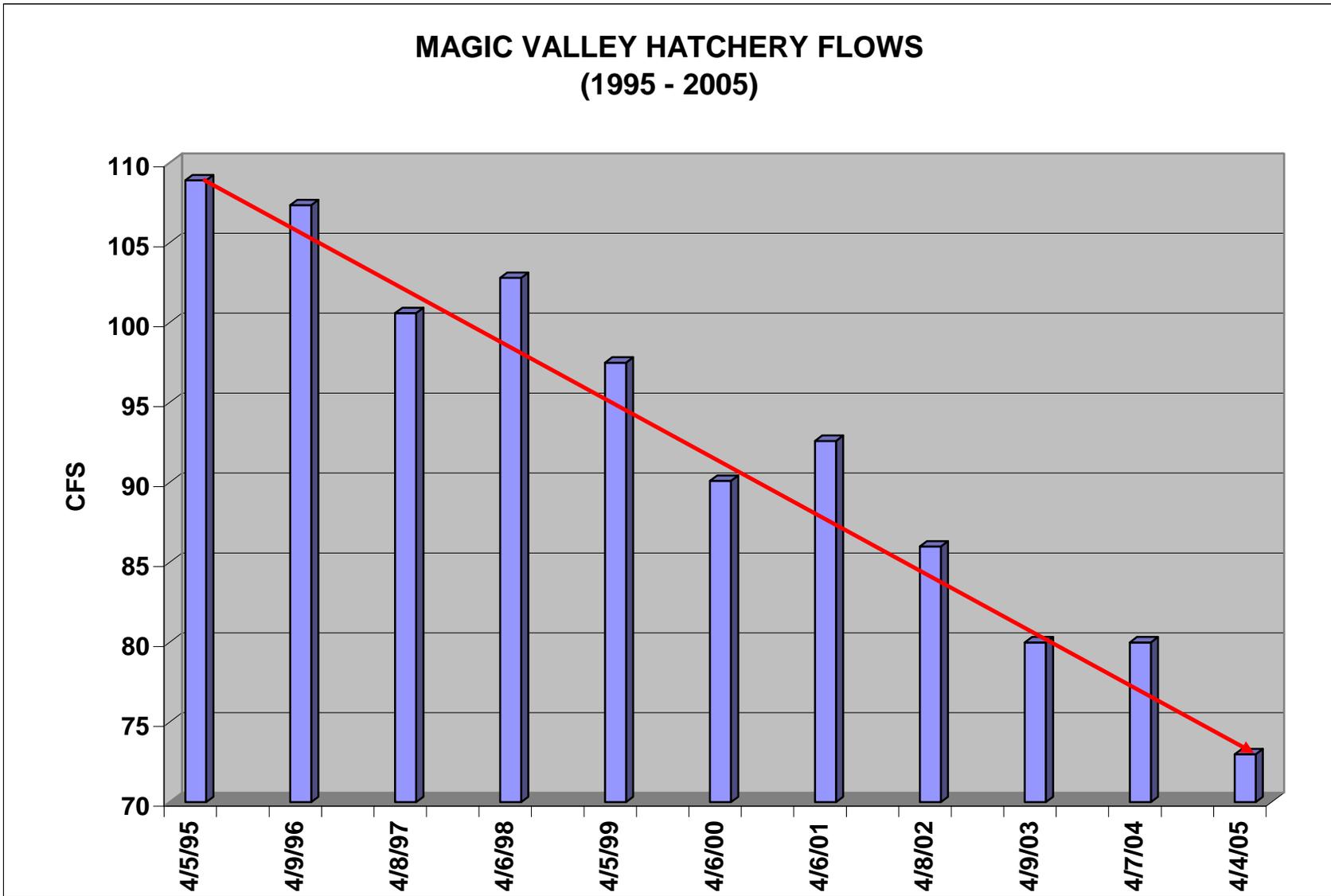


Appendix I. Hayspur Rainbow and Kamloop Trout started for Hagerman State Hatchery 2004–2005.

Hayspur Eggs Received @ Magic Valley Hatchery

2004-2005

Date	Vat #	Egg #	Stock	Moved to Hagerman			Number	Percent Survival
				Date	Pounds	#/lb		
8-Dec-04	11	128,216	T9	2/15/2005	700	168	117,600	91.7%
8-Dec-04	12	129,160	T9	2/15/2005	625	174	108,750	84.2%
14-Dec-04	13	143,524	T9	2/15/2005	575	214	123,050	85.7%
14-Dec-04	14	143,524	T9	2/23/2005	650	189	122,850	85.6%
14-Dec-04	15	116,580	KT	2/23/2005	600	183	109,800	94.2%
22-Dec-04	16	88,696	KT	3/4/05	480	168	80,640	90.9%
22-Dec-04	17	95,544	KT	3/4/05	350	209	73,150	76.6%
22-Dec-04	18	145,265	T9	3/4/05	640	195	124,800	85.9%
22-Dec-04	19	129,429	T9	3/4/05	530	171	90,630	70.0%
22-Dec-04	20	111,430	T9	3/4/05	500	165	82,500	74.0%
TOTAL		1,231,368			5,650	183	1,033,770	84.0%

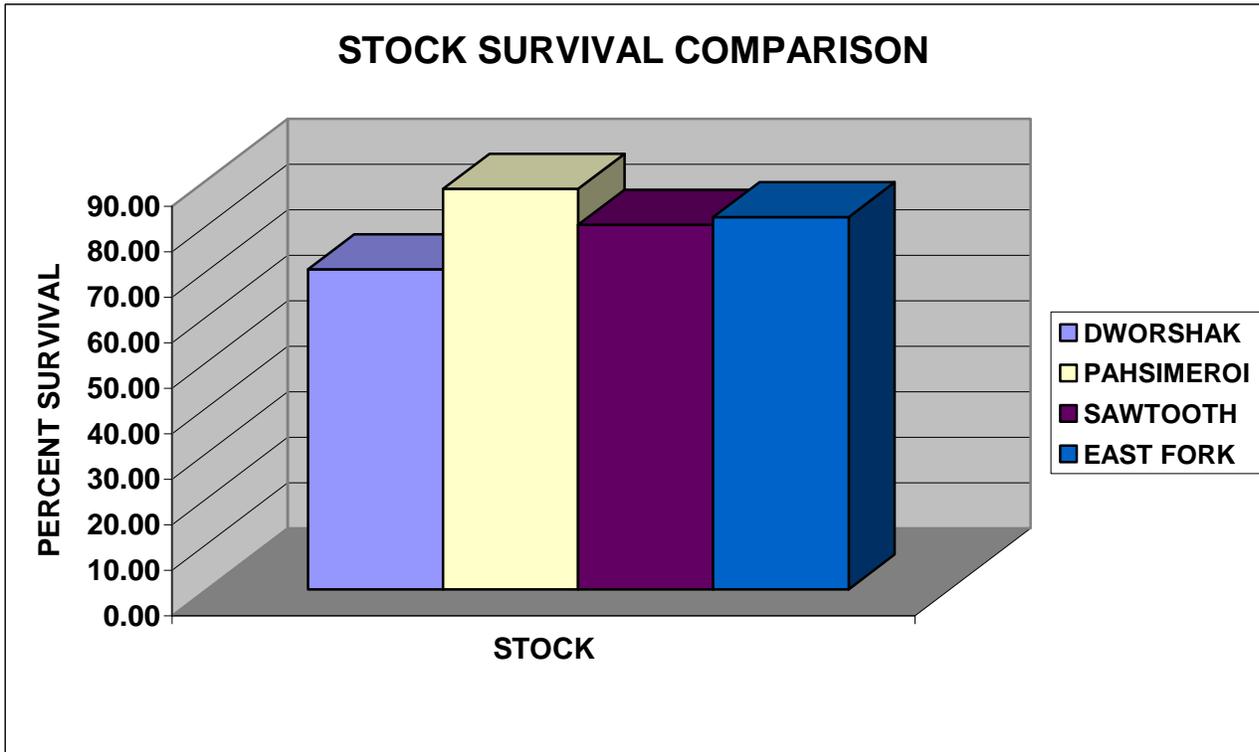


Appendix K. Brood Year 2004 Precocial Male Sampling Results.

Group	% Precocity (Males)	Sample Size	Date of Sample
Early Migrants	0*	*	
Non-Migrant	14	98	5/5/05

*No sample taken, because nothing was found the last two years.

Appendix L. Sixteen-Year Average of Stock Survival.



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