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LOWER SNAKE RIVER
COMPENSATION PLAN

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MAGIC VALLEY HATCHERY

2006 Brood Year Report

By

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August 2007
IDFG 07-37

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ABSTRACT

The twentieth year (May 1, 2006 to May 10, 2007) of steelhead *Oncorhynchus mykiss* production at Magic Valley Steelhead Hatchery (MVSH) was completed with a total of 1,624,649 smolts planted. Of the 123,164 smolts initially released into Squaw Creek Acclimation Pond, over 25,000 died from oxygen deficit when the pond intake became plugged. Smolt production yielded a total weight of 375,610 lbs. Fish were fed 360,000 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 or swim-up fry during May, June and July of 2006. The Dworshak B-run eggs totaled 932,190 and contributed 614,383 smolts to the river. The Upper Salmon B-run eggs totaled 149,260 and contributed 127,266 smolts to the river. East Fork Natural eggs totaled 66,543 and resulted in 50,592 fish planted as smolts. Sawtooth A-run eggs totaled 338,094 which produced 295,958 smolts. Pahsimeroi A-run eggs totaled 612,143. Pahsimeroi A swim-up fry totaled 135,392. The combination of eggs and fry yielded 536,450 smolts. Better than predicted early rearing survival primarily in the Dworshak Steelhead resulted in a total of 281,630 surplus steelhead fingerlings being stocked into Salmon Falls Creek and Roseworth reservoirs.

For the tenth consecutive year, Hayspur strain sterile 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 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. 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 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. 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 "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, walk-in freezer, 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 60,000-70,000 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-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 1.19 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 A shows flows over the last thirteen 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 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 2006 brood year, MVH was staffed with the following permanent employees: Rick Lowell, Fish Hatchery Manager II; Pat Moore, Assistant Hatchery Manager; Wade Symons, Dan Green, 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 Brian Terry, and Joe Gigantelli. Jeff Walker continues as 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

As a result of the continued depletion of the Eastern Snake River Plain Aquifer (ESRPA) Production targets remained approximately at 1.6 million smolts for BY 2006. Magic Valley Hatchery received 932,190 B-run (Dworshak) eyed eggs, 149,260 B-run eyed eggs (Upper Salmon B stock), and 66,543 East Fork Natural B stock. A-run eyed eggs included 612,143 (Pahsimeroi), and 338,094 (Sawtooth). An additional 135,392 Pahsimeroi swim-up fry were transferred from Oxbow Hatchery to compensate for losses due to IHN infection. The combined total number of steelhead eggs and swim-up fry received this year was 2,233,622. All eggs were received during May and June 2006. 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 outside raceways. The highest mortality rate occurred during the hatching, swim-up, and early-rearing stages. Compared to Brood Year 2005, survival improved in most stocks of eggs. Historically, Dworshak progeny survive at a significantly lower rate than other stocks. Recent changes in incubation techniques appear to have contributed to an improvement in Dworshak Stock Steelhead early rearing survival. Appendix C compares the eighteen-year average of survival from the eyed egg stage to final release for all stocks cultured at Magic Valley Steelhead Hatchery.

Surplus Steelhead Fry Distribution

As a result of better than predicted survival, surplus steelhead fry were transported and released into Salmon Falls Creek and Roseworth Reservoirs. With the assistance of Hagerman State Hatchery, a total of 198,000 Dworshak B at 125.52 per pound, and 52,000 Pahsimeroi A at 119.60 per pound were stocked into Salmon Falls Creek Reservoir in Late August 2006. In October, an additional 5,600 Dworshak B (89 lbs.), 6,030 Upper Salmon B (90 lbs.), and 20,000 Pahsimeroi A (200 lbs.) steelhead fingerlings were released into Roseworth Reservoir.

Hayspur Sterile Rainbow and Kamloop Production

For the tenth 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 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 until the beginning of February 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 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 at 89.7 cfs (84.8 cfs, October 2005). Spring flows began their seasonal decline during the last four months of rearing. In anticipation of decreasing flow, and to maintain a water turnover rate of two per hour or greater, only 27 raceways were used for final production rearing. Each of the outside 27 raceways had about 2.7 cfs prior to distribution in April.

Smolt distribution commenced on April 9th and continued through May 2nd. An average of five trucks per day was used for the transportation of 375,610 lbs. of fish and involved 81 truckloads (Appendix G). Transportation costs continued to increase during 2006. Brood Year 2005 transportation costs totaled \$95,480.00 for 76 truckloads while brood year 2006 increased to \$102,863.00 with five more trucks 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 (IHN) virus caused clinical losses in Pahsimeroi-A, Sawtooth-A, and Dworshak-B stocks at Magic Valley Steelhead Hatchery. One vat of Pahsimeroi-A fry were destroyed due to IHN, but were replaced with swim-up fry from Oxbow Hatchery. This was the only detection of virus in the indoor vats. Other episodes involved larger fish in the outside raceways, with isolations almost always detected in conjunction with bacterial infections. There is no effective treatment available for any viruses.

Clinical bacterial coldwater disease (CWD), caused by *Flavobacterium psychrophilum*, was diagnosed from East Fork-B and Pahsimeroi-A stocks in the indoor vats during June. Treatment with oxytetracycline-medicated feed (OTC) was applied under INAD protocols. Response to treatment was positive but not exceptional. Both of these groups were very small fry at the time. Small fish are not aggressive feeders and OTC is highly water soluble, so the fish may not have been able to ingest the targeted therapeutic dose.

The presence of CWD was detected 8 times from fish in the outside raceways, from all stocks except for Upper Salmon River-B. In all but one instance, IHN virus was also present. Because of the virus, all clinical episodes were allowed to run their course without intervention. The one instance when the bacterium was isolated from East Fork-B fish without the virus present, clinical signs were minimal and the isolation was considered a carrier state. *Aeromonas sobria* (a cause of motile aeromonad septicemia or MAS) was isolated from Dworshak-B fish twice, both times in conjunction with IHN and CWD.

Organosomatic Index

See Appendix J.

Acute Losses

One vat of Pahsimeroi-A fry experienced acute losses due to IHN. Replacements were available, so the manager chose to destroy the survivors rather than risk mixing them with healthy fish during the transfer to outside raceways. Sub-acute losses occurred among East Fork-B and Pahsimeroi-A fry in the hatchery vats due to CWD. Sub-acute losses occurred in nearly all stocks in the outside raceways due to a combination of IHN virus and bacterial CWD.

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

As a result of a significant fish loss at Squaw Creek Pond (>25K) Nampa Research personnel declined to sample smolts for precocity. PIT tagging was not implemented as well.

FISH MARKING

A total of 60,392 Pahasimeroi A unmarked steelhead were produced for releases into Slate Creek. A total of 30,451 Sawtooth A unmarked steelhead were produced for releases into the Yankee Fork of the Salmon River and 54,640 into Valley Creek. Additionally, 50,592 East Fork Natural Steelhead were marked with Coded Wire Tags and released as non-adipose clipped smolts.

At MVH the fin clipping crew Ad-marked 1,260,686 fish during July and August. During coded-wire tagging, an additional 445,028 fish were Ad-marked as well. Fin-clipping mortality was negligible. No treatment was necessary after handling.

A total of 495,965 fish received coded-wire tags in 2006, of which 480,577 survived and were out-planted as smolts in 2007. Nine different release locations were identified by coded wire tags. See Appendix L for CWT details.

In addition, a total of 3,691 had Passive Integrated Transponder (PIT) tags inserted in them. 3,645 PIT tagged smolts were released.

MAINTENANCE PROJECTS

During the year, the following projects were completed:

1. Received 100 new aluminum dam boards.
2. Received and set up 4 surplus Canadian Troughs from Looking Glass Hatchery.
3. A local contractor repaired three pumps in our pump room. Two of the pumps serviced the hatchery irrigation and residence heat pump system, and one pump serviced the water chiller.
4. A local contractor poured concrete approach pads for all four residence front entries.
5. Installed repaired drive-line wheel to the traveling bridge.
6. Made several trips to the County waste transfer station to haul old Koch rings from the degassing tower.
7. Landscape preparation and installation of sod at residences "A" and "D".
8. Completed a gravel based turn-around area for residence A.
9. Completed work on the residence C basement remodel.
10. Purchased blinds for all four residence basement egress windows.
11. Had the electric motor on the south feed bin metering valve rebuilt.
12. A local HVAC contractor repaired the heat pumps in residence "D" and "B".
13. Replaced several sections of rail for the traveling bridge buss bar.
14. Met with contract engineers to evaluate raceway wall deterioration issues.
15. Local contractors completed the interior painting, down-stairs carpet installation, and installation of four vinyl windows for residence "D".
16. Purchased a safety lifting harness for the T Size Oxygen bottles.
17. 17LSRCP sold our surplus semi-square vats, the old gas-powered Cushman Cart, Chevy ¾ ton 4 x 4 pickup and the old, pressure washer/steam cleaner on GSA auction.
18. A local electrical contractor completed installing 15 new flex conduit connectors to the bridge feeders

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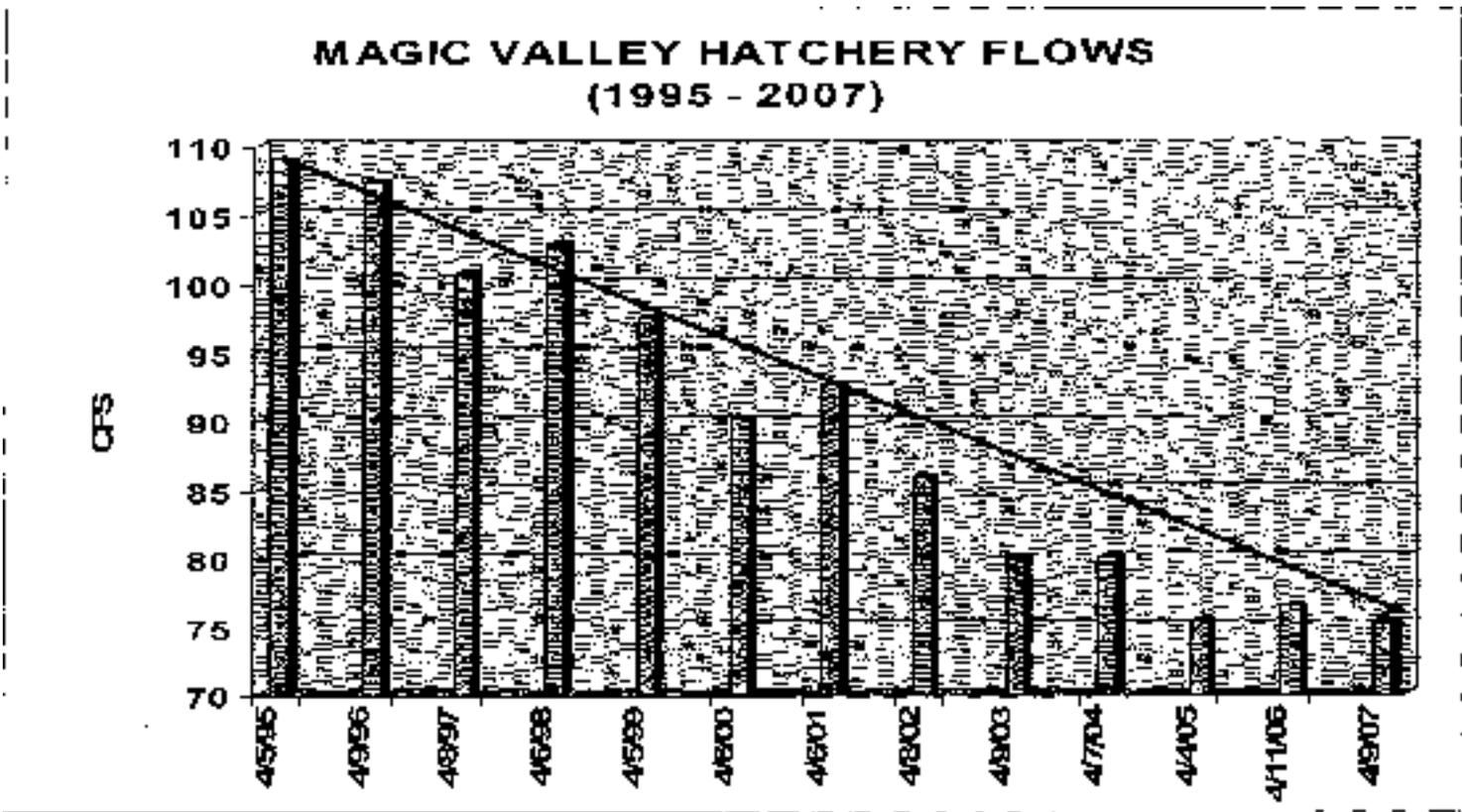
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APPENDICES

Appendix A. Hatchery Water Flows 1995-2007.

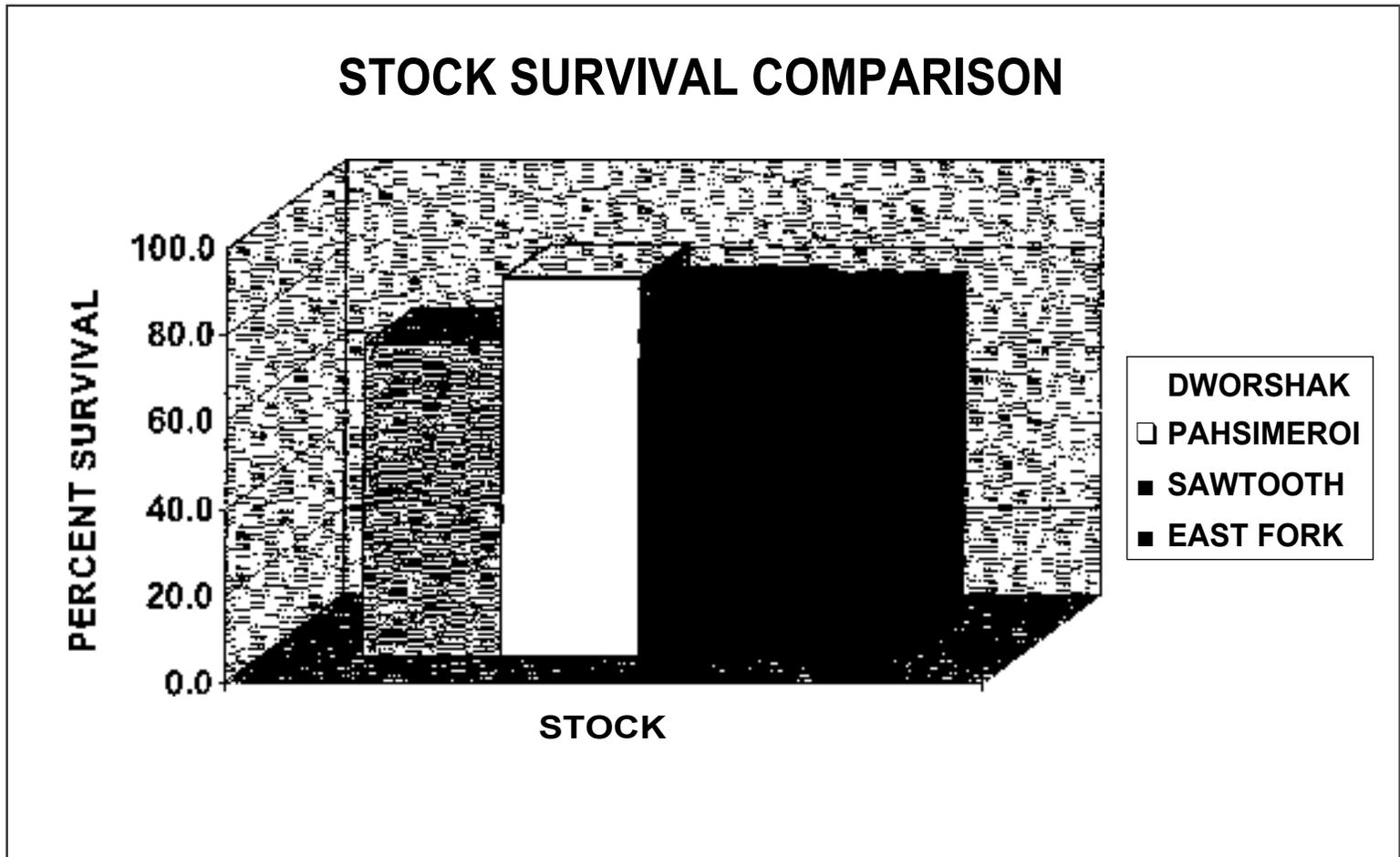


Appendix B. Brood Year 2006 Steelhead Survival Rates.

	DWORSHAK "B"	UPPER SALMON "B"	EAST FORK NATURAL "B"	PAHSIMEROI "A"	SAWTOOTH "A"	GRAND TOTAL
EGGS	932,190	149,260	66,543	*747,535	338,094	2,233,622
HATCHED	87%	97%	97%	99%	99%	96%
SMOLTS STOCKED	614,383	127,266	50,592	536,450	295,958	1,624,649
WEIGHT SMOLTS	139,703	27,411	12,191	128,105	68,199	375,610
NO./LB.	4.39	4.64	4.15	4.19	4.34	4.32
TOTAL NUMBER	817,983	133,296	50,592	608,450	295,958	1,906,279
TOTAL WEIGHT	141,325	27,501	12,191	128,707	68,199	377,924
% SURVIVAL						
EGG/RELEASE	87.7%	89.3%	76.0%	81.4%	87.5%	85.3%
POUNDS OF FOOD	142,469	26,616	11,133	116,491	63,292	360,000
CONVERSION	1.01	0.97	0.91	0.91	0.93	0.95

* 135, 392 swim-up fry from Oxbow Hatchery are included in the Pahsimeroi egg total.

Appendix C. Eighteen-Year Average of Stock Survival.



Appendix D. Hayspur Rainbow and Kamloop Trout started for Hagerman State Hatchery 2006-2007.

Date	Vat #	Egg #	Stock	Moved to Hagerman			Percent Survival	
				Date	Pounds	#/lb	Number	Eggs
28-Nov-06	11	110,000	T9	2/22/2007	700	126.8	88,760	80.7%
28-Nov-06	12	110,000	T9	2/22/2007	750	115.6	86,700	78.8%
28-Nov-06	13	105,000	T9/KT	2/27/2007	775	103.8	80,445	76.6%
28-Nov-06	14	105,000	KT	2/22/2007	700	118.7	83,090	79.1%
28-Nov-06	15	105,000	KT	2/22/2007	650	123.7	80,405	76.6%
28-Nov-06	16	105,000	KT	2/22/2007	680	114.6	77,928	74.2%
6-Dec-07	17	110,000	T9	2/27/2007	800	114.9	91,920	83.6%
6-Dec-07	18	112,485	T9	2/27/2007	720	129.0	92,880	82.6%
6-Dec-07	19	110,000	T9	2/27/2007	720	105.0	75,600	68.7%
TOTAL		972,485			6,495	116.7	757,728	77.9%

Appendix E. Brood Year 2005 and 2006 Production Feed Cost and Utilization.

	BY 2006	BY 2005
Number Of Fish	1,906,279	1,547,990
Lbs Of Fish	377,924	364,100
Feed Cost	\$152,347.56	\$130,326.96
Lbs Of Feed	360,000	347,512
Conversion	0.95	0.95
Total Cost	\$667,125.46	\$714,756.00
Cost Per 1000 Fish	\$349.96	\$461.73
Cost Per Pound Fish	\$1.77	\$1.96
Feed Cost/Lb. Fish	\$0.40	\$0.36

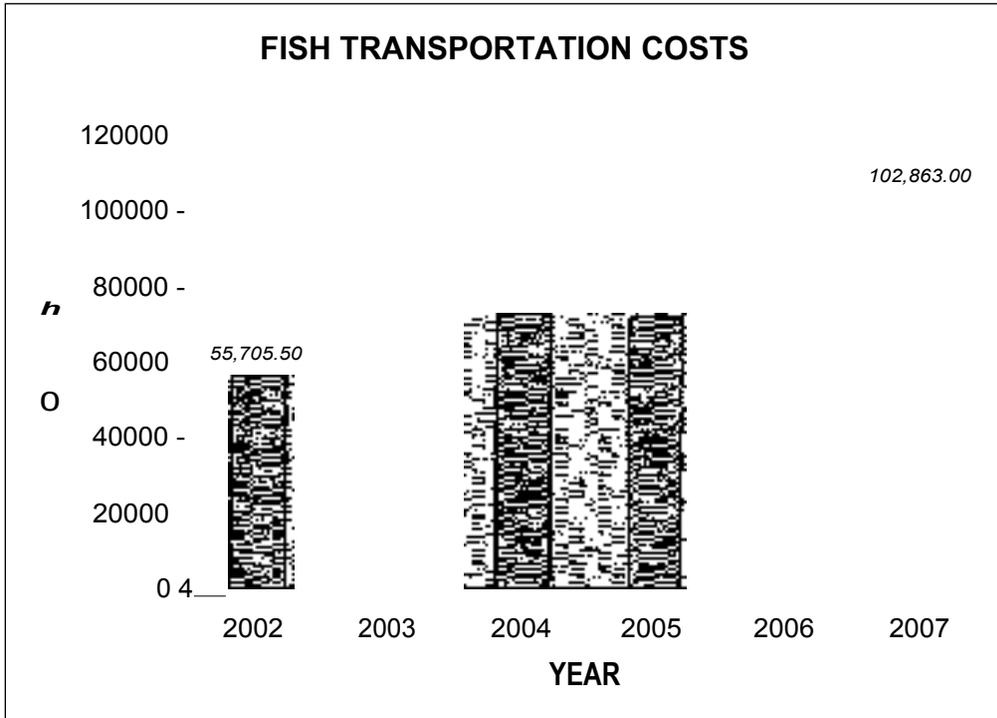
Appendix F. Brood Year 2006 Final Raceway Inventory with Flow and Density Indices.

Raceway	Stock	Number	Weight	No/lb	Length	Flow Index	Density Index
E1A	PAH A	30,082	7,428	4.05	8.62	1.37	0.32
E1B	PAH A	31,123	7,106	4.38	8.40	1.35	0.31
E2	PAH A	60,392	14,277	4.23	8.50	1.34	0.31
E3	PAH A	58,518	13,136	4.45	8.35	1.25	0.29
E4	PAH A	55,044	14,150	3.89	8.74	1.29	0.30
E5	PAH A	61,936	13,650	4.54	8.30	1.31	0.31
E6	PAH A	57,812	15,000	3.85	8.77	1.37	0.32
E7	PAH A	61,467	13,450	4.57	8.28	1.30	0.30
E8	PAH A	59,547	14,250	4.18	8.53	1.33	0.31
E9A	PAH A	29,938	6,900	4.34	8.43	1.31	0.30
E9B	DWOR B	31,570	7,000	4.51	8.32	1.34	0.31
E10	DWOR B	59,415	13,649	4.35	8.42	1.29	0.30
E11	DWOR B	61,410	13,350	4.60	8.27	1.29	0.30
E12	DWOR B	62,775	13,500	4.65	8.24	1.31	0.31
E13	DWOR B	59,567	11,937	4.99	8.04	1.18	0.28
E14	USB	63,597	13,006	4.89	8.10	1.28	0.30
W1	PAH A	59,875	13,957	4.29	8.46	1.32	0.31
W2A	PAH A	31,739	7,741	4.10	8.59	1.44	0.34
W2B	PAH A	29,770	7,279	4.09	8.60	1.35	0.32
W3A	PAH A	28,700	7,000	4.10	8.59	1.30	0.30
W3B	PAH A	30,591	6,874	4.45	8.36	1.31	0.31
W4	PAH A	62,817	14,441	4.35	8.42	1.37	0.32
W5	DWOR B	61,252	13,921	4.40	8.39	1.32	0.31
W6	DWOR B	63,568	13,971	4.55	8.30	1.34	0.31
W7	DWOR B	59,550	15,762	3.78	8.83	1.43	0.33
W8	DWOR B	60,421	14,956	4.04	8.63	1.38	0.32
W9A	SAW A	30,451	7,049	4.32	8.44	1.33	0.31
W9B	DWOR B	32,038	7,216	4.44	8.36	1.38	0.32
W10	DWOR B	63,669	14,405	4.42	8.38	1.37	0.32
W11	SAW A	60,783	14,202	4.28	8.47	1.34	0.31
W12	SAW A	54,640	12,856	4.25	8.49	1.21	0.28
W13	EFKNAT	50,592	12,191	4.15	8.55	1.14	0.27
Total		1,624,649	375,610	4.33	8.43	1.32	0.31

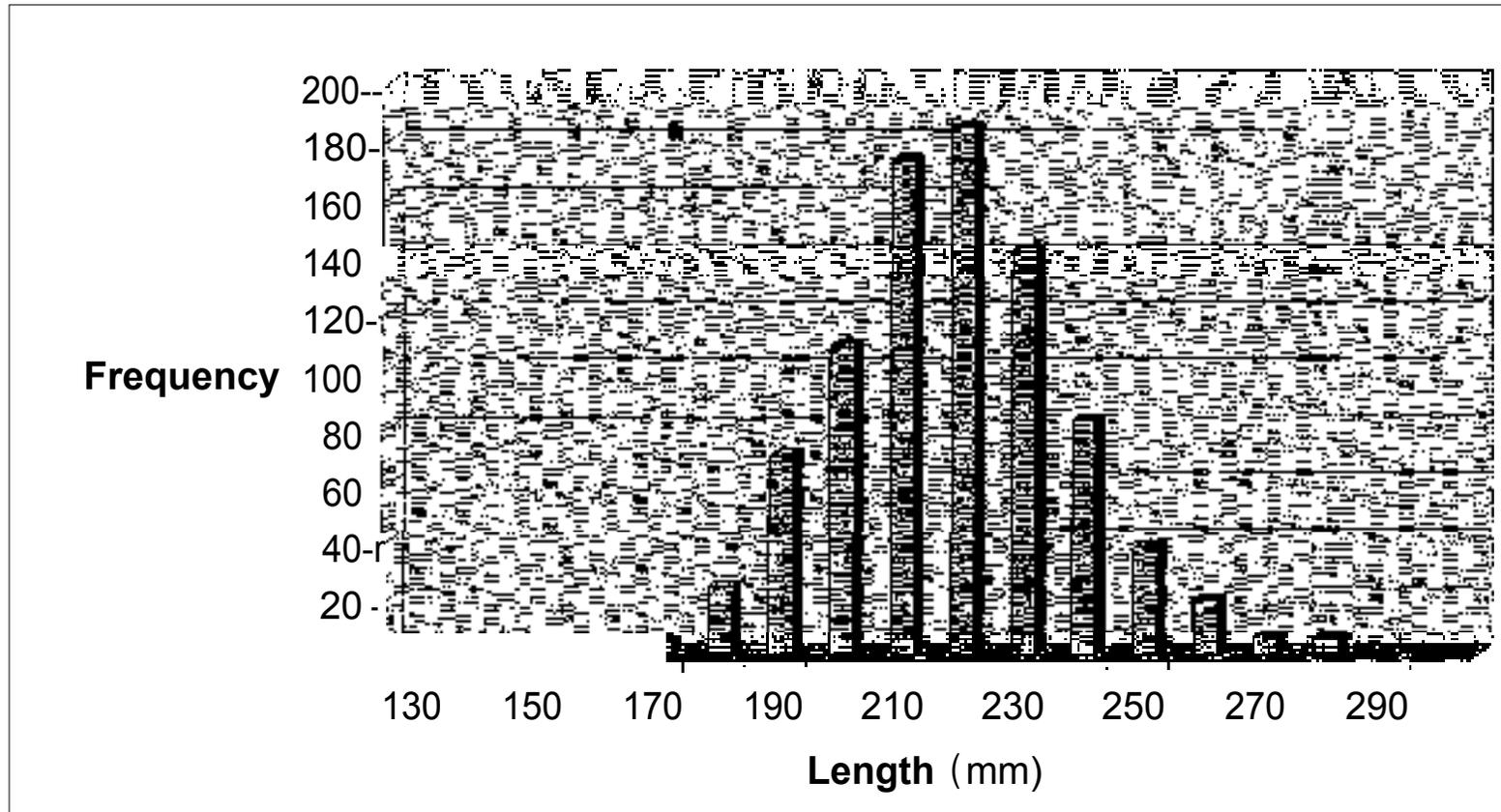
Appendix G. Brood Year 2006 Steelhead Smolt Distribution in the Salmon River and Tributaries.

Date	Site	Number Released	Stock	Fish/lb	Pounds	Marks
4/9-4/10	Squaw Creek Acclimation Pond (acclimated fish)	59,567	Dwor B	4.99	11,937	59,567ad/cwt,500 PIT
4/9-4/10	Squaw Creek Acclimation Pond (acclimated fish)	63,597	USB	4.89	13,006	63,597ad/cwt,500 PIT
4/10-4/12	Little Salmon R (Stinky Springs)	215,170	Dwor B	4.53	47,499	59,415 ad/lv/cwt, 300PIT
4/23-4/25	East Fork Salmon River (lower)	207,487	Dwor B	4.36	47,587	100% ad-clip, 299 PIT
4/30-5/1	East Fork Salmon River (above E. Fk. Weir)	50,592	Natural B	4.15	12,191	100% no clip, CWT
4/25-4/27	Squaw Creek	132,159	Dwor B	4.04	32,680	100% ad-clip, 481 PIT
4/26/2007	Squaw Creek	63,669	USB	4.42	14,405	63,669ad/cwt,492 PIT
4/20/2007	Pahsimeroi River (below weir)	30,591	Pah A	4.45	6,874	100% ad-clip, 30,591 ad/CWT
	Salmon River (Section 16) Includes:					
4/12-4/16	(Red Rock)	129,930	Pah A	4.33	30,000	100% ad-clip, 29,705 ad/CWT,293 PIT
	Salmon R. (Section 17) Includes:					
4/16-4/17	(Colston Corner)	165,473	Pah A/Saw A	4.18	39,600	100% ad-clip, 31,981 ad/CWT,300 PIT
4/17-4/18	(Shoup Bridge)	78,847	Pah A	4.22	18,700	100% ad-clip
	Salmon R. (Section 18) Includes:					
4/19-4/20	(McNabb Point)	119,727	Paw A/SAW A	4.18	28,663	100% ad-dip, 29,770 ad/CWT,298 PIT
4/20-4/23	(Tunnel Rock)	60,439	Pah A/Saw A	4.10	14,741	100% ad-clip
4/30/2007	(Valley Creek)	54,640	Saw A	4.25	12,856	100% no clip, 299 PIT
4/27/2007	Yankee Fork	60,783	Saw A	4.28	14,202	100% ad-clip, 30,567 ad/CWT
4/27/2007	Yankee Fork	30,451	Saw A	4.32	7,049	100% no clip, 298 PIT
4/18/2007	Slate Creek	41,136	Pah A	4.40	9,342	100% ad-clip, 31,123 ad/CWT,293 PIT
5/1-5/2	Slate Creek	60,392	Pah A	4.23	14,277	100% no clip, 292 PIT
	Totals	1,624,649		4.33	375,610	

Appendix H. Fish Transportation Costs 2002 — 2007.



Appendix I. Brood Year 2006 Length Frequency Graph.



Appendix J. Brood Year 2006 Organosomatic Index Expressed in Percent of Normals.

Date	Stock	Eyes	Gills	Pseudo-Branch	Thymus	Mesentery Fat	Spleen	Hind Gut	Kidney	Liver
3/5/2007	Saw A	100	100	100	75	100	100	100	100	100

COMMENTS:

FINS: Second consecutive year with worse fins: BY04 65% erosion w/mean index = 0.9; BY05 70% and m.i. = 1.05; BY06 90% and m.i. = 1.30
 SKIN: No abnormalities observed.
 GONADS: No precocial males observed in the sample.
 OTHER: Problems were experienced with clotting in the hematocrit tubes. Readings were taken from all but hematocrit data may be low.

3/15/2007	Pah A	100	100	100	75	100	100	100	100	100
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COMMENTS:

FINS: No fin observations were recorded. The hazard of 2 people working on 1 inspection is that sometimes a set of data is accidentally missed.
 SKIN: No abnormalities observed.
 GONADS: No precocial males observed in the sample.
 OTHER: Problems were experienced with clotting in the hematocrit tubes. Only 5 samples were readable.

3/15/2007	USB	100	100	100	40	100	100	100	100	95
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COMMENTS:

FINS:
 SKIN: No abnormalities observed.
 GONADS: No precocial males observed in the sample.
 OTHER: Problems occurred with clotting in 3 hematocrit tubes. Means from hematocrit and serum protein are from 17 readings.

3/15/2007	Dwor. B	100	100	100	75	100	100	100	100	100
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COMMENTS:

FINS: Dorsals, pelvises, and pectorals eroded, with 95% of the fish showing some level of active erosion.
 SKIN: No abnormalities observed.
 GONADS: No precocial males observed in the sample.
 OTHER:

Appendix K. Brood Year 2006 Coded-Wire and PIT Tag Releases.

CWT Code	Stock	# CWT	# Stocked	# PIT Tag	# Stocked	Site & Purpose	Raceway #
10/17/71	PAH A	21,892				Slate Creek	E2B
10/11/73	PAH A	9,991	31,123	298	293	Slate Creek	E2B
10/12/80	SAW A	30,491	29,770			McNabb	W2B
10/10/73	PAH A	10,179				Pahsimeroi Trap	W3B
10/16/71	PAH A	21,136	30,591			Pahsimeroi Trap	W3B
10/09/80	PAH/SAW	31,623	31,981			Colston	E5B
10/15/71	PAH A	21,065				Red Rock	E7B
10/09/73	PAH A	10,179	29,705			Red Rock	E7B
10/16/80	DWOR B	30,696	29,577			Little Salmon River	E10B
10/07/80	DWOR B	30,584	29,838			Little Salmon River	E10A
10/10/71	USB	8,870				Squaw Creek	W10A
10/91/75	USB	23,810				Squaw Creek	W10A
10/10/71	USB	10,891				Squaw Creek	W10B
10/91/75	USB	21,873	63,669	498	492	Squaw Creek	W10B
10/11/80	SAW A	31,354	30,567			Yankee Fork	W11B
10/08/80	DWOR B	32,662				Squaw Creek Pond	E13A
10/10/80	DWOR B	31,526	59,567			Squaw Creek Pond	E13B
Agency 10	EFK	25,363				East Fork Weir	W13A
Agency 10	EFK	26,692	50,592			East Fork Weir	W13B
10/90/75	USB	20,168				Squaw Creek Pond	E14A
10/09/71	USB	12,874				Squaw Creek Pond	E14A
10/90/75	USB	23,912				Squaw Creek Pond	E14B
10/09/71	USB	8,154	63,597			Squaw Creek Pond	E14B
	SAW A			300	298	Yankee Fork	W9A
	SAW A			300	298	McNabb	W1B
	DWOR B			300	299	Lower East Fork	W4B
	DWOR B			500	481	Squaw Creek	W9B
	SAW A			299	299	Valley Creek	W12B
	PAH A			298	292	Slate Creek	E1B
	PAH/SAW			300	300	Colston	E6B
	PAH A			298	293	Red Rock	E8B
	DWOR B			300	300	Little Salmon River	E12B
Total:		495,985	480,577	3,691	3,645		

Appendix L. 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
2006-07	1,085,629	149,260	66,543	932,190	2,233,622	1,624,649	281,630	1,906,279	85.34%	75.4	4.32	377,924	360,000	0.95

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