



**2003 ANNUAL RESIDENT
HATCHERIES REPORT**

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RESIDENT FISH HATCHERIES

2003 ANNUAL REPORT

Resident fish hatcheries reared and stocked over 14 million fish weighing over a million pounds. More than 2,500 stocking trips were made to plant fish in over 500 waters in the state. There were a total of 18 species and strains raised by the resident hatcheries during 2003.

Resident hatchery program costs were about \$2.1 million for an average cost of \$2.11 per pound or \$0.15 per fish.

Rainbow trout of catchable size (8 to 12 inches) accounted for approximately one-half the program costs at approximately \$1.2 million. All of the put and take program fish stocked were triploid to minimize the crossing of the hatchery fish with native fish in the wild.

The resident hatcheries cooperated with the states of California, Utah, Wyoming, Montana, Washington, Oregon and British Columbia as well as the US Fish and Wildlife Service to obtain various species to meet management efforts in Idaho. Golden trout eggs were obtained from California. Kokanee eggs were obtained from Utah. Grayling, Lake trout and Bear River Cutthroat were obtained from Wyoming. Westslope cutthroat and kokanee were obtained from Montana. Lahontan cutthroat and Coho salmon were obtained from Washington. Fall Chinook were obtained from Oregon. Kokanee salmon were obtained from the Fresh Water Fisheries Society of British Columbia.

Three captive broodstocks were maintained and spawned at the resident hatcheries, producing over 18 million eggs for various resident programs. These stocks include Westslope Cutthroat Trout, Kamloop rainbow trout and Hayspur rainbow trout maintained at Hayspur Hatchery.

The resident hatcheries operated adult fish traps on the Deadwood River and Granite Creek to obtain kokanee salmon eggs.

The Engineering Bureau coordinated major construction at the Hayspur, Henrys Lake, Hagerman, Mackay and Sandpoint hatcheries this fiscal year. The medium raceways at the Hayspur Hatchery are being replaced; the spawn house at Henrys Lake Hatchery was replaced along with siding on the primary residence. The new well was connected to the domestic water system at Hagerman, and the design of the Sandpoint Waterlife Center was done. Mackay Hatchery received a new two car garage, new siding on one of the residences, and a garage expansion along with a concrete floor in the garage and new sidewalks.

Idaho Department of Fish and Game
Resident Hatcheries Fish Production
01/01/03 - 12/31/03

Production Hatchery	Put-and-Take Number	Pounds	Put-Grow-and-Take Number	Pounds	Average Fish/ pound	Feed Pounds	Feed Costs	Average Length	Total cost	Cost 1,000 fish	Cost/ Pound
American Falls	187,436	63,363	77,104	677	4.13	67,737	\$22,235	7.8	\$179,952	\$680.00	\$2.81
Ashton	158,728	30,961	243,426	4,012	11.50	34,730	\$12,328	5.6	\$149,106	\$370.77	\$4.26
Cabinet Gorge			3,619,399	17,656	205.00	15,069	\$9,716	2.3	\$293,781	\$81.17	\$16.64
Grace	135,786	61,468	756,654	15,710	11.56	75,918	\$23,703	5.6	\$211,655	\$237.64	\$2.74
Hagerman	1,719,899	385,232	1,350,963	24,153	7.51	458,487	\$129,196	6.4	\$551,788	\$179.69	\$1.35
Mackay	155,083	51,806	3,942,694	34,344	47.57	90,735	\$26,968	3.5	\$255,126	\$62.26	\$2.96
McCall			202,335	84	2,408.75	87	\$89	1.0	\$6,000	\$29.65	\$71.43
Nampa	981,383	285,537	535,119	16,239	5.02	336,130	\$96,274	7.3	\$441,840	\$291.35	\$1.46
TOTAL	3,338,315	878,367	10,727,714	112,875	14.19	1,078,893	\$320,509	5.4	\$2,089,248	\$148.53	\$2.11
Total cost for each hatchery is that hatchery's total budget minus capital outlay expenditures											
Redistribution Hatchery											
Clearwater	108,428	42,684	0	0	3.0	4,030	\$1,571	10.0	\$10,812	99.71	0.26
McCall	91,480	30,500	0	0	3.0	300	\$102	10.0	\$8,764	95.80	0.29
Mullan	39,847	13,282	0	0	3.0	0	0	10.0	\$36,359	910.00	2.74
Sandpoint	116,240	40,130	0	0	3.0	0	0	10.0	\$44,415	382.00	1.11
Sawtooth	45,830	15,276	29,625	110		500	\$128		\$2,442 ^a		

^aIndicates costs of transportation of catchables only.

IDAHO DEPARTMENT OF FISH AND GAME

2003 ANNUAL RESIDENT REPORT

AMERICAN FALLS FISH HATCHERY

**Steve Wingert, Fish Hatchery Manager
David Billman, Assistant Fish Hatchery Manager**

INTRODUCTION

American Falls Fish Hatchery (AFFH) is a resident fish hatchery located on approximately 120 acres of land on the north bank of the Snake River, one-half mile below the American Falls Reservoir Dam, and two miles by road from the town of American Falls. It is owned and operated by the Idaho Department of Fish and Game (Department).

The primary mission of the AFFH is to rear approximately 250,000 catchable-sized (10-inch) Rainbow Trout *Oncorhynchus mykiss*. The AFFH also produces 18-inch catchable Rainbow Trout for Springfield Lake as well as some Yellowstone Cutthroat *O. clarki* catchables. In addition, fingerling (from 3-inches to 6-inches) Rainbow and Westslope cutthroat trout *O. clarki* are reared as requested. The number and lbs of fingerling produced varies from year to year.

Two permanent employees and one 8-month temporary employee staffed the AFFH during 2003. Volunteer hatchery hosts are utilized for the spring and summer tourist season when available.

Funding for the AFFH operation comes from license monies, from interest on an American Falls Irrigation District endowment, and from mitigation funds for the Gem State Hydropower Project at Idaho Falls.

The physical layout of the AFFH consists of ten single-pass 100-ft x 8-ft x 4-ft concrete raceways, ten reuse 100-ft x 8-ft x 4-ft concrete raceways, and a hatchery building containing fourteen 21-ft x 4-ft x 3-ft concrete rearing vats.

Water for the AFFH comes from Reuger Springs, which is located on AFFH property. These springs flow an average of 20 cubic feet per second (cfs) at a water temperature of 54°F to 56°F.

During September 2002, the AFFH Fish Culturist position was transferred to the Ashton Fish Hatchery. A 3-month increase in temporary time was associated with this personnel loss for FY04. However, the implementation of this increase in temporary time will not be realized until the spring of 2004.

FISH PRODUCTION

The AFFH raised triploid Hayspur strain rainbow trout (T9), triploid Troutlodge Kamloops (TT), Henrys Lake Cutthroat trout (C3), and Westslope Cutthroat (C2) from the Westslope Trout Company as well as from the Hayspur Hatchery for the 2003 production year.

The AFFH transferred 77,104 Westslope Cutthroat trout fingerlings (677 lbs) to the Cabinet Gorge Hatchery. These Westslope trout were the only fingerlings reared at the AFFH during 2003. The AFFH stocked 206,548 catchable trout (82,945 lbs). Total fish stocked and transferred was 283,652 fish, weighing 83,622 lbs (Appendix 1). Net production for the year (lbs stocked + lbs on hand 12/31/2003 - lbs on hand 1/1/2003) was 63,363 lbs. Net number of catchable fish produced, using the same basic formula, was 187,436 fish.

Cost for various types and sizes of fish food in 2003 was \$22,235 (Appendix 2). Feed costs for the year were \$0.351 per lb of fish produced, or \$0.053 per fish. Production costs overall were \$2.81 per net lb of fish produced. This cost includes all AFFH personnel and operating costs, as well as the cost of transportation of AFFH fish to stocking waters using fish transports stationed at the Hagerman and Nampa Fish Hatcheries during 2003.

Feed conversion for the year averaged 1.07 lbs of feed per lb of fish produced.

The number of catchables stocked this year was up 20% from last year, yet the lbs of fish stocked were virtually the same as last year. Net production was down 25,044 lbs from last year, in part because fish were not allowed to grow significantly beyond the requested size, as has been the case in the past but mostly due to the fact that some production at the AFFH was shifted from the spring to the fall for the 2004 rearing season. This change in operations resulted in a decrease in the number of lbs of fish being carried over from 2003 to 2004. The 2004 annual reports net production figures will reflect this change in operations.

HATCHERY IMPROVEMENTS

- Numerous trees were trimmed and cut on hatchery grounds.
- Numerous trees were transplanted on hatchery grounds.
- Several single-pane, steel-frame windows in residence #2 were replaced.
- A new door was installed in residence #3.
- A low-water alarm was installed in the hatchery building headbox.
- A high efficiency propane heater was installed in the shop to replace electric heaters.
- Installation of heat pumps in all three residences was completed.

HATCHERY NEEDS

- Residence #2 should be remodeled.
- The garage of residence #1 needs to be replaced.
- Siding should be installed on residence #3.
- The automatic feeding system should be replaced.
- The effluent pond dam needs to be replaced.
- Additional raceways are needed to maximize efficiency and to more fully utilize the available water.

PUBLIC RELATIONS

The AFFH welcomed an estimated 2,000 visitors during this period, including public school groups from March through July, and again in October and November. We also had scout groups, bird-watchers, drop-in visitors, hunters, and fishermen.

VOLUNTEER PROGRAM

Several different volunteers were used throughout the year to assist in scatter planting catchable fish. During 2003 we documented 47.5 hours of volunteer time.

ACKNOWLEDGEMENTS

Employees at AFFH this year were: Steve Wingert, Hatchery Manager I; David Billman, Assistant Fish Hatchery Manager; and Paul Wert, Biological Aide.

APPENDICES

Appendix 1. Swimming inventory with fish transferred or stocked by month, American Falls Fish Hatchery, 2003.

Month	Fish on hand	Pounds on hand	Fish stocked	Pounds stocked
December 2002	203,435	13,935	0	0
	29,634*	1,718*		
January 2003	203,380	17,967	0	0
	29,634*	2,511*		
February 2003	201,888	31,514	852	275
	29,570*	4,349*		
March 2003	192,034	38,086	8,025	2,675
	29,570*	6,291*		
April 2003	142,696	32,393	38,644	16,562
	55,571*	8,375*	1,053*	300*
May 2003	115,113	25,781	30,820	11,530
	104,530*	129*	11,191*	3,697*
June 2003	169,498	26,167	26,930	10,184
	30,000 *	12*	15,064*	5,380*
July 2003	73,380	17,721	32,257	10,712
	79,680*	314*		
August 2003	156,636	15,699	8,920	3,215
	108,936*	776*		
September 2003	182,161	15,212	6,146	2,630
	106,410*	1,025*		
October 2003	136,460	2,395	25,514	15,145
	20,990*	583*	77,104*	677*
November 2003	155,693	5,139	1,132	640
	20,979*	1,011*		
December 2003	176,356	8,749	0	0
	20,969*	1,048*		
Total Rainbow			179,240	73,568
Total Cutthroat			104,412*	10,054*
Grand Total			283,652	83,622

* Denotes cutthroat trout, all others are rainbow trout.

Appendix 2. Fish feed used during the 2003 production year, American Falls Fish Hatchery.

<u>Source</u>	<u>Size/Type</u>	<u>Pounds</u>	<u>Cost</u>
Rangen Dry	OO Swim-up/Starter	39.25	
Rangen Dry	O Swim-up/Starter	108.5	
Rangen Dry	#1	165.5	
Rangen Dry	#2	336.5	
Rangen Dry	#3	1,159	
Rangen Dry	1/16"	6,194	
Rangen Dry	1/8" Extruded Floating	54,660.5	
Rangen Soft Moist	0 Swim-up/Starter	29	
Rangen Soft Moist	1/8 "	4,827	
Rangen Medicated	1/8" with OTC	1,475	
Silver Cup	2.5mm	1,019	
Skretting	0 Swim-up/Starter	11	
Skretting	#1	42	
Skretting	#2	14	
TOTALS		67,737.25	\$22,234.62

IDAHO DEPARTMENT OF FISH AND GAME

2003 ANNUAL RESIDENT REPORT

ASHTON FISH HATCHERY

**Mel Sadecki, Fish Hatchery Manager I
Paul Martin, Fish Culturist**

INTRODUCTION

Ashton Fish Hatchery (AFH) is located in Fremont County, approximately two miles southwest of the small community of Ashton. The water source is Black Springs, which has a maximum flow of 5.5 cubic feet per second (cfs) at 50°F. Constructed in 1920, and funded by fishing license dollars, Ashton Hatchery serves as a "specialty station," rearing five species/strains of trout, char and grayling including rainbow trout *Oncorhynchus mykiss*, cutthroat trout *O. clarki*, Arctic grayling *Thymallus arcticus*, brook trout *Salvelinus fontinalis*, rainbow x cutthroat hybrid and brown trout *Salmo trutta*.

The majority of fish produced at AFH are fry and fingerling (1-inch to 6-inches) that are distributed throughout Idaho as part of various put-grow-and-take management programs. Catchable size fish (6-inches to 10-inches) are also reared at AFH and distributed locally in waters managed on a put-and-take basis.

FISH PRODUCTION

General Overview

A total of 402,154 fish (34,973 lbs) were produced at AFH this year, consisting of 243,426 fingerlings (4,012.44 lbs), and 158,728 catchable sized fish (including holdovers) (30,961 lbs). Total numbers were up while total lbs produced were down from the previous year (Appendix 1). An additional 18,973 (7,160 lbs) Troutlodge Triploid Rainbow Trout catchables were received from Nampa Hatchery during 2003. Production costs (excluding capital outlay) were \$149,106.55 with \$12,328.44 spent on fish feed and the remaining \$136,778.11 spent on general hatchery operations and personnel costs. Fish transportation cost for 2003 was \$8,961.70. The average cost per lb of fish produced (less transportation cost) was \$4.00 (Appendix 1). All production costs are up from last year.

All of the fish reared at AFH were received as eyed eggs (Appendix 2) with the exception of 39,000 Troutlodge triploids transferred from Nampa Fish Hatchery received during 2002 for stocking as catchables during 2003 and the 18,973 catchables from Nampa mentioned above.

All fry and fingerlings were fed by automatic belt feeders that dribbled feed into the tanks and raceways 8 to 10 hours per day. Human disturbance was kept to a minimum, and conversions improved over hand-feeding techniques.

Demand feeders were utilized in outdoor raceways for the catchables and holdovers. Feed conversion for catchables and holdovers was 1.17 in 2003 (Appendix 3). Lights over the nursery tanks were adjusted to a moderate intensity, and growth rates were maintained by use of automatic fry feeders and covers when the fish were moved outside to the small raceways.

The average survival for all fish stocked from eyed egg to distribution was 62.9%. This is a decrease of 0.4% primarily due to decreased rainbow triploid, brook trout triploid survival and bird predation. The poor survival of the Hayspur triploid rainbow and triploid brook trout remains unexplained. We are in the process of constructing screen covers for the outdoor raceways to reduce bird predation.

Rainbow Trout

Ashton Fish Hatchery produced and stocked 62,418 9-inch catchable rainbow (19,853 lbs) for distribution into area lakes and streams (Appendix 1). An additional 18,973 (7,160 lbs) Troutlodge triploid Rainbow Trout catchables were received from Nampa Fish Hatchery to meet our requests. The total number of catchables stocked was 80,610 fish (26,753 lbs). We received 196,000 Hayspur triploid rainbow trout (T9) eggs in December 2002. From these eggs, 10,582 T9 fingerlings, averaging 3-inches, were planted in a number of Upper Snake Region waters. An additional 96,310 (11,108 lbs) of 6-inch T9 holdovers were produced for stocking in 2004.

Henry's Lake Cutthroat Trout

No cutthroat were reared at Ashton Hatchery during 2003.

Rainbow x Cutthroat Hybrid

Ashton Fish Hatchery reared Rainbow x Cutthroat Hybrid triploids this year, in lieu of Henry's Lake Cutthroat. We received 67,700 eggs from Henry's Lake Hatchery during April. From these eggs we stocked 56,086 fingerlings (390 lbs).

Arctic Grayling

Arctic grayling are reared at AFH for statewide mountain lake stocking. In May 2003, green eggs totaling 90,000 were transported to AFH from Meadow Lake, Wyoming. The eggs arrived in very good condition and were placed in five upwelling incubators. Approximately 67% eyed up resulting in an estimated 60,000 eyed eggs. From these eggs 6,834 grayling were stocked into Horseshoe Lake and Divide Creek Lake. An additional 41,608 fish were transferred to Mackay and McCall hatcheries for stocking into mountain lakes statewide.

Brook Trout

The Idaho Fish and Game Department (Department) has decided to resume brook trout stocking into Henry's Lake. We received 90,000 diploid brook trout and 105,000 triploid brook trout from Henry's Lake Hatchery during 2002. From these eggs 44,399 (1,450 lbs) diploid and

54,312 (1,375 lbs) triploid brook trout were stocked into Henrys Lake. All the fish were fin clipped. The triploids received an adipose clip, while the diploids were LV clipped.

The brook trout request for 2004 is for triploids only. We received 133,000 eyed eggs from Henrys Lake Hatchery for stocking as fingerlings during the autumn of 2004.

Brown Trout

In November we received 34,300 brown trout eggs from Dubois, Wyoming. From these eggs 29,605 (168.5 lbs) fingerlings were transferred to Hagerman Hatchery for stocking in Region 4.

HATCHERY IMPROVEMENTS

The septic tank at residence #2 was repaired. A persistent basement-flooding problem in residence #2 was solved when the drain was located and roots were removed. Cleanouts for this drain were installed to facilitate future cleaning.

We are in the process of building covers for all outdoor rearing areas to reduce or eliminate severe bird predation. We also screened the hatch house discharge pipes to prevent entrance by muskrats and mink.

Future needs include construction of a large storage area, heated shop/garage north of the raceways, siding for both residences, as well as a new concrete driveway for residence #1. We need to complete the purchase of the additional spring area and cover it, to reduce debris and disease problems. Our 16-year-old snow blower will need replacement soon.

FISH STOCKED AND TRANSFERRED

The stocking requests at AFH remained similar to last year.

The number of catchable rainbow trout on-station was not sufficient to meet 2003 requests; an additional 18,973 Troutlodge triploid rainbow catchables were transferred in from Nampa Hatchery.

ASHTON FISH SPAWNING

Personnel from AFH traveled to Henrys Lake Hatchery to sort and spawn cutthroat trout and rainbow x cutthroat hybrids.

FISH FEED

A total of 34,730 lbs of fish feed were fed (Appendix 5) to produce 27,402 lbs of gain (Appendix 1), for an average conversion of 1.267. The grayling were fed Biokyowa. All others were fed Rangens dry.

PUBLIC RELATIONS

Approximately 1,000 people visited AFH this past year. About 100 elementary students from as far away as Idaho Falls visited the hatchery during the spring, summer, and fall for tours. We also resumed our Free Fishing Day event. Approximately 150 kids attended and all caught fish. The AFH filled several requests from area schools for eggs/fish for educational purposes.

SPECIAL PROJECTS

We installed and operated a trap at Moose Creek for the first time since 1995. Insufficient numbers of adult fish returned to the trap, so no eggs were taken and all fish were released to spawn naturally.

APPENDICES

Appendix 1. Fish production and cost, Ashton Fish Hatchery, 2003

Species	Size	Number Fish	Pounds Planted	Weight Gained In 2002	Cost/lb	Cost/fish	Total Cost
Fingerlings Produced and Stocked							
Hayspur triploid Rainbow	5.2	10,582	620	576.70	5.20	0.305	3,223.33
Henrys Lake triploid hybrid Rainbow/Cutthroat	2.6	56,086	390	371.49	27.06	0.188	10,552.91
Arctic Grayling	0.9	48,422	8.94	6.17	956.24	0.121	8,548.83
Brown Trout	2.4	29,605	168.5	157.39	31.52	0.179	5,311.49
Brook Trout Diploids	4.5	44,399	1,450	1,429.5	7.34	0.240	10,651.02
Brook Trout Triploids	4.1	54,086	1,375	1,362.25	8.90	0.255	12,234.64
Totals/Ave	3.4	243,426	4,012.44	3,903.5	12.59	0.207	50,522.22
Catchables Produced and Stocked							
Hayspur triploid Rainbow	9.0	36,313	10,732	5,994.74	2.59	0.766	27,818.75
Troutlodge triploid Rainbow	9.5	26,105	9,130	6,449	2.50	0.875	22,843.61
Totals/Ave	9.25	62,418	19,853	12,443.74	2.55	0.811	50,662.36
Catchables Produced For 2004							
Hayspur triploid Rainbow	6.6	96,310	(11,108) On hand	11,054.7	3.52	0.404	38,960.27
Totals/Ave	6.6	96,310	11,108	11,054.7	3.52	0.404	38,960.27
GRAND TOTAL		402,154	23,865.44 *34,973.44	27,401.95	4.00	0.348	140,144.84

* Includes fish on hand

Appendix 2. Eggs and fish received and transferred, Ashton Fish Hatchery, 2003

Species	Eggs received	Fish received	Fish transferred	Destination
Arctic grayling	90,000	0	41,608	Statewide
Hayspur triploid Rainbow	^a 142,000	0	0	Region 6
Henry's Lake triploid rainbow/cutthroat hybrids	67,742	0	0	Region 6
TT triploids	0	18,973	0	Region 6
Brown Trout	^a 26,280	0	0	Region 4
Henry's Lake Triploid Brook Trout	^a 133,000	0	0	Henry's Lake
Totals	459,022	18,973	41,608	

^aFor stocking in 2004

Appendix 3. Comparative growth rates, feed conversion, and percent survival for all species reared at Ashton Fish Hatchery, 2003.

Species	Average Monthly Length Increase	Average Conversion	Percent Survival
Brown Trout	.462	.810	86.3
Brook Trout Diploid	.468	.820	49.3
Brook Trout Triploid	.440	.730	51.7
Rainbow (catchables) Hayspur Troutlodge	.510	1.01	65.3
	.610	1.30	
Rainbow (fingerlings)	.490	1.10	45.6
Rainbow/Cutthroat hybrids triploid	.156	0.73	82.8
Arctic grayling	.036	2.90	76.9
Holdover for 2003 stocking			
Rainbow	.490	1.19	45.6

Appendix 4. Origin of fish stocked or transferred, Ashton Fish Hatchery, 2003

Species	Source	Eggs	Fish	Destination	Stocked	Transferred	Size (inches)
Brown Trout	Dubois,WY	^a 26,280		Region 4			
Brook Trout Triploid	Henrys Lake	^a 133,000		Henrys Lake			
Brown Trout	Dubois,WY	34,375		Region 4		29,605	2.4
Brook Trout Diploid	Henrys Lake	90,000		Henrys Lake		44,399	4.5
Brook Trout Triploid	Henrys Lake	105,000		Henrys Lake		54,312	4.1
Hayspur triploid rainbow	Hayspur	^a 142,000	--	Region 6		--	
Hayspur Triploid rainbow	Hayspur	234,000	--	Region 6	10,582	--	5.1
Troutlodge triploid rainbows	Nampa		18,973	Region 6	18,192		9.8
Henrys Lake Triploid Rainbow/Cutthroat Hybrid	Henrys Lake	67,742	--	Region 6	56,086		2.6
Arctic Grayling	Meadow Lake, WY	90,000	--	Statewide	6,834	41,608	0.9
Total stocked or transferred					151,556	13,569	

^aReceived prior to 2004

Appendix 5. Feed use, Ashton Fish Hatchery, 2003

Size	Source	Pounds	Cost/lb	Total Cost
B-250	Biokyowa	2.2	40.9091	90.00
Swimup	Rangens	232.5	0.4273	99.35
#1 Starter	Rangens	261.0	0.4278	111.65
#2 Starter	Rangens	1,000	0.4272	427.20
#3 Starter	Rangens	5,450.0	0.2989	1,629.00
3/32 Pellet	Rangens	6,273.0	0.2581	1,619.06
1/8 Pellet	Rangens	21,512.0	0.2576	5,541.49
Freight				2,810.69
TOTALS		34,733.7		\$12,328.44

IDAHO DEPARTMENT OF FISH AND GAME

2003 ANNUAL RESIDENT REPORT

CABINET GORGE FISH HATCHERY

**John Rankin, Fish Hatchery Manager I
Bruce Thompson, Assistant Fish Hatchery Manager**

INTRODUCTION

Cabinet Gorge Fish Hatchery (CGFH) is located on the south bank of the Clark Fork River in Bonner County, approximately eight miles southeast of the community of Clark Fork. The hatchery was constructed in 1985 and was co-funded by Avista (formerly Washington Water Power), Bonneville Power Administration (BPA), and the Idaho Department of Fish and Game (Department). The primary purpose for CGFH is to produce late-spawning Kokanee salmon *Oncorhynchus nerka kennerlyi* fry for release into Idaho's Lake Pend Oreille. Kokanee fry are needed to mitigate for the loss of wild Kokanee recruitment caused by hydroelectric power projects in the Pend Oreille watershed. The Kokanee fry releases are timed to coincide with cycles of zooplankton blooms. Maximum hatchery capacity is 20 million eggs, with fish production of 16 million two-inch fry.

The CGFH is staffed with three permanent employees. Thirty-one months of temporary labor are available for use during the year. Housing on-station includes two residences for the permanent staff and crew quarters for two temporary employees. The newly added fish culturist position is housed at a residence at the Clark Fork Hatchery.

Water Supply

Cabinet Gorge Dam is located about one mile upstream from the hatchery. After its completion in 1952, artesian springs began appearing along the Clark Fork River at the present site of the hatchery. The CGFH water supply consists of approximately 5.4 cubic feet per second (cfs) from a spring and approximately 20 cfs from a wellfield. The temperatures of the lower spring and upper wellfield vary inversely with each other over a 12-month period. The cooler water from the lower springs (pumps #7 and #8) was utilized for the entire Kokanee incubation and early rearing period. Incubation and early-rearing water temperatures were maintained around 49°F (range 44°F to 53°F). Production water ranged from 39°F to 45°F.

The hatchery utilizes six pumps to move water to a common headbox. The lower spring and upper wellfield water serves the 31,000 cuft of rearing space in the hatchery building and the 1,500 cuft of space in the adult holding ponds.

Rearing Facilities

Rearing facilities at the hatchery include 128 upwelling incubators and 64 concrete raceways. The incubators are 12-inches x 24-inches with a maximum capacity of 150,000 Kokanee eggs each. In addition, a total of 30 upwelling incubators, which are 6-inches x 18-inches, are available. The smaller incubators have a maximum capacity of 30,000 Kokanee eggs each. The 64 concrete raceways have rearing space of 31,000 cuft. The hatchery building encloses approximately one-third of each raceway. The adult Kokanee holding area consists of two holding ponds (10-ft x 30-ft each) at the head of the fish ladder. Additional adult holding is available in three holding ponds (10-ft x 30-ft each).

PRODUCTION

In 2003, CGFH produced a total of 3,619,399 fish weighing 17,656 lbs (Appendix 2). On January 1, 2004, an estimated total of 12,641,033 Lake Pend Oreille Kokanee eggs were on hand (Appendix 1). In addition, 48,822 fall chinook fry and 1,587,657 early-spawning Kokanee alevin were on hand at the end of the year.

A total of 15,069 lbs of feed produced 14,278 lbs of gain for an overall (all species reared) feed conversion of 1.06. Total production cost (including Nampa's transportation costs) was \$293,781, resulting in a cost per lb of fish of \$16.64, cost per inch of fish of \$0.0353, and per thousand fish of \$81.17 (Appendix 2).

Lake Pend Oreille Kokanee

General Rearing

Fertilized eggs were brought to the CGFH and disinfected in 100-ppm iodine for 10 minutes. After enumeration, the green eggs were placed in upwelling incubators and rolled until eye-up. At eye-up, soft-shell disease of the eggs prevented them from being shocked, sorted and counted with the Jentsorter JHC-114 model sorter. Instead, mortality was siphoned off throughout the incubation period, recorded, and deducted from the original egg number plus five percent (seven-year average of the difference between the Jentsorter counter and displacement numbers). Fry were allowed to volitionally swim out of the incubators into the raceways at 1,500 temperature units (TUs). All fry were thermally mass marked via temperature manipulation in the raceways. Feed training began at 1,700 to 1,720 TUs.

Kokanee were feed trained at approximately 50°F to 53°F using Skretting (formerly Moore-Clark) Nutra Plus #0 starter for 10 days. Feed training continued from day 11 to day 28 utilizing a 50:50 mix of Skretting Nutra Plus and Rangen Trout and Salmon Starter diets in sizes from Swim-up to Starter #1. On day 20, raceways were extended to full-length and on day 25 the fry were placed on Rangen Trout and Salmon Starter #1 only. On day 29, water temperatures were lowered to simulate natural production in LPO. The fry remained on Rangen Trout and Salmon Starter #1 for the duration of rearing. This was the same rearing protocol that was initiated on Brood Year 2002 with very favorable results.

Initial early rearing loading rates were lowered from 250,000 swim-up fry per raceway to 215,000 fry per raceway, mainly due to the small number of Lake Pend Oreille eggs collected. With the new rearing protocols and lower rearing densities, Kokanee growth rates were equivalent to 28 monthly temperature units (MTUs) per inch of growth even though 30 MTUs had been used for fish rearing projections. Fish health was excellent throughout rearing and no Bacterial Gill Disease (BGD) was encountered in 2003.

A total of 3,194,887 late Kokanee fry were produced at an average length of 2.10 inches and an average weight of 361 fish per pound (fpp). These fish gained 8,296 lbs from 7,391 lbs of feed, resulting in a conversion rate of 0.89:1.0. Fish production cost was \$17.37 per lb, \$0.0215 per inch, and \$45.10 per thousand.

Survival of green eggs to feeding fry was estimated at 80.2% (2002, 85.7%). Survival from first feeding to release was estimated at 99% (2002, 99.2%), resulting in survival from green egg to release of 79.3% (2002, 85%).

Fish Marking

To evaluate the success of a Kokanee *O. nerka kennerlyi* stocking program in Lake Pend Oreille, an otolith thermal mass marking (Volk et al. 1990) program was utilized at CGFH. All Kokanee fry received a thermally induced otolith pattern at the swim-up stage of development. Differential temperature was about 9°F. These fish will be distinguishable from their wild counterparts, as well as other hatchery year-classes by examining otolith growth rings for these distinctive bands, which are unique each year.

Analysis of pre-release fish specimens (Grimm et al. 2002) verified the presence of a recognizable otolith mark on all thermally treated fry.

Two factors contributed to the success of the T-marking and recovery of the T-marks. The first was the ability to manipulate water sources separately in each raceway without affecting the water in the other raceways. The second was the small (less than seven days) spread of the egg takes in each raceway. These factors allowed hatchery personnel to thermally treat groups of fry that collectively were at the same developmental stage. That is important because it places the otolith pattern in relatively the same geographic region of the otolith, making examination for and recovery of the mark much easier.

All of the adults that returned to the Sullivan Springs Kokanee trap in the fall of 2002 were T-marked. With results from the Washington Department of Fish and Wildlife otolith lab in Olympia, Washington, Idaho fisheries biologists were able to determine the age of the fish and whether it was of hatchery or wild origin. Based on 60 fish sampled from the 2002 Kokanee spawning run, 75% were hatchery three-year-olds (1998 brood year) and 25% were four-year-olds of wild origin. No four-year-old (1997 brood year) hatchery fish were detected. To date, no results have been received from the 2003 spawning adults.

Fish Liberation

On June 18 and 19, 2003, 2,994,707 late Kokanee fry were released into Sullivan Springs. On June 24, 100,159 late Kokanee fry were released into Spring Creek. Also on June 24, 100,021 late Kokanee fry were released into Twin Creek. The Twin Creek site was chosen as a future adult trapping location to replace or supplement the erratic adult numbers returning up the fish ladder at CGFH. No late Kokanee fry were released from the CGFH into the Clark Fork River.

Numbers at release were based upon raceway pound counts and truck displacement weights. All fish were off feed one day before inventory pound counts were taken. Pound counts were completed on all raceways one to three days prior to fish being loaded onto the transport vehicles. Actual displaced number was 4.6% more than estimated fish inventory number.

All of the Twin Creek and most of the Spring Creek release groups were liberated at dusk. The fish were planted in four trips utilizing the 1-ton stocking truck from the Sandpoint Fish Hatchery.

The Sullivan Springs release group was transported in two 3,000-gallon capacity Department tankers. Loading densities of small fish in the tankers was kept below 0.60 lbs per gallon. Fish were planted below the bridge on the access road to the Department patrol cabin. One tanker made two releases on June 18, 2003. The other tanker made three releases during the days of June 18 and 19, 2003.

Other Species

On December 31, 2003, a total of 46,486 fall chinook salmon were on-station. The fish averaged 444 fpp and were 1.96 inches in length. The chinook stock came from Big Creek Hatchery in Astoria, Oregon. Fall chinook salmon survival of eyed-eggs to feeding fry was estimated at 79.1% (2002, 91.2%). These fish are scheduled for transfer to Nampa Hatchery on January 14, 2004. Production costs will be reported on the 2004 annual report as the fry were only fed for twenty-one days in 2003.

During April 2003, a total of 203,192 Westslope cutthroat were released into numerous Panhandle lowland lakes. These fish averaged 39 fpp and had attained an average length of 4.17 inches at release.

On October 21, 2003, the hatchery received 53,192 Westslope cutthroat (Connor Lake stock) weighing 603 lbs from American Falls Hatchery, and 122,766 Westslope cutthroat weighing 396 lbs from Grace Hatchery. On December 31, 2003, the hatchery had on hand a total of 175,012 Westslope cutthroat weighing 3,431 lbs and averaging 3.83 inches in length (Appendix 2).

On October 30, 2003, a total of 1,653,957 eyed, early spawning Kokanee eggs were received from the Kootenay Trout Hatchery in Canada. On December 31, 2003, the hatchery had 1,587,657 sac-fry on hand. These fish will be released in Panhandle lowland lakes and used to start a run of early spawners in Sullivan Springs.

HATCHERY IMPROVEMENTS

Repairs and Improvements

- A new snowplow was installed on the hatchery plow truck.
- Four new doors were purchased to replace existing rusted-out doors on the hatchery building.
- A new 50 hp pump was purchased to replace pump #7 (rated at 25 hp). The pump was installed during the summer of 2003. A frequency drive was also installed on this pump and wired to be backed up by both emergency generators.
- A new picket weir was built on Twin Creek for trapping Kokanee.
- The pump, shaft and 50 hp motor were replaced on pump #5 in October 2003. The concrete base the pump sits on was also replaced.

HATCHERY RECOMMENDATIONS

Inadequate amounts of available warm water (50°F) during the production months remains the limiting factor for fish production. Although the upper wellfield can yield up to 20 cfs, it is too cold during the production cycle. Warmer water from the lower springs must be added to temper the upper wellfield water. Unfortunately, only 5.4 cfs is available from the lower springs. Modification of existing water collection and pumping facilities, or drilling additional wells at this location is warranted. The lower springs collect approximately 6 cfs of available water but the means to pump it is unavailable. Additional water at this location is also available for collection.

All 64 raceways need to be sandblasted and repainted (inside and out), as their condition is deteriorating rapidly. Increased algae growth in the porous walls is becoming more of a problem in Kokanee fry rearing in late spring.

The catwalk structure and stream anchors for the lower weir at the Granite Creek trap are made of wood and should be replaced with metal framework and concrete anchors.

The three full-time employee residences at Cabinet Gorge and Clark Fork hatcheries are in need of forced air heating systems. The current electric baseboard and ceiling heat systems are very inefficient and costly to operate.

A third residence, for the Fish Culturist who currently lives at the Clark Fork Hatchery, needs to be built at CGH. This would make the Fish Culturist available for alarm duty as well as be more accessible during Kokanee spawning and egg incubation.

Twelve more doors need to be purchased to replace the existing rusted-out doors on the hatchery building.

FISH SPAWNING

Fish Trapping

The Clark Fork River fish trap was in operation from July 1, 2003 to December 17, 2003. The first adult Kokanee entered the trap on November 5, 2003 and trapping continued through the middle of December. There were 7,158 adult Kokanee trapped. Trapping records indicated 29.7% (31.2% in 2002) of the spawning run was female (2,126). From July 1, 2003 to October 17, 2003 the trap was used by Avista Corp personnel to collect and sample bull trout. A total of 69 adult bull trout were trapped, tagged, held, and released. Avista also electroshocked bull trout from the Clark Fork River that were staged on the spawning beds. Thirty-five adults (five from the hatchery ladder) were trucked around the Cabinet Gorge Dam and released into the mouth of Bull River and other Montana tributaries of the Clark Fork River. These fish were part of a USFW experiment to utilize traditional spawning habitat in Montana, which became inaccessible to the native bull trout stock when the Cabinet Gorge Dam was completed in 1952. After spawning, 16 of the outmigrating adults were recaptured and trucked back to the hatchery ladder. Another six adults went through the dam and also returned to the lower Clark Fork River and Pend Oreille Lake watershed.

The Sullivan Springs trap was in operation from October 20, 2003 to December 29, 2003. The trap collected 129,102 (34,586 in 2002) adult Kokanee salmon. Of these, 15,089 (5,410 in 2002) adults were passed above the trap to spawn naturally in Sullivan Springs Creek. Spawntaking records showed that 39.5% (52.3% in 2002) of the run was female (45,066).

An attempt was also made to trap three-year-old (Brood Year 1999) Kokanee adults returning to Twin Creek. No fish were captured the entire season.

Spawntaking and Eggs Received

An estimated total of 12,640,973 green fertilized Kokanee eggs were collected during the 2003-2004 spawning season. These eggs were obtained from 43,159 female Kokanee captured at the Sullivan Springs and hatchery ladder traps (Appendix 1).

A total of 60,000 eyed fall chinook eggs were received from Oregon's Big Creek Hatchery on October 31, 2003.

A total of 1,653,957 eyed early spawning Kokanee eggs were received from Canada's Kootenay Trout Hatchery on October 30, 2003.

FISH FEED

Fish produced during 2003 were fed a total of 15,069 lbs of feed. Fish feed was acquired from Rangen Inc. and Skretting USA, Inc. (formerly Moore-Clark USA, Inc). The overall conversion was 1.06 lbs of feed to produce 1 lb of fish, not including the weight of mortality (Appendix 2).

PUBLIC RELATIONS

The surrounding communities recognize the CGFH as one of the major contributors of Kokanee to the Lake Pend Oreille fishery. The importance of this forage species to the world-class Pend Oreille trophy fishery and the local economy is presently estimated in the millions of dollars. The hatchery has been the focus of many radio, television, and newspaper stories in recent years. With the decline in Kokanee numbers in recent years, even more attention is focused on the hatchery. Because of the popularity of the lake and its attractions, tourism is a booming business, and we have people from all over the world visiting the hatchery.

A total of 200 people signed our guest registration book this year. An estimated 600 visitors toured the hatchery during the 2003 season. In addition, tours were given to school groups and other organizations.

The CGFH staff was also involved with the Living Stream In The Classroom program. A total of five local schools received eyed-eggs (Kokanee) or fish (Westslope cutthroat) for their classroom tanks. An educational presentation was given to each class at the time of delivery.

ACKNOWLEDGMENTS

The CGFH staff would like to thank the Cabinet Gorge Dam and Northern Lights personnel for their continued cooperation with hatchery operations. Thanks also to the Lake Pend Oreille Idaho Club, Bonner County Sportsmen's Association, numerous volunteers, and various regional and hatchery Department personnel for their cooperation during the spawning season. The staff would also like to thank Zach Olson - Fish Culturist, CGFH Maintenance Craftsman - John Suhfras, Mullan Hatchery Biological Aide - Mary Van Broeke and CGFH Biological Aides: Beth Brown, Steve Lowe, Rauno Raiha (Bonner County Sheriff's boat operator), Stacey Taylor, Jeff Piazza, and Taneesha Smith for their dedication and hard work in making 2003 a successful year.

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IDAHO DEPARTMENT OF FISH AND GAME

2003 ANNUAL RESIDENT REPORT

CLEARWATER FISH HATCHERY

**Chris Shockman, Fish Culturist
Lacey Alberts, Bio Aide
Jerry McGehee, Fish Hatchery Manager 2**

INTRODUCTION

The Clearwater Fish Hatchery (CFH) is located in the community of Ahsahka in Clearwater County. Ahsahka is a Native-American word meaning, "where two great rivers join", and refers to the confluence of the North Fork of the Clearwater River to the main Clearwater River. The hatchery was built by the US Army Corps of Engineers (USACE), under the United States Fish and Wildlife Service (USFWS) Lower Snake River Compensation Plan (LSRCP), and was completed in 1991. Funding is provided by the USFWS. The hatchery is operated by the Idaho Department of Fish and Game (Department).

The primary purpose for CFH is mitigation for anadromous fish losses caused by hydroelectric dams. Anadromous fish production is using all available rearing space; therefore, the facility had no excess rearing space for catchable rainbow trout *Oncorhynchus mykiss* production.

The hatchery water source is a double pipeline from Dworshak Dam, which can supply over 70 cubic feet per second (cfs) of reservoir water to the facility. Two intakes are located at the dam. The primary intake is adjustable from five feet to fifty feet to collect surface water; the secondary intake is about 200 feet below full pool level. This design allows mixing of water to target a specific temperature.

All available money for fish feed at CFH was transferred to the Nampa Hatchery program. A total of \$4,710.00 was available for two temporary employees for 3.3 months.

FISH PRODUCTION

Release Year 2003

Catchable Rainbow Trout

The CFH produced zero catchable-sized rainbow trout for release in 2003. The CFH was strictly a redistribution center for Nampa State Fish Hatchery (NSFH) reared rainbow trout catchables in 2003. The CFH did not produce catchables in 2003 because spring chinook and steelhead occupied all available rearing space.

FISH FEED

Catchable Rainbow Trout

The CFH redistributed catchable rainbow trout into Region 2 waters during 2003. Because these fish were stocked in local waters as fast as they arrived, little supplemental feed was needed to maintain overall health and size of the fish.

A total of 4,030 lbs of 2.5 mm BioDry 1000 bulk feed was fed to the rainbows through the summer of 2003 (Appendix 2). This was leftover Brood Year 2002 steelhead feed and was purchased with LSRCP dollars. No feed was purchased with state money for the rainbows at CFH during 2003.

FISH STOCKED AND TRANSFERRED

Catchable Rainbow Trout

Production goals of anadromous fish required the use of rearing space for spring chinook and steelhead. Therefore, the hatchery had no space available to rear catchable rainbow trout during 2003.

The CFH redistributed 108,428 Troutlodge triploid rainbow trout during 2003 (Appendix 1). They averaged 3.0 fpp, weighed 42,648 lbs, and averaged 10 inches in length. A total of 77 fish plants were administered to 29 different plant sites. Included in this total were 850 (Shasta strain) rainbow trout that were reared at Dworshak and Kooskia national hatcheries for their annual Open House. These fish were stocked into one additional plant site by CFH personnel. These rainbow trout weighed 850 lbs, averaged one fpp, and averaged 13.8 inches in length.

High water delayed some stream stocking until late May. The CFH also had problems in late July, August, and early September of 2003 with water temperatures getting too warm. Flexibility in release dates and fish numbers during these times was imperative for a successful stocking season. This flexibility would not have been possible without the cooperation of regional fisheries biologist Robert Hand. Due to these warm water temperatures, few plants occurred in August and September. As a result, there was a small surplus of rainbows that were planted in Spring Valley Reservoir in October.

PUBLIC RELATIONS

Clearwater Hatchery and its satellites were open to visitors during the year. Tours of the main hatchery were given to various groups including a group of teachers with the Sustainable Forest group. We had visitors from many states, as well as from other countries.

Theresa Elliott and three summer youth employees assisted Dworshak Hatchery during their annual Open House on June 14.

On August 1, Fred Hough hauled 250 catchable rainbow trout (2.99 fpp) and 13 trophy-size trout to Orofino Creek near Pierce for their annual 1860 Days Celebration.

On July 16, Fred Hough planted 250 rainbows with 10 trophy fish into Jaypee Mill Pond for a 4H forestry tour of several hundred sixth grade students.

SPECIAL PROJECTS

A total of 233 adult-size fish, ranging in weight from 3 lbs to 8 lbs, were recovered from the settling pond. The crew supplemented 31 fish stocking trips to 13 different sites with these large fish.

ACKNOWLEDGEMENTS

The CFH would like to thank the Nampa Fish Hatchery crew for raising the rainbows, and Dick Bittick and Gary Ady for transporting them for distribution. The CFH would also like to thank Robert Hand and Larry Barrett for their cooperation in redistributing fish to different plant sites due to warm water temperatures in August and September. Bio Aides Robert Schloss, Brian Peterson, Theresa Elliott, Gary Duke, Fred Hough, Barbara Zimiga, Joe Zimiga, Lacey Alberts, Daryn Call, and Chad Henson assisted in rainbow distribution. Three youths involved in the Clearwater Youth Program also provided assistance.

APPENDICES

Appendix 1. Clearwater Hatchery resident fish redistribution, January 1 - December 31, 2003.

2003 Catchable Rainbow Trout (Troutlodge Triploid)

			Number of Fish	Weight (lbs)
2003 catchable RBT on hand 1/1/03			0	0
2003 catchable RBT on hand 12/31/03			0	0
Date	Number released	Pounds	Fish per Pound	Type of Fish
4/1-4/30	32,073	10,605	3.0	Troutlodge TT
5/1-5/29	31,281	10,498	3.0	Troutlodge TT
6/1-6/30	17,851	5,670	3.2	Troutlodge TT
7/1-7/24	11,900	5,578	2.1	Troutlodge TT
8/1-8/30	490	205	2.4	Troutlodge TT
9/1-9/23	2,515	1,302	1.9	Troutlodge TT
10/1-10/17	12,318	8,603	1.4	Troutlodge TT
Totals	108,428	42,461	2.4	

Appendix 2. Fish feed costs and amount fed for the CFH rainbow programs, January 1 - December 31, 2003.

DATE	BRAND	FEED TYPE	WEIGHT (lbs)	COST PER LB	TOTAL
4/11/03	Bio Oregon	2.5mm BioDry 1000 bulk	4,030	\$0.39	\$1,571.70*

* Purchased with Lower Snake River Compensation dollars.

Total Summary of Catchable Rainbow Trout Redistributed.

# Of FISH	WEIGHT (lbs)	FEED FED	CONVERSION	COST PER LB FOR REDISTRIBUTION	COST/1000 FISH FOR REDISTRIBUTION
108,428	42,461	4,030	NA	\$0.26*	\$99.71**

Estimated costs include 50% of the FY02 & FY03 budgets and do not include permanent salaries or feed cost @ NSFH. Redistribution expenditure by CFH \$10,811.94.

* Cost/lb equals total budget (minus feed cost @ NSFH) divided by total lbs produced, 1/1/03-12/31/03.

** Cost/1000 fish equals total budget (minus feed cost @ NSFH) divided by total number of fish produced times 1000.

1/1/03 to 12/31/03	TOTAL SPENT	\$20,811.94
	NSFH Feed Cost	<u>-10,000.00</u>
	CFH COST for Redistribution	\$10,811.94

IDAHO DEPARTMENT OF FISH AND GAME

2003 ANNUAL RESIDENT REPORT

GRACE FISH HATCHERY

**Dwight Aplanalp, Hatchery Manager I
Jeffrey D. Seggerman, Assistant Manager
Tom Kent, Fish Culturist**

INTRODUCTION

Grace Fish Hatchery (GFH) is located in Caribou County, approximately seven miles south of the community of Grace. The GFH was acquired in 1946 and is owned and operated by the Idaho Department of Fish and Game (Department). Funding is received from revenue generated by fishing license sales.

The primary mission of GFH is to produce quality catchable and fingerling rainbow trout *Oncorhynchus mykiss*, for stocking waters in the Southeast Region. Catchable-size trout (from 6-inches to 10-inches) are distributed locally on a put-and-take basis. Fingerling trout (3-inches to 6-inches) are distributed in area waters as part of various put-grow-and-take management programs. The GFH also produces specialty species of various sizes to meet statewide requests.

The GFH is staffed with a Fish Hatchery Manager I, Assistant Fish Hatchery Manager, and a Fish Culturist. Two temporary employees may be hired to assist with hatchery operations.

Water for GFH is supplied by gravity flow from Middle and West Whiskey Creek springs located on private property owned by Robert Harris. Flow was approximately the same as in 2002 with an annual average of 11.24 cubic feet per second (cfs). There is a natural fluctuation in water quantity basically opposite of run-off and GFH biomass. Flows are at a minimum during May and June and peak in October and November. The GFH biomass is at a maximum in May and at minimum in October. Water temperature fluctuates from 52°F to 54°F.

Fish rearing space consists of sixteen (3-ft x 1.5-ft x 13-ft) single pass building vats, sixteen (4-ft x 3.5-ft x 40-ft) single pass small raceways, four (4-ft x 3.5-ft x 100-ft) single pass medium raceways, two (12-ft x 3.5-ft x 300-ft), eight (5-ft x 3.5-ft x 75-ft) and four (12-ft x 3.5-ft x 200-ft) large raceways. The water for the large raceways is second-use water from the vats and small raceways that is mixed with fresh water from the middle spring. All water exiting GFH flows through a settling pond before being discharged into Whiskey Creek.

FISH PRODUCTION

The GFH cultured Westslope cutthroat trout (C2), Yellowstone strain Henrys Lake cutthroat trout (C3), sterile Hayspur strain rainbow (T9), Sterile Kamloop rainbow (KT), Troutlodge triploid rainbow trout (TT), and lake trout (LT) in 2003.

The GFH began the 2003 calendar year with 226,016 fish weighing 17,386 lbs. A total of 874,379 fish weighing 67,442 lbs were reared and planted by GFH in 2003. At the end of the year there were 179,811 fish weighing 27,122 lbs on hand. This accounts for a total production of 828,174 fish and 77,178 lbs (Appendix 1).

The GFH received eyed eggs from various state and private hatcheries in 2003. During the year, 893,065 eyed-eggs of various species were received (Appendix 2).

Production costs are bottom-line figures and are not broken out by species (Appendix 3). Production costs at GFH for 2003, excluding capital outlay, were \$211,655. Production costs were calculated for pondside and streamside amounts. Pondside cost is total budget minus capital outlay minus transportation. Streamside cost includes transportation.

Rainbow trout (fingerlings and catchables combined) accounted for 91.9% of the total lbs produced and 87.4% of total cost. The average cost to produce a rainbow trout at GFH in 2003 was \$2.25 per lb or \$209.78 per 1,000 fish. Specialty species accounted for the remaining 8.1% of the lbs produced and 12.6% of total cost. The average cost to produce a specialty species at GFH in 2003 was \$2.68 per lb or \$183.80 per 1,000 (Appendix 4).

There were 889,204 fish requested and 874,379 were planted for 98.3% achieved. Excluding the experimental lake trout, the GFH achieved 100% of its fish plants. See Appendix 5 for a breakdown by species.

Catchable Rainbow Trout

During 2003, the GFH planted tributaries of the Bear River and Snake River watersheds with sterile catchable rainbow trout. Sterile Hayspur rainbow (T9) and Sterile Kamloop rainbow (KT) were the strains of rainbow catchables planted. Sterile rainbows were planted in the Bear River watershed to prevent hybridization with the native Bear River cutthroat trout.

The GFH began the calendar year with 101,125 triploid catchable trout. Over the course of the year, 108,100 (43,918 lbs) of triploid catchable trout averaging 10-inches were planted into area waters. Another 9,625 (3,850 lbs) of catchable trout were transferred to Sandpoint Hatchery in northern Idaho in June. On December 31, 119,186 (27,079 lbs) of fish remain on-station for future planting. Total produced for the year is 135,786 triploid catchable rainbows weighing 61,468 lbs. These fish converted 61,026 lbs of fish food at a rate of 0.99 to produce 61,468 lbs of flesh. The average cost to plant a 10-inch catchable was approximately \$1.12 per lb, or \$455.72 per 1,000 fish (Appendix 4).

Rainbow Trout Fingerlings

Triploid fingerlings were stocked into Blackfoot Reservoir, Daniels Reservoir, Treasureton Reservoir, Twenty-Four Mile Reservoir, Hayden Lake, and a few other northern Idaho reservoirs. Sterile Hayspur rainbow (T9), Sterile Kamloop rainbow (KT), and Troutlodge triploid (TT) were the strains of rainbow fingerlings planted.

During 2003, 607,254 (9,409 lbs) triploid rainbow trout fingerlings were planted. From that total, 38,816 (3,020 lbs) fish were planted as 5.8-inch fingerlings. The average cost of planting a 5.8-inch fingerling was approximately \$3.40 per lb, or \$264.32 per 1,000 fish. The remaining 568,438 (6,389 lbs) of fish were planted as 3-inch fingerlings. The average cost of planting a 3-inch fingerling was approximately \$12.16 per lb, or \$136.72 per 1,000 fish (Appendix 4). Triploid fingerlings converted 8,464 lbs of food at a rate of 0.90 to produce 9,438 lbs of flesh.

Westslope Cutthroat

In 2003, the GFH acquired Westslope cutthroat trout *O. clarki ssp.* (C2) eyed-eggs to rear for north Idaho's Region 1 waters. A total of 163,636 eggs produced 99,294 1.8-inch fish (203 lbs) that were transferred to Cabinet Gorge Hatchery in October. While at GFH these fish converted 202 lbs of fish food at a rate of 1.0 to produce 203 lbs of flesh. The average cost to produce and ship these fish was approximately \$40.12 per lb, or \$82.03 per 1,000 fish (Appendix 4).

Bear River Cutthroat

The GFH usually receives Bear River cutthroat *O. clarki ssp.* (C7) eggs from Daniels Fish Hatchery in Wyoming. Fish pathology tests returned positive and prevented our acquisition of Bear River cutthroat eggs in 2003. To fulfill annual Bear River cutthroat request there is a need to explore other options obtaining disease-free Bear River cutthroat eggs. One option would be developing a broodstock station at the GFH.

Lake Trout

The GFH started out the calendar year with 35,620 (1,316 lbs) of lake trout (LT). During 2003, 8,922 (2,953 lbs) of lake trout (LT) were planted. A total of 8,005 (2,890 lbs) 11.3-inch diploid fish were planted into Payette Lake in May 2003. These fish received a right ventral fin clip prior to stocking. The average cost of planting an 11.3-inch LT was \$1.43 per lb, or \$514.96 per 1,000. There were 917 (62.93 lbs) 6.5-inch triploid fish planted into Bear Lake in November 2003. These fish received an adipose clip prior to stocking. The average cost of planting a 6.5-inch triploid LT was \$4.31 per lb, or \$296.22 per 1,000 (Appendix 4). Lake trout converted 2,596 lbs of fish food at a rate of 1.59 to produce 1,637 lbs of flesh.

The GFH completed the second year of a cooperative agreement with the Utah Department of Wildlife Resources (UDWR). The objective of the agreement is for GFH to stock 50,000 triploid LT into Bear Lake every three years. The program is still in the experimental phase. In plans for meeting the agreement, GFH received a total of 123,409 experimental pressure-treated (triploid) lake trout eggs in November and December 2003 from Saratoga National Fish Hatchery and Story Fish Hatchery in Wyoming. These eggs will be tested for triploid induction and cultured at GFH.

Yellowstone Cutthroat

During 2003, 41,184 (7,109 lbs) Yellowstone strain Henrys Lake cutthroat trout (C3) were planted in area waters. Originally these fish were scheduled to go into Chesterfield Reservoir as catchables in the spring of 2003. Due to the drought, these fish were put into American Falls Reservoir, Hawkins Reservoir, McTucker Ponds, Springfield Reservoir, and the Portneuf River.

As of December 31, 2003, no Yellowstone cutthroat (C3) remained on-station. The Yellowstone cutthroat converted 3,630 lbs of fish food at a rate of 0.82 to produce 4,432 lbs of flesh. The average cost to plant a 7.95-inch Yellowstone cutthroat was approximately \$2.10 per lb or \$362.30 per 1,000 fish (Appendix 4).

FISH FEED

The fish produced during 2003 were fed a total of 75,918 lbs of feed from Rangen Inc and Skretting (Appendix 6). The net weight gained during 2003 was 77,178 lbs, which resulted in an overall conversion of 0.98 lbs of feed to produce one lb of fish.

REPAIRS AND IMPROVEMENTS

- Installed a new metal roof on the two-stall garage.
- Built new wood shed for residence #2.
- Updated the information kiosk.
- Put in concrete handicap sidewalk leading to the information kiosk.
- Installed self-guided tour signs on raceways and vat building.
- Installed vinyl fencing in front of valves on large raceways.
- Stenciled black lettering on vats and raceways.
- Planted new pine trees on hatchery grounds.
- Had lettering and Department decals put on tank of 2-ton stocking truck.
- Had incubation room wired for 220-volt for chiller used on lake trout.
- Installed propane heater in incubation room for egg picking.
- Repainted tank on 1-ton truck.
- Installed new road signs on highway for GFH.
- Repainted interior of shop.

NEEDED RENOVATIONS

- Replace one of the residences.
- Install a single pressure tank to the domestic water line.
- Install an auxiliary water supply pipe from the main supply line to the small raceway header to increase flow.
- Replace the domestic water lines in residences #1 and #3.
- Install a new main line from the spring to a headbox with new lines going to the vats, small, and medium raceways.
- Install baffles or extend air cleaning to the medium raceways.
- Rewire residences #1 and #3.
- Create an offline settling pond for the large raceways.
- Dredge existing settling pond and build new concrete settling pond with a sump basin.
- Renovate the existing domestic sewer system.
- Build a doublewide garage and storage area for 2-ton, plow, and tractor with feed wagon.

PUBLIC RELATIONS

The GFH staff gave several scheduled tours to local area schools as well as numerous informal tours to interested general public visiting the facility. Staff also participated in the Governor's Idaho Corps of Discovery program by providing information and serving as a passport stamp point of service. The GFH staff conducted a Free Fishing Day clinic at the hatchery. During Free Fishing Day, kids 14 and under as well as handicapped individuals were allowed to fish the escapement pond. The GFH provided eggs and fingerlings to schools for a trout in the classroom educational program. Staff of GFH also answered many questions from personal contacts and phone calls.

ACKNOWLEDGEMENTS

During 2003, the Grace Fish Hatchery crew included: Dwight Aplanalp, Hatchery Manager I, Jeffrey D. Seggerman, Assistant Hatchery Manager, Thomas Kent, Fish Culturist, Biological Aides: Lewis Meiners, and Quenton Tuckett, and Chad Smith, WIA student worker. The GFH would like to give special thanks to Reservist Wendell Dunn for providing and coordinating all volunteer efforts at GFH this year. Volunteers helped with fin clipping of the lake trout and north Idaho fingerling rainbow trout. Volunteers also helped with fish stocking and Free Fishing Day activities.

APPENDICES

Appendix 1. Number and pounds of fish produced, reared and stocked by Grace Fish Hatchery in 2003

Species/strain Lot #	Number (pounds) on hand 01/01/03	Number Reared & planted (pounds)	Number (pounds) on hand 12/31/03	Pounds produced	Conversion
Triploid Rainbow Catchables	101,125	117,725	119,186		
	(13,379)	(47,768)	(27,079)	61,468	0.99
Triploid Rainbow Fingerlings	55,000	607,254	60,625		
	(14)	(9,409)	(43)	9,438	0.90
Lake Trout (LT)	35,620	8,922	0*		
	(1,316)	(2,953)	0	1637	1.59
Cutthroat/Yellowstone Henrys Lake	34,271	41,184	0**		
	(2,677)	(7,109)	(0)	4,432	0.82
Cutthroat/Westslope Fingerlings	0	99,294	0		
	(0)	(203)	(0)	203	1.0
Totals	226,016	874,379	179,811	828,174	
	(17,386)	(67,442)	(27,122)	77,178	0.98

*GFH personnel culled diploid lake trout and kept only triploid lake trout for Bear River request.

**Actual Yellowstone cutthroat planted was higher than numbers of fish on hand at the start of the year.

Appendix 2. Eyed eggs received at Grace Fish Hatchery 2003.

Species/strain	Source	Number Received	Date Received
Sterile Kamloops rainbow (KT)	IDFG Hayspur	31,622	03/05/03
Sterile rainbow trout (T9)	IDFG Hayspur	17,800	03/05/03
Sterile rainbow trout (T9)	IDFG Hayspur	18,630	03/11/03
Sterile Kamloops rainbow (KT)	IDFG Hayspur	20,810	03/11/03
Sterile rainbow trout (T9)	IDFG Hayspur	1,954	03/25/03
Sterile Kamloops rainbow (KT)	IDFG Hayspur	3,705	04/09/03
Sterile rainbow trout (T9)	IDFG Hayspur	13,820	04/15/03
Sterile Kamloops rainbow (KT)	IDFG Hayspur	24,290	04/15/03
Sterile rainbow trout (T9)	IDFG Hayspur	27,072	04/22/03
Sterile Kamloops rainbow (KT)	IDFG Hayspur	6,599	04/22/03
Troutlodge Triploid rainbow (TT)	Troutlodge	150,000	05/23/03
Westslope cutthroat trout (C2)	Westslope Trout Co.	163,636	07/11/03
Sterile rainbow trout (T9)	IDFG Hayspur	75,000	11/18/03
Experimental Triploid Lake Trout	WGFD Story	59,978	11/24/03
Experimental Triploid Lake Trout	Saratoga NFH	63,431	12/02/03
Sterile Kamloops rainbow (KT)	IDFG Hayspur	209,718	12/17/03
Total		893,065	

Appendix 3. Pondside and streamside production costs at Grace Fish Hatchery, 2003. Streamside cost includes \$5,609 of Hagerman State and Nampa's transportation costs.

Pounds Produced	Production Cost	Pondside Cost	Pondside Cost/lb	Stream side Cost	Stream side Cost/lb
77,178	\$211,655	\$201,992	\$2.62	\$217,264	\$2.82

Appendix 4. Costs of fish produced at Grace Fish Hatchery, 2003. Reflects all costs budgeted except capital outlay, and includes \$5,609 of Hagerman State and Nampa's transportation costs.

Species/Strain	Length/ Inches	Number Produced	Weight Pounds	Costs Produce And plant	Cost/1000	Cost/lb
Fish on Hand Jan 1, 2003						
Diploid lake trout (LT)	7.83	6,740	1296.15			
Triploid lake trout (LT)	1.0	28,880	19.85			
Hayspur rainbow (T9,KT)	6.87	101,125	13,379			
Yellowstone cutthroat (C3)	5.80	34,271	2,677			
Hayspur rainbow (T9)	0.86	55,000	14.0			
TOTAL		226,016	17,386			
Fish Planted						
Diploid lake trout (LT)	11.3	8,005	2,890	\$4,122.29	\$514.96	\$1.43
Triploid lake trout (LT)	6.5	917	63	\$271.63	\$296.22	\$4.31
Westslope cutthroat (C2)	1.80	99,294	203	\$8,145.06	\$82.03	\$40.12
Yellowstone cutthroat	7.95	41,184	7,109	\$14,920.88	\$362.30	\$2.10
SUBTOTAL AVERAGE	5.8	149,400	10,265	\$27,459.86	\$183.80	\$2.68
Hayspur rainbow (T9,KT)	10.0	117,725	47,768	\$53,649.71	\$455.72	\$1.12
Hayspur rainbow (T9)	5.8	38,816	3,020	\$10,259.77	\$264.32	\$3.40
Triploid rainbow (KT,T9,TT)	3.0	568,438	6,389	\$77,714.68	\$136.72	\$12.16
SUBTOTAL AVERAGE	5.8	724,979	57,177	\$141,624.16	\$195.35	\$2.48
TOTAL		874,379	67,442	\$169,084.02	\$193.38	\$2.51
Fish on Hand Dec 31, '03						
Hayspur rainbow (T9,KT)	8.26	119,186	27,079	\$44,864.62	\$376.43	\$1.66
Hayspur rainbow (T9)	1.20	60,625	42.81	\$3,315.37	\$54.69	\$77.44
TOTAL	7.27	179,811	27,121.81	\$48,179.99	\$267.95	\$1.78
GRAND TOTAL						
Planted in 2003		874,379	67,442	\$169,084.02	\$193.38	\$2.51
(+)On Hand Dec. 31, 2003		179,811	27,121.81	\$48,179.99	\$267.95	\$1.78
TOTAL		1,054,190	94,563.81	\$217,264.01	\$206.10	\$2.30
(-)On Hand Jan. 1, 2003		226,016	17,386			
TOTAL GAINED		828,174	77,178	\$217,264.01	\$262.34	\$2.82

Appendix 5. Fish requested and planted by Grace Hatchery, 2003

Species	Number requested	Number planted		% Achieved
Catchable rainbow trout (triploids)	115,200	117,725		102.2%
Fingerling rainbow trout (triploids)	590,254	590,254		100%
Lake trout (diploid)	8,005	8,005		100%
Lake trout (triploid)	16,667*	917		5.5%
Yellowstone cutthroat	41,184	41,184		100%
Bear Lake cutthroat (BLC)	16,600	15,000	Substituted**	90.4%
Bear River cutthroat (BRC)	2,000	2,000	Substituted***	100%
Westslope cutthroat	99,294	99,294****		100%
Totals	889,204	874,379		98.3%
*Number of triploid lake trout requested is 50,000 over a three-year period.				
**T9's were substituted for (BLC) in Daniels, Reservoir. Little Valley Reservoir had 1,600 (BLC) requested but did not have enough water in 2003 to plant.				
***T9's were substituted for (BRC) in Bloomington Lake.				
****Transferred to Cabinet Gorge				

Appendix 6. Fish food fed and cost, Grace Hatchery, 2003.

Source	Diet	Size	Cost/lb.	Pounds	Total Cost
Rangens	Dry	00	0.46	274	124.89
Rangens	Dry	# 0	0.46	650	296.27
Rangens	Dry	#1	0.46	800	364.64
Rangens	Dry	#2	0.46	2,360	1,075.86
Rangens	Dry	#3	0.32	5,400	1,717.20
Rangens	Dry	#4	0.32	5,200	1,653.60
Rangens	Extr. 450	3/32	0.28	5,300	1,460.68
Rangens	pellet	1/8 sack	0.30	2,600	771.68
Rangens	Extr. 450	1/8 sack	0.28	2,375	654.55
Rangens	Extr. 450	1/8 bulk	0.27	43,720	11,585.81
SUB-TOTAL				68,679	19,705.18
Rangens	med. OTC	#1	0.60	14	8.46
Rangens	med. OTC	1/8	0.52	6,770	3,516.34
SUB-TOTAL				6,784	3,524.8
Skretting	Dry	Mash	1.04	15	15.62
Skretting	Dry	#0	1.04	132	137.49
Skretting	Dry	#1	1.04	44	45.83
Skretting	Dry	#2	1.04	264	274.98
SUB-TOTAL				455	473.92
GRAND TOTAL				75,918	23,703.90

*OTC is Oxytetracycline

IDAHO DEPARTMENT OF FISH AND GAME

2003 ANNUAL RESIDENT REPORT

HAGERMAN FISH HATCHERY

**Joe Chapman, Hatchery Manager II
Walt Rast, Assistant Hatchery Manager I
Brian Thompson, Fish Culturist
Tim Klucken, Fish Culturist
Ken Taylor, Transport Operator**

INTRODUCTION

Hagerman Fish Hatchery (HFH) is a state-owned resident trout production facility. The HFH raises several strains of rainbow trout *Oncorhynchus mykiss* and various specialty species for statewide distribution. The HFH is the largest resident trout production facility of the Idaho Department of Fish and Game (Department). Built in 1947, it is located approximately 30 miles west of Twin Falls on the Snake River.

Funding is provided primarily through Department license money. The HFH used approximately \$551,788 this year: \$293,111 from Hagerman's budget, \$199,933 from Dingell-Johnson (DJ) monies, and \$58,744 from the fish transportation budget, to rear and stock fish in the 2003 production year, not including capital outlay expenditures (Appendix 1).

The HFH is staffed with a Hatchery Manager II, Hatchery Manager I, two Fish Culturists, and a Fish Transport Operator. Approximately 19 months of temporary labor is available from the DJ budget for use during the year.

The HFH water supply consists of approximately 52 cubic feet per second (cfs) from Tucker Springs during the winter and 47 cfs during the irrigation season. An additional 69 cfs is supplied from Riley Creek although the quantity and quality fluctuates seasonally. The Tucker Springs water serves the 2,045 cubic feet (cuft) of rearing space in the HFH building, 10,530 cuft of rearing space in the fingerling ponds, and up to 138,000 cuft of rearing space in the large production raceways. Water from Riley Creek supplies the 165,600 cuft of rearing space available in eight additional raceways. The Tucker Springs water is a constant 59°F year-round while Riley Creek fluctuates from 50°F to 67°F annually.

HATCHERY PRODUCTION

During 2003, HFH reared and stocked 2,746,676 fish weighing 355,155 lbs. Of these, 1,082,354 were stocked 6 inches or longer, and 1,664,322 were stocked smaller than 6-inches long (Appendix 1). About 41% of the total fish were stocked in Magic Valley Region waters (Appendix 2). The majority of the larger trout were Kamloops rainbows from Troutlodge Inc., with the balance from Hayspur Fish Hatchery. Coho salmon comprised about one-fourth by number of this group of larger fish. Approximately 109,000 steelhead were also stocked. The 4-inch to 6-inch fish consisted of rainbow trout and Kamloops trout from Hayspur, and Coho salmon from Eagle Creek National Hatchery (Appendix 1). Many of the original stocking request numbers were eliminated or modified to compensate for water shortages in area reservoirs due to drought.

The 355,155 lbs stocked included 294,116 lbs of put-and-take fish averaging 8.7 inches, and 61,039 lbs of fingerlings that averaged 4.3 inches. The cost of planting the average 7.7 fish per pound (fpp) (7.6 inches) fish was approximately \$1.11 per lb, or \$143.94 per 1,000 fish (Appendix 1).

In addition to the fish reared and planted, 1,491,704 fish (118,168 lbs) were on hand at the HFH on December 31, 2003. These consisted of 774,451 fish (116,494 lbs, average 6.65 fpp, or 7.1 inches) in the large raceways and 717,253 fingerlings (1,674 lbs, average 429 fpp, or

1.73 inches) in the west raceways. The cost of producing the larger fish was \$1.09 per lb or \$163.52 per 1,000, and \$17.80 per lb or \$41.53 per 1,000 for the fingerlings (Appendix 1).

On hand January 1, 2003 were 1,167,518 fish (63,939 lbs). The HFH also received 857,817 fish (6,020 lbs) of fish from other hatcheries. Consequently, these subtractions yielded a net production for 2003 of 2,213,045 fish (403,364 lbs), mortality excluded (Appendix 1).

A total of 10,032,596 eggs and fry were acquired to yield the fish produced. About 3,041,478 eggs were purchased and the balance was acquired from government sources at no cost (Appendix 4). Of the 9,174,779 eggs received, 5,229,735 were received for the fish planted and the balance was used for 2003 production. Eggs were sent to Magic Valley Fish Hatchery (MVFH) to alleviate overcrowded conditions here. They were then transferred to Hagerman Fish Hatchery (HFH) when they were about 142.5 fpp (2.6-inches). Because of last year's success, eggs were again shipped to MVFH for early rearing and will be transferred here in February 2004.

The overall survival rate of fish stocked was 45%, up from 32% survival last year (Appendix 3). Some of this difference can be attributed to less Coldwater Disease in the hatchery building, as is the case every other year at this hatchery. Once again, mortality due to IHN *Infectious Hematopoietic Necrosis Virus* decreased.

Fish transport operator Ken Taylor logged 26,380 miles delivering fish to state waters, while the rest of the crew logged 14,344 miles. This amounted to a total of 40,724 miles and 278 stocking trips during 2003, which included 64 trips for the private sector. In addition, hatchery personnel witnessed, but did not stock, another 58 stockings by the private sector.

In addition to the annual requests by regional fisheries managers, the HFH crew made 71 trips to haul and stock 538,184 fish weighing 182,146 lbs from other sources (Appendix 7). These included one trip for the Grace Fish Hatchery to stock 192,221 trout weighing 2,420 lbs; four trips for the American Falls Fish Hatchery to stock 60,134 trout weighing 22,630 lbs; three trips to stock 11,136 channel catfish weighing 3,200 lbs; four trips to stock 26,075 brown trout weighing 1,510 lbs from the University of Idaho Fish Culture Station; and 59 trips for several commercial hatcheries to stock 259,754 trout weighing 155,586 lbs. In addition, the crews from HFH and Niagara Springs Fish Hatchery (NSFH) witnessed 58 trout stockings totaling 846,799 fish weighing 155,026 lbs by the commercial hatcheries in the Magic Valley region.

FISH FEED

The fish produced during 2003 were fed a total of 458,478 lbs of feed from Rangen Inc and Moore-Clark (Appendix 5). The net weight gained during 2003 was 403,364 lbs, which resulted in an overall conversion of 1.14 lbs of feed to produce one lb of fish, not including the weight of the mortalities (Appendix 5).

HATCHERY IMPROVEMENTS

Numerous HFH improvements were completed this year and are listed below:

- Replaced all of the domestic water lines to the residences and office.
- Removed the old fuel oil tank from the break room and replaced it with a new propane stove.
- Installed an automatic gate with timer on the upper roadway.
- Replaced some raceway damboards.
- Removed the old water storage tanks and began construction of buildings over the new tank.
- Constructed a fenced area at the Quonset hut for storing equipment.
- Replaced the flooring in the office, dorm, and in residences #2, 4 and 5.
- Installed siding, new windows and doors on residence #4.
- Installed a flowmeter in the supplementation line and repaired the other flowmeters.
- Repaired the road between Anderson Pond #4 and the Riley Creek Impoundment.
- Added new metal roofs to the remaining residences that didn't have any.
- Installed two new office desks in computer room.
- Removed one of the two motors in the sewage lift station and re-plumbed the lines.
- Replaced the drain line from the visitor's bathroom to the sewage lift station.

PUBLIC RELATIONS

The HFH received a large number of visitors and sportsmen throughout the year. An estimated 25,000 visitors toured the facility and used the surrounding public grounds this year. The 37 acres of HFH property are surrounded by 880 acres of the Hagerman Wildlife Management Area (WMA). The WMA provides a large variety of outdoor experiences, including fishing and hunting, wildlife viewing, and family picnic areas.

Hatchery personnel were called upon to give numerous school tours during the spring and fall, and several talks were presented to regional personnel and civic groups. The hatchery sponsored a Free Fishing Day clinic here for over 300 participants. The Hagerman Boy Scouts, Hagerman National Hatchery personnel, and personnel from Wal-Mart and the Department assisted. Pepsi-Cola, Falls Brand Meats, Eagle Claw, Wal-Mart, and Trader Jack's Sporting Goods in Hagerman contributed to the event.

Again this year, a monthly article was contributed to the Hagerman newspaper, the "Fish Wrap", to keep local anglers informed about fishing hot spots, tips, and miscellaneous fishing adventures.

Also this year, the "Trout in the Classroom" program continued for fifth-graders at Hagerman Elementary School. Two sessions were given which included delivery of eggs, discussion of habitat needs, spawning, and fish anatomy.

FISH TAGGING OPERATIONS

The HFH crew participated in several tagging operations during the year in which 69,917 fish weighing 4,069 lbs were marked (Appendix 6). This included 11,136 channel catfish, which were adipose fin-clipped and stocked into Alexander Reservoir, Dog Creek Reservoir, and Herman Anderson Pond #3 in August. Also, about 8,785 brown trout were ad-clipped and stocked into Billingsley Creek in April to differentiate this group from the group stocked in October of 2003. Finally, 49,996 trout were given ventral clips and stocked into Crane Falls Reservoir, Dierkes Lake, Manns Lake, and Winchester Lake on April 30 and May 1, 2003. This study was to evaluate the success of the predator training experiment.

ACKNOWLEDGMENTS

Thanks to the permanent HFH staff of Walt Rast, Brian Thompson, and Tim Klucken; to transport operator Ken Taylor; and to temporaries Larry Miller, Paul Gaulin, Drew McGuire and Andrea Buhler.

Regional fisheries and enforcement personnel Doug Megargle, Chuck Warren, Richard Holman, and Gary Hompland also deserve our gratitude. Thanks also to personnel from Niagara Springs and Magic Valley hatcheries for their cooperation this year.

APPENDICES

Appendix 1. Costs of fish produced at Hagerman Fish Hatchery 2003. Costs reflect all costs budgeted, except capital outlay, and include \$58,774 of the fish transportation budget.

<u>Species/Strain</u>	<u>Length/ Inches</u>	<u>Number Produced</u>	<u>Weight/ Pounds</u>	<u>Cost to produce And plant</u>	<u>Cost/ 1,000</u>	
FISH ON HAND JANUARY 1, 2003						
Rainbow trout, yellow (YT,SP,01)	15.8	796	1,327			
Kamloops rainbow trout (TT,Troutlodge)	12.9	6,550	5,955			
Kamloops rainbow trout (KT, Hayspur)	10.3	12,000	5,455			
Steelhead (Saw)	6.5	117,560	12,641			
Kamloops rainbow trout (TL,TT,01)	5.6	462,005	36,387			
Kamloops rainbow trout (KT)	2.1	436,667	1,879			
Hayspur rainbow trout (KT)	1.7	131,940	295			
Totals	5.0	1,167,518	63,939			
FISH PLANTED						
Rainbow trout, yellow (YT,SP,01)	18.5	226	632	100.53	444.80	
Steelhead (SA)	9.6	109,340	37,800	25,237.44	230.82	
Kamloops rainbow trout (TL,TT)	9.3	460,173	155,434	102,896.12	223.60	
Hayspur rainbow trout (T9)	8.7	106,145	29,800	22,203.10	209.18	
Kamloops rainbow trout (KT)	8.3	161,530	39,050	32,234.89	199.56	
Coho salmon (CO)	6.8	244,940	31,400	40,046.41	163.49	
Subtotals	8.7	1,082,354	294,116	222,718.48	205.77	
Hayspur rainbow trout (T9)	4.2	751,912	25,089	75,929.62	100.98	
Kamloops rainbow trout (KT)	4.2	766,810	24,750	76,512.22	99.78	
Coho Salmon (CO)	5.8	145,600	11,200	20,199.10	138.73	
Subtotals	Average	4.3	1,664,322	61,039	172,640.94	103.73
Total Planted	Average	7.6	2,746,676	355,155	395,359.42	143.94
FISH ON HAND DECEMBER 31, 2003						
Rainbow trout, yellow (YT,SP,01)	19.1	269	897	123.40	458.75	
Kamloops rainbow trout (KT)	10.9	53,725	29,848	14,066.93	261.83	
Steelhead (SA)	6.9	73,888	10,721	12,240.19	165.66	
Hayspur rainbow trout (T9)	6.6	35,796	4,838	5,637.29	157.48	
Kamloops rainbow trout (TL,TT,00)	6.4	610,773	70,190	94,571.57	154.84	
Kamloops rainbow trout (KT)	1.8	553,201	1,400	23,675.43	42.807	
Hayspur rainbow trout (T9)	1.6	164,052	274	6,113.76	37.27	
Totals	5.15	1,491,704	118,168	156,428.57	104.87	
TOTAL FISH PRODUCED						
Planted in 2003		2,746,676	355,155			
On Hand December 31, 2003		1,491,704	118,168			
Totals		4,238,380	473,323	\$551,787.99	\$130.19	
From other hatcheries		857,817	6,020			
On Hand January 1, 2003		1,167,518	63,939			
TOTAL GAINED		2,213,045	403,364			

Appendix 2. Fish distribution from Hagerman Fish Hatchery, 2003.

Percent of number planted by Region									
	Number	Pounds	1	2	3	4	5	6	7
Catchables ≥6 inches									
Rainbow trout, yellow	226	632				100			
Hayspur rainbow trout (T9)	106,145	29,800	-	-	-	75.2	-	24.8	-
Kamloops rainbow trout (TT)	460,173	155,434	-	14.5	25.9	34.6	17.6	7.4	-
Kamloops rainbow trout (KT)	161,530	39,050		10.9	13.1	76.0			
Steelhead (SA)	109,340	37,800	-	-	100	-	-	-	-
Coho Salmon	244,940	31,400	-	-	100	-	-	-	-
Subtotal	1,080,354	294,116	-	7.8	45.7	33.5	7.5	5.5	-
Fingerlings <6 inches									
Hayspur rainbow trout (T9)	751,952	25,089	-	4.8	2.8	54.3	18.1	20.0	-
Kamloops rainbow trout (KT)	766,810	24,750	-	-	-	47.2	41.2	11.6	-
Coho Salmon	145,600	11,200	-	-	100	-	-	-	-
Subtotal	1,664,322	61,039	0.0	2.2	10.0	46.3	27.1	14.4	0.0
TOTAL	2,746,676	355,155	0.0	4.4	24.0	41.2	19.4	11.0	0.0

Appendix 3. Fish survival from eyed-egg to stocking, 2003.

Species/Strain	Number Stocked	Eggs and Fry Received	Percent Survival
Rainbow trout, Yellow	226	3,288	N/A*
Rainbow trout, Hayspur (T9)	858,057	1,440,959	59.55
Kamloops, Troutlodge (TT)	460,173	1,478,150	31.13
Kamloops, Hayspur (KT)	928,340	2,168,820	42.80
Steelhead (SA)	109,340	296,335	36.90
Coho Salmon (WA.)	390,540	700,000	55.79
TOTAL	2,746,676	6,087,552	45.12

* Not all stocked in 2003.

Appendix 4. Number of eyed-eggs and fry received, species, and source for fish produced in 2003.

Species/Strain	Eggs/Fry received		Source
	For Fish Planted	For fish on hand December 31, 2003	
Received as eggs			
Rainbow/Yellow (YR)	3,288*	0*	Seapac, ID.
Rainbow/Kamloops (KT)	1,741,984	1,439,341	IDFG Hayspur
Rainbow/Hayspur (T9)	1,009,978	453,956	IDFG Hayspur
Rainbow/sterile Troutlodge (TT)	1,478,150	1,563,328	Troutlodge, WA
Steelhead	296,335	488,419	IDFG Pahsimeroi, Oxbow
Coho	700,000	0	Eagle Creek Hatchery
Subtotal eggs	5,229,735	3,945,044	
Received as fry			
Rainbow from Magic Valley (T9)	430,981	0	IDFG Hayspur
Kamloops (Hayspur) from Magic Valley (KT)	426,836	0	IDFG Hayspur
Subtotal fry	857,817	0	
TOTAL	6,087,552	3,945,044	

* Not all stocked in 2003, some on hand for 2004.

Appendix 5. Fish feed used during Brood Year 2003 at Hagerman Fish Hatchery.

Size	Source	Pounds	Cost/pound	Cost
Str	Rangen	50	\$0.43	\$21.30
#1	Rangen	2,800	\$0.43	\$1,192.80
#1 TM	Rangen	850	\$0.57	\$483.06
#2	Rangen	19,450	\$0.43	\$8,285.70
#2 TM	Rangen	950	\$0.57	\$539.89
#3	Rangen	42,850	\$0.30	\$12,812.15
#3 TM	Rangen	5,900	\$0.57	\$3,352.97
Str. Soft moist	Rangen	880	\$0.80	\$700.48
3/64 soft moist	Rangen	2,112	\$0.77	\$1,625.82
3/32 in, EXT450Float	Rangen	139,950	\$0.25	\$34,567.65
3/32 in, TM	Rangen	2,500	\$0.49	\$1,220.00
5/32 in, EXT450Float	Rangen	233,600	\$0.25	\$57,699.20
5/32 in, TM	Rangen	2,200	\$0.49	\$1,073.60
Subtotal		454,092	\$0.27	\$123,574.61
#0	Moore-Clark	396	\$0.94	\$372.24
#1	Moore-Clark	2,582	\$0.90	\$2,323.80
#1 ProActive	Moore-Clark	1,408	\$0.45	\$633.60
Subtotal		4,386	\$0.76	\$3,329.64
TOTAL		458,478	\$0.28	\$126,904.25
Freight charges				\$2,292.00
Total cost				\$129,196.25

Appendix 6. Summary of fish marked at Hagerman Fish Hatchery in 2003.

Date Stocked	Species	Water	Number	Pounds	Clip
04/16	BN	Billingsley Creek- 3 sites	8,785	50	Ad-clip
04/30	T9	Crane Falls Reservoir	5,024	79	Left Ventral
04/30	T9	Crane Falls Reservoir	4,999	87	Right Ventral
04/30	T9	Dierkes Lake	2,003	32	Left Ventral
04/30	T9	Dierkes Lake	2,006	35	Right Ventral
05/01	T9	Manns Lake	9,990	150	Left Ventral
05/01	T9	Manns Lake	9,986	176	Right Ventral
05/01	T9	Winchester Lake	7,992	120	Left Ventral
05/01	T9	Winchester Lake	7,996	140	Right Ventral
08/22	CC	Alexander Reservoir	6,264	1,800	Ad-clip
08/22	CC	Dog Creek Reservoir	3,828	1,100	Ad-clip
08/25	CC	Herman Anderson #3	<u>1,044</u>	<u>300</u>	Ad-clip
TOTALS			69,917	4,069	

Appendix 7. Fish stocked or witnessed by Hagerman Fish Hatchery from other sources, 2003.

	Hatchery Stocking	Species	Number	Pounds	Source	Destination
	Hagerman	T9	192,221	2,420	Grace Hatchery (IDFG)	Blackfoot Res.
	Hagerman	C3	15,064	5,380	American Falls Hatchery (IDFG)	Golden Lake and Isl. Park Res.
	Hagerman	TT	45,070	17,250	American Falls Hatchery (IDFG)	Am. Falls, Blackfoot and Isl. Park
	Subtotal		60,134	22,630		
	Hagerman	BN	19,327	110	Ashton Hatchery	Billingsley and Rock Creek
	Hagerman	BN	6,748	1,400	U of ID	Billingsley Creek
	Subtotal		26,075	1,510		
	Hagerman	CC	11,136	3,200	Fish Processors, Buhl, ID	Herman Anderson #3, Dog Crk. Res. Alexander Res.
	Hagerman	R1	234,175	130,425	ARK Fisheries	Salmon Falls Creek Res., Hawkins, Crane Falls, Roberts Gravel pond, Thorn Creek Res., Dog Creek Res., Featherville dredge pond, Freedom Park Pond, Snake R, Riley Creek, Rupert Gravel pond, Dierkes Lake, Emerald Lake, Burley Pond, Frank Oster Lakes, Herman Anderson #1, Crystal Lake, Blair Trail Res.
	Hagerman	R1	13,079	10,061	Bob Rowland Hatchery	Devil's Creek Reservoir
	Hagerman	R1	4,050	8,100	Clear Springs Foods	Crystal Lake, Dierkes Lake
	Hagerman	R1	<u>8,450</u>	<u>7,000</u>	Idaho Trout Processors (Rim View)	Lake Cleveland, Featherville Dredge pond
	Subtotal		259,754	155,586		

Appendix 7. Continued

	Hatchery Stocking	Species	Number	Pounds	Source	Destination
	ARK Fisheries	R1	41,486	10,488	ARK Fisheries	Crystal Lake, Snake River
	Blind Canyon Hatchery	R1	21,571	1,605	Blind Canyon Hatchery	Snake River
	Clear Springs Foods	R1	594,446	4,301	Clear Springs Foods	Crystal Lake, Snake River
	Idaho Trout Processors	R1	185,892	96012	Idaho Trout Processors	Crystal Lake, Snake River, Riley Creek, Frank Oster #1
	Jones Hatchery	R1	<u>3,043</u>	<u>3,620</u>	Pisces Investments	Snake River
	Subtotal		846,799	155,026		
	TOTALS		1,384,983	337,172		

IDAHO DEPARTMENT OF FISH AND GAME

2003 ANNUAL RESIDENT REPORT

HAYSPUR FISH HATCHERY

**Bradford W. Dredge, Fish Hatchery Manager II
Jarrett L. Page, Fish Hatchery Assistant Manager
Jamie H. Mitchell III, Fish Culturist**

INTRODUCTION

Hayspur Fish Hatchery (HSFH) is a license-funded resident salmonid broodstock facility. The mission of the HSFH is production of eyed eggs that are made sterile or triploid by heat shocking technique. Two captive rainbow trout *Oncorhynchus mykiss* brood stocks and one Westslope cutthroat *O. clarki lewisi* broodstock are maintained on-station. These are the Hayspur strain rainbow trout, Kamloops strain rainbow trout and Westslope cutthroat strain trout from Connors Lake, British Columbia, Canada. The HSFH personnel maintain an on-site public campground, family fishing water (Gavers Lagoon), and a trophy stream fishery.

The HSFH is located in Blaine County, approximately 30 miles south of Sun Valley on Loving Creek. The HSFH property is an odd-shaped 105.12-acre parcel. Fish culture facilities include an incubation building with 23 vertical 8-tray Heath-type incubator stacks for trout eggs, a hatchery building with 20 early rearing vats, 12 covered 24-foot circular ponds, 6 small raceways, and 6 large production raceways. Other buildings include a fish spawning equipment storage building, two generator buildings, three residences for permanent employees, an office building, shop, three bay garage, barn, and dormitory for temporary employees.

Water sources include the covered spring that supplies 3.0 to 5.5 cubic feet per second (cfs) at 52°F (11.6°C), and three pumped artesian wells producing 5.0 cfs at 48°F to 52°F (8.9°C to 11.6°C). The spring and wellwater are both considered specific-pathogen-free (SPF) water supplies.

Three permanent employees (Fish Hatchery Manager II, Fish Hatchery Assistant Manager, and Fish Culturist) and 20.95 months of temporary biological aide time are assigned to the HSFH.

RAINBOW AND KAMLOOPS EYED EGG PRODUCTION

The 2003 rainbow trout spawning season was a nine-month project, beginning in August and ending in May, with an egg take of 10,523,740 green eggs from 2,856 females during the year (Appendix 1). Photoperiod manipulation, or light control, has expanded "normal" spawn timing to more closely match egg production with eyed-egg requests. Only three-year-old and older Hayspur rainbows and Kamloops rainbows were manipulated. We have found two-year-olds respond poorly to photoperiod manipulation. Hayspur rainbow trout triploid eyed-egg production totaled 2,748,030 with 1,253 females spawned. Kamloop triploid eyed-egg production totaled 3,477,133 with 1,603 females spawned. All eggs produced, except for broodstock replacement eggs, were heat-shocked for triploidy. American Falls, Ashton, Cabinet Gorge, Eagle, Grace, Hagerman, Mackay, Magic Valley, McCall, and Nampa hatcheries were shipped eggs per their requests. Magic Valley Fish Hatchery received 905,883 trout eggs destined for Hagerman. In addition, the Tuccanon National Fish Hatchery in Washington received 165,069 Kamloop trout eggs for mitigation purposes. Value to the Department, at the current contract price of \$25.00/1,000 for sterile triploid eggs and \$38.00/1,000 for Westslope trout eggs, equates to \$159,766.29 (Appendix 2).

In 2003, all rainbow trout eggs produced for shipping were heat-shocked and made sterile. Replacement broodstock eggs were not heat-shocked and were utilized exclusively at HSFH for replacement broodstock needs. This was the third year of full production using the heat-shock method refined during the previous six years of research. Washington State University performed induction rate sampling on thirteen randomly selected lots of eggs reared at the Eagle Fish Health Lab (EFHL). After the eggs had hatched and fish reached approximately three inches in length, blood samples were sent to the lab. A total of 520 individuals were sampled. Sample results indicated that 509 out of 520 were verified as being triploid. The overall induction rate was 97.88%, up from 94.3% the previous year. The Hayspur rainbow trout induction rate was 98.75% (316 out of 320). The Kamloop rainbow trout induction rate was 96.5% (193 out of 200).

WESTSLOPE CUTTHROAT TROUT EYED EGG PRODUCTION

The 2003 spawning season was a four-month project beginning in February and ending in May (the parental high mountain lake stock spawns in June). The first spawn occurred on February 27, 2003. Spawning was completed on May 19, 2003. A total of 10 spawntakes resulted in 539 females being spawned. Average fecundity was 707 eggs per female. The overall eye-up rate was 34%. A total of 316,900 green eggs were collected and eyed-egg production equaled 108,874 (Appendix 1).

Joe Kozfkay and Art Butz conducted a Westslope cutthroat triploid experiment on March 19, 2003.

FISH LIBERATIONS

Fish requested for the Big Wood and Little Wood drainages were reared at Nampa Fish Hatchery (NFH) and transported to HSFH for redistribution by HSFH personnel. Semi-tank and trailer loads were hauled as needed to complete HSFH 2003 plant request. A total of 61 stocking trips into the Big Wood and Little Wood drainages stocked with 43,187 catchable-sized rainbow trout (Appendix 3). A total of 1,261 Westslope cutthroat trout fingerlings were stocked into Yellowbelly Lake on July 15, 2003. In addition, a total of 15,891 surplus diploid rainbow trout fingerlings were stocked into Salmon Falls Creek Reservoir during six stocking trips.

FISH FEED

Rangen provided the 1/4-in brood feed. This food was ordered with 150 grams per ton of canthaxathin red additive to enhance egg color and other possible health benefits. Rangen was the source of early rearing feeds, food for catchables, and for replacement broodstock feeds (Appendix 4). The Westslope cutthroat trout were fed Rangens for most of 2003 and then switched to Skretting in December.

HATCHERY IMPROVEMENTS AND NEEDS

Improvements to the HSFH during 2003 included:

- The garage door on residence #2 was replaced.
- Three large willow trees were removed from behind residence #2 and two others trimmed.
- The fish spawning equipment building was finished with insulation, drywall, windows, lights, heat and electricity.
- Carpets in all residences and in the hatchery dormitory were professionally cleaned.
- One garage door to the shop was fixed.
- Vegetation was removed from large raceways C, D, E and F.
- Idaho Power Company (IPC) removed branches from around all power poles and power lines.
- The cattle guard on the hatchery entrance was filled, and the gate removed to provide a larger entry to the hatchery.
- Russian olive trees were pruned in the campground.
- Standpipes to the round ponds were modified to prevent dewatering.
- Additional predator covers were constructed for the small raceways.
- Small raceways #1 and #2 were enclosed with fencing.
- New carpet was installed in residence #1.
- Genplus, a division of Cummins Intermountain generator, serviced both generators in October.
- New temporary keyways and screens were constructed for the small raceways.
- Small wire cloth screen was installed on the doors to the round ponds.
- Additional adult round pond crowd racks were constructed. In addition, several crowd rack extensions were constructed for round pond segregation.
- All hatchery fire extinguishers were serviced.
- Batteries were replaced in generators #1 and #2 and the block heater in generator #2 was replaced.
- All of the chimneys were professionally cleaned.

Needs of the HSFH are:

- Replace open headbox (2) in the hatchery building with water intake valves (2), PVC piping, and replace water control valves to each vat.
- Replace all water valve control wheels on the hatchery headbox.
- Construct and install additional small raceway predator covers.
- Remove several willows behind residence #1.
- Repair and/or replace numerous concrete areas around the HSFH.
- Replace all degassing towers and media.
- Replace the sewage lift station electrical panel components.
- Replace and enlarge the Gavers Lagoon intake and outlet pipes.
- Resurface the HSFH entrance road and redo the asphalt in front of the office building.
- Repair the flapper valve associated with pump #4.
- Repair the broken spring on the pump #3 flapper valve.
- Demolish small raceways and construct new round ponds to better serve HSFH production needs.
- Replace the linoleum in residences #1, #2, and #3 and replace carpet in residence #3.
- Overhaul pump #2.

BROODSTOCK MANAGEMENT

The Hayspur rainbow trout (R9) replacement population is perpetuated by using year-class crosses. Using one male with one female, 199 pairs of fish were crossed. The adult fish used in the replacement program were adipose clipped. Marked fish are generally used for production egg lots and are rarely used again for development of a replacement population.

Hayspur's Kamloops rainbow (K1) broodstock replacement population is perpetuated by using year-class crosses. Using one male with one female, 99 pairs of fish were crossed. The adult fish utilized were adipose clipped. Marked fish are generally used for production egg lots; and are rarely used again for development of a replacement population.

Isolation incubators were used to separate individual families. In 2003, two R9 and two K1 families tested positive for Bacterial Kidney Disease (BKD) and were culled. Isolation trays, constructed of disinfectable metal and plastic, were tested and used as isolation incubators. Each stainless steel tray was capable of holding 10 families segregated from one another. Each plastic tray was capable of holding one family. Trays were placed in Heath stacks and eggs were added for isolation incubation. Similar results occurred regardless of the method used.

No Westslope cutthroat trout eggs were obtained in 2003. Cutthroat eggs are available in even years from Conners Lake, British Columbia, Canada. Three more groups will be obtained in 2004, 2006, and 2008 to provide a reasonable amount of genetic material from the Conners Lake population. These fish, along with the Brood Year 2000 and Brood Year 2002 fish on-station, will be used as an adfluvial broodstock to provide fry for the high mountain lake program.

PUBLIC RELATIONS

Many people used the Hayspur campground and the popular fishing pond, Gavers Lagoon, during the spring, summer, and fall periods. The HSFH campground benefited from the efforts of volunteer Camp Hosts. Kenny and Blondy Robbins volunteered their time to answer questions, give directions, clarify regulations, tidy outhouses, clean up litter, provide fishing tips, and generally enhanced the image of the Department and HSFH.

Tours were provided to area schools. Bellevue Elementary, Valley Elementary, Hailey Elementary, Idaho Falls Elementary, Hemingway Elementary School (Ketchum), Valley School, and the Wood River Middle School were exposed to the life cycle of trout, shown a spawning demonstration, followed up by a question and answer period.

The following schools received eyed eggs: Naples, Wood River Middle School, Fairfield High School, the Twin Falls School District, and the Boise School District. Some of the resultant fry were stocked into Adopt-a-Stream projects.

The Morrison Knudsen Nature Center received a total of 3,000 surplus diploid eyed-eggs. Eggs were delivered to Darren Beckley on November 2, 2003.

MISCELLANEOUS

Roger Elmore transferred to the Sawtooth Fish Hatchery in February. Jarrett Page was promoted to Assistant Fish Hatchery Manager in March 2003. Jamie Mitchell was hired as the new Fish Culturist in April. All permanent staff went to ISTS in May 2003. Jarrett Page attended the Coldwater Fish Culture Course held in Boise in October 2003.

Sperm from Kamloop trout were pooled, two males per bag, and used at Henrys Lake to generate cutthroat/rainbow hybrids via delayed fertilization.

A total of 35,408 unfertilized Kamloop rainbow trout eggs were shipped to Paul Wheeler at Washington State University.

A total of eight 1x1 crosses (four Hayspur rainbow trout and four Kamloop trout) were taken to supply diploid eggs for the University of Idaho Hagerman Research facility. The eggs were delivered to Ken Overturf at the lab. In addition, fin clips were taken for genetic analysis.

Hayspur Hatchery experimented with the use of hormone injections to accelerate the reproductive readiness of Westslope cutthroat trout males. Specifically, gonadotropin-releasing hormone (GnRHa) were injected into 30 males seven to ten days prior to spawning. Prior to the injections, none of the males were producing sperm. After injection, some of the 30 males could be used for spawning 10 days after the injection.

ACKNOWLEDGMENTS

In 2003, Hayspur Hatchery benefited from the capable assistance of biological aides James Taylor, Shane Claborn, Deskin Waters, Sta Muh Stoot Redner, and Deanna Byington. The HSFH would like to thank the people who helped out during the spawning season: Darlene Snyder, Wade Symons, Bryan Grant, Lynnette Moran, Marva Wertz, Laura Story and Tom Frew. Special thanks go to Gary Ady and Dick Bittick for transporting catchables to HSFH from NFH during 2003.

APPENDICES

Appendix 1. Egg production summary of Hayspur Fish Hatchery, 2003.

Species	^aEggs Taken	Eggs Shipped
T9's (R9's 3N)	4,335,143	2,748,030
KT's (K1's 3N)	6,188,597	3,477,133
C2's	316,900	108,874
Totals	10,523,740	6,334,037

^aTotal is displaced (volumetric or weight) of both good and bad eggs taken in 2003.

Appendix 2. Eyed egg shipment summary from Hayspur Fish Hatchery, 2003.

Hatchery	^a Species	Total eggs shipped	^b Estimated value
American Falls	T9	3,657	\$91.43
	KT	41,370	\$1,034.25
	**C2	108,874	\$4,137.21
Ashton	T9	171,082	\$4,277.05
Cabinet Gorge	KT	13,557	\$338.93
	T9	86,742	\$2,168.55
Eagle	T9	25,000	\$625.00
Grace	T9	157,383	\$3,934.58
	KT	296,781	\$7,419.53
Hagerman	T9	988,145	\$24,703.63
	KT	1,894,408	\$47,360.20
Mackay	T9	116,536	\$2,913.40
	KT	86,459	\$2,161.48
Magic Valley	T9	452,442	\$11,311.05
	KT	453,441	\$11,336.03
McCall	T9	33,072	\$826.80
	KT	90,045	\$2,251.13
Nampa	T9	699,555	\$17,488.88
	KT	269,772	\$6,744.30
^c Other	T9	1,429	\$35.73
	KT	38,847	\$971.18
Hagerman NFH	T9	12,987	\$324.68
	KT	127,384	\$3,184.60
Tucannon NFH	KT	165,069	\$4,126.73
Totals		6,334,037	\$159,766.29

^aT9=sterile R9, KT=sterile Kamloops, C2 = Westslope cutthroat

^bAt contract value of \$25.00/1,000 sterile rainbow trout eggs.

**At contract value of \$38.00/1,000 Westslope cutthroat trout eggs.

Appendix 3. Hayspur Fish Hatchery stocking summary, 2003.

Fish size	Number of fish	Pounds of fish
Catchables	43,187	15,325
Rainbow fingerlings	15,891	2,684
Westslope Cutthroat fingerlings	1,261	39
Total	60,339	18,048

Appendix 4. Hayspur Fish Hatchery Feed Summary, 2003.

Rangens			
Date	Size	Amount/pounds	Cost
3/7/2003	1/4 in. Brood pellet	16,240	\$ 5,050.64
Totals		16,240	\$ 5,050.64

Rangens			
Date	Size	Amount/pounds	Cost
3/7/2003	Extruded 450 1/16"	400	\$150.80
	Extruded 450 3/32"	400	\$102.80
	Extruded 450 1/8"	300	\$77.10
4/2/2003	Trout/Salmon Starter #2	100	\$42.60
6/2/2003	Trout/Salmon Starter #3	50	\$21.30
	Extruded 450 1/16"	100	\$37.70
	Soft-Moist 3/32"	88	\$64.38
6/24/2003	Extruded 450 3/32"	300	\$77.10
	Extruded 450 1/16"	100	\$37.70
7/22/2003	Extruded 450 1/16"	300	\$113.10
	Extruded 450 3/32"	600	\$154.20
	Extruded 450 1/8"	800	\$205.60
9/12/2003	Soft-Moist 1/8"	88	\$64.38
	Extruded 450 3/32"	300	\$77.10
	Extruded 450 1/8"	800	\$205.60
11/7/2003	Extruded 450 3/32"	1,000	\$257.00
	Extruded 450 1/8"	88	\$64.38
Totals		5,814	\$1,752.84

Skretting			
Date	Size	Amount/pounds	Cost
1/3/2003	Nutra Fry 1.5	44	\$29.92
	Nutra Fry 2.0	44	\$29.04
12/1/2003	Nutra Fry 2.5	132	\$76.56
	Nutra Fry 4.0	132	\$76.56
12/10/2003	Nutra Plus #0	44	\$40.92
	Nutra Plus #1	44	\$40.92
TOTALS		440	\$293.92

IDAHO DEPARTMENT OF FISH AND GAME
2003 ANNUAL RESIDENT REPORT
HENRYS LAKE HATCHERY

Damon Keen, Assistant Hatchery Manager

ABSTRACT

The 2003 spawning operations at Henrys Lake produced 2,112,498 eyed Yellowstone cutthroat trout eggs, 406,855 eyed hybrid trout eggs, and 133,065 eyed brook trout eggs. Yellowstone cutthroat trout in the Hatchery Creek run showed a mean length of 464 mm, the hybrid trout mean was 546 mm, and the brook trout mean was 484 mm.

Pathology reports detected no viral or bacterial presence from any of the ovarian samples taken from either the spring or the fall spawning operations.

A creel survey was conducted on Henrys Lake from May 24 through October 31. The catch rate was .17 fish/hr.

Riparian fencing, fish diversion structures and screening were maintained on the tributaries of Henrys Lake. Tributaries maintained were Howard Creek, Targhee Creek, Duck Creek, Timber Creek, and Kelly Creek. Additionally, fencing was maintained on the shoreline on the west side of Henrys Lake.

A new spawning facility was planned and constructed by the engineering crew of the Idaho Fish and Game Department (Department). The completed facility was in operation in the fall of 2003.

Late winter dissolved oxygen concentrations were assessed at established sampling sites. Oxygen concentrations were monitored to establish oxygen depletion rates and predict possible hazardous oxygen levels for fish in the lake. Sufficient levels of oxygen concentrations were predicted and subsequently maintained throughout the winter in the lake proper. Aeration was not required this year and only maintenance level aeration was performed.

Author:

Damon Keen
Assistant Hatchery Manager

INTRODUCTION

Henry's Lake Hatchery is a license-funded resident station located in the northern Island Park area of Fremont County in east central Idaho. The hatchery was established in 1924 as an egg taking facility to offset the potential loss of spawning habitat due to the construction of a dam at the lake outlet in 1922 (Idaho Fish and Game 1924).

The hatchery continues to function as an egg taking station and ships eyed eggs of Yellowstone cutthroat trout *Oncorhynchus clarki*, sterile rainbow trout *O. mykiss* x Yellowstone cutthroat trout *O. clarki* hybrids, and sterile and fertile brook trout *Salvelinus fontinalis* to statewide hatcheries.

The current hatchery building was completed in 1949 and remodeled in 1989. The building consists of 10 double stacks of Heath tray incubators. Hatchery water is supplied via gravity flow from Hatchery Springs at 1.5 cfs for domestic and egg incubation use. Unused water flows into Hatchery Creek through the spawning/trapping facility and then finally into Henry's Lake via a 150 foot long fish ladder.

The hatchery is staffed with one permanent Fish Hatchery Assistant Manager, one five-month temporary employee, and one three-month temporary employee.

METHODS

Spawning Operation

The Hatchery Creek fish ladder was opened for the spring run on February 12 and remained in operation until April 30. Fish ascending the ladder were identified as Yellowstone cutthroat or hybrid trout and enumerated. A sub-sample of 10% of each group was measured (total length - mm). Yellowstone cutthroat trout were produced using ripe females spawned into seven fish pools and fertilized with pooled milt from four to seven males. Hybrid trout were produced with Yellowstone cutthroat trout eggs and Kamloops rainbow trout milt obtained from Hayspur Hatchery. The hybrid contribution was sterilized by inducing a triploid condition by thermal shocking the eggs post-fertilization. Hybrid eggs were placed in 28°C water and held in this condition for 20 minutes. Hybrid eggs were shipped to Ashton and Mackay hatcheries for hatching, rearing, and subsequent release back into Henry's Lake and other local waters. Yellowstone cutthroat eggs were shipped to Mackay and American Falls hatcheries for hatching, rearing, and release back into Henry's Lake.

The fish ladder was opened for the fall run of brook trout on October 10. Low water condition prevented the brook trout from successfully ascending the ladder, so trap nets were installed at the mouth of the Hatchery Creek. Part of the brook trout eggs were placed in 28°C water and held in this condition for 10 minutes. Brook trout eggs were shipped to Ashton Hatchery for hatching, rearing, and release back into Henry's Lake.

Disease samples were taken from the spring and fall spawning runs. Ovarian fluids were collected from Yellowstone cutthroat and brook trout during spawning at Henrys Lake Hatchery. Ovarian samples were taken from egg pools of seven females in the spring run and six females in the fall run. All female egg pools were tested. Viral samples were taken randomly from 25 seven female fish-egg pools in the spring run and six six-fish egg pools in the fall run. A mixed-sex group of 60 adult Yellowstone cutthroat trout from the spring run and 30 adult brook trout from the fall run were sacrificed for disease testing. All samples were sent to the Eagle Fish Health Laboratory (EFHL) for testing.

Creel Survey

From May 24 through October 31, a creel survey was conducted on Henrys Lake. Anglers were counted and interviewed on computer creel program generated random dates and times. Anglers were counted at the designated time and date from a point overlooking the lake with the aid of binoculars and spotting scopes. A revolution of the lake was subsequently taken by boat to count any anglers not visible from the point. Counts were completed within one half-hour. Anglers were then interviewed at random throughout the day by boat access and occasional point of access sites.

Anglers were asked method of fishing, length of fishing time for each method, number of fish caught and harvested, number of fish caught and released, and species of fish caught. Time of the interview was also recorded.

Riparian Fencing and Fish Screening

Electric fencing has been in place at Henrys Lake since the early 1990s. Fencing was stretched and solar panels, batteries, and connections were installed in May 2003 at ten sites on the tributaries of Henrys Lake as established in routine maintenance guidelines. Fencing was checked daily during the summer and fall months for proper voltage and function. Voltage was checked using a voltmeter at each of the ten sites.

Fish diversion screens are located at nine sites on the tributaries of Henrys Lake. Screens were maintained, cleaned and checked for proper operation on a daily basis during the summer and fall of 2003.

Water Quality

Late winter (January, February, and March 2003) dissolved oxygen concentrations, snow depth, ice thickness, and water temperatures were taken at established sampling sites. Sites were located using GPS readings from historical sampling sites. Holes in the ice were drilled prior to sampling using a gas powered ice auger. Dissolved oxygen samples were taken using a YSI Model 550A oxygen probe and by sampling at each site at ice bottom and subsequent one-meter intervals until the bottom of the lake was incurred. Total g/m² of oxygen were calculated for each site.

RESULTS AND DISCUSSION

Spawning Operation

A total of 3,599 Yellowstone cutthroat trout ascended the spawning ladder between February 12 and April 30 with 2,213 males and 1,386 females enumerated. Hybrid trout totaled 2,332 fish: 1,141 males and 1,191 females. Yellowstone cutthroat trout males and females total length averaged 469 and 459 mm, respectively. Combined mean Yellowstone cutthroat trout length was 464 mm. Hybrid trout males and females averaged 548 mm and 573 mm, respectively. Combined mean hybrid trout length was 561 mm.

Yellowstone cutthroat green eggs totaled 2,617,050 from 1,033 females for a mean fecundity of 2,533 eggs per female (Table 1). Eyed Yellowstone cutthroat eggs totaled 2,112,500 for an overall eye-up rate of 80.7% (Table 1). Of the total production of eyed Yellowstone cutthroat eggs, 25,806 were shipped to American Falls for hatching, rearing, and subsequent release back into Henrys Lake in the spring of 2004. The remaining 2,086,694 eyed Yellowstone cutthroat eggs were shipped to the Mackay facility where they were hatched, reared, and subsequently released back into Henrys Lake in the fall of 2003. Fourteen spawn days during this year's spring run were devoted to Yellowstone cutthroat spawning.

Hybrid trout green eggs totaled 657,900 from 258 females for a mean fecundity of 2,550 eggs per female (Table 2). Eyed hybrid trout eggs totaled 406,855 for an overall eye-up rate of 61.8% (Table 2). Of the total production of eyed hybrid eggs, 67,742 were shipped to Ashton for hatching, rearing, and release into local area waters and 339,113 were shipped to Mackay for hatching, rearing, and subsequent release into Henrys Lake in the fall of 2003. Three spawn days were devoted to production of hybrid eggs during this year's spawn.

A total of 108 brook trout either ascended the ladder or were caught in trap nets placed in front of the hatchery and Pittsburgh Creek. Of this total, 96 females and 12 males were enumerated. Brook trout males and females total length averaged 494 mm and 484 mm, respectively. Combined mean brook trout length was 484 mm. Brook trout green eggs totaled 216,000 from 80 females for a mean fecundity of 2,700 eggs per female (Table 3). Eyed brook trout eggs totaled 133,065 for an overall eye-up of 61.6% (Table 3). The entire take of brook trout eggs was shipped to the Ashton facility for hatching, rearing, and subsequent release back into Henrys Lake in the fall of 2004. Three spawn days were devoted to production of brook trout eggs during this year's spawn.

Disease sampling was completed on adult spawning fish during the spring and fall runs. Results and discussion are included in the resident fisheries pathologist report.

Bacterial disease sampling taken during spawning from ovarian fluid was negative for all samples in both the spring and fall runs. Likewise, viral sampling was also negative for all samples collected during spring and fall spawn sampling.

Creel Survey

Creel clerks conducted interviews from May 24 through October 31,. Using the creel program, estimates were extrapolated and summarized. Catch rate was .17 fish/hr. Complete analysis as well as corresponding graphs and charts are included in the regional fisheries management report.

Riparian Fencing and Fish Screening

Electric fencing functioned well during the year. Voltages remained high throughout the season and riparian infringements by cattle were rare. Fish screens functioned well on Targhee and Howard creeks and screens on Duck Creek did not run due to low water conditions.

Water Quality

Oxygen profiles for January-March 2003 were recorded for the four sites (Pittsburgh Creek, County boat dock, Wild Rose, and the Outlet). Total oxygen diminished from 21.2g/m² to 20.17g/m² at the Pittsburgh site, 19.2 g/m² to 8.55 g/m² at the County dock, 24.35 g/m² to 13.4 g/m² at the Wild Rose site, and 15.0 g/m² to 10.4 g/m² at the new hatchery site. Due to slushy ice conditions throughout most of the winter, the Outlet site was only monitored once and that reading was recorded at 11.0 g/m² on December 30, 2002. The level of concern of 10g/m² was reached only briefly at the County boat dock site. Complete analysis as well as corresponding graphs and charts are included in the regional fisheries management report.

ACKNOWLEDGEMENTS

Henrys Lake Fish Hatchery continues to operate with assistance from a wide variety of sources. Acknowledgement is at least a minimal thank you for people going out of their way to contribute to the success of the Henrys program. Department personnel from around the state, as well as entire Department programs, assisted in spawning, rearing, and transportation. Additionally, several hundred hours of volunteer time was devoted to the Henrys program, mostly during the spawning cycle. Of special consideration is Basic American Foods, located in Blackfoot. Basic American Foods donates hundreds of hours annually to the Henrys program. A special thanks is given to that business, as well as to the employees who venture to the site in the name of resource benefit.

Likewise, a special acknowledgement is given to the Henrys Lake Foundation (HLF). For many years, the foundation has given unselfishly in the form of donated time and funds to maintain this important fishery. In the last three years alone, HLF has committed \$25,000.00 to the program. Funding for many projects would be impossible without the assistance of the HLF. In 2003, the HLF donated approximately \$1,000.00 for the purchase of a new oxygen sensor probe and approximately \$6,500.00 for the shared purchase of a new pressure sterilization machine that will allow for production pressure sterilization to improve induction rates on sterile hybrids at Henrys.

LITERATURE CITED

Idaho Department of Fish and Game. 1924. Fish and Game Warden. 10th Biennial Report. 10:113-114.

APPENDICES

Table 1. 2003 Henrys Lake Spring Yellowstone Cutthroat Spring Spawning Summary

<u>Spawn Date</u>	<u>Lot Number</u>	<u>Females Spawned</u>	<u>Number of Green Eggs</u>	<u>Mean Fecundity</u>	<u>Number Eyed Eggs</u>	<u>Disease Status</u>	<u>Percentage Eye-up</u>
2/20/2003	1	61	152,500	2,500	105,645	Neg.	69.3%
2/27/2003	2	104	260,000	2,500	241,935	Neg.	93.1%
3/14/2003	6	78	198,900	2,550	166,935	Neg.	83.9%
3/17/2003	7	103	262,650	2,550	250,806	Neg.	95.5%
3/20/2003	8	74	188,700	2,550	168,952	Neg.	89.5%
3/24/2003	9	97	247,350	2,550	205,242	Neg.	83.0%
3/27/2003	10	76	193,800	2,550	173,387	Neg.	89.5%
3/31/2003	11	77	196,350	2,550	125,806	Neg.	64.1%
4/7/2003	12	121	308,550	2,550	262,500	Neg.	85.1%
4/10/2003	13	65	165,750	2,550	114,516	Neg.	69.1%
4/14/2003	14	46	115,000	2,500	86,290	Neg.	75.0%
4/17/2003	15	29	72,500	2,500	25,806	Neg.	35.6%
4/21/2003	16	35	87,500	2,500	81,452	Neg.	93.1%
4/24/2003	17	67	167,500	2,500	103,226	Neg.	61.6%
TOTALS		1,033	2,617,050	2,533	2,112,498		80.7%

Table 2. 2003 Henrys Lake Hybrid Spring Spawning Summary

<u>Spawn Date</u>	<u>Lot Number</u>	<u>Females Spawned</u>	<u>Number of Green Eggs</u>	<u>Mean Fecundity</u>	<u>Number Eyed Eggs</u>	<u>Disease Status</u>	<u>Percentage Eye-up</u>
3/3/2003	3	135	344,250	2,550	223,790	Neg.	65.0%
3/6/2003	4	75	191,250	2,550	115,323	Neg.	60.3%
3/10/2003	5	48	122,400	2,550	67,742	Neg.	55.3%
TOTALS		258	657,900	2,550	406,855		61.8%

Table 3. 2003 Henrys Lake Brook Trout Fall Spawning Summary

<u>Spawn Date</u>	<u>Lot Number</u>	<u>Females Spawned</u>	<u>Number of Green Eggs</u>	<u>Mean Fecundity</u>	<u>Number Eyed Eggs</u>	<u>Disease Status</u>	<u>Percentage Eye-up</u>
3/3/2003	1	32	86,400	2,700	62,903		72.8%
3/6/2003	2	24	64,800	2,700	50,807		78.4%
3/10/2003	3	24	64,800	2,700	19,355		29.9%
TOTALS		80	216,000	2,700	133,065		61.6%

IDAHO DEPARTMENT OF FISH AND GAME

2003 ANNUAL RESIDENT REPORT

MACKAY FISH HATCHERY

**Bryan Grant, Fish Culturist
Robert Hoover, Assistant Fish Hatchery Manager
Phillip Coonts, Fish Hatchery Manager I**

INTRODUCTION

The Mackay Fish Hatchery is a specialty fish production facility located approximately 17 miles north of Mackay, in Custer County. The hatchery produces fish of various species and strains, from 1 inch to 16 inches in length, for statewide distribution. The funding source comes from state license monies for operational and personnel cost.

The hatchery is staffed with three full-time and two part-time employees. The part-time employees share 16 months of temporary time. Wages, including benefits, cost \$181,643 for all personnel. The operating budget for the calendar year was \$76,031.00. This year's fish production included five species and eleven strains (Appendices 1,3).

Rainbow trout (*Oncorhynchus mykiss*)

Hayspur triploid (Hayspur SFH) three year classes

Troutlodge triploid (Troutlodge, WA)

Kamloops triploid (Hayspur SFH)

Cutthroat trout (*Oncorhynchus clarki*)

Henry's Lake (Henry's Lake SFH)

Yellowstone (Jackson NFH) three year classes

Rainbow x Cutthroat hybrid triploids

Henry's Lake cutthroat females x Hayspur SFH rainbow males

Kokanee salmon (*Oncorhynchus nerka kennerlyi*)

Early (Deadwood Res) two year classes

Early (New Fork Lk, WY)

Early (Kootenay Lk, BC)

Late (Strawberry Res, UT)

Grayling (*Thymallus arcticus*)

New Fork Cr (Meadow Lk, WY)

WATER SUPPLY

The hatchery's water is provided by three collection springs in an artesian area on the hatchery grounds. The area was dug out and filled with cobblestones to eliminate any standing water. The available volume of water for hatchery production has remained consistent for many years. Flows range from 18 cfs during the early months of the year to 24 cfs during the summer months. The 1983 earthquake varied the temperatures of the supply springs: one is at 50°F, one at 51°F and one at 54°F. Egg incubation temperature is 51°F.

HATCHERY IMPROVEMENTS

Some improvements completed by hatchery personnel include:

- A cement lid was installed on the “Hole” junction box. The area was graded to allow the tanker trucks easy access to the “Hole” raceways when loading fish.
- Jump shields were designed, fabricated and installed on the early-rearing troughs.
- The north property fence was replaced and the east property fence reinforced.
- The woven wire fence along large raceway #8 was removed.
- Three more “new process” screens were constructed and installed in the large raceway tail-sections.
- Residence #2 was scraped and painted.
- Vinyl siding was started on the residence #2 garage.
- The overhead fuel barrel was relocated to meet state safety code.
- New drain plugs were installed on the large raceways.

Improvements completed by contracted personnel include:

- Installed vinyl siding, and new windows and doors on residence #3.
- A new double-car garage built for residence #3.
- A new parking garage was built next to the existing hatchery parking garage.
- New windows, doors, sidewalks, and step-landing surface were installed on residence #1.
- The existing hatchery parking garage and the front of the shop received cement pads.
- A new power line was buried to supply electricity to residence #3 and the new garage, as the existing overhead line breaks code by passing over the new garage. It will be connected this spring.

FISH STOCKED

Fingerlings were stocked in six regions across the state. These put-grow-and-take fish numbered 2,413,753 and weighed 34,399 lbs.

Catchable rainbow were planted into Regions 6 and 7. These fish numbered 61,542 and weighed 37,600 lbs. Catchable cutthroat planted in Region 6 numbered 24,979 and weighed 15,465 lbs.

The hatchery also reared 24,789 cutthroat, 12,750 sterile rainbow and 3,500 grayling fry for planting in 44 mountain lakes in Regions 4 and 6. Volunteers and Department personnel planted these fish on foot, or by 4-wheeler and horse transportation (Appendix 2).

TRANSPORT COSTS

The three fish transport trucks assigned to MFH made 79 separate stocking trips during the year, planting 28 different waters. We traveled over 19,100 miles doing this, which averages almost 250 miles per trip. The fleet rental charges are \$326.46/month for each of the two 2-ton trucks and \$0.287/mile. Fleet rental for the 1-ton truck is \$279.61/month and \$0.2096/mile. All of these expenses totalled \$16,000.

The fish transport tanker trucks from Nampa Fish Hatchery made ten trips to five different waters for MFH during the year. For the use of the two tanker trucks, Nampa Hatchery expenses were \$10,600, bringing our total fish transportation cost to \$26,600.

FISH FEED

A total of 90,735 lbs of fish feed, costing \$26,968 and \$2,644 in shipping costs, was used during the year. Conversions ranged from a low of 0.81 for the 2003 Henrys Lake cutthroat to a high of 1.2 for the 2003 Jackson Lake cutthroat. The average conversion for all lots of fish combined during the year was 1.06 (Appendix 4).

FISH MARKING

A crew of four employees clipped the adipose fin of 130,600 Henrys Lake cutthroat during the first week of August. This required 230 hours of work and represents about 10% of the cutthroat we planted into the lake.

FISH PRODUCTION COSTS

The personnel and operating costs are calculated using the FY03 budget for the first six months of the year and using the FY04 budget for the last six months of the year.

FY 2003 Personnel	\$181,642 / 2 equals	\$90,821
FY 2003 Operating	\$ 62,742 / 2 equals	\$31,371
FY 2004 Personnel	\$176,548 / 2 equals	\$88,274
FY 2004 Operating	\$89,320 / 2 equals	<u>\$44,660</u>
Total 2003 Costs:		\$255,126

I am going to calculate cost taking into consideration the time spent at the hatchery by the different lots of fish. This number will be used to proportion the total cost between fingerlings and catchables.

Total catchable time at the hatchery	45 months
Total fingerling time at the hatchery	<u>39 months</u>
Total months	84 months

Proportion catchable time	45 / 84 equals 53 %
Proportion fingerling time	39 / 84 equals 47 %

Total hatchery costs devoted to catchables	\$255,126 X 53 % =	\$135,217
Total hatchery costs devoted to fingerlings-	\$255,126 X 47% =	<u>\$119,909</u>
Total hatchery cost		\$255,126

Fingerling Costs – \$119, 909

Cost / fingerling- \$119,909 / 2,413,753 fingerlings equals \$0.05, or 5 cents a fish
 Cost / pound - \$119,909 / 34,399 pounds equals \$3.48 a pound of fingerling

Catchable Costs - \$135,217

Cost / catchable- \$135,217 / 86,521 catchables equals \$1.56 a fish
 Cost / pound - \$135,217 / 53,065 pounds equals \$2.55 per pound of catchable

PUBLIC RELATIONS

Approximately 800 people toured the hatchery during the year. Most of these visitors come to fish the diversion pond by the hatchery. Scheduled tours were given to Arco and Mackay schools, a Forest Service youth work group, and a sheltered adult group. Hatchery personnel assisted the Mackay High School aquaculture program. The hatchery crew participates in the *Adopt a Highway* program by clearing the litter from six miles of Highway 93 bi-annually. The hatchery also participated in Idaho's tourist promotion *Passport Stamp Program* until the program quietly died.

ACKNOWLEDGEMENTS

First, I want to thank Bob Evans and Carren Morgan, bio-aides, for their very important contribution to the hatchery's accomplishments during the year. Their work, along with the efforts of Fish Culturist Bryan Grant, Fish, and Assistant Hatchery Manager Mick Hoover, enabled the hatchery to produce an excellent quality product for the angler.

APPENDICES

Appendix 1. Fish Production at Mackay Fish Hatchery, January 1 to December 31, 2003

SPECIES/STRAIN	LOT	SOURCE	FISH #		POUNDS		DESTINATION	
			RECEIVED	RECEIVED OR	RECEIVED OR	NUMBER		POUNDS
			AS	CARRIED INTO 03	CARRIED INTO 03	PLANTED		PLANTED
Hayspur rainbow triploid	02-ID-T9	Hayspur SFH	eyed eggs	89,273	23,047	60,534	38,250	03 catchables 04 catchables
Hayspur rainbow triploid	03-ID-T9	Hayspur SFH	eyed eggs	150,000	60	26,400	300	04 catchables
Troutlodge rainbow triploid	03-WA-TT	Troutlodge	eyed eggs	23,313	eyed eggs	12,750	14.2	03 mtn. lake
Hayspur kamloops triploid	04-ID-KT	Hayspur SFH	eyed eggs	85,486	eyed eggs	0	0	05 catchables
Hayspur rainbow triploid	04-ID-T9	Hayspur SFH	eyed eggs	122,584	eyed eggs	0	0	05 catchables
Yellowstone cutthroat	01-WY-C4	Jackson NFH	eyed eggs	24,000	10,619	23,029	14,165	03 catchables
Yellowstone cutthroat	02-WY-C4	Jackson NFH	eyed eggs	96,059	730	64,281	5,410	03 fingerlings 04 catchables
Yellowstone cutthroat	03-WY-C4	Jackson NFH	eyed eggs	253,703	eyed eggs	0	0	04 fingerlings 05 catchables
Henry's Lk. Cutthroat	03-ID-C3	Henry's Lk. SFH	eyed eggs	1,972,878	eyed eggs	1,654,122	18,447	03 fingerlings 03 mtn. lake
Deadwood Res. kokanee	02-ID-KE	Nampa SFH	green eggs	370,000	180	364,011	7,291	03 fingerlings
Deadwood Res. kokanee	03-ID-KE	Nampa SFH	green eggs	622,083	green eggs	0	0	04 fingerlings
Strawberry Res. kokanee	03-UT-KO	White Rocks SFH	eyed eggs	248,620	eyed eggs	0	0	04 fingerlings
New Fork Lake kokanee	03-WY-KE	Dubois SFH	eyed eggs	711,234	eyed eggs	0	0	04 fingerlings
Kootenay Lake kokanee	03-CN-KE	Kootenay Hatchery	eyed eggs	752,730	eyed eggs	0	0	04 fingerlings
Rainbow/cutthroat hybrid triploid	03-ID-TH	Henry's Lk. SFH	eyed eggs	341,117	eyed eggs	263,900	2,900	03 fingerlings
Arctic grayling	03-WY-GR	Dubois SFH	fry	4,000	0.5	3,500	5.8	03 mtn. lake

Appendix 2. Mackay Fish Hatchery Stocking Summary, 2003

<u>SPECIES/STRAIN</u>	<u>LOT</u>	<u>NUMBER PLANTED</u>	<u>POUNDS PLANTED</u>	<u>SIZE AT RELEASE</u>
Yellowstone cutthroat	01-WY-C4	24,979	15,465	catchable
Yellowstone cutthroat	02-WY-C4	64,281	5,410	fingerling
Deadwood Res. kokanee	02-ID-KE	364,011	7,291	fingerling
Hayspur rainbow triploid	02-ID-T9	61,542	37,600	catchable
Henry's Lk. cutthroat	03-ID-C3	1,654,122	18,447	fingerling
Henry's Lk. cutthroat	03-ID-C3	24,789	31	fry
Arctic grayling	03-WY-GR	3,500	6	fry
rainbow/cutthroat hybrid triploid	03-ID-TH	263,900	2,900	fingerling
Troutlodge rainbow triploid	03-WA-TT	12,750	14	fry
Hayspur rainbow triploid	03-ID-T9	26,400	300	fingerling
		Total Fish Stocked, 2003		
		NUMBER OF FISH		POUNDS OF FISH
mountain lake fry	41,039		51	
fingerlings	2,372,714		34,348	
cutthroat catchables	24,979		15,465	
rainbow catchables	61,542		37,600	
TOTALS	2,500,274		87,464	

Appendix 3. Total Pounds of Fish Produced, 2003

Pounds of fish stocked	87,464
Pounds of fish on hand 12/31/02	33,355
Total pounds produced, 2003	120,819
Minus pounds on hand 12/31/03	35,316
Net pounds produced, 2003	85,503

Appendix 4. Feed Used at Mackay Fish Hatchery, 2003

<u>Rangen Feeds</u>	<u>Cost/lb.</u>	<u>Lbs. Used</u>	<u>Cost</u>
TSS S.U.	\$0.426	718	\$309
TSS #1	\$0.426	2,921	\$1,256
TSS #2	\$0.426	11,221	\$4,825
Trout Grower #3	\$0.303	15,280	\$4,630
Ext. 450 3/32 sinking	\$0.257	4,200	\$1,079
Ext. 450 5/32 sinking	\$0.257	<u>56,050</u>	<u>\$14,574</u>
<u>TOTALS</u>		90,390	\$26,673

<u>Skretting Feeds</u>	<u>Cost/lb.</u>	<u>Lbs. Used</u>	<u>Cost</u>
Apollo #0	\$0.83	100	\$83
Apollo #1	\$0.83	157	\$130
Nutra Plus #0	\$0.93	<u>88</u>	<u>\$82</u>
<u>TOTALS</u>		<u>365</u>	<u>\$295</u>

Total feed used = 60,250 lbs. catchables Total feed used = 30,485 lbs. fingerling

Total feed cost = \$15,653 catchables Total feed cost = \$11,315 fingerling

Feed Cost/Catchable= \$0.18 Feed Cost/Fingerling= \$0.005

Total feed used, '03 = 90,735 lbs.

Total feed costs, '03 = \$26,968

Net pounds produced, '03 = 85,503 lbs.

Feed Cost/lb. Produced, '03 = \$0.315

Conversion = 1.06

IDAHO DEPARTMENT OF FISH AND GAME

2003 ANNUAL REPORT

MCCALL FISH HATCHERY

Steven T Kammeyer, Assistant Hatchery Manager

INTRODUCTION

McCall Summer Chinook Fish Hatchery (MCFH) is located within the city limits of McCall, approximately ¼-mile downstream of Payette Lake, adjacent to the North Fork of the Payette River. This facility underwent a complete renovation by the US Army Corps of Engineers (USACE) in 1979. The primary objective for MCFH is to produce one million summer chinook salmon *Oncorhynchus tshawytscha* smolts annually. Anadromous funding is provided through the Lower Snake River Compensation Program (LSRCP). Secondary hatchery objectives pertain to resident programs. Resident fisheries program activities are financially supported through Idaho Department of Fish and Game (Department) sales revenue. Most resident activities occur during the summer months from May to September. Funding for personnel time used on resident program objectives is also derived from Department license sales revenue and provides for six months of assistant fish hatchery manager and nine months of seasonal biological aide time. Facility overhead and maintenance charges are provided through the anadromous program as funded by LSRCP.

Gravity flow from Payette Lake provides for all of MCFH water needs. Two water intakes are available which provide limited water temperature control through mixing. The surface intake is located at Lardo Dam at the outlet of Payette Lake. The subsurface intake extends approximately ¼-mile into Payette Lake at a depth of 50 feet. A 2-foot diameter constriction in the 3-foot diameter mainline limits maximum flow capacity to 20 cubic feet per second (cfs).

Incubation capacity consists of 26 eight-tray Heath style incubation stacks. Additional incubators may be plumbed into six of the early rearing vats if more incubation space is required. Rearing of resident fry is accomplished utilizing several of the 14 indoor vats. Each early rearing vat is 40-feet long and 4-feet wide. Outside rearing space consists of two concrete ponds 196-ft x 101-ft x 4-ft that are used exclusively for rearing summer chinook salmon. Outdoor ponds are joined to a common collection basin (101-ft x 15-ft x 4-ft) that is used to hold catchable size rainbow trout for redistribution in the summer.

MAJOR RESIDENT PROGRAM OBJECTIVES:

- Hatch and rear westslope cutthroat trout *O. Clarki lewisi*, domestic kamloop rainbow trout *O. Mykiss*, golden trout *O. Aguabonita* and rear grayling *Thymallus arcticus* fry for stocking into high mountain lakes in the Panhandle, Clearwater and Southwest regions.
- Redistribute up to 98,000 catchable-size rainbow trout.
- Maintain the statewide high mountain lakes stocking request database.
- Provide assistance to the anadromous program as needed and available.

FISH PRODUCTION

High Mountain Lake Stocking

A total of 170 mountain lakes were stocked with 202,335 fry in 2003 (Appendix 1). Of these, 153 lakes were stocked using fixed-winged aircraft at a cost of \$6,000 in flight time. Ten flights were flown July 30 through September 6, 2003 and in doing so, approximately 3,527 miles were flown. No golden trout were available Statewide in 2003. Fire restrictions prevented stocking three lakes in the Clearwater Region with cutthroat trout fry numbering 4,000; these lakes will be made up on the 2004 stocking rotation. The average cost, based on flight time, to stock a mountain lake in 2003 was \$39.22 and ranged from \$32.21 to \$64.31 for individual Regions. Volunteers stocked 13 lakes in the McCall area, saving the Department approximately \$475.00 in comparable flight time. Excess fry, westslope cutthroat and rainbow trout, were stocked into Granite Lake by hatchery personnel on September 11, 2003.

Catchable Trout Redistribution

A total of 91,480 sterile Troutlodge rainbow trout triploids were stocked into 35 water bodies in the McCall vicinity, between May 14 and September 15, 2003. These fish were reared at Nampa Fish Hatchery (NFH) and then transferred to MCFH. Transport costs to bring catchable size trout from NFH totaled \$3,798.00 with 1,642 miles driven. Hatchery personnel drove approximately 4,583 miles on 98 stocking trips to complete requests at an approximate cost of \$4,966.00. To maximize efficiency, multiple sites were stocked on 11 occasions eliminating the need to make additional separate stocking trips. Combined transport distribution cost was \$ 95.80 for each 1,000 fish stocked.

The last group of fish received from NFH occurred on August 6. To maintain the condition of these fish through the end of the stocking period 300 lbs of 4.0 mm BioDry trout feed was purchased to provide intermittent feeding at a cost of \$102.00.

Payette Lake Net Pens

Ongoing negotiations with the City of McCall and Department Regional Fish Manager Dale Allen has resulted in a cost-sharing agreement to build a new multipurpose dock, located at Mill Park, that will include space to set up two net pens. The existing net pens will be modified to allow them to be hung directly on the dock structure to eliminate the need for a floating cradle for the net pens, as was used in the past. Primary operation of the net pens will be directed out of the McCall sub-Regional Office with assistance provided by the hatchery staff. Construction on the new dock is scheduled for the spring of 2004 and it is hoped that it will be finished in time to allow for the placement of the net pens by the early summer of 2004.

Special Projects

Throughout the summer catchable redistribution period GPS coordinates taken in 2002 were verified for each stocking location receiving fish. Also, detailed directions were compiled for catchable stocking sites that will be compiled into a master reference guide for seasonal employees.

Public Relations

Fish stocking opportunities were provided to 9 groups of volunteers, coordinated through Mary Dudley, Department Volunteer Coordinator, who brought fry into 13 mountain lakes in the McCall area. Assistance was provided to the Free Fishing Day event located at Kimberland Meadow Pond by hatchery personnel. Timing of fish stocking was coordinated to support the McCall Optimist Club Kid's fishing derby at Browns Pond and a Cascade Chamber of Commerce sponsored event at Fischer Pond. Numerous hatchery tours were given to visitors and several school groups throughout the summer.

ACKNOWLEDGEMENTS

Resident program tasks in 2003 were completed thanks to the support and cooperation of the entire staff at McCall Summer Chinook Hatchery. I wish to thank Gene McPherson, MCFH Fish Manager II, for his advice and assistance on various resident projects as well as for generously allowing personnel hired primarily for anadromous activities to be utilized on resident endeavors. Individuals assisting on MCFH resident program activities in 2003 included: Joel Patterson (MCFH Fish Culturist) and seasonal employees Jerry Harris, Chris Schneider, Bud Forsythe, Joey Ishida Jr., Nathan Parker, Dan Jindrich, and Kyle Levin.

APPENDICES

Appendix 1. High mountain lake fry redistribution by Region, MCFH, 2003.

Species	Panhandle	Clearwater	Southwest (Nampa)	Southwest (McCall)	Salmon	Subtotal
Arctic Grayling (Meadow Lake, WY)	8,800	-	1,500	18,200	7,025	35,525
Kamloop Triploid (Hayspur – KT)	14,600	500	5,000	22,550	-	42,650
Rainbow Triploid (Hayspur – T9)	-	500	-	210	8,375	9,085
Westslope Cutthroat (Westslope Cutthroat Trout Co.)	19,700	18,000	27,750	49,625	-	115,075
Region Subtotal	43,100	19,000	34,250	90,585	15,400	202,335
Total Lakes Stocked	16	22	42	67	23	170
Approximate Flight Costs	\$ 1,029.00	\$ 993.00	\$ 1,352.83	\$ 1,825.49	\$ 799.68	\$ 6,000
Approximate Cost Each Lake Stocked	\$ 64.31	\$ 45.14	\$ 32.21	\$ 36.51 ^a	\$ 34.77	\$ 39.22 ^a

^a Calculations do not include 17 lakes either stocked by volunteers or stocked as excess fry in McCall Sub-region.

Appendix 2. Resident feed usage and conversion data, MCFH, 2003.

	# Stocked/ Transferred	Feed Used (lb)	Pounds Gained	Conversion	Cost per Lb Gain	Cost per 1000 fish	Total Feed Cost
Arctic Grayling (Meadow Lake, WY)	35,525	23.9	21.0	1.14	\$ 1.16	\$ 0.69	\$ 24.38
Kamloop Triploid (Hayspur – KT)	42,650	24.2	23.8	1.02	\$ 1.04	\$ 0.58	\$ 24.69
Rainbow Triploid (Hayspur – T9)	9,085	8.5	8.1	1.05	\$ 1.08	\$ 0.95	\$ 8.67
Westslope Cutthroat (Westslope Cutthroat Trout Co.)	115,075	30.2	31.5	0.96	\$ 0.98	\$ 0.27	\$ 30.80
Total	202,335	86.8	84.4	1.03	\$ 1.05	\$ 0.44	\$ 88.54

Appendix 3. Total production and distribution costs, MCFH, 2003.

Species	Eggs/ fish Received	Fish Stocked	Transportation Cost	Pounds Gained	Cost per lb Gained	Cost per 1000 Stocked
Mountain Lake Fry Redistribution ^a						
Arctic Grayling (Meadow Lake, WY)	38,000 fry	35,525	\$ 1,019.04	21.0	\$ 48.53	\$ 28.69
Kamloop Triploid (Hayspur – KT)	90,045 eyed	42,650	\$ 1,152.36	23.8	\$ 48.42	\$ 27.02
Rainbow Triploid (Hayspur – T9)	19,763 eyed	9,085	\$ 530.86	8.1	\$ 65.54	\$ 58.43
Westslope Cutthroat (Westslope Cutthroat Trout Co.)	130,000 eyed	115,075	\$ 3,331.74	31.5	\$ 105.77	\$ 28.95
Subtotal	277,808	202,335	\$ 6,034.00	84.4	\$ 71.49	\$ 29.82
Note: ^a Cost partitioned for number of species stocked on each individual flight; excess fry and fry stocked by volunteers are included in calculations.						
Catchable Size Redistribution						
Troutlodge Rbt Triploid (Reared at Nampa FH)	91,583	91,480	\$ 8,764.00 ^b	N/a		\$ 95.80
Note: ^b Cost based on transportation costs of \$ 8,764 (MCFH \$4,966, \$3,798 Nampa FH).						
Grand Total		293,815		84.4	\$ 578.50	\$ 166.18
Note: Grand total cost based on resident program expenditures (Nov 02 to Nov 03) of \$ 48,825; no capital outlay is included.						

IDAHO DEPARTMENT OF FISH AND GAME

2003 ANNUAL RESIDENT REPORT

MULLAN FISH HATCHERY

Mary Van Broeke, Bio-aide

INTRODUCTION

The Mullan Fish Hatchery (MUFH) is a resident species redistribution station located four miles east of Mullan. The Shoshone County Sportsmen's Association owns the MUFH, while Shoshone County provides funds to maintain the physical plant. The Idaho Department of Fish and Game (Department) provides funds for personnel costs, production costs, and equipment through fishing and hunting license fee revenue. The manager of Cabinet Gorge Fish Hatchery supervises operations and provides additional labor and equipment if needed. There is one temporary employee on-station year-round.

The hatchery receives water from the South Fork of the Coeur d'Alene River and the Little North Fork of the Coeur d'Alene River. Two (10-ft x 60-ft) concrete raceways and three dirt ponds (30-ft x 100-ft) are used to hold fish prior to stocking into the Coeur d'Alene and St. Joe river drainages. One of the dirt ponds has been developed as a show pond complete with a visitor's access deck, information board, and a feed dispenser.

The Mullan facility plays a vital role in supporting the put-and-take rainbow trout *Oncorhynchus mykiss* fishery. From this location, daily trips are made to the Coeur d'Alene and St. Joe River drainages from May to September to stock ponds and lakes, providing the frequent stocking service needed to support such a fishery. The close proximity to a Shoshone County park encourages the highest visitor attendance rate of any hatchery in the Panhandle Region.

In 2003, Mullan Hatchery personnel were also involved with the Kokanee spawning operation at Granite Creek.

HATCHERY IMPROVEMENTS

Hatchery improvements during 2003 included:

- Replaced one chimney on the shop building and removed one on the main hatchery building. This was a joint project with the Department and Shoshone County.
- The domestic water reservoir was drained and silt was removed. The intake screen was also replaced. Hatchery personnel and the Shoshone County work crew did this project. Also, the road to the reservoir was rebuilt.

FISH STOCKED OR TRANSFERRED

A total of 39,847 rainbow trout (9-inches long) were released into the Coeur d'Alene and St Joe river drainages from May to September to support a put-and-take fishery. New for 2003 was the Clee Creek Pond stocking site. All stocking sites received sterile rainbow trout. Troutlodge triploid (TT) trout released from the MUFH came from Nampa Hatchery. Hatchery personnel loaded the fish into a 500-gallon pick-up truck mounted tank and delivered them to numerous lakes and ponds. The distribution schedule requires three-hour to five-hour trips, four to five days each week during the summer season, while lake stocking is usually accomplished with single large releases.

Mullan Hatchery has an annual budget of \$32,116.00. If you include the transportation costs for Nampa Hatchery to deliver fish to Mullan of \$4,243.00, the streamside cost to stock fish from Mullan Hatchery is \$0.91/ fish.

PUBLIC RELATIONS

The MUFH is located adjacent to a popular Shoshone County "day-use" park. As a direct result, the hatchery has a much higher visitor level than would be expected in this remote location. The hatchery receives the highest number of visitors of any hatchery in the Panhandle Region, with over 8,000 people touring the grounds in 2003. The hatchery also hosted the Chrysler/Jeep Jamboree and the Silver Valley Good Samaritan RV Rally. People from across the nation attended these functions. Many groups of local school children also toured the hatchery.

The hatchery maintains a covered visitor information center with a map of stocking areas and information about the special harvest regulations in the Coeur d'Alene River and St. Joe River drainage.

IDAHO DEPARTMENT OF FISH AND GAME

2003 ANNUAL RESIDENT REPORT

NAMPA FISH HATCHERY

**Rick Alsager, Fish Hatchery Manager II
Brian Malaise, Assistant Fish Hatchery Manager
Bob Turik, Fish Culturist**

INTRODUCTION

Nampa Fish Hatchery (NFH) is a resident trout rearing facility located one mile south of Nampa. The NFH water is supplied by eight pump-assisted artesian wells. A maximum flow of 40 cubic feet per second (cfs) of 59°F water is available for fish production. Built in 1975 and purchased by the Idaho Department of Fish and Game (Department) in 1982, fish rearing facilities consist of a hatchery building/dorm containing four early rearing vats and a feed storage room. Outside rearing tanks including 16 fry raceways, 3 fingerling/broodstock raceways and 10 production raceways. Sixteen upwelling incubators are available for use in the fry raceways for eyed-egg incubation. A settling pond treats flows from the production units before discharge into Wilson Springs Ponds and Wilson Springs Drain.

FISH PRODUCTION

During the 2003 fish year, the NFH net fish production was 1,516,502 at a net weight of 301,776 lbs (Appendix 1). The net cost for rearing fish at NFH from growout through stocking was \$441,840.00 (Appendix 2). Fish transferred to other hatcheries are included in the total number and lbs produced. Kamloops and rainbow trout *Oncorhynchus mykiss* comprised 86.5% of the fish stocked or transferred from NFH. In addition, Lahontan cutthroat trout *O. clarki henshawi* and fall chinook salmon *O. tshawytscha* were produced at NFH during 2003 (Appendix 3). Another 2,000 fish weighing 650 lbs were produced at NFH and given to schools for dissection and to department personnel for various research programs. These fish were not included in overall production numbers. A total of 2,363,997 eyed-eggs were received during the 2003 fish year (Appendix 4).

On the morning of February 22 at approximately 2:00 am, NFH had an incident in which the hatchery lost power due to a storm passing through the area for approximately 2.5 hours. Before the outage, NFH was running eight pumps and had aerators running on the bottom two sections in each of the large raceways. Before the outage the raceways were at maximum load capacity and had dissolved oxygen (DO) levels of approximately 5 ppm. When the storm hit and the hatchery lost power, the backup generator came on and operated as it should. The problem was, the generator at NFH is only large enough to back up six pumps without the aerators. After being called four times, Idaho Power finally arrived around 4:30 am to reset the breakers on the power pole near the hatchery, which immediately restored power. Due to the extended power outage the DO levels dropped to critical levels and fish started dying in the large raceways. By the time the fish kill was all cleaned up NFH had lost approximately 35,000 fish weighing 8,830 lbs. The hatchery personnel involved in the clean up of the dead fish were Bob Turik, Dick Bittick and Gary Ady along with Dave Saindon, Dennis Hardy from the Southwest region and Travis Brown.

In September, NFH received 42,010 Hayspur triploid fingerlings weighing 121.8 lbs from Sandpoint Hatchery. These fish were sent to Sandpoint Hatchery as eggs to slow down their development. This should aid NFH's ability to produce the correct size catchables for release into Stanley basin lakes as per ESA permit number 1188.

FISH STOCKED/TRANSFERRED

The NFH personnel stocked or transferred 1,815,268 fish, weighing 331,367 lbs, during the 2003 fish year. These fish included warmwater transfers and fish reared in non-Department hatcheries to waters in Idaho. Personnel from NFH made 194 stocking trips to 367 planting waters during 2003.

The NFH stocked or transferred a total of 165,819 fry (Appendix 5), 538,364 fingerlings (Appendix 6) and 898,094 catchables (Appendix 7), which are listed by species/strain in each table. A total of 475,888 catchables (165,925 lbs) (Appendix 8) were transferred to seven other hatcheries throughout the state.

FISH TRANSPORTATION

Fish transport operators stationed at NFH stocked waters in all seven regions throughout the state. They transported fish to and from 16 different state and federal fish hatcheries. The transport operators made 125 trips totaling 52,722 miles during 2003.

The NFH transport operators stocked rainbow trout fingerlings from Lyons Ferry Fish Hatchery (209,510 fish, 4,847 lbs) into Clearwater Region waters. They also stocked spring chinook salmon and B-run steelhead smolts from Clearwater Fish Hatchery and assisted with the transportation of summer chinook salmon smolts from McCall Fish Hatchery. In the fall of 2003, the transport operators assisted in transporting and stocking 950 surplus A-run adult steelhead from Oxbow Fish Hatchery into the Boise River and 50 surplus steelhead to the Payette River.

In the winter and spring of 2003, Dick Bittick worked on writing the specifications for a new fish transport truck he should be receiving in 2004.

LAHONTAN CUTTHROAT TROUT

During the 2003 fish year, NFH stocked 165,819 Lahontan cutthroat trout (254 lbs) into lakes and reservoirs located in the Southwest and Upper Snake regions. The Lahontan cutthroat eggs were received from Omak Fish Hatchery in Washington. Southwest Region and Upper Snake Region fish were stocked as fry (Appendix 5). Estimated survival from eyed-egg to stocking was 49.3%. Due to past shipping and handling problems, NFH personnel picked up the cutthroat eyed-eggs from Omak personnel at Pendleton, OR.

FALL CHINOOK

In 2003, fall chinook were again reared at NFH. The fry were transferred to NFH from Cabinet Gorge Hatchery in January and reared through June. A total of 44,831 fingerlings were stocked in Coeur d'Alene Lake, meeting the June fish request (Appendix 6).

SPECIAL STUDIES

The NFH assisted resident research biologist Joe Kozfkay with a predator avoidance study. Four raceways of fingerlings were used in this study. Two control raceways and two test raceways in which predator fish were introduced during the rearing cycle. The study was set up to compare whether fingerlings that had predators introduced into the raceways during the rearing cycle survived better than the control raceways with no predators once they are released into the lakes. Results from this study and further information can be obtained from Joe Kozfkay at the Department Research Office in Nampa.

FISH FEED

A total of 336,130 lbs of feed was fed during 2003 at a cost of \$96,274.43 (Appendix 9). The average cost per lb of feed was 27.29 cents. Rangen Inc made up 96.24% of the feed purchased by weight. An additional 1,500 lbs of feed was received from other hatcheries and fed throughout the year. The overall feed conversion was 1.12 lbs of feed fed to produce one lb of fish.

Moore-Clark feed continues to out-perform other starter feeds. The NFH continued to use their starter feeds for starting fry on feed in 2003. Rangen continues to carry the feed contract and is used throughout the remainder of the rearing cycle. Moore-Clark feed was used throughout the rearing cycle of the Lahontan cutthroat trout and fall chinook salmon. The cutthroat were stocked as fry this year and were only on feed about three weeks before stocking.

FISH SPAWNING

Early Kokanee

The NFH continues to operate the early Kokanee salmon *O. nerka kennerlyi* trapping and spawning project. Numbers of Kokanee at Deadwood Reservoir are still on the rebound. The fish trapped at the weir continued to increase in size and averaged 17.5 inches. Egg-take goals for 2003 were 1.75 million green eggs for Mackay Hatchery.

The kokanee population continues to slowly increase but has not reached a number to meet both escapement goals and egg-take goals. This year, per Southwest Regional biologist directions, no fish were intentionally released above the weir for natural spawning. All fish that entered the trap and ripened were spawned. The trap was installed on August 12 and the first fish arrived in the trap that evening. With another low water year in 2003, the weir was installed just below Wild Buck Creek. The water level in the river and reservoir remained relatively constant throughout the spawning season.

The KE run started about the same time as it has the past few years. There were a total of three spawning takes this year. The first spawn date was August 21 and the last was on September 4th. All fish were spawned at the trap site. A green egg yield of 622,083 eggs was taken from 631 females for a fecundity rate of 986 eggs/female (Appendix 11). Average total length of Kokanee females was 421 mm, with males averaging 425 mm (Appendix 12). Eggs were shipped to Mackay Hatchery via fixed-wing aircraft. The shipping techniques were similar to those used in previous years. The Department contracted the flying service with McCall Air Taxi. On August 22, with sudden heavy thunderstorms in the area, the river rose approximately two feet and containment was lost at the weir at approximately 11:00 pm. By 10:00 am the following morning, the water level in the river had receded enough to put the weir back into operation. Approximately 350 Kokanee being held in the live boxes died during the high water event. Trap tenders estimated 100 fish escaped upstream while the weir was not in operation. The trap was removed on September 11 per direction from Southwest Regional biologist and the few fish that remained in the trap were destroyed.

Deadwood Reservoir continues to be a popular fishing spot during the Kokanee run. With the low number of returning Kokanee, an emergency fishing closure was issued by the Department on August 27 running through September 15 to protect the fish that were in the Deadwood River. The closure area was from the weir in the river to the slack water of the Deadwood Reservoir. Information and "No Fishing" signs were installed on both sides of the river from the weir downriver every 100 yards to the mouth to inform the public about the fishing closure.

The weir across Trail Creek was not installed again this year due to the low number of returning fish. The crew walked Trail Creek twice a week throughout the spawning season counting the number of adults in the creek and noting which section of the creek they were observed.

With low fish numbers returning to the North Fork of the Payette River the trapping and spawning operation was not conducted this year.

The Morrison Knudsen Nature Center received 60 adult Kokanee for viewing at the Nature Center ponds. Salmon and Steelhead Days received 100 spawned-out Kokanee kelts for educational purposes. An additional 120 kelts were shipped to Lyons Ferry Hatchery for Salmon and Steelhead Days in that region.

HATCHERY IMPROVEMENTS

- Several important improvements were implemented at NFH during 2003:
- Replaced faulty windows in residences 2 & 3 and the hatchery office.
- Replaced the old 1-ton pick-up with a new ¾-ton pick-up.
- Installed new carpet in residence # 1.
- Installed front entry door in residence # 1.
- Installed garage doors in upper shop.
- Installed new garage and double door in lower shop.
-
- Removed old deck on the east side of the hatchery office building and built a new, smaller deck at the lower shop entrance.
-
- Made minor repairs to the dormitory.
-
- Purchased three floating fresh flow aerators for C raceways.
-
- Received a 24-foot travel trailer for use at the Deadwood trap from sockeye research.
-
- Repaired and oiled roofs on the hatchery office, dorm & residence # 1.
-
-

NFH improvements scheduled for 2004 include:

- Develop hatchery pamphlets for self-guided tour.
- Budget for aluminum screens and damboards for B & C raceways.
- Construct and install new degassing towers on wells 4 & 5.
- Purchase a new 1-ton pick-up to replace the 1998 1-ton pick-up.
- Replace the roof on residence # 2.
- Replace the Kenworth transport truck.
- Install new backup generator for wells 7 & 8.
- Replace garage doors in the upper shop.

PUBLIC RELATIONS

As in past years, the NFH was a focal point for many visitors, tours, and special groups. An estimated 3,500 tourists visited the NFH in 2003. Most visits came through the late spring and summer months although with year-round schooling tours were scheduled spring, summer and fall. A total of 42-guided tours were given to area school, church, and Boy Scout groups.

The NFH participated in two job shadows during 2003. Two slide show presentations were presented to area schools. The disabled veterans were allowed to fish the settling pond five times during the summer months. Six other disabled groups from the Nampa area were allowed to fish the settling pond through the summer. The settling pond was also opened to fishing on Free Fishing Day. The NFH, with the help of regional personnel, reservists and local Boy Scouts, hosted the Free Fishing Day clinic, which saw 544 visitors/fishermen, with an estimated 650 fish caught. The largest fish caught was a five-pound rainbow trout with several more over three pounds. Free Fishing Day at NFH was again a big success and will be continued in the future. The "kids only" session from 8:00 am to noon continued to be very popular and successful. The Gem State Fly Fishing Group continues to hold a 3-day fly-fishing instructional class (no hooks allowed) at the hatchery. Assistance on fish culture programs was provided to many area schools. Eggs, fry and fingerlings were provided for living streams and catchables were provided for dissection in several classes.

ACKNOWLEDGEMENTS

The NFH staff for 2003 included Rick Alsager, Fish Hatchery Manager II; Brian Malaise, Assistant Fish Hatchery Manager; Bob Turik, Fish Culturist; Gary Ady and Dick Bittick, Fish Transport Operators. Bio Aides for 2003 included: Travis Brown, Ken Felty and James Johnson. Chuck Kiester assisted with the Kokanee spawning operation and fish marking. Three high school students assisted hatchery personnel through a work-study program. Volunteers have also helped on a number of projects throughout the year by donating approximately 659 hours of time.

Appendix 1. Total net fish production at Nampa Fish Hatchery, 1994 through 2003

Year	Put-and-Take		Put-grow-and-take		Total Number	Total Pounds	Feed		Feed Conversion
	Number	Pounds	Number	Pounds			Pounds	Costs	
1994	308,023	146,978	793,065	55,014	1,101,088	201,992	220,544	\$72,340	1.09
1995	567,147	193,309	783,722	42,336	1,350,869	235,645	261,589	\$76,793	1.11
1996	694,659	212,011	950,412	34,271	1,645,071	246,282	262,902	\$91,893	1.07
1997	556,718	188,208	693,859	19,006	1,250,577	207,214	240,140	\$94,502	1.12
1998	692,706	228,006	2,172,659	22,901	2,865,363	250,907	267,782	\$96,338	1.07
1999	1,077,110	336,841	348,962	26,677	1,426,072	363,518	345,288	\$112,003	0.95
2000	864,603	250,976	1,100,595	18,197	1,965,198	269,173	281,264	\$81,862	1.04
2001	754,641	241,435	1,197,489	15,513	1,952,130	256,948	282,264	\$75,737	1.10
2002	923,854	346,918	1,155,212	24,334	2,079,066	371,252	356,982	\$100,727	0.96
2003	981,383	285,537	535,119	16,239	1,516,502	301,776	337,630	\$91,742	1.12

* Feed cost does not include feed donated from other hatcheries, but is included in feed fed and feed conversion.

Appendix 2. Total cost of net fish production at Nampa Fish Hatchery, 1994 through 2003

Year	<u>Total cost through Growout</u>				<u>Mean Length in inches</u>	<u>Total cost through stocking</u>			
	<u>Total Cost</u>	<u>Cost/1000 Fish</u>	<u>Cost/ Pound</u>	<u>Cost/ Inch</u>		<u>Total Cost</u>	<u>Cost/1000 Fish</u>	<u>Cost/ Pound</u>	<u>Cost/ Inch</u>
1994	\$258,010	\$234.32	\$1.28	\$0.029	8.06	\$291,650	\$264.87	\$1.44	\$0.028
1995	\$271,156	\$200.77	\$1.15	\$0.033	7.93	\$304,695	\$225.30	\$1.29	\$0.037
1996	\$274,072	\$166.60	\$1.11	\$0.027	7.50	\$310,851	\$188.96	\$1.26	\$0.031
1997	\$308,979	\$247.07	\$1.49	\$0.043	7.79	\$342,063	\$273.52	\$1.65	\$0.048
1998	\$279,045	\$97.39	\$1.11	\$0.023	7.30	\$329,161	\$114.88	\$1.31	\$0.027
1999	\$363,623	\$255.00	\$1.00	\$0.025	10.12	\$428,624	\$300.58	\$1.18	\$0.030
2000	\$353,747	\$180.02	\$1.31	\$0.032	5.59	\$411,497	\$209.41	\$1.53	\$0.037
2001	\$338,998	\$173.67	\$1.32	\$0.031	5.64	\$390,917	\$200.27	\$1.52	\$0.036
2002	\$379,398	\$182.49	\$1.02	\$0.027	7.75	\$440,031	\$211.66	\$1.23	\$0.032
2003	\$408,764	\$269.63	\$1.35	\$0.037	7.22	\$441,840	\$291.45	\$1.46	\$0.040

Appendix 3. Fish Requested and Produced at Nampa Fish Hatchery, 2003

Species/Strain	Size	Production	Actual	% of Goal
		Goal	Production	Achieved
Lahontan cutthroat trout (C6)	1-3 inches	140,000	165,819	118.4%
Triploid Kamloops x steelhead trout (TT)	3-5 inches	0	71,052	0.0%
Triploid rainbow trout (T9)	3-5 inches	70,000	69,572	99.4%
Triploid Kamloops trout (KT)	3-5 inches	400,000	352,909	111.4%
Fall Chinook (FC)	6-8 inches	50,000	44,831	89.7%
Triploid Kamloops x steelhead trout (TT)	8-12 inches	900,000	830,200	92.2%
Triploid rainbow trout (T9)	8-12 inches	18,000	26,362	146.5%
Triploid Kamloops trout (KT)	8-12 inches	40,000	41,532	103.8%
Totals:		1,688,000	1,602,277	94.9%

Appendix 4. Eyed-Eggs Received at Nampa Fish Hatchery, January 1 to December 31, 2003

Date	Species/Strain	Source	Number	Destination	Cost/1000
Received					Fish
1/8/03	Triploid rainbow trout	Hayspur	105,280	SW/Reg.	N/C
1/8/03	Triploid Kamloops trout	Hayspur	171,887	C Reg.	N/C
1/17/03	Triploid rainbow trout	Hayspur	115,478	SW/Reg.	N/C
2/10/03	Triploid rainbow trout	Hayspur	55,720	Salmon Region	N/C
4/29/03	Lahontan cutthroat trout	Omak	336,111	SW/Reg. & US Reg.	N/C
4/30/03	Triploid Kamloops trout	Hayspur	69,022	SW/Reg. & Salmon Reg.	N/C
6/4/03	Triploid Kamloops x steelhead trout	Trout Lodge	496,000	All Regions	\$25.00
6/25/03	Triploid Kamloops x steelhead trout	Trout Lodge	431,680	SW Reg., MV Reg., P Reg. & Salmon Reg.	\$25.00
10/1/03	Triploid Kamloops x steelhead trout	Trout Lodge	220,819	SW Reg.	\$25.00
12/17/03	Triploid Kamloops trout	Hayspur	181,000	SW/Reg. & Salmon Reg.	N/C
12/23/03	Triploid rainbow trout	Hayspur	181,000	Reg.	N/C
Total:			2,363,997		

Designation Key

C Reg.	Clearwater Region
MV/Reg.	Magic Valley Region
P Reg.	Panhandle Region
SE Reg.	Southeast Region
SW/Reg.	Southwest Region
US/Reg.	Upper Snake
Salmon Reg.	Salmon Region

Appendix 5. Fry Production at Nampa Fish Hatchery, 2003

Species/Strain	Source and Date Received	Number Received	Number Produced	Pounds Produced	% Survival Egg to Plant	Destination
Lahontan cutthroat trout	Omak 4/03	200,000	98,819	154	49.4%	Southwest Region
Lahontan cutthroat trout	Omak 4/03	136,111	67,000	100	49.2%	Southeast Region
Totals:		336,111	165,819	254	49.3%	

Appendix 6. Fingerlings Produced at Nampa Fish Hatchery, 2003

Species/Strain	Source	Date Received	Number Received	Number Produced	Pounds Produced	% Survival Egg to Plant	Designation
Triploid Kamloops Trout	Hayspur	12/02, 1/03 & 4/03	550,000	352,909	7,825	64.2%	Southwest & Clearwater Region
Triploid Rainbow Trout	Hayspur	1/03	106,500	69,572	1,394	65.3%	Southwest Region
Triploid Kamloops x Steelhead	Troutlodge	6/03	84,000	71,052	2,545	84.6%	Magic Valley, Clearwater & Upper Snake Regions
Fall Chinook	Cabinet Gorge	1/03	46,308	44,831	3,600	96.8%	Panhandle Region
Totals:			786,808	538,364	15,364		

Appendix 7. Catchables Produced at Nampa Fish Hatchery, 2003

<u>Species/Strain</u>	<u>Source</u>	<u>Date Received</u>	<u>Number Received</u>	<u>Number Produced</u>	<u>Pounds Produced</u>	<u>% Survival Egg to Plant</u>	<u>Designation</u>
Triploid Kamloops Trout	Hayspur	5/02	75,000	41,532	11,970	55.4	Panhandle & Salmon Regions
Triploid Rainbow Trout	Hayspur	5/02 & 6/02	47,800	26,362	8,411	55.2	Southwest & Salmon Regions
Triploid Kamloops x Steelhead	Troutlodge	6/02 & 9/02	1,100,300	830,200	280,217	75.5	Panhandle, Clearwater, Southwest, Magic Valley Regions
Totals:			1,223,100	898,094	300,598		

Appendix 8. Catchables Transferred from NFH to other hatcheries throughout the state in 2003.

<u>Hatchery</u>	<u>Species</u>	<u>Number</u>	<u>Pounds</u>	<u>Fish/Pound</u>
Ashton Fish Hatchery	TT	19,080	7,200	2.65
Clearwater Fish Hatchery	TT	119,432	44,100	2.71
Hayspur Fish Hatchery	TT	46,752	16,120	2.90
McCall Fish Hatchery	TT	91,799	32,200	2.85
Mullan Fish Hatchery	TT	38,346	12,600	3.04
Sandpoint Fish Hatchery	TT	106,615	35,575	3.00
Sawtooth Fish Hatchery	TT	106,615	35,575	3.00
Sawtooth Fish Hatchery	T9	2,191	700	3.13
Totals:		475,888	165,925	

Appendix 9. Nampa Fish Hatchery Feed Cost, 2003

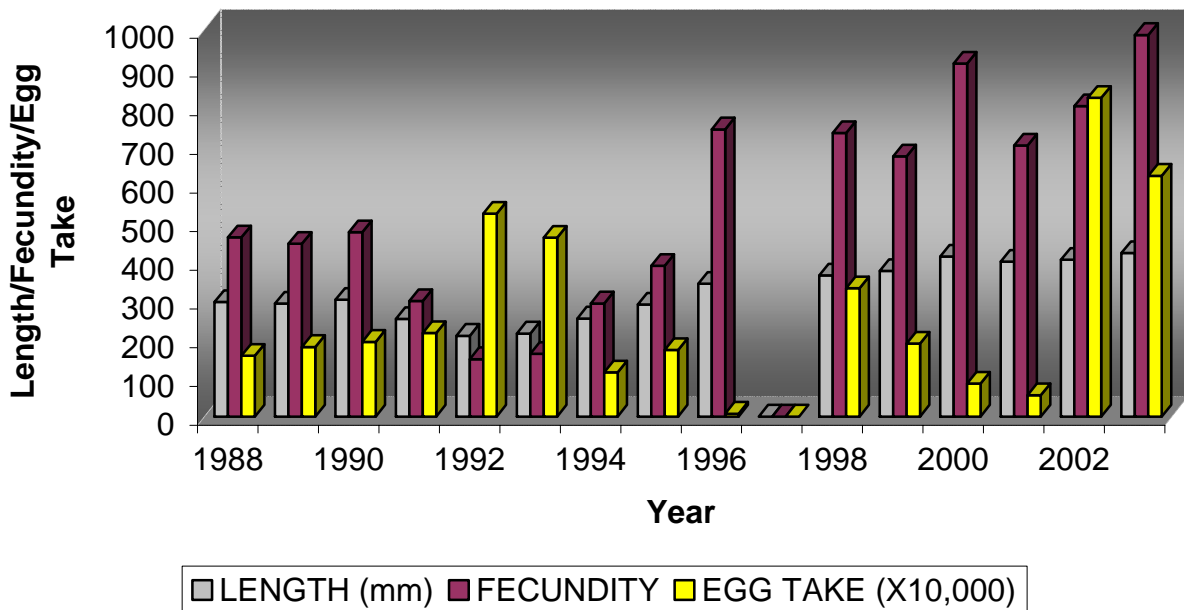
Supplier/Source	Size/Type	# Boxes/ Bags	Pounds	Price/ Lb.	Feed Charges
Moore-Clark					
Nutra Plus	Starter #0	2	88	0.88	\$77.44
Nutra Plus Proactive	Starter #3	21	924	0.94	\$868.56
Nutra 2000	Starter #0	4	176	1.02	\$179.52
Nutra 2000	Starter #1	2	88	1.01	\$88.88
Nutra 2000	Starter #2	2	88	1.05	\$92.40
Nutra 2000	Starter #3	34	1,496	1.03	\$1,540.88
Nutra Fry	Grower 1.5 mm	30	1,320	0.62	\$818.40
Total:		95	4,180		\$3,666.08
Freight:					\$866.55
Grand Total:					\$4,532.63
Rangen					
Dry Crumble	Starter #2	75	3,750	0.426	\$1,597.50
Dry Crumble	Starter #3	355	17,750	0.299	\$5,307.25
450 floating	1/16 in. pellet	120	6,000	.377	\$2,262.00
450 floating	3/32 in. pellet	230	11,500	0.257	\$2,955.50
450 floating	1/8 in. pellet	270	13,500	0.257	\$3,469.50
450 floating	5/32 in. pellet	2	100	0.257	\$25.70
450 floating	3/32 in. pellet	Bulk	8,660	0.247	\$2,139.02
450 floating	1/8 in. pellet	Bulk	268,440	0.247	\$66,304.68
Dry Crumble med.	Starter #1	1	50	0.568	\$28.42
Dry Crumble med.	Starter #2	3	150	0.568	\$85.25
Dry Crumble med.	Grower #3	11	550	0.568	\$312.57
Dry Crumble med.	Grower #4	5	250	.492	\$122.88
450 floating med.	3/32 in. pellet	25	1,250	0.472	\$590.25
Total:		1,097	331,950		\$85,200.50
Freight:					6,541.30
Grand Total:			336,130		\$91,741.80

Appendix 10. Kokanee egg-take at Deadwood Reservoir by Nampa Fish Hatchery, 2003

Lot Number	Spawn Date	Females Spawned	Green Eggs	Eyed Eggs	% Eye-up
1	21-Aug-03	425	397,715	245,450	61.7
2	28-Aug-03	145	146,588	101,117	69.0
3	4-Sep-03	61	77,780	39,990	51.4
Totals:		631	622,083	386,557	62.1

Appendix 11. Kokanee spawning length, fecundity, egg-take (x1000), Nampa Fish Hatchery, (1992-2003)

Deadwood Kokanee Spawning Spawning Summary (1988-2003)



IDAHO DEPARTMENT OF FISH AND GAME

2003 ANNUAL RESIDENT REPORT

SANDPOINT HATCHERY

Zach Olson, Fish Culturist

INTRODUCTION

Sandpoint Fish Hatchery (SPFH) is located two miles west of the town of Sandpoint, on the south side of the Pend Oreille River in Bonner County. The Idaho Department of Fish and Game (Department) constructed SPFH in 1908, with additional funding from the Bonner County Sportsmen's Club. The hatchery is currently owned and operated by the Department and is funded with revenue generated from hunting and fishing license sales.

Duties at this facility include the put-and-take stocking program for lowland lakes and swim-up fry for high mountain lakes in the northern section of Region 1. Because of the closure of Clark Fork Hatchery in 2000, SPFH has taken over the annual stocking of 22 lakes with catchable sterile rainbow trout *Oncorhynchus mykiss*. On even years, high mountain lakes are stocked with sterile Kamloop (KT) rainbow and Westslope cutthroat *O. clarki* trout fry. This program involves receiving eyed-eggs from state and private sources, incubating, and then stocking the swim-up fry. Department personnel, reservists, and volunteers are utilized to backpack these fish into 29 lakes.

On even years, McCall Fish Hatchery (MFH) stocks golden trout *O. aguabonita* and arctic grayling *Thymallus arcticus* into four additional high mountain lakes in the northern portion of Region 1 via fixed-wing aircraft. On odd years, MFH is responsible for stocking all high mountain lakes in the southern portion of Region 1 via a fixed wing aircraft.

The SPFH is in operation from mid-March through October and is staffed with a Fish Culturist. The Fish Culturist spends the remainder of his time working at Cabinet Gorge Fish Hatchery (CGFH) assisting with the Kokanee spawning operation and egg incubation. The Manager 1 position at CGFH oversees operations at SPFH and supplies additional labor when needed. During the season there is also a great deal of ground and facilities maintenance at SPFH that needs to be completed on a regular basis.

WATER SUPPLY

The hatchery receives water from Murphy Spring, which flows into a pipeline located one quarter-mile southwest of the hatchery. The spring supplies the hatchery with 400-450 gallons per minute (gpm) of water. Temperature ranges from 44°F to 48°F throughout the seasonal use of the facility.

There are five water flow control valves within the supply pipeline system. A valve located at the entrance to the main hatchery building can divert flows between the indoor vats and the outdoor raceways. Four valves are located within the parking lot at the hatchery. Two of the valves operate as isolation valves and the two remaining valves allow water to be diverted into the new outdoor raceways and/or Nature Center, which started construction in the summer of 2003. A valve located at Murphy Spring can compensate for overflow situations by spilling water back into Murphy Creek. An additional valve was added in 2003 at the tail end of the outdoor raceways, which will supply water to the future Nature Center viewing pond. All valves are adjusted to allow water levels at the spring to remain full while maintaining maximum flow to the hatchery.

REARING FACILITIES

The hatchery rearing facilities include eight half-stack Heath incubators (8-tray), and 18 concrete vats (15-ft x 2.5-ft x 3-ft) inside the hatchery building. There are also two outdoor concrete raceways measuring 10-ft x 60-ft x 4-ft each.

FISH STOCKING

Catchable-size triploid rainbow trout (~9.0 inches) were stocked in the Kootenai, Pend Oreille, and Spokane river drainages to support a put-and-take fishery. All of the lakes and reservoirs stocked are located within the northern portion of Region 1. Fish supplied for redistribution in 2003 were Troutlodge triploid rainbows from Nampa Fish Hatchery (NFH). A single truckload of Kamloop triploid rainbows was delivered from Grace Fish Hatchery (GFH). A total of 116,240 fish weighing 40,130 lbs (2.9 fpp) was stocked between the first week of April and the first week of October. Fish stockings scheduled for late-March were cancelled due to road restrictions and were added to April's stocking request. Twenty-two different bodies of water received catchable rainbows in 2003. In addition, the hatchery provided fish for a number of fishing clinics including Wal-Mart shopping center, and Free Fishing Day events at Rathdrum Boy Scout Park, Snow Creek Pond and Clark Fork Hatchery (CFH). The cost of stocking fish from SPFH includes employee wages, transportation cost, and operating expenses that totaled \$44,415.00 (Appendix 1). The streamside cost to redistribute fish was \$0.382 (Appendix 2).

Production

On May 1, SPFH received 86,000 eyed T9 eggs from Hayspur Fish Hatchery (HFH). After disinfecting in PVP iodine, these eggs were placed in Heath Stack incubators at ~12,000 eggs per tray. Initial feeding began on June 23. Survival to hatching was estimated at 54%, resulting in 46,000 fry being ponded. On September 22, 42,000 fish weighing 121.8 lbs (345 fpp) were sent to NFH for final growout. A total of 82 lbs of Moore-Clark NutraPlus feed was fed to produce 105 lbs of gain for a conversion of 0.78:1.

HATCHERY IMPROVEMENTS

Hatchery improvements in 2003 included:

- Construction of two new raceways, which can now accommodate a truck and trailer load of catchables.
- Removed old raceways.
- Installed new security fencing around raceways
- Nature Center Committee began construction of new pond with fish viewing windows.
- Refinished and painted exteriors of garage and freezer buildings.

HATCHERY NEEDS

- Design and construct new bird netting over raceways.
- Paint exterior of main hatchery building.
- Repair hatchery building interior ceiling panels, windows, and re-paint floors.

PUBLIC RELATIONS

The hatchery receives a fair number of visitors because of its proximity to Sandpoint and US Highway 95. A kiosk, built by the Lake Pend Oreille Idaho Club (LPOIC), serves as an information center for self-guided tours. The SPFH is a one-person fish distribution station and there is not a great deal of public interaction due to lack of time actually spent at the hatchery. When available, hatchery personnel conduct educational tours, provide information to the public, and attend community events on the Department's behalf. Hatchery staff has more contact with the public during fish plants, and use that opportunity for positive interaction. In addition, hatchery personnel attend meetings with LPOIC and other sportsmen's groups to communicate hatchery information and issues to them.

Construction has started on the Sandpoint Hatchery Nature Center, which will increase public educational opportunities in the future. The Nature Center will include a pond with viewing windows, spawning channel, interpretive trail system, and information building for visitors.

ACKNOWLEDGEMENTS

The SPFH staff would like to thank the staff at CGFH: John Rankin (Fish Hatchery Manager 1), Bruce Thompson (Assistant Manager), John Suhfras (Maintenance Craftsman), and Steve Lowe (Bio-aide) for their assistance when additional manpower was needed. Thanks also to Gary Ady, and Dick Bittick, who transported catchable rainbows from Nampa Fish Hatchery throughout the stocking season.

APPENDICES

Appendix 1. Redistribution cost of catchable rainbow trout

Expenditure	Cost
Wages	\$12,000
Transportation	\$16,415
Operating	\$16,000
Total Cost	\$44,415

Appendix 2. Streamside cost per fish

Program	Distribution Cost	# Fish	Cost/Fish
Catchable Stocking	\$44,415	116,240	\$.382

IDAHO DEPARTMENT OF FISH AND GAME

2003 ANNUAL RESIDENT REPORT

SAWTOOTH FISH HATCHERY

**Roger Elmore, Fish Culturist
Tony Herold, Bio Aide**

INTRODUCTION

Sawtooth Fish Hatchery (SFH) is a US Fish and Wildlife Service (USFWS) Lower Snake River Compensation Plan (LSRCP) hatchery and has been in operation since 1985. The Idaho Fish and Game Department (Department) operates this facility. The primary goal of SFH is to trap, spawn, rear, and release spring chinook salmon *Oncorhynchus tshawytscha*. Adult steelhead are also trapped and spawned, with the eyed eggs and fry being sent to other hatcheries for hatching and rearing. In 1990, a program to stock rainbow trout *O. mykiss* into surrounding area waters for improved angling opportunities began.

FISH STOCKING

Sawtooth Fish Hatchery met its stocking requests in 2003 with the exception of the following: 100 fish into Grouse Lake eliminated due to warm water and Squaw Pond reduced from 800 to 600 due to warm water.

Nampa Fish Hatchery (NFH) supplied SFH with Troutlodge triploid rainbow for stocking. A total of 53,127 fish were received at SFH on four shipping days from May 27 until July 22. Based on 8 sample counts and 57 fish plants, SFH personnel stocked a total of 45,830 fish in lakes and streams in the area. Nampa Fish Hatchery stocked Stanley, Pettit, Perkins and Alturas lakes in 2003.

National Marine Fisheries Service (NMFS) permit #1188, which expires Dec 31, 2004, outlines resident rainbow trout releases in anadromous waters in the Salmon River drainage. Permit #1188 dictates hatchery-reared rainbow trout to be released in rivers, streams, and lakes with ESA-listed fish should have an average size not greater than 250 mm and no individual exceeding 300 mm in total length. The 250 mm size restriction would include fish planted in the Salmon River, Valley Creek, and Yankee Fork Dredge Ponds. Based on 45 fish plants from SFH to the Salmon River, Valley Creek, and Yankee Fork Dredge Ponds, fish averaged 3.24 fish per pound (fpp) and 9.15 inches (232 mm) in total length. The permit also dictates fish in the upper Salmon River cannot be stocked until after June 15 and be adipose fin clipped. Only fish with the adipose fin clip may be kept, thereby protecting wild rainbow trout. All rainbow trout received at SFH in 2003 had been adipose clipped by personnel at NFH and then delivered to SFH 21 days later to allow for withdrawal of MS-222 to comply with label directions.

The catchable rainbow trout were fed a maintenance diet of Rangen's 450 extruded pellets in the 5/32 size throughout the summer. A total of 500 lbs were purchased at a cost of \$128.50. Fish feed is available for the public to purchase to feed to the rainbow trout. Cost is \$0.25 per handful. The SFH deposited a total of \$1,000.00 collected from the coin operated fish feeder into PCA 31819 to help offset the costs of printing the *Fishing the Sawtooth Valley* brochure.

Weekly notices informing the public of the whereabouts of the latest stocking locations are distributed to the local businesses and are posted at SFH. A repeating message can be heard over the local radio transmitter containing stocking information and current news about SFH. Stocking information can also be found on the Idaho Fish and Games web site.

SFH personnel resumed high mountain lake stocking of westslope cutthroat trout by fixed wing aircraft in the Salmon Region. Two flights flown by McCall Air Taxi occurred on August 29 and September 2. A total of 29,625 fish were stocked into 74 different lakes. Sizes of the fish were between 2,500 and 3,000 fpp. Flight time was 11 hours at a cost of \$2,442.00.

Sawtooth Fish Hatchery sponsored another Kid's Fishing Day at the Sawtooth Pond on Free Fishing Day, June 7, 2003. There were 34 kids and 30 adults who participated in fishing activities between the hours of 11:00 am and 3:30 pm. Over 100 catchable-sized rainbow trout were stocked by hatchery staff prior to Free Fishing Day. Fishing was good and everyone caught fish. Thanks to all who participated.

PLANS FOR 2004

Sawtooth Fish Hatchery will stock flowing water sites with Nampa Fish Hatchery stocking Sawtooth Basin lakes.

In 2004, SFH plans to continue high mountain lake stocking of westslope cutthroat trout, *Oncorhynchus clarki lewisi* by airplane in the Salmon Region.

The SFH plans to participate in Free Fishing Day program again.

SFH plans to reprint the popular Fishing the Sawtooth Valley brochure.

ACKNOWLEDGEMENTS

The SFH would like to thank Rick Alsager and the Nampa Hatchery crew for their cooperation in making 2003 successful. Special thanks go to Dick Bittick and Gary Ady for transporting fish from Nampa and stocking the big lakes in the Stanley Basin. Tony Herold, Bio Aide, did a good job of stocking fish, delivering stocking notices, and entering the weekly data for SFH

APPENDICES

Appendix 1. Planting sites and numbers of catchable rainbow trout stocked in the Salmon Region by Sawtooth Fish Hatchery from May through September 2003.

Site	Number
Little Bayhorse Lake	2,000
Kelly Creek Pond	900
Salmon River	33,430
Yankee Fork Dredge Ponds	4,000
Valley Creek	4,000
Meadow Blue Mountain Pond	900
Squaw Creek Pond	600
Totals	45,830

Appendix 2. Planting sites and numbers of cutthroat fry stocked in the high mountain lakes by Sawtooth Fish Hatchery from late August through early September 2003.

High Mountain Lakes Stocking:

Site	Number
Alpine Lake Creek #2	50
Alpine Creek Lake #6	300
Alpine Creek Lake #7	350
Alpine Creek Lake #12	50
Baldwin Creek Lake	350
Bear Creek Lake #1	200
Cabin Creek Lake #3	100
Cabin Creek Lake #4 (Crimson)	600
Cabin Creek Lake #7	200
Cabin Creek Peak Lake #01	150
Cabin Creek Peak Lake #04	75
Cliff Creek Lake #01	150
Cliff Creek Lake #04	75
Collie Creek Lake #01	1,075
Decker Creek Lake #01	575
Elizabeth Lake	500
Elk Lake	675
Finger Lake #03 (Fall Creek Lake #3)	475
Fishhook Creek Lake #02	75
Fishhook Creek Lake #03	75
Goat Lake #01	2,225
Goat Lake #04	425
Goat Lake #05	50
Hanson Lake #01	225
Hanson Lake #03	725
Hanson Lake #05	125
Harlan Creek Lake #01	300
Harlan Creek Lake #02	250
Hasbrook Lake #01	375
Helldiver Lake	550
Hidden Lake	250
Hindman Lake #1	500
Imogene Lake #02	200
Imogene Lake #03	625
Imogene Lake #04	100
Imogene Lake #06	525
Iris Lake #03	350
Iris Lake #01	225
Kidney Lake #02	150
Knapp Lake #07	200
Lola Lake #02	500
Lola Lake #03	500
Loon Creek Lake #03 (Fish Lake)	150

Appendix 2. Continued

Site	Number
Loon Creek Lake #11	175
Loon Creek Lake #13	225
Loon Creek Lake #15	175
Lost Lake	200
Lower Island Lake	550
Lower Valley Creek Lake	550
Lucille Lake	775
Marshall Lake #02	500
Martha Lake	200
McGowan Lake #03	250
P-38 Lake	325
Parks Peak Lake #01	500
Profile Lake	775
Rocky Lake	450
Saddleback Lake #01	775
Saddleback Lake #02	325
Soldier Lake #04	975
Soldier Lake #07	250
Soldier Lake #08	250
Soldier Lake #10	250
Soldier Lake #11	250
Tango Lake #04	675
Tango Lake #05	250
Tango Lake #06	900
Thompson Cirque Lake	900
Upper Cramer Lake	500
Upper Hell Roaring Lake #01	275
Upper Hell Roaring Lake #02	275
Upper Redfish Lake #02	425
Upper Redfish Lake #03 (Kathryn)	625
Valley Creek Lake #02	400
Vanity Lake #05	125
Totals	28,050

IDAHO DEPARTMENT OF FISH AND GAME

2003 ANNUAL REPORT

RESIDENT HATCHERIES

FISH HEALTH REPORT

Douglas R. Burton, Fishery Pathologist

INTRODUCTION

The Resident Hatchery Pathologist's (RHP) primary duties are to provide fish health inspection and diagnostic services to the Idaho Department of Fish and Game's (Department) resident fish hatcheries and to assist hatchery personnel in maintaining good health in cultured resident fish. These same services are provided to Department fishery managers and biologists and occasionally to private individuals or companies when the information or relationship is of benefit to the State of Idaho. The author, Douglas R. Burton, has held the RHP position since 1993. The RHP and the Anadromous Hatchery Pathologist work closely together, often assisting each other in their respective programs and coordinating efforts when those programs overlap. Both pathologists work out of the Eagle Fish Health Laboratory (EFHL), and are supported by the personnel and facilities there. The American Fisheries Society certifies both individuals as Fish Health Inspectors.

The RHP is the Investigational New Animal Drug (INAD) monitor for the Department resident hatcheries. This is the process by which the US Food and Drug Administration (USFDA) will allow the limited use of certain drugs and chemicals not currently labeled for a specific use in food fish, while accumulating data to support adding such use to the label. The Department joined the US Fish and Wildlife Service, Aquatic Animal Drug Approval Partnership Program (USFWS, AADAPP) in 1998. This group administers INAD programs for State, Tribal, and Private aquaculture across the United States. Chemical compounds used under this program by Department resident hatcheries during 2003 included Oxytetracycline (OTC) and Chloramine-T (Chlor-T). Oxytetracycline is used to treat systemic bacterial infections in many hatcheries, and Chlor-T was used to treat bacterial gill infections at Hayspur Hatchery. Statewide, the single most significant fish disease in the Department resident hatchery program continued to be bacterial coldwater disease (CWD). Bacterial CWD is caused by *Flavobacterium psychrophilum*, a motile, gram-negative bacterium that is usually susceptible to OTC, but requires the use of an INAD protocol for the treatment to be legal. The total number of INAD protocols to use OTC at resident hatcheries decreased from 36 in 2002 to 23 in 2003.

Another responsibility of the RHP was to issue import permits for all the resident programs that brought eggs or fish into the state. This duty involves collecting fish health inspection and certification information from various sources in order to be certain that such importations do not present a significant risk to established fish hatchery programs or the native fish that they may contact. The goal of the program is to reduce the risk of adversely impacting Idaho's fishery resources by increasing our ability to track fish imports and eliminating the appearance of a double standard between the Department and the general public. This was the third year that we have required all Department personnel to seek such permits and compliance has been very good.

The RHP and EFHL personnel examined 87 cases for Department resident hatchery programs during 2003 (34 diagnostic cases, 29 routine hatchery inspections, and 24 inspections of feral brood fish). This was a significant reduction from 2002, primarily due to the drop in diagnostic cases at Hagerman State Hatchery from 45 to 19. In addition, the RHP was responsible for one inspection done for Rangen's Aquaculture (rainbow trout purchased by Idaho Power Co [IPC] for release in American Falls Reservoir), 16 various research tests, and one wild fish sample of kokanee salmon from Warm Lake.

A summary of the work done for each Department hatchery, as well as the results of all sampling done at those hatcheries, is as follows:

AMERICAN FALLS HATCHERY

Two of three diagnostic examinations documented CWD and motile aeromonad septicemia (MAS) as the significant infectious diseases at American Falls Hatchery in 2003 (Appendix A). Treatments with OTC-medicated feed at the standard dosage were moderately successful. It may be necessary to treat at a higher dosage, as allowed by INAD protocol, in the future. The third diagnostic examination detected no pathogens, but a condition of extremely pale livers was observed. Samples were sent to Charlie Smith at the Bozeman Fish Health Center for histological examination. His finding was that there were excessive glycogen deposits in the livers. A change was made in the fish diet and the condition was not observed again.

Two routine inspections of Westslope cutthroat trout detected no viruses, bacteria, or *Myxobolus cerebralis* (MC) spores.

ASHTON HATCHERY

The RFP visited the hatchery in March to sample the catchable rainbow trout population. No viral or bacterial pathogens, or *Myxobolus* spores were detected (Appendix B). The hatchery manager reports that infestations of the external parasite *Gyrodactylus* continue to be the only significant disease problem on the station. Ashton Hatchery continues to be at risk for MC contamination, because the hatchery water source is not completely enclosed. As more bodies of water in the vicinity are shown positive for the parasite, the greater the probability that the spring and stream above the hatchery intake may become contaminated. In addition, the hatchery experiences heavy depredations by herons and other avian predators. These birds can also serve as vectors for disease agents. Portable screening that can be removed during times when snow is heavy and birds are not present would be a significant enhancement for this hatchery.

CABINET GORGE HATCHERY

The RFP visited Cabinet Gorge Hatchery twice in 2003 (Appendix C). The first visit was in May, when juvenile Sullivan Springs kokanee salmon were inspected prior to release. No replicating viruses were detected. The fish were too small for any other tests.

Spawning kokanee adults were examined at both the Sullivan Springs trap and the Clark Fork River Ladder. Both groups were tested for replicating viruses, for *Renibacterium salmoninarum* (RS) by both the direct fluorescent antibody test (FAT) and the enzyme-linked immunosorbent assay test (ELISA), and for *Myxobolus* spores. No pathogens were detected from the Sullivan Springs population, and no viruses or *Myxobolus* spores were detected from the Clark Fork River fish. However, RS antibodies were detected in 6 of 12 five-fish pools from the Clark Fork River population. This was consistent with historic findings, although no clinical signs of bacterial kidney disease were observed.

GRACE HATCHERY

Grace Hatchery was at full production levels in 2003, while at the same time experiencing a drought that significantly reduced the water flow from the hatchery springs. As a result of these conditions, more fish health problems were evident. Specifically, CWD was the confirmed diagnosis in five inspections and suspected in a sixth, with concomitant MAS in three cases (Appendix D). Treatments with OTC-medicated feed under INAD protocols were generally successful in reducing mortalities.

Fish in the large raceways were also diagnosed with bacterial gill disease (BGD) in late January. This was most likely a result of the low water flows leading to near 100% reuse of water in the large raceways, and heavy loading in the upper portion of the hatchery resulting in a heavy waste load in the re-used water. Treatments with potassium permanganate moderated the losses to manageable levels, but the situation was not resolved until enough fish were stocked out to reduce the hatchery load levels. Chloramine-T has always been a more effective treatment for this condition at Grace, but the INAD for its use was not available at the time.

HAGERMAN STATE HATCHERY

A total of 20 cases (19 diagnostic and 1 research) were examined from Hagerman State Fish Hatchery in 2003 (Appendix E), a reduction from 45 diagnostic cases in 2002 and comparable with the 18 diagnostic cases in 2001 or the 26 diagnostic cases in 2000. The hatchery manager feels that there is a biennial cycle in which the impacts of CWD and *Infectious Hematopoietic Necrosis* (IHN) virus alternate in severity. It was true that 2002 was an exceptionally high peak for CWD, while IHN was definitely much less significant until November and December, when the 2003 production cycle began. As indicated by the caseload and mortalities reported on the hatchery, CWD and IHN were both less severe in 2003.

Multiple pathogens are often detected in clinically ill fish at Hagerman Hatchery. This was true in 11 of the 19 diagnostic cases (58%). Because of this, diagnosis and treatment choice is dependent upon the predominant clinical signs. The IHN virus was confirmed four times (two clinical and two carrier conditions), each time in combination with one or more bacterial pathogens (*F. psychrophilum*, *F. columnare*, or an *Aeromonas/Pseudomonas* species). Experience has taught that if the viral infection appears to be carrier, it is usually beneficial to treat the concomitant bacterial infection. But if the viral infection is clinical, it is generally necessary to let the virus run its course before a bacteria treatment will be effective.

Several bacterial infections, primarily CWD, MAS, or columnaris disease (COL), were diagnosed without the complication of virus. Again, multiple bacteria species were frequently isolated in conjunction with each other. These episodes were treated with OTC-medicated feed when the situation warranted. Success of the treatments was highly variable, usually dependent upon the size of the fish and speed of diagnosis. Generally, the larger the fish and the quicker the application of therapy, the better the response.

The number of INAD protocols to treat CWD and/or COL was significantly lower than the previous year (15 v. 25), with the majority due to an aggressive program to treat small fish in the hatchery vats. There is a long history of losses in the vats, particularly in Hayspur-strain fry within 7-10 days after swim-up. Treatment has been ineffective, primarily because the fish are off feed and too sick by the time that bacterial isolations can be grown for a definite diagnosis. Therefore, the USFWS INAD Coordinator in Bozeman, Montana, gave approval to treat small fish with OTC-medicated feed without a prior isolation of bacteria. Results continued to be equivocal from this effort, so a different treatment regimen was initiated. The one common factor whenever these small fish were necropsied for diagnostic purposes was the terrible condition of their gills. Systemic bacteria could usually be isolated, but there were always heavy loads of bacteria, fungus, and parasites (*Ichthyobodo*) on the gills. The RHP became convinced that the initial infection occurs across the gills, and that key to ending these losses was to block that mode of entry to the fish. Daily 1-hour bath treatments with 100-mg/l hydrogen peroxide were initiated in December. To date, the hatchery manager reports exceptional survival in all but one group of fry treated in this manner. The one exception was a group in which the vats were initially loaded with twice the number of eggs because there was no other room for them. Loading density stresses may have increased the susceptibility of the fishes, and had an impact on the outbreak of disease. Controlled studies have not yet been done, but are planned to confirm the efficacy of this treatment.

A group of 10 rainbow trout from the Riley Creek raceways were tested by PCR for the presence of *Tetracapsula byosalmonae* (PKX), the causative agent of proliferative kidney disease (PKD) in salmonids. No evidence of PKX genetic material was detected from these samples, although the organism has been confirmed on station in the past (Burton 2003).

Aeromonas salmonicida, the causative agent of furunculosis (FUR), was not detected at Hagerman State Hatchery in 2003. This pathogen and clinical FUR have been detected at Hagerman for four of the last six years.

HAYSPUR HATCHERY

The RHP's work at Hayspur Hatchery always involves considerable effort to inspect brood stock and brood stock replacement lots (Appendix F). Contrary to usual practice, the two-year-old (BY2001) replacement rainbow (R9) and Kamloops (K1) populations were not inspected prior to transfer to the round ponds due to a drastic shortage of fish.

All BY2002 replacement R9s and K1s were given a bath vaccination using an autogenous *F. psychrophilum* bacterin. Aqua Health Ltd., (Charlottetown, P.E.I., Canada), produced the bacterin from a bacterial isolate taken at Hayspur in January 2002. In addition, all adult R9 and K1 fish, with the exception of one group, were given intraperitoneal (IP) injections of the same *F. psychrophilum* bacterin approximately one month prior to spawning. This followed a trial in 2002, where blood serum titers from two groups (1 R9 and 1 K1) of IP-injected two-year-old fish were compared to two similar groups of uninjected fish (Burton, D. 2003). The results of that trial were a measurable increase in blood serum antibody titers to *F. psychrophilum* in both injected groups. Using an unpaired t-test (2-tailed), the injected K1s were significantly different from the uninjected K1s ($P = 0.0234$) but there was no statistical difference ($P = 0.0946$) in the R9s. Thanks go to Ben Lafrentz at the University of Idaho for testing these samples and running the statistics. The hatchery manager at Hayspur also reports that post-spawning mortalities were lower in the injected groups than in the uninjected groups.

Intensive sampling of the replacement brood stock pairings continued to be the health priority at Hayspur Hatchery. Ovarian fluids were collected from every female used in the pairings for virology and for RS analysis using the ovarian cell pellet fluorescent antibody test (OCP-FAT). Due to the loss of an entire year class of replacement fish to otters, it was decided not to sacrifice any females for tissue samples again this year. There should be enough new adults available in 2003 to resume lethal sampling. Additionally, good reagents for the ELISA test are again available, making lethal sampling for kidney tissues more valuable. Eggs from individual females were held in isolation until the test results were available. Established protocol dictates that if a parent female tests positive for any virus or for RS, the resulting group of eggs is culled.

The R9 brood stock replacement spawning for the 2002-2003 season began on October 31, 2002 and continued until May 7, 2003. Results for those fish spawned in 2002 have already been reported (Burton, 2003), but results from the later spawn days were not available when that report was submitted. The final total for female R9s tested in the 2002-2003 season was 227, with ovarian fluids from all females tested for viruses and RS. No pathogens were detected, so no eggs were culled.

The 2003-2004 R9 brood stock replacement spawning season began on October 9. Total females sampled by December 31, 2003 was 173, with no fish positive for viruses, but two individuals positive for RS by OCP-FAT. Eggs from the two RS-positive females were culled. Results for fish tested after January 1, 2004 will be reported in the 2004 Fish Health Report.

Kamloops brood stock replacement spawning ran from October 9 to November 19. Ovarian fluids from 99 females were tested for viruses and RS. No viruses were detected, but RS was detected from two females by OCP-FAT. Eggs from those two RS-positive individuals were culled. These positive RS findings from both the R9 and K1 populations were the first since December 2000.

This was the second year that eggs were taken from the BY2000 Westslope cutthroat trout, originating from Connor Lake, Canada. Typical age at maturation for fish in the wild population from which this lot originated is about age-4, and spawning occurs in June. But a majority of this new captive population (BY2000) matured at age-1+ and spawned for the first time in February 2002. The females again began to ripen in February 2003. Sampling of spawning fish began on March 19 and continued to April 3. Ovarian fluids from 165 females were tested for viruses and for RS by OCP-FAT. In addition, 10 spawning mortalities were tested for RS by FAT and ELISA. No pathogens were detected by any testing method. Hatchery personnel collected and froze reasonably fresh mortalities after the spawning season. A total of 18 frozen fish were sampled on August 8 and tested for RS by both FAT and ELISA. No evidence of RS was detected.

A major problem with spawning the Connor Lake cutthroat continues to be that the males do not produce significant quantities of sperm early in the season, when the first females become ripe. This may contribute to poor fertilization rates in the early egg takes. To solve this problem, pituitary glands were harvested from six mature male R9 rainbow trout, fixed in acetone, and dried. The glands were then ground, reconstituted in sterile saline, and injected into 23 cutthroat males on March 6. These males were checked seven days later. It was subjectively concluded that the injected males were producing more sperm, by volume, than uninjected males. This technique will be used in the future to allow for better fertilization of early eggs.

The use of sterile rainbow trout in all Department hatcheries has become an important part of statewide fishery management. With the exception of replacement brood stock groups, all eggs taken at Hayspur Hatchery are treated so that the resulting fish will be sterile triploids. To accomplish this, groups of eggs are shocked 20 minutes post-fertilization in a 26°C water bath. A goal of 95% triploid induction has been set for this treatment. Hatchery personnel randomly selected lots of eggs and gave the RHP subsamples of eyed eggs from those groups for incubation and rearing at the EFHL wet lab. When the resulting fish were large enough, the RFP took blood samples from 40 randomly selected individuals. The samples were then sent to the University of Washington for analysis. A total of 13 groups were tested from the 2002-2003 spawning season (Appendix F). Eleven of the 13 groups met or exceeded the 95% goal, with the two deficient groups at 92.5% and 90%. A total of 520 individual fish were tested, of which 509 (97.9%) were triploid. While it has become evident that temperature shocking is not 100% efficient in inducing triploidy, the overall average did exceed the goal.

HENRYS LAKE HATCHERY

Fish health inspection samples were taken from spawning cutthroat trout at Henrys Lake Hatchery from February 20 through April 24, 2003 (Appendix G). Ovarian fluids were collected by hatchery personnel and shipped to EFHL where they were tested for viruses (175 females in 25 seven-fish pools) and RS by OCP-FAT (1,302 females in 186 seven-fish pools). A group of 60 fish (both males and females) were sacrificed for kidney FAT, tissue virology, bacteriology (20 fish) and *Myxobolus* tests. No viruses or RS organisms were detected in any of the tissue or ovarian fluid samples, thus no eggs were discarded. Bacteriology samples showed a carrier-level infection of a *Pasteurella* species in one fish, that was probably not a primary pathogen. *Myxobolus* spores were detected in 3 of 12 five-fish pools by the PTD method. Spores from this population have been previously confirmed as MC.

Fish health inspection samples were taken from spawning brook trout from October 27 to November 6. Ovarian fluids were collected by hatchery personnel and shipped to EFHL where they were tested for viruses (78 females in 13 pools) and RS by OCP-FAT (48 females in 8 pools). A group of 30 females were sacrificed for kidney FAT, tissue virology, bacteriology (12 fish) and *Myxobolus* tests. No viruses were detected in any of the tissue or ovarian fluid samples. None of the ovarian fluids or kidney tissues tested positive for RS by FAT, so no eggs were discarded. However, three of six pooled (x5) kidney tissue samples tested positive for RS antigens by ELISA at low levels. Samples could not be identified with egg lots, and the levels were well below the limit where transmission of bacteria with the eggs is likely. Bacteriology samples detected *A. hydrophila* (8 of 12), *F. psychrophilum* (5 of 12), and *Pseudomonas fluorescens* (3 of 12). No clinical signs of these bacterial infections were evident. A single *Myxobolus* spore was detected by the PTD method from 1 of 20 individual samples that was presumed to be MC because this population has been confirmed positive in the past. No signs of clinical whirling disease were observed.

MACKAY HATCHERY

No significant clinical disease or fish losses occurred at Mackay Hatchery in 2003. The RFP visited the hatchery in June to inspect the juvenile Deadwood Reservoir kokanee salmon and Snake River fine-spot cutthroat (Appendix H). Both populations were tested for the presence of viruses, RS, pathogenic bacteria, and *Myxobolus* spores. No pathogens were detected.

Mackay Hatchery received green eggs from the early-spawning kokanee in Deadwood Reservoir. The spawning population was inspected on August 21. No viruses or RS were detected. However, *Myxobolus* spores were detected by PTD in 42% (5 of 12) of pooled, half-head samples. In addition, brain tissues from five fish were pooled, squashed on a microscope slide, and examined fresh. *Myxobolus* spores were observed in the squashed tissues. Confirmation by PCR on these samples is pending, but all indications are that the species is not MC. A neurotropic (having an affinity for nervous tissue) *Myxobolus* has been identified in many waters of Idaho (Hogge, Campbell, and Johnson, in press), and it is likely that this is the species involved at Deadwood Reservoir.

MCCALL HATCHERY RESIDENT PROGRAM

The McCall Resident Program experienced no disease problems in 2003, and the RHP was not called in during the short time that resident fish were on station. The Westslope cutthroat trout fry for mountain lakes had experienced episodes of CWD in the two previous years, but no losses occurred in 2003.

NAMPA HATCHERY

The RHP examined three inspection six diagnostic cases at Nampa Hatchery in 2003 (Appendix I). Five episodes of clinical CWD were diagnosed and four were treated under INAD protocols. The inspections were all done in anticipation of moving fish to American Falls Hatchery to make up for production losses there, although the transfer was never made. No significant viral, bacterial, or parasite pathogens were detected during the inspections, but carrier levels of *Pseudomonas putida* were detected from one group. This organism is a common bacterium that is not generally considered a primary disease threat, but rather a secondary opportunist in fish that are somehow previously compromised.

OTHER ACTIVITIES

The RHP assisted personnel from USFWS AADAPP in performing a pivotal field trial using AQUI-S, a potential new fish anesthetic containing isoeugenol, a synthetic form of the active compound in clove oil. The trial utilized two year-classes of summer-run Chinook salmon juveniles tested in two different water temperatures at the EFHL and at McCall Hatchery. The Center for Veterinary Medicine (CVM) required a pivotal study for this compound using an anadromous salmon species. The AADAPP offices are in Bozeman, MT, and did not have

ready access to anadromous fish. The results of this study were submitted to the CVM in October (Bowker and Carty 2003). In summary, the trial results showed that the compound is an effective anesthetic with induction times, recovery times, and safety factors similar to MS-222, the only fish anesthetic currently approved for use. However, these tests were not designed to address the question of tissue residue and withdrawal time for human consumption. The importance of this work to Department resident programs lies in the hope that final approval of AQUI-S will include a zero-time withdrawal period.

The RHP assisted Regional Fish Biologist Paul Janssen and Fish Geneticist Matt Campbell in gill netting and sampling adult kokanee salmon from Warm Lake, Valley County. Disease samples included tissues to be tested for viruses, RS by FAT, and *Myxobolus*. No viruses or RS were detected, but large *Myxobolus* spores were detected in 12 of 12 five-fish pooled samples. Confirmation by PCR is pending, but evidence suggests that this may be the neurotropic species reported by Hogge, Campbell, and Johnson (in press).

The RHP spent two days in July at the Nevada Department of Conservation and Natural Resources' Gallagher Fish Hatchery, assisting in fish sampling and discussing plans for hatchery renovations with the hatchery manager and David Sanger, the Nevada State Fish Pathologist. This assistance was requested by Mr. Sanger, and the effort benefited the Department and the State of Idaho, because Gallagher Hatchery has historically stocked fish in northern Nevada waters that cross state lines into Idaho.

ACKNOWLEDGMENTS

I want to express my deepest thanks to all my colleagues at the Eagle Fish Health Laboratory for the assistance they gave me this last year, particularly when I was on leave for much of November and December. The opportunity I had to visit the People's Republic of China and to return home with a newly adopted daughter was an adventure of a lifetime. The trip was possible because I could take the time away from work with full confidence that no programs would suffer from lack of attention while I was gone.

I wish to acknowledge my anadromous counterpart, Doug Munson, and my supervisor, Keith Johnson, for their assistance in the field and for sharing their considerable knowledge with me. The efforts of Fishery Technologists Carla Hogge, Sharon Landin, and Roberta Scott are greatly appreciated. Their timely and accurate results from the laboratory are essential in managing the resident hatchery system's fish health challenges. Doug Marsters, Utility Craftsman, was a great help in keeping EFHL's physical plant operating and in keeping our vehicles on the road. The Lab Secretary, Elaine Cavanaugh, contributed her computer skills and kept the mounds of paperwork moving. Most importantly, I wish to acknowledge the Hatchery Managers and personnel with whom I work. Their cooperation is greatly appreciated, and I sincerely hope my efforts have been a benefit to their programs.

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Appendix A. Summary report of Eagle Fish Health Laboratory results for American Falls Hatchery, January 1 – December 31, 2003.

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2002	Troutlodge	Rainbow trout--3N	03-099	3/25/2002					-	-	+	+			DX: CWD, MAS; Flavobacterium psychrophilum 7/8 Aeromonas hydrophila 3/8
2003	Westslope (WS Trout Co.)	Cutthroat trout (WS)	03-420	10/1/2003	-	-		-							IX: NPD; VIRO 0/60, FAT 0/12
2003	Connor Lake	Cutthroat trout (WS)	03-421	10/1/2003	-	-		-	-	-	-	-			IX: NPD; VIRO 0/60, FAT 0/60, BACTE 0/4, PTD-WHD 0/60
2002	Hayspur	Kamloops trout--3N	03-422	10/1/2003					-	-	-	+			DX: MAS: A. hydrophila 3/4
2003	Troutlodge	Rainbow trout--3N	03-485	11/10/2003	-	-			-	-	-	-			DX: NPD; VIRO 0/10, BACTE 0/5, Liver lipid degeneration due to excessive glycogen deposition/vacuolation.

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Appendix B. Summary report of Eagle Fish Health Laboratory results for Ashton Hatchery, January 1 – December 31, 2003.

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2002	Hayspur	Rainbow trout--3N	03-088	3/17/03	-	-		-	-	-	-	-	-		IX: NPD; VIRO 0/60, FAT 0/48, BACTE 0/12, PTD-WHD 0/60

Appendix C. Summary report of Eagle Fish Health Laboratory results for Cabinet Gorge Hatchery, January 1 – December 31, 2003.

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2003	Sullivan Springs	Kokanee	03-174	5/6/03	-	-	-								IX: NPD; VIRO 0/30, NAVHS 0/20
Brood	Clark Fork River	Kokanee	03-539	12/9/03	-	-		+					-		IX: BKD; VIRO 0/60, FAT 0/60, ELISA 6/12 (x5; 4 low, 2 high), PTD-WHD 0/60
Brood	Sullivan Springs	Kokanee	03-540	12/10/03	-	-		-					-		IX: NPD; VIRO 0/60, FAT 0/60, ELISA 0/60, PTD-WHD 0/60

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Appendix D. Summary report of Eagle Fish Health Laboratory results for Grace Hatchery, January 1 – December 31, 2003.

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2002	Hayspur	Rainbow trout--3N	03-002	1/2/03	-	-			-	-	+	-			DX: CWD; <i>Flavobacterium psychrophilum</i> 4/4
2002	Hayspur	Rainbow trout--3N	03-036	1/23/03											DX: BGD 8/8 (visual)
2002	Hayspur	Rainbow trout--3N	03-040	2/4/03					-	-	+	+			DX: CWD, MAS; <i>F. psychrophilum</i> 6/11, <i>Aeromonas caviae</i> 4/11, <i>Pseudomonas fluorescens/ aureofaciens</i> 9/11
2003	Westslope (WS Trout Co.)	Cutthroat trout	03-287	8/25/03					-	-	-	-			DX: NPD; BACTE 0/8
2003	Westslope (WS Trout Co.)	Cutthroat trout	03-419	9/20/03	-	-		-	-	-	+	+			IX: CWD, MAS; VIRO 0/60, FAT 0/12, <i>F. psychrophilum</i> 1/8, <i>Aeromonas hydrophila</i> 1/8
2003	Hayspur	Kamloops trout--3N	03-486	11/11/03	-	-			-	-	+	-			DX: CWD; VIRO 0/5 <i>F. psychrophilum</i> 5/5

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Appendix D. (Continued)

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2003	Hayspur	Kamloops trout--3N	03-541	12/16/03					-	-	+	+			DX: CWD, MAS; <i>F. psychrophilum</i> 12/12 <i>Aeromonas hydrophila</i> 2/12

Appendix E. Summary report of Eagle Fish Health Laboratory results for Hagerman State Hatchery, January 1 – December 31, 2003.

Brood					IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
Year	Stock	Species	Accession	Sample Date											
2002	Hayspur	Kamloops trout--3N	03-037	1/24/03	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/8, <i>Flavobacterium psychrophilum</i> 7/8, <i>Aeromonas hydrophila</i> 1/8
2002	Hayspur	Kamloops trout--3N	03-055	2/20/03	-	-			-	-	-	-			DX: NPD; VIRO 0/5, BACTE 0/4
2002	Hayspur	Kamloops trout--3N	03-056	2/20/03	-	-			-	-	+	-			DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 4/4
2002	Hayspur	Kamloops trout--3N	03-057	2/20/03	-	-			-	-	+	+			DX: CWD, BGD: <i>F. psychrophilum</i> 4/4, <i>Aeromonas sobria</i> 3/4, BGD 2/5
2002	Hayspur	Rainbow trout--3N	03-058	2/20/03	-	-			-	-	-	+			DX: MAS; <i>A. hydrophila</i> 4/4
2003	Hayspur	Kamloops trout--3N	03-069	3/4/03	-	-			-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 4/4
2002	Troutlodge	Rainbow trout--3N	03-070	3/4/03	-	-			-	-	-	+			DX: COL, MAS; VIRO 0/4, <i>F. columnare</i> 2/4, <i>A. hydrophila</i> 1/4

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Appendix E. (Continued)

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2002	Hayspur	Rainbow trout--3N	03-110	4/2/03	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, <i>F. psychrophilum</i> 3/4, <i>A. caviae</i> 2/4 <i>A. sobria</i> 2/4
2002	Hayspur	Rainbow trout--3N	03-111	4/2/03	-	-			-	-	+	-			DX: CWD; VIRO 0/4, <i>F. psychrophilum</i> 3/4
2002	Troutlodge	Rainbow trout--3N	03-112	4/2/03	-	-			-	-	-	-			DX: NPD; VIRO 0/5, BACTE 0/4
2002	Troutlodge	Rainbow trout--3N	03-113	4/2/03	+	-	-		-	-	-	+			DX: IHNV, MAS; IHNV 1/1(x5), IPNV 0/5, NAVHS 0/5, <i>Pseudomonas spp.</i> 1/4
2002	Troutlodge	Rainbow trout--3N	03-131	3/26/03											RS: NPD; PCR-PKX 0/10
2003	Hayspur	Kamloops trout--3N	03-155	4/4/03	-	-			-	-	+	-			DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 1/4

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Appendix E. (Continued.)

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2003	Hayspur	Kamloops trout--3N	03-156	4/21/03	+	-			-	-	+	-			DX: IHN, CWD; IHNV 1/1(X5), IPNV 0/5, <i>F. psychrophilum</i> 1/4
2002	Eagle Creek	Coho salmon	03-172	5/3/03	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/10, <i>F. psychrophilum</i> 7/8, <i>A. hydrophila</i> 1/8
2003	Troutlodge	Rainbow trout-3N	03-202	7/1/03	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, <i>F. psychrophilum</i> 4/4, <i>A. hydrophila</i> 1/4, <i>Serratia liquifaciens</i> 4/4
2003	Pahsimeroi	Steelhead A Group	03-203	7/1/03	-	-			-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 2/4
2003	Troutlodge	Rainbow	03-431	10/8/03	+	-			-	-	+	+			DX: IHNV, CWD, COL, MAS; IHNV 1/1(x5), IPNV 0/5, <i>F. psychrophilum</i> 4/4, <i>F. columnare</i> 2/4, <i>P. chloraphis</i> 3/4
2003	Troutlodge	Rainbow trout--3N	03-432	10/8/03	-	-			-	-	+	+			DX: CWD, COL, MAS; VIRO 0/5, <i>F. psychrophilum</i> 4/4, <i>F. columnare</i> 2/3, <i>A. hydrophila</i> 4/4

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Appendix E. (Continued)

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2003	Hayspur	Rainbow trout--3N	03-494	11/12/03	+	-			-	-	+	+			DX: IHN, CWD, MAS; IHNV 2/2(x5), IPNV 0/10, NAVHS 0/10, <i>F. psychrophilum</i> 10/10, <i>A. hydrophila</i> 1/10

Appendix F. Summary report of Eagle Fish Health Laboratory results for Hayspur Hatchery, January 1 – December 31, 2003.

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
	Brood	Hayspur	Rainbow trout	03-035	1/23/03	-	-	-	-						IX: NPD; VIRO 0/22, NAVHS 0/3, OCP-FAT 0/22
2002	Hayspur	Kamloops trout	03-038A	3/3/03											RESEARCH: Triploid induction 37/40 (92.5%)
2002	Hayspur	Rainbow trout	03-038B	3/3/03											RESEARCH: Triploid induction 39/40 (97.5%)
2002	Hayspur	Kamloops trout	03-038C	3/3/03											RESEARCH: Triploid induction 40/40 (100%)
2002	Hayspur	Rainbow trout	03-038D	3/3/03											RESEARCH: Triploid induction 40/40 (100%)
2002	Hayspur	Kamloops trout	03-038E	4/28/03											RESEARCH: Triploid induction 40/40 (100%)
2002	Hayspur	Kamloops trout	03-038F	4/28/03											RESEARCH: Triploid induction 36/40 (90.0%)

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Appendix F. (Continued).

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2002	Hayspur	Rainbow trout	03-038G	4/28/03											RESEARCH: Triploid induction 40/40 (100%)
Brood (2000)	Connor Lake (Canada)	Cutthroat trout (WS)	03-092	3/19/03	-	-	-	-							IX: NPD; VIRO 0/50, NAVHS 0/20, OCP-FAT 0/50
Brood (2000)	Connor Lake (Canada)	Cutthroat trout (WS)	03-100	3/26/03	-	-		-							IX: NPD; VIRO 0/65, OCP-FAT 0/65
	Hayspur	Rainbow trout	03-102	2/7/03				-					-		IX: NPD; FAT 0/1, ELISA 0/1, PTD-WHD 0/1
2000	Connor Lake (Canada)	Cutthroat trout (WS)	03-103	3/27/03				-							IX: NPD; FAT 0/10, ELISA 0/10
Brood	Hayspur	Rainbow trout	03-129	4/2/03	-	-	-	-							IX: NPD; VIRO 0/4, NAVHS 0/1, OCP-FAT 0/4
Brood (2000)	Connor Lake (Canada)	Cutthroat trout (WS)	03-130	4/3/03	-	-	-	-							IX: NPD; VIRO 0/50, NAVHV 0/5, OCP-FAT 0/50
Brood	Hayspur	Rainbow trout	03-163	4/23/03	-	-		-							IX: NPD; VIRO 0/4, OCP-FAT 0/4

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Appendix F. (Continued).

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2003	Hayspur	Rainbow trout	03-169A	5/27/03											RESEARCH: Triploid induction 39/40 (97.5%)
2003	Hayspur	Rainbow trout	03-169B	5/27/03											RESEARCH: Triploid induction 40/40 (100%)
2003	Hayspur	Rainbow trout	03-169C	5/27/03											RESEARCH: Triploid induction 40/40 (100%)
2003	Hayspur	Rainbow trout	03-169D	5/27/03											RESEARCH: Triploid induction 40/40 (100%)
Brood	Hayspur	Rainbow trout	03-179	5/7/03	-	-	-	-							IX: NPD; VIRO 0/4, NAVHS 0/1, OCP-FAT 0/4
2001	Hayspur	Kamloops trout	03-241	8/6/03							-				IX: NPD; BACTE 0/3
2000	Connor Lake (Canada)	Cutthroat trout	03-244	8/8/03				-							IX: NPD; FAT 0/18, ELISA 0/18
2003	Hayspur	Kamloops trout	03-254A	8/11/03											RESEARCH: Triploid induction 40/40 (100%)

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Appendix F. (Continued).

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2003	Hayspur	Rainbow trout	03-254B	8/11/03											RESEARCH: Triploid induction 38/40 (95.0%)
Brood	Hayspur	Kamloops trout	03-436	10/9/03	-	-		-							IX: NPD; VIRO 0/23, OCP-FAT 0/23
Brood	Hayspur	Rainbow trout	03-437	10/9/03	-	-		-							IX: NPD; VIRO 0/8, OCP-FAT 0/8
Brood	Hayspur	Rainbow trout	03-446	10/22/03	-	-	-	-							IX: NPD; VIRO 0/34, NAVHS 0/4, OCP-FAT 0/34
Brood	Hayspur	Kamloops trout	03-469	10/30/03	-	-	-	-							IX: NPD; VIRO 0/50, NAVHS 0/5, OCP-FAT 0/50
Brood	Hayspur	Rainbow trout	03-474	11/5/02	-	-	-	-							IX: NPD; VIRO 0/49, NAVHS 0/5, OCP-FAT 0/49
Brood	Hayspur	Kamloops trout	03-501	11/19/03	-	-		+							IX: RS; VIRO 0/26, OCP-FAT 2/26
Brood	Hayspur	Rainbow trout	03-502	11/19/03	-	-		+							IX: RS; VIRO 0/40, OCP-FAT 2/40

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Appendix F. (Continued).

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
Brood	Hayspur	Rainbow trout	03-538	12/10/03	-	-		-							IX: NPD; VIRO 0/30, OCP-FAT 0/30
Brood	Hayspur	Rainbow trout	03-558	12/30/03	-	-		-							IX: NPD; VIRO 0/12, OCP-FAT 0/12

Appendix G. Summary report of Eagle Fish Health Laboratory results for Henrys Lake Hatchery, January 1 – December 31, 2003.

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
Brood Lake	Henrys	Cutthroat trout (YS)	03-062	2/20/03	-	-		-							IX: NPD; VIRO 0/14, OCP-FAT 0/63
Brood Lake	Henrys	Cutthroat trout (YS)	03-071	2/27/03	-	-		-							IX: NPD; VIRO 0/21, OCP-FAT 0/105
Brood Lake	Henrys	Cutthroat trout (YS)	03-072	3/3/03	-	-		-							IX: NPD; VIRO 0/21, OCP-FAT 0/140
Brood Lake	Henrys	Cutthroat trout (YS)	03-081	3/6/03	-	-	-	-							IX: NPD; VIRO 0/21, NAVHS 0/7, OCP-FAT 0/77
Brood Lake	Henrys	Cutthroat trout (YS)	03-082	3/10/03	-	-		-							IX: NPD; VIRO 0/14, NAVHS 0/7, OCP-FAT 0/49
Brood Lake	Henrys	Cutthroat trout (YS)	03-089	3/18/03	-	-	-	-	-	-	-	-	+		IX: BACTEREMIA, WHD; VIRO 0/60, NAVHS 0/15, FAT 0/60, PTD-WHD 3/12(x5) <i>Pasteurella spp.</i> 1/20
Brood Lake	Henrys	Cutthroat trout (YS)	03-090	3/13/03	-	-		-							IX: NPD; VIRO 0/21, OCP-FAT 0/84
Brood Lake	Henrys	Cutthroat trout (YS)	03-091	3/17/03	-	-		-							IX: NPD; VIRO 0/21, OCP-FAT 0/105

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Appendix G. (Continued).

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
Brood	Henrys Lake	Cutthroat trout (YS)	03-097	3/20/03	-	-	-	-							IX: NPD; VIRO 0/14, NAVHS 0/14, OCP-FAT 0/77
Brood	Henrys Lake	Cutthroat trout (YS)	03-098	3/24/03	-	-	-	-							IX: NPD; VIRO 0/21, NAVHS 0/21, OCP-FAT 0/98
Brood	Henrys Lake	Cutthroat trout (YS)	03-108	3/27/03	-	-		-							IX: NPD; VIRO 0/7, OCP-FAT 0/77
Brood	Henrys Lake	Cutthroat trout (YS)	03-109	3/31/03				-							IX: NPD; OCP-FAT 0/77
Brood	Henrys Lake	Cutthroat trout (YS)	03-136	4/7/03				-							IX: NPD; OCP-FAT 0/91
Brood	Henrys Lake	Cutthroat trout (YS)	03-144	4/10/03				-							IX: NPD; OCP-FAT 0/70
Brood	Henrys Lake	Cutthroat trout (YS)	03-145	4/14/03				-							IX: NPD; OCP-FAT 0/49
Brood	Henrys Lake	Cutthroat trout (YS)	03-158	4/17/03				-							IX: NPD; OCP-FAT 0/35

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Appendix G. (Continued).

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
Brood	Henrys Lake	Cutthroat trout (YS)	03-159	4/21/03	-	-		-							IX: NPD; OCP-FAT 0/35
Brood	Henrys Lake	Cutthroat trout (YS)	03-167	4/24/03				-							IX: NPD; OCP-FAT 0/70
Brood	Henrys Lake	Brook trout	03-456	10/27/03	-	-	-	+	-	-	+	+	+		IX: RS, CWD, MAS, WHD; VIRO 0/30, NAVHS 0/3, FAT 0/30, ELISA 3/6 (x5, low), <i>Aeromonas hydrophila</i> 8/12, <i>Flavobacterium psychrophilum</i> 5/12, <i>Pseudomonas fluorescens</i> 3/12, PTD-WHD 1/20
Brood	Henrys Lake	Brook trout	03-479	11/3/03	-	-	-	-							IX: NPD; VIRO 0/24, NAVHS 0/12, OCP-FAT 0/24
Brood	Henrys Lake	Brook trout	03-480	11/6/03	-	-	-	-							IX: NPD; VIRO 0/24, NAVHS 0/12, OCP-FAT 0/24

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Appendix H. Summary report of Eagle Fish Health Laboratory results for Mackay Hatchery, January 1 – December 31, 2003.

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2002	Deadwood Reservoir	Kokanee salmon	03-188	6/10/03	-	-		-	-	-	-	-	-		IX: NPD; VIRO 0/60, FAT 0/60, BACTE 0/12, PTD-WHD 0/60
2002	Snake River	Cutthroat trout (FS)	03-189	6/10/03	-	-		-	-	-	-	-	-		IX: NPD; VIRO 0/60, FAT 0/60, BACTE 0/12, PTD-WHD 0/60
Brood	Deadwood Reservoir	Kokanee salmon	03-283	8/21/03	-	-		-					-		IX: MYXOBOLUS; VIRO 0/60, FAT 0/60, PTD-MYXOB 8/12(x5) PCR-MYXOB PENDING

Appendix I. Summary report of Eagle Fish Health Laboratory results for Nampa Hatchery, January 1 – December 31, 2003.

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2002	Hayspur	Kamloops trout--3N	03-003	1/8/03	-	-		-	-	-	-	-	-		IX: NPD; VIRO 0/60, FAT 0/60 BACTE 0/20, PTD-WHD 0/60
2002	Troutlodge	Rainbow trout--3N	03-004	1/8/03					-	-	-	-			DX: NPD; BACTE 0/4
2002	Troutlodge	Rainbow trout--3N	03-030	1/22/03	-	-		-	-	-	-	-			IX: NPD; VIRO 0/30, FAT 0/30, BACTE 0/20
2002	Hayspur	Rainbow trout--3N	03-031	1/22/03	-	-		-	-	-	-	+			IX: MAS; VIRO 0/30, FAT 0/30, <i>Pseudomonas putida</i> 2/20
2002	Troutlodge	Rainbow trout--3N	03-039	2/4/03					-	-	+	-			DX: CWD; <i>Flavobacterium psychrophilum</i> 7/7
2003	Hayspur	Rainbow trout--3N	03-185	5/27/03					-	-	+	-			DX: CWD; <i>Flavobacterium psychrophilum</i> 3/4
2003	Hayspur	Kamloops trout--3N	03-242	8/7/03					-	-	+	-			DX: CWD; <i>Flavobacterium psychrophilum</i> 1/4

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Appendix I. (Continued).

Brood Year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2003	Troutlodge	Rainbow trout--3N	03-243	8/7/03					-	-	+	-			DX: CWD; <i>Flavobacterium psychrophilum</i> 4/4
2003	Hayspur	Rainbow trout--3N	03-517	12/2/03					-	-	+	-			DX: CWD; <i>Flavobacterium psychrophilum</i> 4/8

Appendix J. Acronyms used within the text and appendices of this report.

AADAPP	Aquatic Animal Drug Approval Partnership Program
BACTE	Bacteriology test results
BGD	Bacterial Gill Disease, caused by a number of bacterial species
BKD	Bacterial Kidney Disease, caused by <i>Renibacterium salmoninarum</i>
Chlor-T	Chloramine-T, used under INAD protocol to treat bacterial gill disease
COL	Columnaris disease, caused by <i>Flavobacterium columnare</i>
CSH	<i>Ceratomyxa shasta</i> ; enteric parasite
CWD	Coldwater Disease, caused by <i>Flavobacterium psychrophilum</i>
DX	Diagnostic examination
EFHL	Eagle Fish Health Laboratory
ELISA	Enzyme-linked immunosorbant assay;
ERM	Enteric Redmouth Disease, caused by <i>Yersinai ruckeri</i>
FAT	Fluorescent antibody test
FUR	Furunculosis, caused by <i>Aeromonas salmonicida</i>
IDFG	Idaho Department of Fish and Game
IHN	Infectious Hematopoietic Necrosis disease, caused by IHN virus
IHNV	Infectious Hematopoietic Necrosis virus; acronym used in diagnoses to indicate presence of virus without signs of clinical disease
INAD	Investigational New Animal Drug
IPN	Infectious Pancreatic Necrosis disease, caused by IPN virus
IPNV	Infectious Pancreatic Necrosis virus; acronym used in diagnoses to indicate presence of virus without signs of clinical disease
IX	Inspection examination
K1	Kamloops trout of generic origin
MAS	Motile Aeromonad Septicemia, caused by a number of motile <i>Aeromonas</i> and <i>Pseudomonas</i> bacteria.
MC	<i>Myxobolus cerebralis</i> ; myxosporidean parasite that attacks cartilage
NAVHS	North American Viral Hemorrhagic Septicemia; viral disease not yet detected in Idaho
NPD	No Pathogens Detected
OCP-FAT	Ovarian cell pellet fluorescent antibody test
OTC	Oxytetracycline
PCR	Polymerase chain reaction test
PKD	Proliferative kidney disease, caused by <i>Tetracapsula bryosalmonae</i>
PKX	<i>Tetracapsula bryosalmonae</i> , causative agent of PKD
PTD	Pepsin/trypsin digest method for detecting <i>Myxobolus</i> spores

Appendix J. (Continued).

R9	Hayspur-strain rainbow trout
RHP	Resident Hatchery Pathologist
RS	<i>Renibacterium salmoninarum</i> , causative agent of BKD; acronym used in diagnoses to indicate presence of bacteria without signs of clinical disease
USFWS	United States Fish and Wildlife Service
VIRO	Virology test results
WHD	Whirling Disease, caused by <i>Myxobolus cerebralis</i>

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