IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL HATCHERY REPORT

February 2003
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TABLE OF CONTENTS

RESIDENT FISH HATCHERIES
2002 ANNUAL REPORT

Resident fish hatcheries reared and stocked over 16 million fish weighing nearly 1.2 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 2002.

Resident hatchery program costs were 2.1 million dollars for an average cost of $1.73 per pound or $0.12 per fish. Costs varied greatly between the hatcheries. Cabinet Gorge Hatchery had the lowest cost per fish at $0.037, while American Falls Hatchery had the highest at $0.81 per fish. This is due to the great diversity in the resident hatchery system goals. Cabinet Gorge Hatchery produced 7.3 million kokanee *Oncorhynchus nerka* averaging 2.05 inches in length using a seven month growing season and American Falls Hatchery used the entire 12 months of fish production and produced an average 8.85 inch rainbow trout *O. mykiss.*

Rainbow trout of catchable size (8 to 12 inches) accounted for approximately one-half the program costs at approximately $1.2 million. All 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 and Oregon as well as the US Fish and Wildlife Service (USFWS) to obtain various species to meet management efforts in Idaho. Golden trout eggs were obtained from California; Kokanee eggs were obtained from Utah; Grayling 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; while Fall Chinook were obtained from Oregon.

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 Grace, Hagerman, Hayspur and Sandpoint hatcheries this fiscal year. The large raceways at the Grace Hatchery were replaced; a domestic water well was dug at Hagerman; the dormitory at Hayspur was expanded to accommodate a co-ed staff; and the spring water source was collected into piping and buried at Sandpoint. Several roofs were replaced at the Hagerman, Hayspur and Cabinet Gorge hatcheries.

Idaho Department of Fish and Game
Resident Hatcheries Fish Production
01/01/02 – 12/31/02

Hatchery	Put-and-Take Number	Put-and-Take Pounds	Put-Grow-and-Take Number	Put-Grow-and-Take Pounds	Average Fish per Pound	Feed Pounds	Feed Costs	Average Length	Total Cost	Cost/1,000 Fish	Cost per Pound
American Falls	166,342	82,125	95,756	185	3.18	88,830	$25,717.00	8.85	$214,006	$816.80	$2.60
Ashton	150,795	41,173	83,125	44	5.76	31,980	$8,867.00	7.28	$115,066	$457.00	$2.57
Cabinet Gorge			7,326,704	32,030	288	25,281	$11,322.00	2.05	$273,076	$37.27	$10.37
Clearwater	[c]53,071	[c] 21,188	173,257	3,224	53.74	2,878	$2,430.00	[b] 3.45	[b] $17,631	[b] $52.92	[b] $2.84
Grace	136,000	51,094	742,644	20,022	12.36	75,981	$22,240.00	5.64	$226,591	$257.89	$3.19
Hagerman	1,320,598	366,908	792,119	29,275	5.3	476,122	$132,385.00	7.5	$534,122	$191.76	$1.02
Mackay	222,936	141,854	2,953,098	28,777	30.73	94,965	$27,990.00	4.15	$239,250	$78.07	$2.39
McCall			155,805	81.2	1,918	83.5	$92.25	1.08	$47,800[a]	[a] $306.79	[a]$588.67
Nampa	923,854	346,918	1,155,212	24,334	5.6	356,982	$100,727.00	7.75	$400,631	$192.70	$1.08
TOTALS	2,837,732	1,051,260	13,477,720	137,972	13.8	1,153,102	$331,770.25	5.66	$2,068,173	$125.71	$1.73

[a]Includes catchable redistribution costs.
[b]Fingerling production costs only.
[c]Includes fish stocked or redistributed only.
Total cost for each hatchery is that hatchery's total budget minus capital outlay expenditures.

IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL 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-inch to 6-inch) 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 staff the AFFH. Volunteer hatchery hosts are utilized during the spring and summer tourist seasons.

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 3-ft concrete raceways, ten re-use 100-ft x 8-ft x 3-ft concrete raceways, and a hatchery building containing fourteen 21-ft x 4-ft x 2.5-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 55^{o}F to 59^{o}F.

During September 2002, the AFFH fish culturist position was transferred to the Ashton Fish Hatchery. No increase in temporary time or decrease in production was associated with this personnel loss.

FISH PRODUCTION

The AFFH raised triploid Hayspur strain rainbow trout (T9), triploid Troutlodge Kamloops (TT), and Westslope cutthroat from the Westslope Trout Company for the 2002 production year.

The AFFH transferred 95,756 Westslope cutthroat trout fingerlings (185 lbs) to the Cabinet Gorge Fish Hatchery (CGFH). The AFFH stocked 166,342 catchable rainbow trout (82,125 lbs). A total of 262,098 fish, weighing 82,310 lbs, were stocked and transferred (Appendix 1). Net production for the year (lbs stocked + lbs on hand 12/31/2002 - lbs on hand 1/1/2002) was 88,407 lbs.

Cost in 2002 for various sizes of fish food was $25,717.02 (Appendix 2). Feed costs for the year were $0.29 per lb of fish produced, or $0.05 per fish. Production costs overall were $2.60 per lb of fish produced. This cost includes the cost of transportation to stocking waters and the cost of using fish transports stationed at the Hagerman Fish Hatchery (HFH).

Feed conversion for the year averaged 1.005 lbs of feed per lb of fish produced.

Total production was down 9,562 lbs from last year, primarily because fish were not allowed to grow significantly beyond requested size and because the fall fingerling request was dropped due to drought.

HATCHERY IMPROVEMENTS

- Trees on hatchery grounds were trimmed, removed or replaced.
- An emergency response plan was designed in case of power outage and generator failure.
- A new lawn mower was bid.
- Plumbing for new residential heat sources was completed.
- The road to the hatchery was paved.
- The hillside on the north side of the office building was cut back and graded to prevent flooding.
- Trees and brush on the covered springs were removed.
- The offices and dormitory were remodeled, enlarged, and carpeting was replaced.
- Hatchery entrance signs were repainted and relocated.
- Raceway fencing was extended to the concrete to exclude fish-eating predators.
- Shops were consolidated and organized.

HATCHERY NEEDS

- Residence #2 should be remodeled or replaced.
- Siding should be installed on the garage of residence #1.
- 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. We also had scout groups, bird-watchers, drop-in visitors, hunters, and anglers.

VOLUNTEER PROGRAM

The hatchery host program, begun in 1997, was continued this year. Hosts for the 2002 season were Rob and Jeannie Coe. From April through the middle of July Rob and Jeannie donated a total of 376 hours. Their contributions included giving tours, landscaping, public restroom care, painting, assisting with fish stocking, and organizing the office file cabinets.

ACKNOWLEDGMENTS

Employees at AFFH this year were: Steve Wingert, Hatchery Manager I; David Billman, Assistant Fish Hatchery Manager; Paul Martin, Fish Culturist; Josh Gruber, Biological Aide; Kevin Yelton, Biological Aide; and Rob and Jeannie Coe, Hatchery Hosts.

APPENDICES

Appendix 1. Swimming Inventory with fish transferred or stocked by month, American Falls Fish Hatchery, 2002.

Month	Fish on hand	Pounds on hand	Fish stocked	Pounds stocked
December 2001	210,000	9,556	0	0
January 2002	199,216	17,056	0	0
February 2002	195,748	25,598	1,800	600
March 2002	191,483	37,392	3,000	1,304
April 2002	151,652	36,243	34,827	13,931
May 2002	115,185	30,615	36,056	14,797
June 2002	169,498	26,167	19,566	8,819
	30,000 *	12*		
July 2002	155,500	29,157	7,906	3,684
	181,350*	115*		
August 2002	203,375	29,380	13,775	7,490
	173,857*	359*		
September 2002	178,103	27,722	21,793	13,325
	172,900*	739*		
October 2002	231,226	15,242	6,962	6,355
	29,600*	722*	95,756 *	185*
November 2002	205,745	9,597	20,657	11,820
	29,586 *	1,020 *		
December 2002	203,435	13,935	0	0
	29,634*	1,718*		
Total Rainbow trout			166,342	82,125
Total Cutthroat trout			95,756	185
Grand Total			**262,098**	**82,310**

* Denotes cutthroat trout, all others are rainbow trout.

Appendix 2. Fish feed used during the 2002 production year, American Falls Fish Hatchery.

Source	Size/Type	Pounds	Cost
Rangen Dry	OO Swim-up/Starter	79	33.97
Rangen Dry	O Swim-up/Starter	137	58.91
Rangen Dry	#1	264.5	113.74
Rangen Dry	#2	577.5	248.33
Rangen Dry	#3	1,890.75	579.3
Rangen Dry	1/16”	559.5	212.61
Rangen Dry	3/32"	1,880.5	488.93
Rangen Medicated	3/32” with OTC*	4,625	2,153.40
Rangen Dry	1/8" Extruded Floating	78,225	21,504.74
Rangen Medicated	1/8" with OTC	592	323.09
TOTALS		**88,830.75**	**$25,717.02**

*OTC is Oxytetracycline

IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL 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, AFH 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 arcti*cus, brook trout *Salvelinus fontinalis* 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 233,920 fish (41,617 lbs) were produced at AFH this year, consisting of 83,125 fingerlings (444.09 lbs), and 150,795 catchable sized fish (including holdovers) (41,173 lbs). Both total numbers and total lbs produced were down from the previous year (Appendix 1). All fish requests were met. Production costs (excluding capital outlay) were $115,066.64; with $8,867.86 spent on fish feed and the remaining $106,098.78 spent on general hatchery operations and personnel costs. Fish transportation cost for 2002 was $8,146.37. The average cost per lb of fish produced (less transportation cost) was $2.57 (Appendix 1). All production costs are up from last year. This is a result of having a new full-time position on-station. Increased production for 2003 should result in lower average cost per lb and cost per fish produced.

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 (NFH) for stocking as catchables during 2003.

All fry and fingerlings were fed using automatic belt feeders that dribbled feed into the tanks and raceways 8 hours 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 0.93 in 2002 (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 63.6%. This is a decrease of 10.3%, caused primarily by decreased rainbow triploid and grayling survival. The poor survival rate of the grayling is probably due to Bio Kyowa feed being unavailable this year. The poor survival of the Hayspur triploid rainbow remains unexplained.

Rainbow Trout

Ashton Fish Hatchery produced and stocked 82,090 10-inch catchable rainbow weighing 34,570 lbs for distribution into area lakes and streams (Appendix 1). In December 2001, we received 180,000 Hayspur triploid rainbow trout (T9) eggs. From these eggs, 40,529 T9 fingerlings, averaging 3-inches, were planted in a number of Upper Snake Region waters. An additional 30,000 (3,992 lbs) 7-inch T9 holdovers were produced for stocking in 2003. Poor survival of the Hayspur triploid required that we obtain additional fish for use as holdovers. As a result, in October 2002 we received a transfer of 39,175 (615 lbs) of Troutlodge triploid rainbows from NFH for stocking as catchables in 2003.

Henrys Lake Cutthroat Trout

Henry's Lake shipped 30,000 cutthroat trout eggs to AFH in 2002. Of these, 26,872 fingerlings (103 lbs) were planted in Blue Creek Reservoir and Sublette Reservoir.

Arctic Grayling

Arctic grayling are reared at AFH for statewide mountain lake stocking. In May 2002, a total of 72,000 green eggs were transported to AFH from Meadow Lake, Wyoming. The eggs arrived in very good condition and were placed in five upwelling incubators. Approximately 50% eyed-up, resulting in an estimated 36,000 eyed eggs. From these eggs 2,065 grayling were stocked into Horseshoe Lake. An additional 13,659 fish were transferred to Mackay and McCall hatcheries for stocking into mountain lakes statewide.

Brook Trout

The 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. The resulting fish are scheduled to be stocked as fingerlings in the autumn of 2003.

Brown Trout

In November we received 34,300 brown trout eggs from Dubois, Wyoming. These fish are destined for stocking in Region 4.

HATCHERY IMPROVEMENTS

The septic tank at residence #1 was repaired and a groundwater drain was installed near the foundation of the house. The front door to residence #1 was also repaired. This required the replacement of the doorframe and purchase of new main door and storm door. A new steel rack was built to store the pickup fish tank. The hatchery entrance sign was repaired and refinished.

Future needs include construction of a large storage area, heated shop/garage east of the Quonset hut, siding for both residences, septic tank/field work will be needed 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 program at AFH remained similar to last year's program, except the “Super catchable” study was discontinued. The numbers of catchable rainbow trout on-station were more than sufficient to meet 2002 requests, although an additional 39,175 Troutlodge triploid rainbow fingerling were transferred in from NFH. These fish are scheduled for stocking as catchables during the summer of 2003.

ASHTON FISH SPAWNING

Personnel from AFH traveled to Henry’s Lake Hatchery to sort and spawn cutthroat trout, rainbow x cutthroat hybrids and brook trout.

FISH FEED

A total of 31,980 lbs of fish feed were fed (Appendix 5) to produce 26,970 lbs of gain (Appendix 1), for an average conversion of 1.185. All fish were fed Rangen dry feeds.

PUBLIC RELATIONS

Approximately 1,000 people visited AFH this past year. About 500 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. AFH filled several requests from area schools for eggs/fish for educational purposes.

SPECIAL PROJECTS

Ashton Hatchery assisted with the annual Hatchery Managers Meeting at Harriman State Park by coordinating meals, lodging and meeting rooms.

APPENDICES

Appendix 1. Fish production and cost, Ashton Fish Hatchery, 2002

Species	Size	Number Fish	Pounds Planted	Weight Gained In 2002	Cost/lb	Cost/fish	Total Cost
Fingerlings Produced and Stocked							
Hayspur triploid Rainbow	2.7	40,529	338	321.12	28.63	0.238	9,676.28
Henry's Lake Cutthroat	2.5	26,872	103	95.03	60.83	0.233	6,265.52
Arctic Grayling	0.8	15,724	3.09	2.75	1,086.50	0.2135	3,357.30
Totals/Ave	**2.3**	**83,125**	**444.09**	**418.90**	**43.46**	**0.231**	**19,299.10**
Catchables Produced and Stocked							
Hayspur triploid Rainbow	10.1	82,090	34,570	20,576	2.02	0.851	69,880.42
Totals/Ave	**10.1**	**82,090**	**34,570**	**20,576**	**2.02**	**0.851**	**69,880.42**
Catchables Produced For 2003							
Hayspur triploid Rainbow	6.8	30,120	0	3,909.4	3.06	0.398	12,007.15
Troutlodge triploid Rainbow	5.6	38,585	0	2,066	2.77	0.148	5,733.60
Totals/Ave	**6.2**	**68,705**	**0**	**5,975.4**	**2.96**	**0.258**	**17,740.75**
GRAND TOTAL		**233,920**	**35,014.09**	**26,970.3**	**2.57**	**0.457**	**$106,920.27**

Appendix 2. Eggs and fish received and transferred, Ashton Fish Hatchery, 2002

Species	Eggs Received	Fish Received	Fish Transferred	Destination
Arctic grayling	36,000	0	13,659	Statewide
Hayspur triploid Rainbow	[a]234,300	0	0	Region 6
Henry's Lake cutthroat	30,000	0	0	Region 6
TT	0	39,175	0	Region 6
Brown Trout	[a]34,300	0	0	Region 4
Henry's Lake diploid Brook Trout	[a]90,000	0	0	Henry's Lake
Henry's Lake triploid Brook Trout	[a]105,000	0	0	Henry's Lake
Totals	**529,600**	**39,175**	**13,659**	

[a]For stocking in 2003

Appendix 3. Comparative growth rates, feed conversion, and percent survival for all species reared at Ashton Fish Hatchery, 2002.

Species	Average Monthly Length Increase	Average Conversion	Percent Survival
Rainbow (catchables	.422	1.01	72.0
Rainbow (fingerlings)	.441	0.85	49.1
Cutthroat	.375	0.75	89.6
Arctic grayling	.450	0.97	43.6
Holdover for 2003 stocking			
Rainbow	.516	0.85	72.0

Appendix 4. Origin of fish stocked or transferred, Ashton Fish Hatchery, 2002

Species	Source	Eggs	Fish	Destination	Stocked	Transferred	Size (inches)
Hayspur triploid rainbow	Hayspur	[a]180,000	--	Region 6	40,529	--	2.7
Hayspur triploid rainbow	Hayspur	--	--	Region 6	82,090	--	10.0
Henry's Lake Cutthroat	Henry's Lake	30,000	--	Region 6	26,872		2.2
Arctic Grayling	Meadow Lake, WY	36,000	--	Statewide	2,065	13,659	0.8
Total stocked or transferred					**151,556**	**13,569**	

[a]Received prior to 2002

Appendix 5. Feed used, Ashton Fish Hatchery, 2002

Size	Source	Pounds	Cost/lb	Total Cost
Swim-up	Rangens	71.5	0.4120	29.46
#1 Starter	Rangens	89	0.4189	37.36
#2 Starter	Rangens	250	0.4164	104.10
#3 Starter	Rangens	2,250	0.2954	664.65
3/32 Pellet	Rangens	2,377	0.2600	618.02
1/8 Pellet	Rangens	26,943	0.2596	6,994.40
Freight				519.87
TOTALS		**31,980.5**		**$8,967.86**

IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL 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 Idaho Department of Fish and Game (Department). The primary mission 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 accommodations 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 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 4.4 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 to incubate eggs until January 7, 2002. At that time, a mixture of the two water sources allowed incubation and early rearing water temperatures to be maintained around 49ºF (range 47.5ºF to 49.5ºF). Production water ranged from 38.5ºF to 45ºF.

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

Rearing Facilities

Rearing facilities at the hatchery include 192 upwelling incubators and 64 concrete raceways. The incubators are 12 inches in diameter by 24 inches high with a maximum capacity of 140,000 kokanee eggs each. In addition, a total of 30 upwelling incubators, which are 6 inches in diameter and eighteen inches high, 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 cubic feet. The hatchery building encloses approximately one-third of each raceway. The adult kokanee holding area consists of two holding ponds (10-ft by 30-ft each) at the head of the fish ladder. Additional adult holding is available in three holding ponds (10-ft by 30-ft each).

PRODUCTION

Cabinet Gorge Fish Hatchery produced a total of 7,326,704 fish weighing 32,030 lbs in 2002. On January 1, 2003, an estimated 3,833,625 Lake Pend Oreille kokanee eggs were on hand (Appendix 1). In addition, 51,161 fall Chinook fry were also on hand at the end of the year.

A total of 25,281 lbs of feed produced 26,328 lbs of gain for an overall (all species reared) feed conversion of 0.96. Total production cost (less capital outlay) was $273,076, resulting in a cost per lb of fish of $10.37, cost per inch of fish of $0.0163, and $37.27 per thousand fish (Appendix 2).

Lake Pend Oreille Kokanee

General Rearing

Fertilized eggs were brought to CGFH and disinfected in 100-ppm iodine for 10 minutes. After enumeration, the green eggs were placed into upwelling incubators and rolled until eye-up. At eye-up the eggs were shocked, sorted and counted using the Jensorter JHC-114 model sorter. 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 48ºF to 50ºF using Moore-Clark NutraPlus #0 starter for 10 days. Feed training continued from day 11 to day 28 utilizing a 50:50 mix of Moore-Clarke and Rangen Trout and Salmon starter diets in sizes from swim-up to starter #1. On day 29, the fry were placed on Rangen Trout and Salmon starter #1 only. The fry remained on Rangen Trout and Salmon starter #1 for the duration of rearing. This was a new rearing protocol initiated in March 2002. It was based on favorable results from feed test comparisons from previous years. Kokanee rearing in 2002 resulted in the lowest mortality rates and most efficient feed conversions ever recorded in the history of kokanee rearing in north Idaho hatcheries.

Initial early rearing loading rates were lowered from 270,000 swim-up fry per raceway to 250,000 fry per raceway. With the new rearing protocols, kokanee growth rates were equivalent to 30 monthly temperature units (MTUs) per inch of growth, even though 35 MTUs had been used for fish rearing projections. Fish health was excellent throughout rearing and no Bacterial Gill Disease (BGD) was encountered in 2002.

Egg collection lasted over two months, and a cross-section of the run was required for each release strategy. Growth rates were not manipulated during the 2002 season to achieve a universally sized 2-inch fry. The fish were reared using 35 MTUs per inch of growth. For the seventh consecutive season, fish were not taken off feed or overfed to attain the average 2-inch size parameter at release. After approximately 4 weeks of feed training, the fry were extended in the raceway, and water temperatures were lowered to emulate natural production in Lake Pend Oreille.

A total of 6,526,057 late kokanee fry were produced at an average length of 2.17 inches and an average weight of 324.7 fish per pound (fpp). These fish gained 18,964 lbs from 15,323 lbs of feed, resulting in a conversion rate of 0.81:1.0. Fish production cost was $10.42 per lb, $0.0140 per inch, and $30.28 per thousand.

Survival of green eggs to feeding fry was estimated at 85.7% (2001, 91.9%). Survival from first feeding to release was estimated at 99.2% (2001, 97.5%), resulting in survival from green egg to release of 85% (2001, 89.6%).

Fish Marking

To evaluate the success of a kokanee *Oncorhynchus 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 9ºF. 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 voucher specimens (Grimm, et al. 2001) 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-take dates 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.

For the first time, all of the adults (except 5+ year-olds) that returned to the Sullivan Springs kokanee trap in the fall of 2001 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 2001 kokanee spawning run, 7% were-two-year-old hatchery origin (1998 brood year), 38% were three-year-old hatchery origin (1997 brood year), 27% were four-year-old hatchery origin (1996 brood year), and 28% were four-year-olds of wild origin. To date, no results have been received from the 2002 spawning adults.

Fish Liberation

From June 18 through June 20, 2002, 5,077,437 late kokanee fry were released into Sullivan Springs. On June 2, 2002, 724,830 late kokanee fry were released into Spring Creek. And on that same date, 723,790 late kokanee fry were released into Twin Creek. The Twin Creek site was chosen as a possible 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 CGFH into the Clark Fork River.

Numbers at release were based upon Jensorter counter/sorter inventory numbers at eye-up, minus mortality. 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. All raceways of fish were displaced onto the transport trucks for all of the releases to double-check inventory numbers.

All of the Twin Creek and most of the Spring Creek release groups were liberated at dusk. The fish were planted in five trips utilizing the 1-ton and 2-ton stocking trucks from the Sandpoint Fish Hatchery (SPFH).

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 four releases during the period of June 18-19, 2002. The other tanker made five releases during the period of June 18-20, 2002.

Other Species

On December 31, 2002, a total of 51,161 Fall chinook salmon were on-station. The fish averaged 550 fpp and were 1.82 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 91.2% (2001, 94.3%). These fish are scheduled for transfer to NFH on January 29, 2003. Production costs will be reported on the 2003 annual report as the fry were fed for only seventeen days in 2002.

On March 29, 2002, 15,000 eyed westslope cutthroat eggs were received from Hayspur Fish Hatchery. These eggs were taken from 2-year-old Connor Lake (F2 generation) broodstock being held in captivity at Hayspur Fish Hatchery. A total of 3,624 fry were stocked into Mirror Lake on July 1, 2002. The fry averaged 1,208 fpp and had reached 1.33 inches in length. Survival from eyed-egg to release was 24.2%.

On June 20, 2002, 252,511 kokanee salmon (Montana stock) were distributed into the following Panhandle lowland lakes: Mirror, Lower Twin, Hauser, and Spirit lakes. The fry averaged 263 fpp and 2.33 inches in length.

In April and May of 2002, a total of 269,549 Westslope cutthroat were planted into Panhandle lowland lakes. These fish averaged 30 fpp and had attained an average length of 4.58 inches at release.

On October 8, 2002, the hatchery received 95,755 westslope cutthroat weighing 184 lbs from American Falls Hatchery, and 107,734 Westslope cutthroat weighing 183 lbs from Grace Fish Hatchery. On December 31, 2002, the hatchery had on hand 202,595 Westslope cutthroat weighing 1,776 lbs and averaging 2.93 inches in length (Appendix 2).

HATCHERY IMPROVEMENTS

Repairs and Improvements

- A frequency drive was purchased and installed on pump #5 by Remitter Electric. The frequency drive controls pump rpm's to regulate water flows and conserve electricity when less than 5 cfs of water is needed. The drive was operational by the first week in May.

- During the summer of 2002, the Department engineering crew repaired the walls on most of the 64 raceways. Hatchery personnel subsequently painted the concrete patches with epoxy paint.

- A new 50 hp pump was purchased to replace pump #7 (rated at 25 hp). Pump installation is scheduled for the summer of 2003.

- Metal roofs were installed on both hatchery residences to facilitate snow removal and to prevent further roof damage from constant snow shoveling, as was experienced in the heavy winters of 1996 and 1997.

- In early July, pump #2 (the submersible domestic water pump) quit working and was replaced.

- New aluminum racks for the upwelling intakes of the adult holding ponds were purchased and installed. The original intake rack slots were too large for kokanee trapping.

- A new 10-ft x 28-ft trailer was purchased and installed at the Granite Creek fish trap. The old (1962-vintage) trailer was removed and salvaged by a private contractor. The new trailer was in place by November 5, 2002 and ready for use by the Granite Creek trap tender.

HATCHERY RECOMMENDATIONS

Inadequate amounts of available warm water (50ºF) 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 4.4 cfs is available from the lower springs. Modification of existing pumping facilities or drilling additional wells at this location is warranted. The lower springs collect approximately six cfs of available water but the means to pump it is unavailable. Additional water at this location is also available for collection. Currently generator #1 backs up a total of 17.2 cfs and a total of 7.2 cfs is backed up by generator #2. A new 50 hp pump has been purchased to replace pump #7 (25 hp). The new pump will be installed in July 2003 and will include a frequency drive. It will also be wired so either generator can be used as backup power.

The raceways that were not repainted this year need to be sandblasted and repainted 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 50 hp pump (#5), which has the frequency drive on it, is over 15 years old with over 200,000 hours of use on it. It is the pump we use the most and is in need of replacement.

The catwalk structure and the stream anchors for the lower weir at the Granite Creek trap are made of wood and need to be replaced. Metal framework and concrete anchors are needed.

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.

FISH SPAWNING

Fish Trapping

The Clark Fork River fish trap was in operation from July 2, 2002 to December 12, 2002. The first adult kokanee entered the trap on October 24, 2002 and trapping continued through the middle of December, with 229 adult kokanee trapped. Trapping records indicated 31.9% of the spawning run was female (73). From July 2, 2002 to October 9, 2002 the trap was used by Avista Corp. personnel to collect and sample bull trout. A total of 39 adult bull trout were trapped, tagged, held for a few days to determine tag retention, and released. Avista also electroshocked bull trout that were staged on the spawning beds. Thirty-five adults (six 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 USFWS 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, 17 of the out-migrating adults were recaptured and trucked back to the hatchery ladder. Another five 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 23, 2002 to December 23, 2002. The Sullivan Springs trap collected 34,586 (56,036 in 2001) adult kokanee salmon. Of these, 5,410 (8,413 in 2001) adults were passed above the trap to spawn naturally in Sullivan Springs Creek. Spawn-taking records showed that 52.3% (40.5% in 2001) of the run was female (18,088).

Spawn-taking and Eggs Received

No fish were spawned from the Clark Fork River this year. A total of 139 males and 63 females were transported to and released into the main spawning channel of Spring Creek to spawn naturally.

An estimated 3,833,625 green fertilized kokanee eggs were collected during the 2002-2003 spawning season. These eggs were obtained from 14,235 female kokanee at the Sullivan Springs trap (Appendix 1).

FISH FEED

The fish produced during 2002 were fed a total of 25,281 lbs of feed. Fish feed was acquired from Rangen Inc. and Moore-Clark USA, Inc. The overall conversion was 0.95 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 of 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 300 people signed our guest registration book this year. An estimated 650 visitors toured the hatchery during the 2002 season. In addition, tours were given to school groups and other organizations.

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 Department regional and hatchery personnel for their cooperation during the spawning season. The staff would also like to thank Fish Culturists Mark Olson and Zach Olson, CGFH Maintenance Craftsman John Suhfras, and CGFH Biological Aides: Beth Brown, Steve Lowe, Rauno Raiha (Bonner County Sheriff's boat operator), Corie Kedish, Joyce McLaughlin, and Scotty Shoemaker for their dedication and hard work in making 2002 a successful year.

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APPENDICES

Appendix 1. Lake Pend Oreille kokanee spawntaking summary, 2002

Spawntaking Site	Total Fish	Females Spawned	Green Eggs	Fecundity	Percent Females*
Sullivan Springs	29,176	14,235	3,833,625	269	52.30%
Cabinet Gorge	229	0	0	n/a	31.90%
Totals/Average	**29,405**	**14,235**	**3,833,625**	**269**	**52.10%**

* Includes male/female prespawn mortality

Appendix 2. Production summary, all species, 2002

Species	Number	Pounds	Length	Fish/lb	Feed Fed	Feed Cost (a)	Annual Cost (b)	Cost/lb of Fish	Cost/ 1,000 Fish	Cost/inch Of Fish	Conversion
PdO KL	6,526,057	20,099	2.17	325	15,323	$7,849.47	$197,582.07	$10.42	$ 30.28	0.0140	0.81
Mont. KL	252,511	961	2.33	263	734	$333.88	$7,925.84	$8.61	$ 31.39	0.0135	0.80
Ore. FC	72,368	135	1.83	538	57	$615.70	$615.70	$8.44	$ 8.51	0.0046	0.78
01-WS Cutt.	269,549	9,056	4.58	30	6,932	$74,878.23	$74,878.23	$15.10	$277.79	0.0607	1.40
02-WS Cutt. (C.L.)	3,624	3	1.33	1,208	2	$22.14	$22.14	$10.30	$ 6.11	0.0046	0.95
02-WS Cutt.	202,595	1,776	2.93	114	2,233	$24,120.47	$24,120.47	$17.13	$119.06	0.0406	1.59
Totals/Ave	**7,326,704**	**32,030**	**2.28**	**229**	**25,281**	**$11,322.27**	**$273,076.00**	**$10.37**	**$ 37.27**	**0.0163**	**0.96**

IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL RESIDENT REPORT

CLEARWATER FISH HATCHERY

Tom Tighe, Assistant Hatchery Manager

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", referring 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, and 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 has met maximum rearing capacity; therefore, the facility had no excess rearing space for catchable rainbow trout *Oncorhynchus mykiss* production in 2002. In 2002, the CFH was exclusively a redistribution center for Nampa State Fish Hatchery (NSFH) reared rainbow trout (RBT) catchables. Kamloop rainbow trout were also reared to fingerling size for Hayden Lake in Region 1.

The Department funded the resident trout program to cover the cost of feed and operations, plus salary for two 3.5-month temporary employees. A total of $37,195 was available for feed and operations from January 1, 2002 to June 30, 2002 (FY 2002), and $45,600 was allocated to the program on July 1, 2002 (FY 2003). Permanent staff salaries were funded by the LSRCP project.

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 ft to fifty ft to collect surface water; the secondary intake is about 200 ft below full pool level. This design allows mixing of water to target a specific temperature.

FISH PRODUCTION

Release Year 2002

Catchable Rainbow Trout

The CFH produced zero catchable-sized rainbow trout to be released in 2002. The CFH was strictly a redistribution center for NSFH-reared rainbow trout catchables in 2002. The CFH did not produce any catchables in 2002 due to rearing constraints caused by reaching the maximum capacity of spring chinook and steelhead in the vats and raceways on the facility. Maximum capacity of rearing space was reached by having both CFH production and Nez Perce Tribal production ponded in vats and raceways simultaneously.

Fingerling Rainbow Trout

Kamloop rainbow trout eyed-eggs were purchased from Troutlodge in Sumner, Washington and were received on May 16, 2002. We ordered 170,000 eggs and received 203,652 eggs. These eggs were purchased at a cost of $4,250. Hayspur Fish Hatchery did not have enough sterile Kamloops RBT eggs available to meet the northern Idaho egg request, so eggs were purchased using CFH resident project funds.

Survival from eyed-egg to ponding was 98.3%. Fry were ponded into two rearing vats on June 10, 2002. Higher than normal survival of these fry in early rearing (86.5% ponding to release) resulted in excess number of fingerlings available for release.

FISH FEED

Catchable Rainbow Trout

The CFH redistributed catchable rainbow trout into Region 2 waters during 2002 from Nampa State Fish Hatchery. Because these fish were being stocked out to local waters as fast as they were coming in to CFH from NSFH, little supplemental feed was needed to maintain overall health and size of the fish.

A total of 150 lbs of feed was purchased from Rangen Inc. (Appendix 2), at a cost of $0.27 per lb during August and early-September for the catchables. Total feed costs for the catchable RBT feed for 2002 was $93.23. This was fed to the catchables until September, when the elevated water temperatures dropped to levels that were conducive for fish stocking. Fish were then stocked into put-and-take fisheries around the Region 2 waters.

Fingerling Rainbow Trout

A total of 2,728 lbs of feed was fed to the fingerling rainbow trout in 2002 (Appendix 2). BioOregon feed was purchased at an average cost of $0.90 per lb. Total feed costs for the 2002 fingerling RBT were $2,337.20. Feed conversions were estimated at 0.86. All 2,728 lbs of feed were purchased with the CFH resident budget funds.

FISH STOCKED AND TRANSFERRED

Catchable Rainbow Trout

Due to back-to-back record runs of anadromous fish returning to Idaho and rearing chinook smolts for the Nez Perce Tribe, CFH had all of its rearing space occupied by spring chinook and steelhead. Therefore, the hatchery had no vat space available to rear any catchable rainbow trout during 2002.

The CFH redistributed 53,071 rainbow trout during 2002 (Appendix 1). Of this total, 47,650 were catchable Trout Lodge (TT-sterile) rainbow trout that were reared at NSFH and redistributed by CFH. These rainbows averaged 3.05 fish per pound (fpp), weighed 15,767.25 lbs, and averaged 9.33 inches in length. A total of 110 fish plants were administered to 29 different plant sites. Also, of this total were 5,421 (Hayspur R-9) rainbow trout that were reared at Dworshak and Kooskia National hatcheries for their annual open houses. These fish were stocked by CFH personnel into one additional plant site. These rainbow trout averaged 1 fpp, weighed 5,421 lbs, and averaged 15 inches in length.

A total of 356 adult-sized fish, ranging in weight from 3 lbs to 8 lbs, were recovered from the settling pond at CFH. The crew supplemented 31 fish stocking trips to 13 different sites with these large fish.

High water delayed some of the stream stocking until late-May. We had minimal problems with water temperatures getting too warm in 2002. Flexibility in release dates and fish numbers was imperative for a successful stocking season. This flexibility would not have been possible without the cooperation of regional fisheries biologists, Ed Schriever and Larry Barrett.

Fingerling Rainbow Trout

On September 24, 2002, CFH personnel stocked a total of 173,257 fingerling-sized Kamloop rainbow trout into Hayden Lake in Region 1 (Appendix 1). These fish averaged 53.74 fpp, weighed 3,224.12 lbs, and averaged 3.76 inches in length.

PUBLIC RELATIONS

Clearwater Fish Hatchery and its satellites were open to visitors during the year. Tours at 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.

Brad George, Theresa Elliott, and one summer youth employee assisted Dworshak Hatchery during their annual open house on June 14.

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

SPECIAL PROJECTS

1. A total of 356 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.

2. As a stop on the Department's New Employee's Tour, Clearwater Fish Hatchery hosted the new employees at a barbecue and settling pond trophy fish recovery.

FISH HEALTH

In general, the fish health of both the catchables and fingerlings at Clearwater Fish Hatchery was fantastic this year. The catchable RBTs were transferred from NSFH to CFH and these fish were, in most cases, immediately stocked out into regional waters. These fish showed no signs of poor health. The fingerling RBTs looked fantastic throughout the entire rearing cycle (swim-up to stocking). All fish at CFH are monitored daily by hatchery personnel to detect any early signs of fish health problems

APPENDICES

Appendix 1. Clearwater Hatchery resident fish production / Redistribution, January 1 - December 31, 2002.

2002 Catchable Rainbow Trout

	Number of Fish	Weight (lbs)
2002 catchable RBT on hand 1/1/02	0	0
2002 catchable RBT transferred to N. Idaho	0	0
2002 catchable RBT redistributed 1/1-12/31/02 from CFH	53,071	21,188
2002 catchable RBT on hand 12/31/02	0	0
2002 Redistribution sub-total*	53,071	21,188

Total Summary of Catchable Rainbow Trout Redistributed**

Number of Fish	Weight (lbs)	Feed Fed	Conversion	Cost/per lb for redistribution	Cost/1000 fish for redistribution
53,071	21,188	150	N/A	*$0.40	**$161.43

2002 Fingerling Rainbow Trout

	Number of Fish	Weight (lbs)
2002 fingerling RBT on hand 1/1/02	0	0
2002 fingerling RBT liberated (Hayden Lake) on 9/24/02	173,257	3,224
2002 fingerling RBT on hand 12/31/02	0	0
2002 Production sub-total	173,257	3,224

Total Production Summary of 2002 Fingerling Rainbow Trout**

Number of Fish	Weight (lbs)	Feed Fed lbs	Conversion	Cost/per lb	Cost/1000 fish
173,257	3,224	2,728	0.86	*$2.84	**$52.92

Estimated costs include 50% of the FY-02 and FY-03 budgets and do not include permanent salaries
*****Cost/lb equals total budget divided by total lbs produced, 1/1/02-12/31/02.
******Cost/1000 fish equals total budget divided by total number of fish produced times 1000.

Appendix 2. Fish feed purchased and costs for the Clearwater Fish Hatchery rainbow programs, January 1 through December 31, 2002.

2002 Catchables Redistributed

DATE	BRAND	FEED TYPE	WEIGHT (lbs)	COST PER LB	TOTAL
8/20/2002	Rangen	trout production 1/8 pellet	150	$0.27	$93.23

2001 Fingerlings

DATE	BRAND	FEED TYPE	WEIGHT	COST PER LB	TOTAL
5/22/2002	BioOregon	#1 starter	88	$1.01	$89.20
5/22/2002	BioOregon	freight			$33.00
6/12/2002	BioOregon	#2 starter	396	$1.02	$405.00
6/12/2002	BioOregon	#3 grower	308	$1.02	$315.00
7/30/2002	BioOregon	#3 starter	44	$1.02	$44.88
7/30/2002	BioOregon	1.0 grower	220	$0.81	$178.20
7/30/2002	BioOregon	1.0 grower	264	$0.80	$212.40
8/12/2002	BioOregon	1.3 grower	528	$0.79	$417.12
8/12/2002	BioOregon	1.5 grower	880	$0.73	$642.40
TOTAL FEED FED			**2,728**		**$2,337.20**

IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL REPORT

GRACE FISH HATCHERY

Dwight Aplanalp, Hatchery Manager I
Mark Olson, Assistant Hatchery 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; it is owned and operated by the Idaho Department of Fish and Game (Department) and funding is received from revenue generated by fishing license sales.

The mission of the 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 trout species of various sizes to meet statewide requests.

A Fish Hatchery Manager I, an Assistant Fish Hatchery Manager, and a Fish Culturist staff the GFH. Two temporary employees may be hired to assist with hatchery operations.

Water for the GFH is supplied by gravity flow from Middle Creek and West Whiskey Creek springs located on private property owned by Robert Harris. Flow was down approximately 1,302 gallons per minute (gpm) from 2001 with an annual average of 10.9 cubic feet per second (cfs). There is a natural fluctuation in water quantity basically opposite of that from 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 is a constant 52^{o}F.

Fish rearing space includes 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 Creek spring. All water exiting GFH flows through a settling pond before being discharged into Whiskey Creek.

The large raceway complex construction was completed during 2002. Construction equipment used was removed at this time, followed by cleanup and organization of everything left behind. There was also some additional road grading and removal of materials after construction was completed. This year was the first full year of production at the GFH since construction started.

FISH PRODUCTION

The GFH cultured Westslope strain cutthroat trout (C2), Yellowstone strain Henry's Lake cutthroat trout (C3), Henry's Lake Rainbows x cutthroat hybrids (RC), sterile Hayspur strain rainbow (T9), Sterile Kamloop rainbow (KT), Troutlodge Triploid (TT), lake trout (LT) from Egan, Utah, and lake trout (LT) from Saratoga, Wyoming.

The GFH began 2002 with 342,931 fish weighing 25,092 lbs. A total of 878,644 fish, weighing 78,822 lbs, were reared and planted by GFH in 2002. At the end of the year there were 226,016 fish weighing 17,386 lbs on hand. This accounts for a total production of 805,875 fish weighing 71,116 lbs (Appendices 1 and 3).

GFH received eyed-eggs from various state and private hatcheries in 2002. During the year, 2,296,617 eyed-eggs of various species were received (Appendix 2).

Costs (Appendix 4): these are bottom-line figures and are not broken out by species. Rainbow trout (fingerlings and catchables combined) accounted for 82.1% of the total lbs produced and 81.9% of total cost, or $3.12 per lb. Specialty species accounted for the remaining 17.9% of the lbs produced and 18.1% of total cost, or $3.20 per lb. Production costs, excluding capital outlay and transport cost, were $222,833 (Appendix 3).

Production costs were calculated for pondside and streamside cost. Pondside cost is total budget, minus capitol outlay, minus transportation; streamside includes transportation

There were 944,262 fish requested and 969,105 planted for 102.6% achieved. See Appendix 5 for a breakdown by species.

Catchable Rainbow Trout

During 2002, the GFH continued planting tributaries of the Bear River watershed with sterile or triploid (T9) catchable rainbow trout. Sterile rainbows were stocked to prevent hybridization with the native Bear River cutthroat trout.

The GFH started out the year with 141,861 triploid catchable trout. Over the course of the year 136,000 (54,571 lbs) triploid catchable trout were planted into area waters. The GFH produced 95,264 triploid catchable rainbows weighing 51,094 lbs. On December 31, 101,125 triploid (13,379 lbs) fish remained on-station for future planting. Three different strains of rainbow were planted: Sterile Hayspur (T9), Hayspur Sterile Kamloops (KT), and Troutlodge Triploids (TT). These fish converted 50,583.06 lbs of fish food at a rate of 0.99 to produce 51,094 lbs of flesh. The total cost of production was $157,959.

Rainbow Trout Fingerlings

During 2002, 362,987 (7,405 lbs) rainbow trout fingerlings were planted. All were Hayspur strain sterile (T9) rainbows or Hayspur Sterile Kamloops (KT). At the end of the year there were 55,000 (14 lbs) T9 fingerlings on hand. These fish converted 10,333.4 lbs of food at a rate of 1.4 to produce 7,381 lbs of flesh. Triploid fingerlings were stocked into Daniel's, Treasureton, and Twenty-Four Mile reservoirs. Fingerlings raised for Blackfoot Reservoir were planted in north Idaho's Hayden Lake due to low water conditions.

Westslope Cutthroat

In 2002, the GFH acquired 250,000 Westslope cutthroat trout, *O. clarki ssp. (C2)* eyed-eggs to rear for north Idaho's Region 1 waters. These eggs produced 107,734 3-inch fish weighing 183 lbs that were transferred to Cabinet Gorge Hatchery In October. While at GFH these fish converted 512.4 lbs of fish food at a rate of 2.8 to produce 183 lbs of flesh. There were 25,000 Westslope eyed-eggs shipped from GFH to the McCall Hatchery to be used for mountain lake plants

Bear River Cutthroat

The GFH usually receives Bear River cutthroat *O. clarki ssp. (C7)* eggs from Daniels Fish Hatchery in Wyoming; however fish pathology tests returned positive preventing our acquisition of Bear River Cutthroat eggs in 2002. To fulfill annual Bear River Cutthroat requests there is a need to explore other options obtaining disease-free Bear River Cutthroat eggs. One option is developing a broodstock on station at the GFH.

Lake Trout

Lake Trout, *Salvelinus namaycush* (LT) eggs were received in December 2002 from Saratoga National Hatchery in Wyoming and from Egan Hatchery in Utah. All of the eggs from both hatcheries were heat-treated to induce triploidy. All of the eggs from Egan Hatchery were heat-treated using the best recipe from last year's experiment. The eggs from Saratoga Hatchery included a production group that used the best recipe from last year's experimentation and 15 small groups at different treatments. This is an effort to further refine the heat treatment recipe to induce triploidy. All of the fish from both stations will be tested for triploid induction and cultured at GFH. Refer to Appendix 2 for numbers of eggs.

In addition to the above lake trout, GFH also planted and reared lake trout to be released into Payette Lake and Bear Lake. The GFH started out 2002 with 17,739 (3,225 lbs) lake trout. There were 15,660 (5,800 lbs) 11.4-inch fish planted into Payette Lake in May 2002. These fish received an adipose fin clip prior to stocking. There were also 115 (14.75 lbs) 8-inch sterile lake trout planted into Bear Lake. These fish also received an adipose fin clip prior to stocking. This was the first time that sterile lake trout were planted into Bear Lake. There is a cooperative agreement with the Utah DWR to plant 50,000 sterile lake trout every three years. The GFH produced 33,656 fish weighing 3,905 lbs. On December 31, 2002 there were 35,620 (1,316 lbs) fish left on-station for planting into Payette Lake sometime during May 2003. These fish will receive a ventral fin clip prior to stocking. These fish converted 4,295.5 lbs of fish food at a rate of 1.1 to produce 3,905 lbs of flesh.

Yellowstone Cutthroat

In October 2001, GFH received 122,000 (1,865 lbs) 3-inch Yellowstone Cutthroat trout, *O. clarki ssp.* (C3). These fish were transferred to GFH from Mackay Fish Hatchery to hold overwinter due to low water levels causing concerns that Henry's Lake may not sustain them

over winter. We reared these fish through the winter and planted 121,102 (5,025 lbs) 5-inch fish into Henry's Lake in May 2002.

The GFH also received 143,920 Yellowstone Cutthroat (C3) eggs from Henry's Lake Hatchery in May 2002. In October 2002, there were 40,000 (1,162 lbs) 4-inch fish planted into Chesterfield Reservoir and 40,000 (1,162 lbs) 4-inch fish planted into the Upper Portneuf River. On December 31, 2002 there were 34,271 (2,677 lbs) fish remaining on-station. All Yellowstone cutthroat converted 8,386.8 lbs of fish food at a rate of 1.2 to produce 6,989 lbs of flesh throughout the year.

Rainbow X Cutthroat Hybrids

In October 2001, GFH received 56,000 (900 lbs) 3-inch Rainbow x Cutthroat Hybrids (RC). These fish were transferred to GFH from Mackay Fish Hatchery to hold over winter due to the low water levels causing concerns that Henry's Lake might not sustain them over winter. We reared these fish through the winter and planted 55,100 fish (3,500 lbs) into Henry's Lake. We did not receive any other Rainbow X Cutthroat Hybrids during 2002 so GFH had no RCs on hand as of December 31, 2002. These fish converted 1,720.4 lbs of fish food at a rate of 1.2 to produce 1,564 lbs of flesh while here at GFH.

Repairs and improvements

- Installed an underground irrigation system in all lawns.
- Laid sod for new lawns on the south and east sides of the hatchery.
- Finished construction cleanup of new large raceways.
- Finished roadways of new large raceways.
- Finished residence #2 enclosure to the basement.
- Replaced old carpet in all residences.
- Replaced linoleum in residence #1.
- Finished room in basement of residence #2.
- Painted interior of residence #1.
- Replaced pressure washer.

NEEDED RENOVATIONS

- Replace a residence.
- 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 domestic water lines in residences #1 and #3.
- Install a new main line from the spring to a head box 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.
- Improve the visitor's information site.

FISH FEED

Rangens was the only brand of feed fed this year. A total of 71,025 lbs of dry feed was fed at a cost of $19,007.43. A total of 3,625 lbs of soft-moist feed was fed to the specialty species at a cost of $2,560.61. A total of 1,331.4 lbs of medicated feed was fed to catchable rainbow trout, rainbow fingerlings, and westslope cutthroat trout at a cost of $671.96.

PUBLIC RELATIONS

The GFH staff gave several scheduled tours to local area schools and 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 which kids 14 and under, and handicapped individuals were allowed to fish the escapement pond. The GFH provided eggs and fingerling to schools for a Trout in the Classroom educational program. On September 12, 2002, the GFH hosted an open house for Department headquarters staff, Fish and Game Commissioners, key political interests, and cooperative landowners to show all parties the newly renovated facility and accounting of money spent on the construction project. Staff also answered many questions from personal contacts and phone calls.

ACKNOWLEDGEMENTS

During 2002, the GFH crew included: Dwight Aplanalp, Hatchery Manager I; Mark Olson, Assistant Hatchery Manager; Fish Culturists Jarrett Page and Thomas Kent; and Biological Aides Riley Wight and Quenton Tuckett. In February, Mark Olson was promoted from Fish Culturist at Clark Fork Fish Hatchery to Assistant Manager here to replace Dwight Aplanalp as the Assistant Manager. Jarrett Page transferred to Hayspur Fish Hatchery in May. Thomas Kent then transferred from Eagle Hatchery to GFH replacing Jarrett Page in June. In December Mark Olson accepted a transfer to Sawtooth Fish Hatchery and Jeff Seggerman was promoted to Assistant Manager at GFH in January 2003. The GFH crew would also like to thank Keith Johnson and Doug Marsters for providing new and improved rearing pots for the lake trout experiments.

APPENDICES

Appendix 1. Number and pounds of fish produced, reared and stocked by Grace Fish Hatchery, 2002

Species/ Strain Lot #	Number (lbs) on hand 01/01/02	Number Reared & planted (lbs)	Number (lbs) on hand 12/31/02	Lbs produced	Conversion
Triploid Rainbow	141,861	136,000	101,125		0.99
Catchables	(16,856)	(54,571)	(13,379)	51,094	
Triploid Rainbow	15,270	362,987	55,000		1.4
Fingerlings	(38)	(7,405)	(14)	7,381	
Lake Trout (LT)	17,739	15,775	35,620		1.1
	(3,225)	(5,814)	(1,316)	3,905	
Cutthroat x Rainbow	55,100	55,100	0		
Hybrid Henry's LK	(1,936)	(3,500)	0	1,564	1.1
Yellowstone Cutthroat	123,915	201,048	34,271		
Henry's LK	(3,037)	(7,349)	(2,677)	6,989	1.2
Cutthroat / Westslope	0	107,734	0		2.8
Fingerlings	0	(183)	0	183	
	342,931	**878,644**	**226,016**		**1.07**
Totals	**(25,092)**	**(78,822)**	**(17,386)**	**71,116**	

Appendix 2. Eyed eggs received at Grace Fish Hatchery, 2002

Species/strain	Source	Number Received	Date Received
Sterile Kamloops rainbow (KT)	IDFG Hayspur	355,633	01/07/2002
Sterile rainbow trout (T9)	IDFG Hayspur	117,000	01/14/2002
Sterile rainbow trout (T9)	IDFG Hayspur	77,500	04/03/2002
Sterile Kamloops rainbow (KT)	IDFG Hayspur	4,482	04/16/2001
Sterile rainbow trout (T9)	IDFG Hayspur	22,612	04/16/2001
Yellowstone cutthroat trout (C3)	Henry's Lake	143,920	05/09/2002
Sterile rainbow trout (T9)	IDFG Hayspur	63,323	05/14/2002
Sterile Kamloops rainbow (KT)	IDFG Hayspur	50,584	05/29/2002
Sterile Kamloops rainbow (KT)	IDFG Hayspur	29,528	06/04/2002
Westslope cutthroat trout (C2)	Westslope Trout co.	250,000	07/22/2002
Experimental Triploid Lake Trout	Saratoga National, WY	83,327	12/03/2002
Sterile rainbow trout (T9)	IDFG Hayspur	65,000	12/04/2002
Sterile Kamloops rainbow (KT)	IDFG Hayspur	312,492	12/11/2002
Sterile rainbow trout (T9)	IDFG Hayspur	227,035	12/11/2002
Experimental Triploid Lake Trout	Eagan, UT	12,000	12/10/2002
Sterile rainbow trout (T9)	IDFG Hayspur	238,862	12/24/2002
Sterile Kamloops rainbow (KT)	IDFG Hayspur	243,319	12/24/2002
TOTAL		**2,296,617**	

Appendix 3. Fish production costs at Grace Fish Hatchery, 2002.

Species	Size inches	Number produced	Pounds produced	Production cost	Cost/1,000	Cost/lb.
Triploid Rbt. Catchables	10	95,264	51,094	$157,959	$850.93	$3.09
Triploid Rbt. Fingerlings	3-6	402,717	7,381	$24,441	$60.30	$3.32
Lake Trout	12	33,656	3,905	$13,866	$412	$3.55
Westslope Cutthroat	3	107,734	183	$1,924	$17.86	$10.51
Cutthroat X Rainbow Hyb.	6	55,100	1,564	$4,831	$87.67	$3.09
Yellowstone Cutthroat	6	111,404	6,989	$19,813	$178	$2.83
Totals		**805,875**	**71,116**	**$222,834**	**$276.31**	**$3.13**
Rainbow		497,981	58,475	$182,400	$365.96	$3.12
Specialty species		307,894	12,641	$40,434	$131.32	$3.20

Appendix 4. Pondside and streamside production costs at Grace Fish Hatchery, 2002

Pounds Produced	Pond side Cost	Pond side Cost/lb	Stream side Cost	Stream side Cost/lb
71,116	$215,291	$3.03	$226,591	$3.19

Appendix 5. Fish requested and planted by Grace Fish Hatchery, 2002

Species	Number requested	Number planted		% Achieved
Catchable rainbow trout				
(Triploids)	129,600	136,000		104.9%
Fingerling rainbow trout				
(Triploids)	362,987	362,987		100%
Rainbow/cutthroat hybrid	55,100	55,100		100%
Lake trout (diploid)	15,660	15,660		100%
Lake trout (triploid)	*16,667	115		
Yellowstone cutthroat	281,048	281,048		100%
Bear Lake cutthroat	3,200	0	(None available)	0%
Bear River cutthroat	2,000	0	(None available)	0%
Fine spotted cutthroat	2,000	2,061		103.1%
Fine spotted cutthroat*	0	**8,400		NA
Westslope cutthroat**	76,000	***107,734		141.8%
Totals	**944,262**	**969,105**		**102.6%**

*Number requested is 50,000 total fish over a 3-year period
**Extras from Jackson Hole NFH planted into 24-Mile Reservoir, but not requested
***Transferred to Cabinet Gorge Fish Hatchery.

Appendix 6. Fish food fed and cost, Grace Fish Hatchery, 2002

Source	Diet	Size	Cost/lb.	Pounds	Total Cost
Rangens	Dry	00	$0.4218	550	$232.00
Rangens	Dry	Starter	$0.2923	950	$277.68
Rangens	Dry	#1	$0.5028	1,450	$729.03
Rangens	Dry	#2	$0.4252	3,300	$1,403.27
Rangens	Dry	#3	$0.3088	4,050	$1,250.83
Rangens	Dry	#4	$0.2990	5,600	$1,674.42
Rangens	Extr. 450 sack	3/32	$0.2184	7,250	$1,583.45
Rangens	Sinking	1/8	$0.2798	525	$146.92
Rangens	Ext. 450 Bulk	1/8	$0.2473	47,350	$11,709.83
SUB-TOTALS				**71,025**	**$19,007.43**
Rangens	Medicated	#1	$0.4916	50	$24.58
Rangens	Medicated	#2	$0.9159	41.4	$37.92
Rangens	Medicated	1/8	$0.4915	1,240	$609.46
SUB-TOTALS				**1,331.4**	**$671.96**
Rangens	Soft-moist	1/8	$0.7064	3,625	$2,560.61
SUB-TOTALS				**3,625**	**$2,560.61**
GRAND TOTALS				**75,981.4**	**$22240.00**

IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL REPORT

HAGERMAN FISH HATCHERY

Joe Chapman, Hatchery Manager II
Walt Rast, Assistant Hatchery Manager I
Brian Thompson, Fish Culturist
Bill Stutz, 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 Idaho Department of Fish and Game's (Department) largest resident trout production facility. 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 $534,023 this year: $279,232 from Hagerman's budget, $204,684 from Dingell-Johnson (DJ) monies, and $50,107 from the fish transportation budget, to rear and stock fish in the 2002 production year, not including capital outlay expenditures (Appendix 1).

The HFH is staffed with a Hatchery Manager II (Joe Chapman), Hatchery Manager I (Walt Rast), two Fish Culturists (Brian Thompson and Bill Stutz), and a fish transport operator (Ken Taylor). 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^{o}F year-round while Riley Creek fluctuates from 50^{o}F to 67^{o}F annually.

HATCHERY PRODUCTION

During 2002, HFH reared and stocked 2,112,717 fish weighing 396,183 lbs. Of these, 1,320,598 were stocked 6-inches or longer, and 792,119 were stocked smaller than 6-inches long (Appendix 1). About 39% 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. The 2-inch to 6-inch fish consisted of rainbow trout from Troutlodge and Hayspur, and Kamloops trout from Hayspur (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 396,183 lbs stocked included 366,908 lbs of put-and-take fish averaging 8.7 inches, and 29,275 lbs of fingerlings that averaged 4.3 inches. The cost of planting the average 5.3 fish per pound (fpp) (7.5 inches) fish was approximately $1.02 per lb, or $191.76 per 1,000 fish (Appendix 1).

In addition to the fish reared and planted, 1,167,518 fish (63,939 lbs) were on hand at the HFH on December 31, 2002. These consisted of 598,911 fish (61,765 lbs, average 9.7 fpp,

or 6.2 inches) in the large raceways and 568,607 fingerlings (2,174 lbs, average 261 fpp, or 2.04 inches) in the west raceways. The cost of producing the larger fish was $1.58 per lb or $163.10 per 1,000, and $14.36 per lb or $54.89 per 1,000 for the fingerlings (Appendix 1).

On hand January 1, 2002 were 1,727,614 fish (118,659 lbs). The HFH also received 784,555 fish (5,545 lbs) of fish from other hatcheries. Consequently, these subtractions yielded a net production for 2002 of 768**,**066 fish (335,918 lbs), mortality excluded (Appendix 1).

A total of 9,519,489 eggs and fry were acquired to yield the fish produced. About 3,277,087 eggs were purchased and the balance was acquired from government sources at no cost (Appendix 4). Of the 8,736,434 eggs received, 5,779,182 were received for the fish planted, and the balance was used for 2002 production. Eggs were sent to Magic Valley Fish Hatchery to alleviate overcrowded conditions here and were then transferred to Hagerman Fish Hatchery when they were about 148.6 fpp (2.6 inches). Because of last year's success, eggs were again shipped to Magic Valley Fish Hatchery for early rearing and will be transferred here in February 2003.

The overall survival rate of fish stocked was 32%, down from 49% survival last year. Some of this difference can be attributed to poorer survival of the triploid eggs. Also, losses to Coldwater Disease were significantly higher in the hatchery building than the prior year, while mortality due to IHNV *Infectious Hematopoietic Necrosis Virus* decreased (Appendix 3).

Fish transport operator Ken Taylor logged 31,673 miles delivering fish to state waters, while the rest of the crew logged 20,042 miles. This amounted to a total of 51,715 miles and 382 stocking trips during 2002, which was a 37% increase in mileage over the previous year. This increase was due to the addition of the Clearwater region stocking, plus donated fish from the commercial hatcheries.

In addition to the annual requests by regional fisheries managers, the HFH crew made 135 trips to haul and stock 1,282,430 fish weighing 134,401 lbs from other sources (Appendix 7). These included three trips for the Grace Fish Hatchery to stock 37,540 trout weighing 15,800 lbs; two trips for the American Falls Fish Hatchery to stock 410,320 trout weighing 9,460 lbs; 6 trips to stock 846 Tiger muskies weighing 321 lbs; 16 trips to stock 30,845 channel catfish weighing 11,300 lbs; eight trips to stock 1,738 rainbow trout weighing 1,425 lbs from the University of Idaho Fish Culture Station; and 52 trips for several commercial hatcheries to stock 801,141 trout weighing 96,095 lbs. In addition, the crews from Hagerman Fish Hatchery and Niagara Springs Fish Hatchery witnessed 48 trout stockings totaling 2,580,698 fish and 96,591 lbs by the commercial hatcheries in the Magic Valley region.

FISH FEED

The fish produced during 2002 were fed a total of 476,122 lbs of feed from Rangen Inc and Moore-Clark (Appendix 5). The net weight gained during 2002 was 335,918 lbs, which resulted in an overall conversion of 1.42 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:

- A well was drilled to supply domestic water to the residences, shop and office.
- The feed shed in the nursery raceways was painted and shelves were installed.
- The one-ton truck's hauling tank was sandblasted and painted.
- A storage shed and heat pump were installed at residence #4. New flooring, dishwasher and garbage disposal were installed in the kitchen, and the interior of the house was painted.
- An old, leaking, wooden pipe near the intake was dug up and a new discharge pipe was installed.
- The sidewalk was repaired at residence #2. A new back door was also installed.
- A flow meter was installed on the supplementation line. The section of leaking supplementation line was replaced.
- The covering on the upper Tucker Springs small pipeline source was replaced.
- Two leaking valves delivering water to the west raceways were repaired.
- Electric feed augers were installed on the large bulk feed tanks.
- Crumbling keyways in the west raceways were replaced with channel iron.
- The air-lines on some of the large raceways were replaced.
- For security purposes gates were installed at the bridges entering the fish hatchery.
- The dike on the settling pond was repaired and widened.
- A trailer was constructed to facilitate transportation of the JLG man-lift to other hatcheries and hauling needs here.
- The existing blacktop received a new chip-seal coat.
- Most of the domestic and sewer pipes in the dorm were replaced.
- The dewatering tower was transferred from the '57 Chevy to a different truck so the Chevy could be used as a department parade vehicle.

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 about 300 participants. The Hagerman Boy Scouts, Hagerman National Hatchery personnel, and personnel from Wal-Mart and the Department assisted. Pepsi, Falls Brand Meats, South Bend Sporting Goods, 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 315,400 fish weighing 20,834 lbs were marked (Appendix 6). This included ventral clips on steelhead stocked into Cascade Reservoir tributaries to evaluate recruitment and spawning success. About 496 catchables were jaw-tagged and stocked into Chesterfield Reservoir in May. Also, 3,885 channel catfish were adipose-fin clipped and stocked into Alexander Reservoir in September. Finally, 260,709 fingerlings were grit-marked with red and green dye to evaluate the success of the predator training experiment in CJ Strike, Magic, and Oakley reservoirs.

ACKNOWLEDGMENTS

Thanks to the permanent HFH staff of Walt Rast, Brian Thompson, and Bill Stutz; to transport operator Ken Taylor; and to temporaries Larry Miller, Bryce Frates, 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 2002. Costs reflect all costs budgeted, except capital outlay, and include $50,107 of the fish transportation budget.

Species/Strain	Length/ Inches	Number Produced	Weight/ Pounds	Cost to produce and plant	Cost/ 1,000
FISH ON HAND JANUARY 1, 2002					
Kamloops rainbow trout (T9, Hayspur)	9.0	46,530	15,009		
Kamloops rainbow trout (TT,Troutlodge)	5.9	1,026,996	94,458		
Steelhead (Saw)	5.48	114,226	7,897		
Hayspur rainbow trout (T9)	1.44	59,326	79		
Kamloops rainbow trout (KT, Hayspur)	1.78	480,536	1,216		
Totals		**1,727,614**	**118,659**		
FISH PLANTED					
Hayspur rainbow trout (T9)	11.4	39,571	24,433	12,336.35	311.75
Kamloops rainbow trout (TL,TT)	9.1	866,296	276,275	215,581.98	248.85
Kamloops rainbow trout (KT)	6.0	18,190	1,700	2,984.62	164.08
Coho salmon (CO)	6.95	276,230	35,200	52,500.13	190.06
Steelhead (SA)	8.5	120,310	29,300	27,965.68	232.45
Subtotals	**8.7**	**1,320,598**	**366,908**	**311,368.76**	**235.78**
Hayspur rainbow trout (T9)	4.2	399,903	13,710	47,024.90	117.59
Kamloops rainbow trout (KT)	4.7	316,716	15,065	41,573.44	131.26
Rainbow trout (TT)	2.5	75,500	500	5,161.70	68.37
Subtotals Average	**4.3**	**792,119**	**29,275**	**93,760.04**	**118.37**
Total Planted Average	**7.5**	**2,112,717**	**396,183**	**405,128.80**	**191.76**
FISH ON HAND DECEMBER 31, 2002					
Rainbow trout, yellow (YT,SP,01)	15.8	796	1,327	343.93	432.08
Kamloops rainbow trout (TL,TT,00)	12.9	6,550	5,955	2,310.66	352.77
Kamloops rainbow trout (KT)	10.3	12,000	5,455	3,380.05	281.67
Steelhead (SA)	6.5	117,560	12,641	20,896.70	177.75
Kamloops rainbow trout (TL,TT,01)	5.6	462,005	36,387	70,752.12	153.14
Kamloops rainbow trout (KT)	2.1	436,667	1,879	25,076.93	57.43
Hayspur rainbow trout (T9)	1.7	131,940	295	6,133.81	46.49
Totals	**5.0**	**1,167,518**	**63,939**	**128,894.20**	**110.40**
TOTAL FISH PRODUCED					
Planted in 2002		2,112,717	396,183		
On Hand December 31, 2002		1,167,518	63,939		
Totals		**3,280,235**	**460,122**	**$534,023.00**	**$162.80**
From other hatcheries		784,555	5,545		
On Hand January 1, 2002		1,727,614	118,659		
TOTAL GAINED		**768,066**	**335,918**		

Appendix 2. Fish distribution from Hagerman Fish Hatchery, 2002.

Percent of number planted by Region									
	Number	**Pounds**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Catchables ≥6 inches									
Hayspur rainbow trout (T9)	39,571	24,433	-	-	-	100	-	-	-
Kamloops rainbow trout (TT)	866,296	276,275	-	18.8	22.4	47.4	4.1	7.4	-
Kamloops rainbow trout (KT)	18,190	1,700			47.1	52.9			
Steelhead (SA)	120,310	29,300	-	-	100	-	-	-	-
Coho Salmon	276,230	35,200	-	-	100.	-	-	-	-
Subtotal	**1,320,598**	**366,908**	-	**11.7**	**48.1**	**33.1**	**2.5**	**4.6**	-
Fingerlings <6 inches									
Hayspur rainbow trout (T9)	399,903	13,710	-	-	12.4	52.7	34.8	-	-
Kamloops rainbow trout (KT)	316,716	15,065	-	-	20.6	26.9	17.3	35.3	-
Rainbow trout (TT)	75,500	500	-	-	-	64.9	35.1	-	-
Subtotal	**792,119**	**29,275**	**0.0**	**0.0**	**12.5**	**46.4**	**28.7**	**12.4**	**0.0**
TOTAL	**2,112,717**	**396,183**	**0.0**	**6.5**	**32.1**	**39.0**	**14.3**	**8.1**	**0.0**

Appendix 3. Fish survival from eyed-egg to stocking, 2002.

Species/Strain	**Number Stocked**	**Eggs and Fry Received**	**Percent Survival**
Rainbow trout, Hayspur (T9)	439,474	1,191,418	36.89
Kamloops, Troutlodge (TT)	941,797	1,782,562	52.83
Kamloops, Hayspur (KT)	334,906	2,735,328	12.24
Steelhead (SA)	120,310	142,929	84.17
Coho Salmon (WA.)	276,230	710,000	38.91
TOTAL	**2,112,717**	**6,562,237**	**32.20**

Appendix 4. Number of eyed-eggs and fry received, species, and source for fish produced in 2002.

	Eggs/Fry received		
Species/Strain	**For Fish**	**For fish on hand**	
	Planted	**December 31, 2002**	**Source**
Received as eggs			
Rainbow/Yellow (YR)	0	3,288	Seapac, ID.
Rainbow/Kamloops (KT)	2,292,248	889,254	IDFG Hayspur
Rainbow/Hayspur (T9)	851,443	173,850	IDFG Hayspur
Rainbow/sterile Troutlodge (TT)	1,782,562	1,494,525	Troutlodge, WA
Steelhead	142,929	396,335	IDFG Pahsimeroi,Oxbow
Coho	710,000	0	Eagle Creek Hatchery
Subtotal eggs	**5,779,182**	**2,957,252**	
Received as fry			
Rainbow from Magic Valley (T9)	339,975	0	IDFG Hayspur
Kamloops (Hayspur)from Magic Valley (KT)	443,080	0	IDFG Hayspur
Subtotal fry	**783,055**	**2,957,252**	
TOTAL	**6,562,237**	**2,957,252**	

Appendix 5. Fish feed used during Brood Year 2002 at Hagerman Fish Hatchery.

Size	Source	Pounds	Cost/pound	Cost
Str	Rangen	100	$0.37	$36.75
#1	Rangen	3,150	$0.43	$1,354.50
#1 TM	Rangen	1,650	$0.49	$810.98
#2	Rangen	19,050	$0.43	$8,191.50
#2 TM	Rangen	1,850	$0.49	$909.28
#3	Rangen	35,650	$0.30	$10,801.95
#3 TM	Rangen	100	$0.49	$49.15
Str. Soft moist	Rangen	132	$1.00	$131.93
3/64 soft moist	Rangen	132	$0.79	$104.81
3/32 in, EXT450Float	Rangen	103,610	$0.25	$25,902.50
3/32 in, TM	Rangen	1,600	$0.46	$732.48
1/8 in, TM	Rangen	5,450	$0.46	2,495.01
5/32 in, EXT450Float	Rangen	292,500	$0.25	$73,125.00
5/32 in, TM	Rangen	4,800	$0.46	$2,197.44
5/32 in, Romet 30	Rangen	1,450	$0.79	$1,143.04
Subtotal		**471,224**	**$0.27**	**$127,986.31**
#0	Moore-Clark	396	$0.98	$388.08
#1	Moore-Clark	2,654	$0.91	$2,415.14
#1 proActive	Moore-Clark	1,320	$0.97	$1,280.40
1.5	Moore-Clark	440	$0.60	$264.00
2.0 Clark's Fry	Moore-Clark	88	$0.58	$51.04
Subtotal		**4,898**	**$0.90**	**$4,398.66**
TOTAL		**476,122**	**$0.28**	**$132,384.97**

Appendix 6. Summary of fish marked at Hagerman Fish Hatchery in 2002.

Date Stocked	Species	Water	Number	Pounds	Clip
04/23	SA	Cascade Tributary	25,200	4,650	Right Ventral
04/24	SA	Cascade Tributary	25,110	4,650	Left Ventral
05/06	TT	Chesterfield Reservoir	496	184	Jaw Tag
05/13	T9	C.J. Strike Reservoir	49,683	1,695	Grit-mark-control
05/13	KT	C.J. Strike Reservoir	50,190	2,100	Gritmark-Pred.
05/14	T9	Magic Reservoir	60,450	1,550	Gritmark-Control
05/14	KT	Magic Reservoir	60,225	2,750	Gritmark-Pred.
05/13	KT	Oakley Reservoir	20,076	840	Gritmark-Pred.
05/14	T9	Oakley Reservoir	20,085	515	Gritmark-Control
09/05	CC	Alexander Reservoir	3,885	1,900	Ad-clip
TOTALS			**315,400**	**20,834**	

Appendix 7. Fish stocked or witnessed by Hagerman Fish Hatchery from other sources, 2002

Date	Hatchery Stocking	Species	Number	Pounds	Length	Source	Destination
5/16	Hagerman	TT	16,100	7,000	10.2	Grace Hatchery (IDFG)	Blackfoot Res.
10/22	Hagerman	T9	11,040	4,800	10.3	Grace Hatchery (IDFG)	Blackfoot Res.
9/17	Hagerman	T9	10,400	4,000	10.0	Grace Hatchery (IDFG)	Island Park Res.
Subtotal			**37,540**	**15,800**			
4/26	Hagerman	C3	113,270	4,700	4.9	American Falls Hatchery (IDFG)	Henry's Lake
6/3	Hagerman	KT	128,304	1,980	3.3	American Falls Hatchery (IDFG)	Hayden Lake
6/3	Hagerman	T9	168,746	2,780	3.5	American Falls Hatchery (IDFG)	Hayden Lake
Subtotal			**410,320**	**9,460**			
6/18	Hagerman	TM	82	20.5	10.75	Moses Lake, WA	Johnson Res.
6/18	Hagerman	TM	140	35	10.75	Moses Lake, WA	Lamont Res.
6/18	Hagerman	TM	168	42	10.75	Moses Lake, WA	Condie Res.
6/24	Hagerman	TM	41	10	10.75	Moses Lake, WA	Carlson Lake
6/27	Hagerman	TM	150	37.5	12.00	Moses Lake, WA	Dog Creek Res.
7/24	Hagerman	TM	69	46	13.00	Moses Lake, WA	Winchester Lake
7/24	Hagerman	TM	196	130	13.00	Moses Lake, WA	Little Payette Lake
Subtotal			**846**	**321**			
6/27	Hagerman	CC	610	250	11.1	Fish Processors, Buhl, ID.	Herman Anderson #3
6/27	Hagerman	CC	3,051	1,197	11.1	Fish Processors, Buhl, ID.	Dog Creek Res.
6/28	Hagerman	CC	2,099	503	9.5	Fish Processors, Buhl, ID.	Wilson Lake
8/23	Hagerman	CC	1,000	500	11.9	Fish Processors, Buhl, ID.	Carey Lake
8/23	Hagerman	CC	1,300	650	11.9	Fish Processors, Buhl, ID.	Burley (Conner) Pond
8/23	Hagerman	CC	1,300	650	11.9	Fish Processors, Buhl, ID.	Emerald Lake
8/26	Hagerman	CC	500	250	11.9	Fish Processors, Buhl, ID.	Claytonia Pond
8/26	Hagerman	CC	500	250	11.9	Fish Processors, Buhl, ID.	Quinn's Pond #1
8/26	Hagerman	CC	500	250	11.9	Fish Processors, Buhl, ID.	Quinn's Pond #2
8/27	Hagerman	CC	17,985	5,800	10.2	Fish Processors, Buhl, ID.	Alexander Res.
8/27	Hagerman	CC	2,000	1,000	11.9	Fish Processors, Buhl, ID.	Murtaugh Lake
Subtotal			**30,845**	**11,300**			

Appendix 7. continued

2/28	Hagerman	R1	600	240	12.6	U of ID. Fish Culture Station	Salmon Falls Crk-Balance Rock
2/28	Hagerman	R1	1,071	961	12.6	U of ID. Fish Culture Station	Riley Creek Impoundment
9/5	Hagerman	R1	50	160	20.0	U of ID. Fish Culture Station	Frank Oster Lake #1
9/5	Hagerman	R1	17	64	20.0	U of ID. Fish Culture Station	Dierkes Lake
Subtotal			**1,738**	**1,425**			
4/19	Hagerman	R1	12,000	3,000	8.5	Rangen's Hatchery	Roseworth Res.
4/19	Hagerman	R1	16,000	4,000	8.5	Rangen's Hatchery	Salmon Falls Creek Res.
4/19	Hagerman	R1	5,200	1,300	8.5	Rangen's Hatchery	Dog Creek Res.
Subtotal			**33,200**	**8,300**			
1/4	Hagerman	R1	223	950	21.7	Pisces Investments	Crystal Lake
1/4	Hagerman	R1	127	541	21.7	Pisces Investments	Snake R.-Sligar's
Subtotal			**350**	**1,491**			
4/23	ITP	R1	10,002	2,268	8.1	Idaho Trout Processors	Snake R.-Sligar's
4/23	ITP	R1	10,002	2,268	8.1	Idaho Trout Processors	Snake R.-Power Plant
4/24	ITP	R1	10,002	2,268	8.1	Idaho Trout Processors	Snake R. @Crystal Lake
4/25	Hagerman	R1	9,180	3,000	9.2	Idaho Trout Processors	Roberts Gravel Pond
4/29	Hagerman	R1	16,524	5,400	9.2	Idaho Trout Processors	Salmon Falls Creek Res.
Subtotal			**55,710**	**15,204**			
12/3-9	Hagerman	R1	175,339	26,375	6.9	ARK Fisheries	Salmon Falls Creek Res.
12/12	Hagerman	R1	7,025	2,500	9.6	ARK Fisheries	Dog Creek Res.
12/12	Hagerman	R1	5,620	2,000	9.6	ARK Fisheries	Blair Trail Res.
12/13	Hagerman	R1	581	350	11.5	ARK Fisheries	Rock Creek City Park
12/13	Hagerman	R1	747	450	11.5	ARK Fisheries	Rock Creek County Park
12/18-27	Hagerman	R1	11,707	6,500	10.9	ARK Fisheries	Crystal Lake
12/18-27	Hagerman	R1	13,116	7,300	10.9	ARK Fisheries	Dierkes Lake
12/20	Hagerman	R1	3,474	1,800	10.6	ARK Fisheries	Crane Falls Res.
12/9	ARK Fishery	R1	36,524	2,666	5.4	ARK Fisheries	Snake R.-Sligar's
12/10	ARK Fishery	R1	55,258	1,694	4.1	ARK Fisheries	Snake R.-Sligar's
12/11	ARK Fishery	R1	47,991	1,882	4.4	ARK Fisheries	Snake R.-Sligar's
Subtotal			**357,382**	**53,517**			

Appendix 7. continued

3/22	Hagerman	R1	21	75	20.2	Clear Springs Foods	Hagerman Pond
3/22	Hagerman	R1	4,918	2,648	10.7	Clear Springs Foods	Dierkes Lake
7/2	Hagerman	R1	1,818	900	10.7	Clear Springs Foods	Mountain Home Res.
7/2	Hagerman	R1	9,898	4,900	10.7	Clear Springs Foods	Lucky Peak Res.
Feb-June	Hagerman	R1	1,640	1,814	13.8	Clear Springs Foods	Frank Oster #1
2/28	Hagerman	R1	45	149	19.8	Clear Springs Foods	Frank Oster #2
2/28	Hagerman	R1	549	449	12.5	Clear Springs Foods	Frank Oster #3
2/28	Hagerman	R1	45	149	19.8	Clear Springs Foods	Frank Oster #4
May-Nov.	Hagerman	R1	503,854	18,050	4.3	Clear Springs Foods	Salmon Falls Creek Res.
Feb-June	Hagerman	R1	1,490	1,495	13.2	Clear Springs Foods	Riley Creek Impoundment
Subtotal			**524,278**	**30,629**			
Feb-Oct	Clear Springs	R1	16,233	18,580	13.9	Clear Springs Foods	Crystal Lake
Mar-Sept	Clear Springs	R1	10,617	3,051	8.8	Clear Springs Foods	Dierkes Lake
Jan-Feb	Clear Springs	R1	213,769	15,591	5.5	Clear Springs Foods	Snake R.-Bell Rapids
May-Nov	Clear Springs	R1	909,428	16,084	3.4	Clear Springs Foods	Snake R.-Crystal Bridge
Jan-Dec	Clear Springs	R1	1,260,871	30,239	3.8	Clear Springs Foods	Snake R.-Power Plant & Sligars
Subtotal			**2,410,919**	**83,545**			
TOTALS			**3,863,128**	**230,992**			

IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL REPORT

HAYSPUR FISH HATCHERY

Bradford W. Dredge, Fish Hatchery Manager II
Roger Elmore, Assistant Hatchery Manager
Jarrett Page, 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* broodstocks 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 from Conner 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, and an office building, which has an attached shop, three bay garage and a dormitory for temporary employees.

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

Three permanent employees (Fish Hatchery Manager II, Assistant Fish Hatchery Manager, and Fish Culturist) and 16 months of temporary biological aide time are assigned to the HSFH.

RAINBOW AND KAMLOOPS EYED EGG PRODUCTION

The 2002 spawning season was a ten-month project, beginning in September and ending in June with an egg take of 14,707,887 green eggs from 4,077 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 rainbows and Kamloops were manipulated. We have found two-year-olds respond poorly to photoperiod manipulation. Hayspur rainbow trout triploid eyed-egg production totaled 3,948,657 with 1,767 females spawned. Kamloop triploid eyed-egg production totaled 5,254,928 with 2,310 females spawned. Ashton, Grace, Hagerman, Mackay, Magic Valley, McCall, and Nampa hatcheries were shipped eggs as per their requests. Magic Valley Fish Hatchery received 1,384,739 trout eggs destined for Hagerman. In addition, the Tuccanon Fish Hatchery in Washington received 79,096 Kamloop trout eggs for mitigation purposes. Value to the Department, at the current contract price of $25.00/1,000 for sterile triploid eggs, equates to $230,090 (Appendix 2).

In 2002, all eggs produced for shipment were heat shocked and made sterile. Replacement broodstock eggs were not heat shocked and are utilized exclusively at HSFH for replacement broodstock needs. This was the second year of full production using the heat shock method refined during the previous five years of research. Washington State University performed induction rate sampling on twelve 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 475 individuals were sampled. Sample results

indicated that 448 out of 475 were verified as being triploid. The overall induction rate was 94.3%. The Hayspur rainbow trout induction rate was 96.8% (191 out of 198). The Kamloop trout induction rate was 92.7% (257 out of 277).

WESTSLOPE CUTTHROAT TROUT EYED EGG PRODUCTION

The 2002 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 22, 2002 and spawning was completed on May 17, 2002. A total of eight spawn-takes resulted in 670 females being spawned. Average fecundity was 305 eggs per female. The eggs were 734 eggs per ounce and the overall eye-up rate was 25%. A total of 204,350 green eggs were collected and eyed-egg production equaled 51,087.

FISH LIBERATIONS

Fish requested for the Big Wood and Little Wood drainages were reared at Nampa Fish Hatchery and transported to HSFH for redistribution by HSFH personnel. Semi-tank and trailer loads were hauled as needed to complete HSFH 2002 plant request. A total of 59 stocking trips into the Big Wood and Little Wood drainages were stocked with 39,965 catchable-size rainbow trout (Appendix 3). A total of 1,084 cutthroat trout fingerlings were stocked into Yellowbelly Lake on June 25, 2002. In addition, a total of 68,860 surplus diploid rainbow trout fingerlings were stocked into the Snake River at Bell Rapids on March 13, 2002 and March 15, 2002.

FISH FEED

Rangen's, Inc. provided the 1/4-inch 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's, Inc. was the source of early rearing feeds, the food for catchables, and for replacement broodstock feeds (Appendix 4).

HATCHERY IMPROVEMENTS AND NEEDS

Improvements to the HSFH during 2002 included:

- A dormitory modification, which added two new bedrooms and one full bathroom to the existing facility. The project also included replacement of the floor and ceiling in the existing office, common area, original bathroom, and the original bedroom (ceiling only). The original bedroom had new carpet installed. The entire area was repainted and new windows were installed throughout.

- Pump #4 was rebuilt with new packing, a new line shaft, and was equipped with a new electrical control box. In addition, a broken 6-inch water supply line was repaired.

- A new roof was installed on residence #1. The flashing around the chimney was also replaced.

- A fish spawning equipment storage building was constructed with capitol outlay construction funds. The building is 20-ft x 20-ft and will house most of the spawning equipment and waders used in the Round Ponds during spawning operations.

- Wooden fence posts were placed around a portion of the Gavers Lagoon public fishing area to provide a picnic area free of vehicles. In addition, the fence will allow the grassy areas a chance to grow back.

- Residence #2 had new concrete entryway steps installed, new carpeting installed in the hallway and living room, and two of the bedrooms were painted.

- Five headbox covers on the Round Ponds were replaced.

- A new freezer was purchased for the hatchery.

- Other items purchased included new fire extinguishers; weighing scales for egg enumeration and gram weight feed amounts; a new Dell computer; a new computer desk, and a new office desk.

- Used dormitory furniture was transferred to HSFH from other local facilities. In addition, a washer, dryer, and refrigerator were transferred to HSFH from Henry's Lake Fish Hatchery.

- Fifteen adult Round Pond crowd racks were constructed. In addition, several crowd rack extensions were constructed for Round Pond segregation.

Needs of the HSFH are:

- Replace the garage door on residence #2.

- Replace open headbox (2) in the hatchery building with water intake valves (2), PVC piping, and replace water control valves to each vat.

- Construct and install additional small raceway predator covers.

- Repair and/or replace numerous concrete areas around the HSFH.

- Insulate, drywall, and install windows in the fish spawning equipment building at HSFH.

- Replace all degassing towers and media.

- Replace the sewage lift station electrical panel and sewage vault equipment.

- Replace and enlarge the Gaver Lagoon’s intake and outlet pipes.

- Resurface the HSFH entrance road.

- Repair the flapper valve associated with pump #4.

- Repair the broken spring on the pump #3 flapper valve.

- Demolish small raceways and construct new small raceways to better serve HSFH production needs; or demolish small raceways and the hatchery building and construct a covered broodstock replacement early rearing and intermediate rearing hatchery building, with a feed room and genetics triploid induction monitoring center.

BROODSTOCK MANAGEMENT

The Hayspur rainbow trout (R9) replacement population is perpetuated by using year-class crosses. Using one male with one female, 193 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 (K1) 2002 broodstock replacement population was perpetuated by using year-class crosses. Using one male with one female, 154 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 2002, all families tested negative. Isolation boxes, constructed of disinfectable plastic, were tested and used as isolation incubators for Hayspur rainbow trout isolation group #5. Six boxes were placed in each Heath stack tray and eggs were added for isolation incubation. Similar results occurred regardless of the method used.

Westslope cutthroat trout eggs from Conner Lake, British Columbia were obtained from the Kootenay Trout Hatchery as eyed-eggs on July 18, 2002. These fish, along with the Brood Year 2000 fish on-station will be used as an adfluvial broodstock to provide fry for the high mountain lake program and other cutthroat programs as requested by the Regional Fisheries Managers.

Cutthroat eggs are available during even years from Conner Lake. Three more groups will be obtained in 2004, 2006, and 2008 to provide a reasonable amount of genetic material from the Conner Lake population.

PUBLIC RELATIONS

Many people used 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 time to answer questions, give directions, clarify regulations, tidy outhouses, clean up litter, provide fishing tips, and generally enhance the image of the Department and HSFH.

Tours were provided to area schools. Bellevue Elementary, Valley Elementary, Hailey Elementary, Idaho Falls Elementary, and Hemingway School (Ketchum), 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 2,000 eyed-eggs. Eggs were delivered to Darren Beckley on November 2, 2002.

MISCELLANEOUS

Manager Brad Dredge made a lateral transfer from Rapid River Fish Hatchery to HSFH in February of 2002. Fish Culturist, Jarrett Page, made a lateral transfer to HSFH in May of 2002. Brad Dredge and Roger Elmore attended the annual hatchery manager's meeting at Harriman State Park in July and gave a summary of spawning operations at HSFH and recommendations for future production goals. Jarrett Page attended the Northwest Fish Culture Conference held in Bellingham, Washington in December 2002.

Sperm from Kamloop trout were pooled, three males per bag, and used at Henry's Lake to generate hybrids via delayed fertilization.

Hayspur Hatchery experimented with the use of hormone injections to accelerate the reproductive readiness of cutthroat trout males. Specifically, gonadotropin-releasing hormones (GnRHa) were injected into 50 males seven to ten days prior to spawning. Prior to the injections, none of the males were producing sperm. Ten days after injection, some of the males could be used for spawning.

ACKNOWLEDGMENTS

In 2002, Hayspur Fish Hatchery benefited from the capable assistance of biological aides Mike Zahradka, Terry Town, Shane Claborn, Melanie Fuchs, Deskin Waters, and Sta Muh Stoot. The HSFH would like to thank the following people who helped out during the spawning season: Pat Moore, Bryan Grant, Sarah Carriveau, Kenny Robbins, Randy Hutzenbiler, David Dredge, and Paul Martin.

APPENDICES

Appendix 1. Egg production summary of Hayspur Fish Hatchery, 2002

Species	**[a]Eggs Taken**	**Eggs Shipped**
Kamloops rainbow trout	0	0
Hayspur rainbow trout	0	0
T9s (R9s 3N)	5,605,449	3,948,657
KTs (K1s 3N)	9,102,438	5,254,928
TOTALS	**14,707,887**	**9,203,585**

[a]Total is displaced (volumetric or weight) of both good and bad eggs taken in 2002.

Appendix 2. Eyed egg shipment summary from Hayspur Fish Hatchery, 2002.

Hatchery	[a]Species	Total eggs shipped	[b]Estimated value
Ashton	T9	199,613	$4,990.33
Cabinet Gorge	KT	38,000	$950.00
Grace	T9	815,332	$20,383.30
	KT	981,784	$24,544.60
Hagerman	T9	1,745,807	$43,645.18
	KT	2,948,170	$73,704.25
Mackay	T9	200,239	$5,005.98
Magic Valley	T9	693,009	$17,325.23
	KT	691,730	$17,293.25
McCall	T9	39,505	$987.63
	KT	40,000	$1,000.00
Nampa	T9	253,452	$6,336.30
	KT	475,048	$11,876.20
[c]Other	T9	1,700	$42.50
	KT	80,196	$2,004.90
TOTALS		**9,203,585**	**$230.090.00**

Appendix 3. Hayspur Fish Hatchery stocking summary, 2002.

Fish size	Number of fish	Pounds of fish
Catchables	39,965	14,134
TOTALS	**39,965**	**14,143**

Appendix 4. Hayspur Fish Hatchery Feed Summary, 2002.

		Rangens	
Date	**Size**	**Amount /pounds**	**Cost**
02/21/2002	1/4 in. Brood pellet	13,520	$3,559.81
06/14/2002	1/4 in. Brood pellet	13,120	$4,132.80
10/25/2002	1/4 in. Brood pellet	10,060	$3,168.90
Totals		**36,700**	**$10,861.51**

		Rangens	
Date	**Size**	**Amount /pounds**	**Cost**
01/08/2002	Extruded 450 floating 3/16	700	$172.62
	Trout/Salmon starter #3	50	$ 12.40
	TM Medicated 5/32	150	$ 68.67
01/30/2002	Trout/Salmon starter #2	100	$ 36.75
2/21/2002	Idaho #3 Grower	100	$ 24.79
	Trout/Salmon starter #2	50	$ 18.38
03/04/2002	Trout/Salmon starter #2	50	$ 18.38
04/04/2002	Extruded 450 floating 1/16	50	$ 17.96
	Extruded 450 floating 3/32	50	$ 12.33
	Idaho #3 Grower	50	$ 12.40
	Extruded 450 floating 5/32	500	$123.30
	Trout/Salmon starter #00	50	$ 18.38
04/24/2002	Extruded 450 floating 3/32	50	$ 12.20
05/09/2002	Extruded 450 floating 1/16	50	$ 17.96
	Extruded 450 floating 1/8	50	$ 12.33
	Extruded 450 floating 3/32	150	$ 36.99
06/04/2002	Extruded 450 floating 5/32	600	$147.96
	Extruded 450 floating 1/8	250	$61.65
	Extruded 450 floating 3/32	50	$12.33
07/11/2002	Extruded 450 floating 1/8	500	$130.00
	TM Medicated 5/32	600	$343.08
10/25/2002	Trout/Salmon starter swim-up	50	$21.50
	Trout/Salmon starter #1	100	$43.00
	Trout/Salmon starter #2	100	$43.00
10/30/2002	Extruded 450 floating 1/8	300	$78.00
11/27/2002	TM Medicated 5/32	200	$98.30
12/26/2002	Soft Moist 1/16 Pellet	44	$33.39
12/31/2002	Soft Moist 3/32 Pellet	44	$32.37
TOTALS		**5,038**	**$1,660.42**

		Moore Clark	
Date	**Size**	**Amount /pounds**	**Cost**
01/02/2002	Nutra Fry 3.5	88	$ 46.64
TOTALS		**88**	**$ 46.64**

IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL RESIDENT REPORT

HENRY'S LAKE HATCHERY

Damon Keen, Assistant Hatchery Manager

ABSTRACT

The 2002 spawning operations at Henry's Lake produced 1,707,869 eyed cutthroat trout eggs, 363,746 eyed hybrid trout eggs, 105,804 eyed triploid brook trout eggs, and 90,323 eyed diploid brook trout eggs. Cutthroat trout in the Hatchery Creek run showed a mean length of 455 mm, the hybrid trout mean was 546 mm, and the brook trout mean was 438 mm.

Pathology reports detected the presence of *Myxobolus cerebralis* during the 2002 spring spawning run adult fish sample. Likewise, bacterial adult fish sampling of the spring run detected *Flavobacter indologenes*. Fall run brook trout adult sampling detected the presence of *Aeromonas salmonicida*. No viral or bacterial presence was detected from any of the ovarian samples taken from either the spring or the fall spawning operations.

A minor creel survey was conducted on Henry's Lake from May 28 through October 31. Creel clerks conducted 238 interviews. Harvest composition was 41.5% cutthroat trout, 49.4% hybrid trout, and 9.1% brook trout. The cutthroat trout mean was 454 mm, hybrid mean was 540 mm, and the brook trout mean was 462 mm. The catch rate was .41 fish/hr.

Riparian fencing, fish diversion structures, and screening were maintained on the tributaries of Henry's 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 Henry's Lake. Two screens were replaced on Howard Creek and one screen was replaced on Targhee Creek with funding provided by the Henry's Lake Foundation.

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. Insufficient life-sustaining levels of oxygen were sampled in the outlet. Due to the low water conditions, aeration was conducted from January through mid-March.

INTRODUCTION

Henry's Lake Fish 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 cutthroat trout *Oncorhynchus clarki*, sterile rainbow trout *O. mykiss* x 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 cubic feet per second (cfs) for domestic and egg incubation use. Unused water flows into Hatchery Creek, through the spawning/trapping facility, and then into Henry's Lake via a 150-foot long fish ladder.

The hatchery is staffed with one permanent Assistant Fish Hatchery Manager, one eight-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 27 and remained in operation until April 30. Fish ascending the ladder were identified as cutthroat or hybrid trout and enumerated. A sub-sample of 10% of each group was measured (total length - mm). 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 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 28ºC water and held in this condition for 20 minutes. All of the hybrid eggs were shipped to Mackay Fish Hatchery for hatching, rearing, and subsequent release back into Henry's Lake. Cutthroat eggs were shipped to Grace, Ashton, and American Falls hatcheries for the catchable cutthroat program. The remaining cutthroat eggs were shipped to Mackay Fish Hatchery for rearing and release back into Henry's Lake.

The fish ladder was opened for the fall run of brook trout on October 14. 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 contribution was sterilized by inducing a triploid condition by thermal shocking the eggs post fertilization. Brook trout eggs were placed in 28ºC water and held in this condition for 10 minutes. The remaining brook trout eggs were left in a diploid condition to provide future brood replacement for the hatchery operation.

Disease samples were taken from the spring and fall spawning runs. Ovarian fluids were collected from cutthroat and brook trout during spawning at Henry's Lake Hatchery. Ovarian samples were taken from egg pools of seven females. All seven-fish female egg pools were tested. Viral samples were taken randomly from 28 seven-female egg pools in the spring run and 6 seven-fish egg pools in the fall run. A mixed-sex group of 60 adult cutthroat trout from the spring run and 60 adult brook trout from the fall run were sacrificed for disease testing. All samples were sent to the Eagle Fish Health Laboratory (EFHL).

Creel Survey

From May 26 through October 31, a minor creel survey was conducted on Henry's 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 half an hour. Anglers were then interviewed at random throughout the day by boat access and occasional point of access sites.

Anglers were asked about 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 interview was also recorded. Although not considered a creel year, this effort was made to complete a spot check of the fishing success on the lake.

Riparian Fencing and Fish Screening

Electric fencing has been in place at Henry's Lake since the early 1990s. Fencing was stretched and solar panels, batteries, and connections were installed during May 2002 at ten sites on the tributaries of Henry's 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 Henry's Lake. Screens were maintained, cleaned and checked for proper operation on a daily basis during the summer and fall months of 2002. Additionally, the two 10-foot wire mesh screens on Howard Creek and the lower 4-foot wire mesh screen on Targhee Creek were replaced with perforated plate screens fabricated in the Salmon screen shop. Funds for the screen replacements were procured from the Henry's Lake Foundation at a cost of $6,108.00. Installation costs were incurred and paid for by the Henry's Lake project funding of the Idaho Department of Fish and Game (Department).

Water Quality

Late winter (January, February, and March 2002) 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 95 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/m^2 of oxygen were calculated for each site.

RESULTS AND DISCUSSION

Spawning Operation

A total of 3,763 cutthroat trout ascended the spawning ladder between February 27 and April 30, with 2,033 males and 1,730 females enumerated. Hybrid trout totaled 1,090 fish, of which 655 were males and 435 were females. Mean length for male and female cutthroat was 463 and 447 mm, respectively. Combined mean cutthroat trout length was 455 mm. Hybrid trout males and females averaged 543 mm and 549 mm, respectively. Combined mean hybrid trout length was 546 mm.

Cutthroat green eggs totaled 2,648,450 from 1,081 females for a mean fecundity of 2,450 eggs per female (Table 1). Eyed cutthroat eggs totaled 1,707,869 for an overall eye-up rate of 64.5% (Table 1). A total of eleven spawn days during this year's spring run were devoted to cutthroat spawning.

Hybrid trout green eggs totaled 766,850 from 313 females for a mean fecundity of 2,450 eggs per female (Table 2). Eyed hybrid trout eggs totaled 363,746 for an overall eye-up rate of 47.4 % (Table 2). A total of three spawn days were devoted to production of hybrid eggs during this year's spawn.

Brook trout green eggs totaled 469,200 from 204 females for a mean fecundity of 2,300 eggs per female (Table 3). Eyed brook trout eggs totaled 240,482 for an overall eye-up of 51.3% (Table 3). Of this total, 134,678 were diploid and had a mean eye-up of 73.2% eye-up; 105,804 were induced to triploid condition and had a mean eye-up of 37.1% (Table 3). Two spawn days were devoted to diploid production and two spawn days were devoted to triploid production.

Disease sampling completed on adult spawning fish during the spring run detected *Myxobolus cerebralis* in nine of twelve pooled samples. Five of ten samples detected *Flavobacter indologenes*.

Disease sampling completed on adult spawning fish during the fall run detected *Aeromonas salmonicida*.

Bacterial disease sampling from ovarian fluid taken during spawning 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 238 interviews from May 26 through October 31. Using the creel program, estimates were extrapolated and summarized. Catch rate was .41 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. Screens on Duck Creek did not operate due to low water conditions.

Three old screens were replaced with new screens. The two 10-foot screens on the Howard Creek pond were replaced. Additionally, the 4-foot screen located at the Targhee Creek cattle crossing was replaced. All three old screens were fabricated with wire mesh, which has openings that are not exclusive to the passage of cutthroat trout fry. The new screens were fabricated with perforated plate which reduces fry passage, yet still allow for sufficient water flow. The Salmon screen shop fabricated the screens and funds were provided by the Henry's Lake Foundation. Total fabrication costs of the screens were $6,108.00.

Water Quality

Oxygen profiles for January-March 2002 were recorded for the four sites (Pittsburgh Creek, County boat dock, Wild Rose, and the outlet). Total oxygen diminished from 25.345g/m^2 to 13.7g/m^2 at the Pittsburgh site, 16.04 g/m^2 to 13.625 g/m^2 at the County dock, 22.66 g/m^2 to 9.4 g/m^2 at the Wild Rose site, and 2.645 g/m^2 to 2.635 g/m^2 at the outlet site. The level of concern of 10g/m^2 was reached only briefly at the Wild Rose site and throughout the sampling period at the outlet site. However, the outlet site often shows diminished oxygen supplies when water is not running through the dam and that was the case throughout the 2002 sampling period. Complete analysis as well as corresponding graphs and charts are included in the regional fisheries management report.

ACKNOWLEDGEMENTS

Henry's 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 Henry's 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 were devoted to the Henry's program, mostly during the spawning cycle. Of special consideration is Basic American Foods, located in Blackfoot, Idaho. Basic American Foods donates hundreds of hours annually to the Henry's program. A special thanks is given to that business, as well as the employees who venture to the site in the name of resource benefit.

Likewise, a special acknowledgement is given to the Henry's Lake Foundation. For many years, the foundation has given unselfishly in the form of donated time and funds to maintain this important fishery. In the last two years alone, HLF has committed $18,000.00 to the program. Funding for many projects would be impossible without HLF assistance.

LITERATURE CITED

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

APPENDICES

Table 1. 2002 Henry's Lake Spring Yellowstone Cutthroat Spring Spawning Summary

Spawn Date	Lot Number	Females Spawned	Number of Green Eggs	Mean Fecundity	Number Eyed Eggs	Disease Status	Percentage Eye-up
3/7/2002	1	105	257250	2450	167192	Neg.	65.0%
3/11/2002	2	105	257250	2450	183602	Neg.	71.4%
3/14/2002	3	100	245000	2450	154711	Neg.	63.1%
3/18/2002	4	105	257250	2450	168343	Neg.	65.4%
3/21/2002	5	105	257250	2450	178925	Neg.	69.6%
3/25/2002	6	77	188650	2450	162105	Neg.	85.9%
3/30/2002	8	70	171500	2450	126569	Neg.	73.8%
4/8/2002	11	105	257250	2450	191403	Neg.	74.4%
4/11/2002	12	105	257250	2450	173801	Neg.	67.6%
4/18/2002	13	120	294000	2450	160892	Neg.	54.7%
4/25/2002	14	84	205800	2450	40326	Neg.	19.6%
TOTALS		**1081**	**2648450**	**2450**	**1707869**		**64.5%**

Table 2. 2002 Henry's Lake Hybrid Spring Spawning Summary

Spawn Date	Lot Number	Females Spawned	Number of Green Eggs	Mean Fecundity	Number Eyed Eggs	Disease Status	Percentage Eye-up
3/28/2002	7	89	218050	2450	104146	Neg.	47.8%
4/1/2002	9	105	257250	2450	143773	Neg.	55.9%
4/4/2002	10	119	291550	2450	115827	Neg.	39.7%
TOTALS		**313**	**766850**	**2450**	**363746**		**47.4%**

Table 3. 2002 Henry's Lake Brook Trout Fall Spawning Summary

Spawn Date	Lot Number	Females Spawned	Number of Green Eggs	Mean Fecundity	Number Eyed Eggs	Disease Status	Percentage Eye-Up	Diploid or Triploid
10/22/2002	1	35	80500	2300	57258	Neg.	71.1%	Diploid
10/24/2002	2	45	103500	2300	77420	Neg.	74.8%	Diploid
Subtotal 2N		**80**	**184000**	**2300**	**134678**		**73.2%**	**Diploid**
10/31/2002	3	75	172500	2300	65625	Neg.	38.0%	Triploid
11/4/2002	4	49	112700	2300	40179	Neg.	35.7%	Triploid
Subtotal 3N		**124**	**285200**	**2300**	**105804**		**37.1%**	**Triploid**
Totals		**204**	**469200**	**2300**	**240482**		**51.3%**	**Total**

IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL REPORT

MACKAY FISH HATCHERY

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

INTRODUCTION

The Mackay Fish Hatchery (MFH) is a specialty fish production facility located approximately 16 miles north of Mackay, in Custer County. The hatchery produces salmonids of various species and strains, from 1-inch to 16-inches in length, for statewide distribution. Funding has been switched from Dingell-Johnson money to license dollars for all hatchery expenses.

The hatchery has three full-time and two part-time employees. The part-time employees share 16 months of temporary time. Wages, including benefits, cost $149,200 for the permanent employees and $32,450 for the temporary employees. The operating budget for the calendar year January through December 2002 was $57,600. Included in the year's production were 16 lots of fish, comprised of 5 species and 10 different strains.

Rainbow trout *Oncorhynchus mykiss*
- Arlee (Ennis NFH, MT); 2-year classes
- Fish Lake (Ennis NFH, MT)
- Hayspur steriles (T9) (Hayspur SFH); 3-year classes

Cutthroat trout *O. clarki*
- Henry's Lake (Henry's Lake SFH)
- Yellowstone (Jackson NFH, WY); 3-year classes

Rainbow x Cutthroat trout hybrids (TH)
- Henry's Lake cutthroat females x Hayspur SFH rainbow males

Kokanee salmon *O. nerka kennerlyi*
- Early (Deadwood Res.); 2 year classes
- Early (Dubois, WY)
- October (Flathead Lake, MT)

Grayling *Thymallus arcticus*

WATER SUPPLY

Water for hatchery production is provided by three collection springs in an artesian area at the hatchery. The cobblestone-filled spring area is fenced and has a minimum of standing water. The water volume available for hatchery production remained consistent with previous years; flows ranged from 18 to 24 cubic feet per second (cfs). Lowest flows occurred during February while the highest flows occur during July. Temperatures varied between the three different springs supplying the hatchery: one at 50°F, one at 51°F, and one at 54°F. Incubation temperature is 51°F.

HATCHERY IMPROVEMENTS

Some of the improvements made around the hatchery included:

- The exteriors of both the workshop and the garage were cleaned, repaired and painted.
- A new style of raceway tail screen was designed, constructed and installed.
- Sunshade cover hold-downs were fabricated and installed.
- A new tailrace migration barrier screen was designed, fabricated and installed.
- Repair of raceway walls continued.
- A lid to cover the cement box near the “hole” raceways was designed and ordered.

HATCHERY NEEDS

The following projects will be completed during 2003:

- Replace roofing and siding on residence #3.
- Construct garage for residence #3.
- Install an emergency basement window exit on residence #1.
- Expand the hatchery’s parking garage.
- Install a cement pad in front of the shop in order to perform vehicle maintenance work.
- Repaint the exterior of residence #2.

FISH STOCKED

Fingerlings of various species and strains were stocked in seven regions of the state (Appendix 1). These put-grow-and-take fish numbered 2,932,098 fish and weighed 28,750 lbs.

Catchable rainbow trout (10-inches+) were stocked in the Upper Snake and Salmon regions. These put-and-take fish numbered 109,668 fish and weighed 69,727 lbs. Catchable Yellowstone cutthroat, numbering 1,800 fish and weighing 1,200 lbs were planted into Region 7.

The hatchery also reared 18,000 cutthroat, 500 sterile rainbow, and 2,500 grayling fry for planting into sixteen high mountain lakes in Regions 4, 5, and 6. Four-wheelers, pack-stock, and foot travel were used to plant these fish.

The fish transport trucks assigned to MFH made 135 separate fish stocking trips during the year, planting 32 different waters and traveling 20,545 miles. Transport tankers assigned to Nampa Fish Hatchery (NFH) hauled 10 truckloads of fish to six different waters for the hatchery during the year.

FISH FEED

A total of 94,965 lbs of fish feed was used during the year at a cost of $27,990. Feed conversion averaged 0.91 lbs of feed fed for every lb of fish produced. Conversions ranged from a high of 1.4 for the 01-T9 to a low of 0.76 for the 02-C3. Naturally occurring foods supplemented hatchery foods, enabling the lower conversions to occur. Average feed cost per lb of fish produced was $0.32. Feed cost of each fingerling produced was $0.003 and $0.34 for each catchable.

Rangen dry feeds were used exclusively throughout the year. Fish health and performance were excellent using the Rangen DryDiet. All feed sizes and amounts used are shown in Appendix 3.

FISH MARKING

Of the 973,452 cutthroats planted into Henry's Lake, 100,680 were adipose-fin clipped prior to stocking. The three members of the clipping crew worked a total of 171 hours over six days. This clipping is for a never-ending study of natural vs. hatchery fish returning to the creel and ladder.

PUBLIC RELATIONS

Approximately 800 people toured the hatchery during the year. Most visitors come to fish in the diversion pond below the hatchery. Scheduled tours were given to Mackay and Arco elementary classes, and to Boy Scout and FFA groups. The hatchery is assisting Mackay High School in an aquaculture program. The hatchery crew and the local conservation officer participated in Idaho's "Adopt a Highway" litter control program. Six miles of Highway 93 along Mackay Reservoir are cleaned bi-annually. The hatchery continued to be a "Passport Stamping Station", the state's attempt at promoting tourism.

ACKNOWLEDGEMENTS

The Mackay Hatchery crew included Biological Aides Bob Evans and Carren Morgan. Without their excellent assistance, we could not have accomplished all that we did during the year. Their care and concern enabled the hatchery to produce quality fish. Doug Young, Fish Culturist, transferred to Niagara Springs Fish Hatchery in April. Bryan Grant was hired as the new Fish Culturist. Mick Hoover, Assistant Hatchery Manager and Phil Coonts, Hatchery Manager, round out the hatchery's personnel.

APPENDICES

Appendix 1. Fish production at Mackay Fish Hatchery, January 1 to December 31, 2002.

Species/strain	Lot	Source	Received as	Fish Numbers Received or Carried Into 02	Pounds Received or Carried Into 02	Number Planted	Pounds Planted	Destination
Arlee rainbow trout	00-EN-RA	Ennis NFH	eyed eggs	4,747	3,829	4,499	4,050	02 catchables
Arlee rainbow trout	01-EN-RA	Ennis NFH	eyed eggs	87,500	27,918	86,967	51,524	02 catchables
Hayspur rainbow sterile	01-R9-T9	Hayspur SFH	eyed eggs	20,000	8,700	17,336	13,195	02 catchables
Hayspur rainbow sterile	02-R9-T9	Hayspur SFH	eyed eggs	95,000	1,050	0	0	03 catchables
Hayspur rainbow sterile	03-R9-T9	Hayspur SFH	eyed eggs	195,465	eggs	0	0	04 catchables 03 fingerlings
Fish Lake rainbow	02-RF	Ennis NFH	eyed eggs	213,500	eggs	211,430	1,610	02 fingerlings
Meadow Lk. grayling	02-WY-GR	Ashton SFH	fry	7,500	0.8	2,500	0.8	02 Mtn. Lk.
Henry's Lk cutthroat	02-ID-C3	Henry's Lk SFH	eyed eggs	1,100,000	eggs	997,620	7,740	02 fingerlings
rainbow/cutthroat hybrid sterile (TC)	02-ID-RC	Henry's Lk. SFH	eyed eggs	300,000	eggs	275,400	1,700	02 fingerlings
Yellowstone cutthroat	00-C4	Jackson NFH	eyed eggs	2,192	691	2,000	2,503	02 catchables
Yellowstone cutthroat	01-C4	Jackson NFH	eyed eggs	31,400	475	0	0	03 catchables
Yellowstone cutthroat	02-C4	Jackson NFH	eyed eggs	146,046	eggs	0	0	03 fingerlings 04 catchables
Deadwood kokanee	01-ID-KE	Deadwood Res.	Green eggs	778,520	502	720,268	11,042	02 fingerlings
Deadwood kokanee	02-ID-KE	Deadwood Res.	green eggs	463,478	eggs	0	0	03 fingerlings
Flathead Lk kokanee	02-MT-KO	Somers SFH	eyed eggs	570,000	eggs	440,000	3,786	02 fingerlings
Wyoming kokanee	02-WY-KE	Dubois, WY	eyed eggs	470,000	eggs	287,380	2,758	02 fingerlings

Appendix 2. Mackay Fish Hatchery Stocking Summary, 2002

Lot Number	Number Planted	Pounds Planted	Size Planted
00-C4	1,800	1,200	catchable
00-RA	5,365	5,008	catchable
01-RA	86,967	51,524	catchable
01-T9	17,336	13,195	catchable
02-C3	991,380	7,680	fingerling
02-C3	6,240	60	fingerling
02-C3	18,000	24	fry
02-EN-RF	211,430	1,610	fingerling
02-GR	2,500	0.8	fry
02-RC	275,400	1,700	fingerling
02-T9	500	2.1	fry
01-U-ID-KE	720,268	11,156	fingerling
01-WY-KE	287,380	2,758	fingerling
01-MT-KO	440,000	3,786	fingerling

Total Fish Planted

		Number Planted	**Pounds Planted**
High Mtn. Fry		21,000	27
Fingerlings		2,932,098	28,750
Total catchables		111,468	70,927
Rainbow		109,668	69,727
Cutthroat		1,800	1,200
Totals		**3,064,566**	**99,704**

TOTAL POUNDS FISH PRODUCED, YEAR 2002

Pounds Fish Planted - 99,704

Plus Pounds On Hand, 12/31/02 - 34,566

Pounds Produced, 2002 - 134,270

Minus Pounds On Hand, 1/1/02 - 47,786

Net Pounds Produced, 2002 - 86,484

Appendix 3. Feed Used at Mackay Fish Hatchery, January 1 through December 31, 2002

Rangen Fish Feeds	**Pounds Used**	**Feed Cost**
00 swim-up	150	$64.00
0 swim-up	615	$378.00
#1	3,700	$1,537.00
#2	10,550	$4,442.00
#3	14,100	$4,350.00
Extruded 450 Pellets		
Ext 3/32	8,850	$2,398.00
Ext 5/32	55,650	$14,461.00
Ext 1/4	1,350	$360.00
Total Pounds	**94,965**	**$27,990.00**

IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL REPORT

MCCALL FISH HATCHERY

Gene McPherson, Hatchery Manager II
Steven T. Kammeyer, Assistant Hatchery Manager
Joel Patterson, Fish Culturist

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) license 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 the 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-ft x 4-ft. Outside rearing space consists of two 196-ft x 101-ft x 4-ft concrete ponds 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 210 mountain lakes were stocked with 155,805 fry in 2002 (Appendix 1). Of these, 195 lakes were stocked using fixed-winged aircraft at a cost of $6,670 in flight time. To meet requests, a total of 12 flights were flown from August 21 through September 23, 2002. One flight was aborted in progress due to adverse weather conditions that made low altitude flying unsafe. The average flight time cost to stock a mountain lake in 2002 was $34.21 and ranged from $25.11 to $218.50 for individual regions. Volunteers stocked 15 lakes in the McCall area, saving the Department approximately $375.00 in comparable flight time. Mountain lake requests were met in all regions except for the McCall sub-region where only 78% of the cutthroat and 88.6% of the rainbow trout requests were met. Brundage Reservoir did not receive any cutthroat in 2002 and is the reason for most of the total cutthroat trout request not being met. Westslope cutthroat trout requests were met at 97.3% for all other McCall sub-region lakes. Excess golden trout and grayling were available and were stocked in McCall sub-region waters.

The first shipment of golden trout eggs from Mt. Whitney Fish Hatchery from the California Department of Fish and Game was a complete loss due to mishandling by Federal Express. Eyed-eggs had been shipped on July 1, but did not arrive at MCFH until July 5 with no cooling ice remaining. It was evident from the condition of the shipping container that at some point in transit the transport box had been placed on its side for an extended period of time. Fortunately, communication with Mt Whitney FH allowed for a second shipment of eyed-eggs to be sent to meet golden trout requests.

On August 5, 2002, Douglas Burton, Department Fish Pathologist, conducted a Penicillin G re-circulating bath treatment for Westslope cutthroat trout fry obtained from the Westslope Cutthroat Trout Company as eggs. During the past two years it has been necessary to complete an Oxytetracline feed treatment on cutthroat trout originating from this company due to outbreaks of coldwater disease (*Flexibacter psychrophilium)*. The Penicillin G treatment was done in an attempt to prevent, or least minimize the severity of, such an outbreak occurring in 2002. No incidence of coldwater disease was observed in these fish prior to release and although promising, no control groups were reared at MCFH to demonstrate efficacy.

Catchable Trout Redistribution

From May 15 to September 25, 2002 a total of 91,285 sterile Trout Lodge rainbow trout triploids were stocked into 37 water bodies in the McCall vicinity. These fish were reared at NFH and then transferred to MCFH. Transportation costs to bring catchable-size trout from NFH totaled $3,170 with 2,018 miles driven. Hatchery personnel drove approximately 4,132 miles on 94 stocking trips to complete requests at an approximate cost of $4,525.00. To maximize efficiency, multiple sites were stocked on 16 occasions thus eliminating the need for additional separate stocking trips. Combined transport distribution cost was $84.30 for each 1,000 fish stocked.

Hatchery personnel assisted in the collection of 743 smallmouth bass captured in Hells Canyon Reservoir by Trout Unlimited, Bass Club members and McCall sub-Regional fishery biologists. These fish were transported and released into Little Payette Lake to provide more diversity of opportunity for sport anglers, as these fish are able to overwinter and grow in this lake but have not demonstrated the ability to naturally recruit.

The last group of fish received from NFH arrived on July 30. To maintain the condition of these fish through the end of the stocking period, 400 lbs of 4.0 mm BioDry trout feed was purchased at a cost of $148.00 to provide intermittent feeding.

Payette Lake Net Pens

Net pen frames and floats were cut apart and removed from the Payette Lake shoreline on December 4, 2002. McCall City officials had decided not to make repairs to the main docks and pilings that lead to where the net pens were placed as they had been significantly damaged by shifting ice during the spring of 2001. This dock area has been condemned and will be dismantled by the City. Should funding become available in the future, City planners have indicated that they would like to make some fish rearing operation a part of a new multi-purpose dock to be located in conjunction with Mill Park on Payette Lake.

Special Projects

Throughout the summer catchable redistribution period GPS coordinates were taken for each location receiving fish. This list will be verified during the 2003 stocking season and additional visual reference notes will be taken that can be correlated to the GPS reference points.

Hatchery/Program Improvements

Capital outlay money was available in FY02 to replace the resident program primary fish transport 1-ton truck's standard bed with a flatbed. This modification has improved employee safety by allowing personnel to walk around the transport tank without having to stand on pickup side rails when netting fish out of the tank. Hatchery programs in general have benefited by the additional flexibility this flatbed provides when the transport tank is removed.

Public Relations

McCall Summer Chinook Hatchery staff assisted Department fishery biologists in the collection and transfer of smallmouth bass collected in Hells Canyon Reservoir to Little Payette Lake. Fish stocking opportunities were provided to 12 groups of volunteers, coordinated through Mary Dudley, Department Volunteer Coordinator, who brought fry into 15 mountain lakes in the McCall area.

Hatchery personnel provided assistance to organizers of Free Fishing Day events at Kimberland Meadow Pond, Rowland Pond, and Fischer Pond. 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. In order to allow event organizers an opportunity to award various prizes, hatchery personnel jaw-tagged 25 catchables for Fischer Pond. Numerous hatchery tours were given to visitors and to several school groups throughout the summer.

ACKNOWLEDGEMENTS

Resident program tasks in 2002 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 2002 included: MCFH Fish Culturist Joel Patterson and seasonal employees: Jerry Harris, Chris Schneider, Bud Forsythe, Joey Ishida Jr., Nathan Parker, Jeff Thurston, and Dan Jindrich. I would like to thank Douglas Burton, Department fish pathologist, for his efforts in developing a treatment regime to help prevent coldwater disease problems previously experienced in the westslope cutthroat trout. I would also like to recognize Dwight Aplanalp, GFH Manger I; for his responsiveness and assistance in providing additional westslope cutthroat trout eggs on very short notice. Finally I would like to thank Marvin Waters of the California Department Fish and Game, for his help and quick action in making available the additional golden trout eggs needed to meet mountain lake requests.

APPENDICES

Appendix 1. High mountain lake fry redistribution by Region at McCall Fish Hatchery, 2002.

Species	Panhandle	Clearwater	Southwest (Nampa)	Southwest (McCall)	Salmon	Subtotal
Arctic Grayling (Meadow Lake, WY)	2,000		3,500	215	4,525	10,240
Golden Trout (Mt Whitney, CA)	3,300		4,000	9,115	400	16,815
Kamloop Triploid (Hayspur – KT)			2,975	12,150		15,125
Rainbow Triploid (Hayspur – T9)		1,000	7,275	12,650	1,700	22,625
Westslope Cutthroat (Westslope Cutthroat Trout Co.)		15,000	12,750	39,300	23,950	91,000
Region Subtotal	5,300	16,000	30,500	73,430	30,575	155,805
Total Lakes Stocked	4	25	40	81 Flight 15 Volunteer	60	210
Approximate Flight Costs	$ 874	$ 918	$ 1,174	$ 1,657	$ 2,047	$ 6,670
Approximate Cost Each Lake Stocked	$ 218.50	$ 36.72	$ 29.35	$ 25.11[a]	$ 34.12	$ 34.205[a]

[a] Calculations do not include lakes stocked by volunteers in McCall Sub-region.

Appendix 2. Resident feed usage and conversion data at McCall Fish Hatchery, 2002.

Species	# Stocked/ Transferred	Feed Used (lb)	Lbs Gained	Conversion	Cost per lb gain	Cost per 1000 fish	Total Feed Cost
Arctic Grayling (Meadow Lake, WY)	10,240	9.5	8.2	1.17	$ 1.28	$ 1.03	$ 10.50
Golden Trout (Mt Whitney, CA)	16,815	12.5	12.1	1.03	$ 1.14	$ 0.82	$ 13.80
Kamloop Triploid (Hayspur – KT)	15,125	10.6	10.8	0.98	$ 1.08	$ 0.77	$ 11.70
Rainbow Triploid (Hayspur – T9)	22,625	17.5	18.5	0.94	$ 1.05	$ 0.86	$ 19.35
Westslope Cutthroat (Westslope Cutthroat Trout Co.)	91,000	33.4	31.6	1.06	$ 1.17	$ 0.41	$ 36.90
Total	155,805	83.5	81.2	1.03	$ 1.14	$ 0.59	$ 92.25

Appendix 3. Total production and distribution costs at McCall Fish Hatchery, 2002.

Species	Eggs/fish Received	Fish Stocked	Transportation Cost	Lbs Gained	Cost per lb Gained	Cost per 1000 Stocked
Mountain Lake Fry Redistribution [a]						
Arctic Grayling (Meadow Lake, WY)	11,000 fry	10,240	$ 767.90	8.2	$ 93.65	$ 74.99
Golden Trout (Mt Whitney, CA)	17,700 eyed	16,815	$ 938.95	12.1	$ 75.60	$ 55.84
Kamloop Triploid (Hayspur – KT)	40,000 eyed	15,125	$ 334.64	10.8	$ 30.99	$ 22.12
Rainbow Triploid (Hayspur – T9)	39,500 eyed	22,615	$ 849.72	18.5	$ 45.93	$ 37.56
Westslope Cutthroat (Westslope Cutthroat Trout Co.)	125,000 eyed 25,000 eyed [b]	91,000	$3,778.79	31.6	$ 119.58	$ 41.53
Subtotal		**155,805**	**$6,670.00**	**81.2**	**$ 82.14**	**$ 42.81**
Notes: [a] Cost partitioned for number of species stocked on each individual flight; fry stocked by volunteers are included in calculations. [b] Eyed eggs transferred from Grace FH.						
Catchable Size Redistribution						
Smallmouth Bass (Collected in Hells Canyon)	743	743	$ 290.00			$ 390.31
Trout Lodge Rbt Triploid (Reared at Nampa FH)	93,779	91,285	$ 7,695.00 [c]			$ 84.30
Subtotal	**94,522**	**92,028**	**$ 7,985.00**			**$ 84.48**
Note: [c] Cost based on transportation costs of $ 7,695 (MCFH $4,525, Nampa FH 3,170).						
Grand Total		**247,833**		**81.2**	**$ 588.67**	**$ 192.87**
Note: Grand total cost based on resident program expenditures (Nov 01 to Nov 02) of $ 47,800; capital outlay is excluded.						

IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL 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, and 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 revenues. The manager at Cabinet Gorge Fish Hatchery (CGFH) 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 (6-ft x 65-ft) concrete raceways, as well as one (12-ft x 65-ft) concrete raceway 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 May to September daily trips are made from this location to the Coeur d'Alene and St. Joe rivers, 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 2002, Mullan Hatchery personnel were also involved with the kokanee spawning operation at Granite Creek.

HATCHERY IMPROVEMENTS

Hatchery improvements during 2002 included:

- Two old concrete raceways were replaced with two new (10-ft x 60-ft x 4-ft) concrete raceways. The Department, Shoshone County Sportsmen's Association, and Shoshone County funded this project.

- The SF Coeur d'Alene River hatchery intake reservoir was drained and silt was removed. The intake screen was also replaced. Hatchery personnel and the Shoshone County work crew did this project.

- A new, 11 hp Honda walk-behind snow blower was purchased.

FISH STOCKED OR TRANSFERRED

A total of 46,096 rainbow trout (9-inches long) were released in waters of the Coeur d'Alene, St. Joe, and St. Marie's river drainages from May to September to support a put-and-take fishery. There were three new stocking sites for 2002: Lucky Friday Pond, Steamboat Pond and Calder Pond. All stocking sites received sterile rainbow trout. Trout Lodge triploids (TT) trout released from the MUFH came from Nampa Hatchery. Hatchery personnel loaded the fish into a 500-gallon pickup truck-mounted tank and delivered them to hundreds of miles of streams and numerous lakes and ponds. The distribution schedule required 8-hour to 10-hour trips, four to five days each week during the summer season. While lake stocking is usually accomplished with single large releases, river stocking is much more labor intensive. Even relatively small numbers of fish required multiple stops to distribute the fish effectively for sportsmen's access.

A total of 1,161 hours ($12,661.60) were worked and 6,192 miles ($2,260.08) were driven to redistribute fish from MUFH in 2002. It took another 627 miles ($1,057.00) of driving to transport fish from Nampa Hatchery to MUFH. The total streamside cost to redistribute fish from MUFH to Region 1 waters, based on employee wages and transportation costs, was $15,978.68.

PUBLIC RELATIONS

The MUFH is located adjacent to a popular Shoshone County "day-use" park. As a direct result, the hatchery receives a much higher visitor level than would be expected in this remote location. The hatchery serves the highest number of visitors of any hatchery in the Panhandle Region, with over 10,000 people touring the grounds in 2002. 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

2002 ANNUAL REPORT

NAMPA FISH HATCHERY

Rick Alsager, Hatchery Manager II
Brian Malaise, Assistant Hatchery Manager
Dan Baker, Assistant Hatchery Manager
Bob Turik, Fish Culturist
Ken Felty, Biological Aide
Travis Brown, Biological Aide

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^{o}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 4 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 2002 fish year, the NFH net fish production was 2,079,066 at a net weight of 371,252 lbs (Appendix 1). The net cost for rearing fish at the NFH from grow-out through stocking was $339,398.00 (Appendix 2). Fish transferred to other hatcheries are included in the total number and lbs produced. Kamloops and rainbow trout *Oncorhynchus mykiss* comprised 90.7% 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 2002 (Appendix 3). Another 1,000 fish weighing 100 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 2,280,808 eyed-eggs were received during the 2002 fish year (Appendix 4).

FISH STOCKED/TRANSFERRED

The NFH personnel stocked or transferred 2,558,884 fish weighing 365,889 lbs during the 2002 fish year. These fish included warm water transfers and fish stocked from non-Department hatcheries to waters in Idaho.

The total number of fry (Appendix 5), fingerlings (Appendix 6), and catchables (Appendix 7) produced at NFH that were stocked or transferred are listed by species/strain in each table. The NFH made 279 stocking trips to 416 planting waters during 2002.

A total of 392,170 catchable (127,785 lbs) (Appendix 8), and 57,083 fingerling trout (985 lbs) (Appendix 9) were transferred to nine other hatcheries throughout the state.

FISH TRANSPORTATION

Fish transport operators stationed at NFH stocked waters in all regions throughout the state and transferred fish to and from 15 different state and national fish hatcheries. The transport operators made 117 trips totaling 48,000 miles during 2002.

The NFH transport operators stocked rainbow trout fingerlings from Lyons Ferry Fish Hatchery (202,297 fish, 2,604 lbs) into Clearwater Region waters. They also stocked chinook salmon and B-run steelhead smolts from Clearwater Fish Hatchery and assisted with the transportation of chinook salmon smolts from McCall Fish Hatchery. In the fall of 2002 the transport operators assisted in transporting and stocking surplus A-run adult steelhead from Oxbow Fish Hatchery; 1,000 steelhead were released into the Boise River and 50 steelhead were transported and released in the Payette River.

NFH transport operators also assisted the Engineering Department with seven personnel moves.

In the spring of 2002, Gary Ady received a new fish transport tank for his truck and replaced his old (1958) tank and trailer with a new trailer and installed the old tank from his truck to the new trailer. All the changes and modifications on the new tank and trailer were completed by the time the chinook smolts were stocked in April.

LAHONTAN CUTTHROAT TROUT

During the 2002 fish year, NFH stocked 219,170 Lahontan cutthroat trout (570 lbs*)* into lakes and reservoirs located in the Southwest and Upper Snake regions. All 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 62.4%. Due to past shipping and handling problems, NFH personnel picked up the cutthroat eyed-eggs from Omak personnel at Pendleton, OR.

FALL CHINOOK

In 2002, fall chinook were again reared at NFH. The fry were transferred to NFH from Cabinet Gorge Fish Hatchery in January and reared through June (Appendix 6). A surplus of 34,188 chinook fingerlings was stocked into CJ Strike Reservoir in March. The remaining 40,986 fingerlings were stocked in Coeur d'Alene Lake, meeting the June fish request.

SPECIAL STUDIES

The NFH continued assisting resident research biologists with a heritability study. Joe Kozfkay is heading this project, which is in the third year of stocking catchable trout. Ashton

Fish Hatchery reared the catchables for the first year of the study for stocking in the Upper Snake Region. The NFH has reared the catchables during the second and third years of the study. All the fish reared at NFH were stocked in the Southwest and Magic Valley regions. The study is set up to compare tag returns of catchable trout from two groups. The first group is a control that models our current rearing practices. The second group is from a stock of Hayspur broodstock, which was determined to be more "catchable" through fishing and tagging. The offspring from the more catchable broodstock will make up the test group in this study. Results from this study and further information can be obtained from Joe Kozfkay at the Resident Research Office in Nampa.

FISH FEED

A total of 349,152 lbs of feed was fed during 2002 at a cost of $100,736.91 (Appendix 6). The average cost per lb of feed was 28.85 cents. Rangen's Inc. made up 96.24% of the feed purchased by weight (Appendix 10). An additional 7,830 lbs of feed was received from other hatcheries and fed throughout the year. The overall feed conversion was 0.96 lbs of feed fed to produce one lb of fish.

Moore-Clark feed continues to outperform other starter feeds. The NFH continued to use their starter feeds for starting fry on feed in 2002. Rangen's continues to carry the feed contract and was 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 size fish trapped at the weir continued to increase and ranged from 15 to 17 inches. Egg-take goals for 2002 were 1.75 million green eggs for Mackay Fish Hatchery.

The kokanee population continues to slowly increase, but has not reached a number to meet both escapement goals and egg take goals. The Southwest Region requested an escapement of 2,000 KE pairs for natural production in the Deadwood River and 500 KE pairs released above the Trail Creek weir. The main weir across the Deadwood River was installed on August 8. With another low water year in 2002, 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 again started almost two weeks earlier than normal and fish were also ripe earlier. The first spawn date was August 20 and spawning occurred every third day concluding on August 30th. All fish were spawned at the trap site. A green egg yield of 823,276 eggs was taken from 1,027 females for a fecundity rate of 801 eggs/female (Appendix 11). Average total length of kokanee females was 398 mm, with males averaging 420 mm (Appendix 12). Eggs were shipped to Mackay Fish Hatchery via fixed-wing aircraft. Shipping techniques were similar to those used during previous years. The Department contracted the flying service with McCall Air Taxi. On August 26, with sudden heavy thunderstorms in the area, the river rose approximately two feet and containment was lost at the weir. An estimated 300 kokanee escaped upstream. On August 30, Joe Kozfkay and his crew conducted a research experiment involving triploidy KE using various induction rates. A total of 800 adults were released for natural reproduction; this includes an estimated 300 that escaped during high water. About 10 days into the spawning season, the fish numbers coming into the trap dropped to below 10 a day. The weir was removed on September 8.

Deadwood Reservoir continued to be a popular fishing spot during the kokanee run. With the run starting earlier and a small number of kokanee in the run, fishing pressure was down from previous years. Information signs were installed around the weir to inform the public about the kokanee operation. No problems occurred this season. Matt Erickson also took an active roll in enforcement operations on the river. The weirs on Deadwood River were checked numerous times throughout the day. The weir across Trail Creek was not installed this year due to the low number of returning fish. The crew walked the Trail Creek four times throughout the spawning season counting fish escapement numbers and redd sites.

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 60 spawned-out kokanee kelts for educational purposes. An additional 30 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 2002:

- Purchased and installed new aluminum screens and dam boards in the A raceways.
- Increased tank openings in Dick Bittick's truck and trailer.
- Replaced tank on Gary Ady's truck with new tank and moved old tank to new trailer.
- Installed a new dishwasher in residence #2.
- Constructed a new storage shed for lawnmowers and hatchery equipment.

- New discharge pipes were installed and modifications were made to the degassing towers on wells 2,3 & 6.

- Constructed and installed metal head box covers on B raceways.

NFH improvements scheduled for 2003 include:

- Develop hatchery pamphlets for self-guided tours.

- Replace windows in residences 2 & 3 and in the hatchery office.

- Budget for aluminum screens and dam boards in B raceways.

- Construct and install new degassing towers on wells 4 & 5.

- Purchase a new ¾-ton pickup to replace the 1991 1-ton pickup.

- Purchase and install new carpet in residence #1.

- Replace the Kenworth transport truck.

- Install a garage door in the lower shop.

- Replace the garage doors in the upper shop.

PUBLIC RELATIONS

As in past years, NFH was a focal point for many visitors, tours, and special groups. An estimated 4,000 tourists visited the NFH In 2002. Most visitations came through the late spring and summer months although with year-round schooling, tours were scheduled spring, summer and fall. A total of forty-five guided tours were given to area school, church, and Boy Scout groups. The NFH participated in three job shadows during 2002. Three 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 and reservists, hosted the Free Fishing Day clinic, which saw 500 visitors/fishermen catch an estimated 800 fish. The largest fish caught was a five-pound rainbow trout and several more weighed over three pounds. Free Fishing Day at NFH was again a big success and will be continued in the future. We felt the “kids only” session from 8:00 a.m. to noon continued to be very popular and successful. The Gem State Fly Fishing Group again held 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 2002 included Rick Alsager, Fish Hatchery Manager II; Dan Baker & Brian Malaise, Assistant Fish Hatchery Managers; Bob Turik, Fish Culturist; Gary Ady and Dick Bittick, Fish Transport Operators. Bio-aides for 2002 included Travis Brown, Ken Felty and Shane Claiborn. Chuck Kiester assisted with the kokanee spawning operation and fish marking. Six area students assisted with fin clipping projects during 2002. One high school student assisted hatchery personnel through a work-study program. Volunteers have also helped on a number of projects throughout the year, donating over 123 hours of time.

Dan Baker was promoted to hatchery manager at Eagle Fish Hatchery in August; and in December, Brian Malaise lateral transferred from Eagle Fish Hatchery to NFH to fill the assistant hatchery manager position.

APPENDICES

Appendix 1. Total net fish production at Nampa Fish Hatchery, 1994 through 2002

Year	Put-and-Take Number	Put-and-Take Pounds	Put-grow-and-take Number	Put-grow-and-take Pounds	Total Number	Total Pounds	Feed Pounds	Feed Costs	Feed Conversion
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

* 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 2002

Year	Total cost through grow - out: Total Cost	Cost/1000 Fish	Cost/ Pound	Cost/ Inch	Mean Length in inches	Total cost through stocking: Total Cost	Cost/1000 Fish	Cost/ Pound	Cost/ Inch
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	$339,398	$163.25	$0.91	$0.024	7.75	$400,631	$192.70	$1.08	$0.029

Appendix 3. Fish requested and produced at Nampa Fish Hatchery, 2002

Species/Strain	Size	Production Goal	Actual Production	% of Goal Achieved
Lahontan cutthroat trout (C6)	1-3 inches	203,000	219,106	107.9%
Triploid Kamloops x steelhead trout (TT)	3-5 inches	0	188,894	0.0%
Triploid rainbow trout (T9)	3-5 inches	75,000	72,439	96.6%
Triploid Kamloops trout (KT)	3-5 inches	528,000	588,273	111.4%
Fall chinook(FC)	3-5 inches	0	34,188	0.0%
Fall chinook(FC)	6-8 inches	40,000	40,986	102.5%
Triploid Kamloops x steelhead trout (TT)	8-12 inches	750,000	753,510	100.5%
Triploid rainbow trout (T9)	8-12 inches	76,000	88,663	116.7%
Triploid Kamloops trout (KT)	8-12 inches	80,000	81,410	101.8%
Totals:		**1,752,000**	**2,067,469**	**118.0%**

Appendix 4. Eyed-eggs received at Nampa Fish Hatchery, January 1 to December 31, 2002

Date Received	Species/Strain	Source	Number	Destination	Cost/1000 fish
02/11/02	Triploid rainbow trout	Hayspur	117,780	SW/Reg	N/C
04/24/02	Triploild kamloops trout	Hayspur	104,800	C Reg	N/C
05/01/02	Lahotan cutthroat trout	Omak	351,000	SW/Reg & US Reg	N/C
050/2/02	Triploid kamloops trout	Hayspur	45,881	Salmon Region	N/C
05/02/02	Triploid rainbow trout	Hayspur	48,464	Salmon Region	N/C
06/06/02	Triploid kamloops x steelhead trout	Trout Lodge	439,995	SW/Reg & Salmon Reg	$25.00
06/11/02	Triploid rainbow trout	Hayspur	27,428	Salmon Region	N/C
06/27/02	Triploid kamloops x steelhead trout	Trout Lodge	502,775	SW Reg, MV Reg, P Reg & Salmon Reg	$25.00
09/25/02	Triploid kamloops x steelhead trout	Trout Lodge	224,600	SW Reg	$25.00
10/16/02	Triploid kamloops trout	Hayspur	102,523	Salmon Region	N/C
12/17/02	Triploid kamloops trout	Hayspur	16,775	SW Region	N/C
12/17/02	Triploid rainbow trout	Hayspur	298,787	SW Region	N/C
Total:			**2,280,808**		

	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, 2002

Species/Strain	Source and Date Received	Number Received	Number Produced	Pounds Produced	% Survival Egg to Plant	Destination
Lahontan cutthroat trout	Omak 5/02	200,000	143,120	360	71.6	Southwest Region
Lahontan cutthroat trout	Omak 5/02	151,000	75,986	210	50.3	Southeast Region
Totals:		**351,000**	**219,106**	**570**	**62.4%**	

Appendix 6. Fingerlings produced at Nampa Fish Hatchery, 2002

Species/Strain	Source	Date Received	Number Received	Number Produced	Pounds Produced	% Survival Egg to Plant	Destination
Triploid Kamloops Trout	Hayspur	11/01& 12/01	964,381	588,273	12,710	61.0	Southwest & Clearwater Region
Triploid Rainbow Trout	Hayspur	2/02	122,777	72,439	955	59.0	Southwest Region
Triploid kamloops x Steelhead	Troutlodge	6/02	242,287	188,894	4,830	78.0	Magic Valley, Clearwater & Upper Snake Regions
Fall Chinook	Cabinet Gorge	1/02	78,933	75,174	3,900	95.2	Panhandle & Southwest Regions
Totals:			**1,408,378**	**924,780**	**22,395**		

Appendix 7. Catchables produced at Nampa Fish Hatchery, 2002

Species/Strain	Source	Date Received	Number Received	Number Produced	Pounds Produced	% Survival Egg to Plant	Designation
Triploid Kamloops Trout	Hayspur	6/01& 11/01	142,824	81,410	34,395	57.0%	Panhandle & Salmon Regions
Triploid Rainbow Trout	Hayspur	6/01	161,205	88,663	26,635	55.0%	Panhandle & Salmon Regions
Triploid kamloops x Steelhead	Troutlodge	6/01 & 9/01	1,032,205	753,510	252,135	73.0%	Panhandle, Clearwater, Southwest, Magic Valley Regions
Totals:			**1,336,234**	**923,583**	**313,165**		

Appendix 8. Catchables transferred from NFH to other hatcheries throughout the state in 2002.

Hatchery	Species	Number	Pounds	Fish/pound
Clearwater Fish Hatchery	TT	41,718	14,178	2.9
Clearwater Fish Hatchery	KT	11,960	4,000	3.0
Cabinet Gorge Fish Hatchery	TT	7,370	2,700	2.7
Hayspur Fish Hatchery	TT	45,375	14,650	3.1
McCall Fish Hatchery	TT	93,577	32,685	2.9
Mullan Fish Hatchery	TT	47,640	15,947	3.0
Sandpoint Fish Hatchery	TT	90,132	27,675	3.3
Sandpoint Fish Hatchery	KT	8,613	3,300	2.6
Sawtooth Fish Hatchery	T9	45,785	12,500	3.7
Totals:		**392,170**	**127,635**	

Appendix 9. Fingerling transferred form NFH to other hatcheries throughout the state in 2002

Hatchery	Species	Number	Pounds	Fish/pound
Ashton Fish Hatchery	TT	45,018	610	73.8
Cabinet Gorge Fish Hatchery	KT	9,990	270	37.0
Sandpoint Fish Hatchery	KT	2,075	105	19.8
Totals:		**57,083**	**985**	

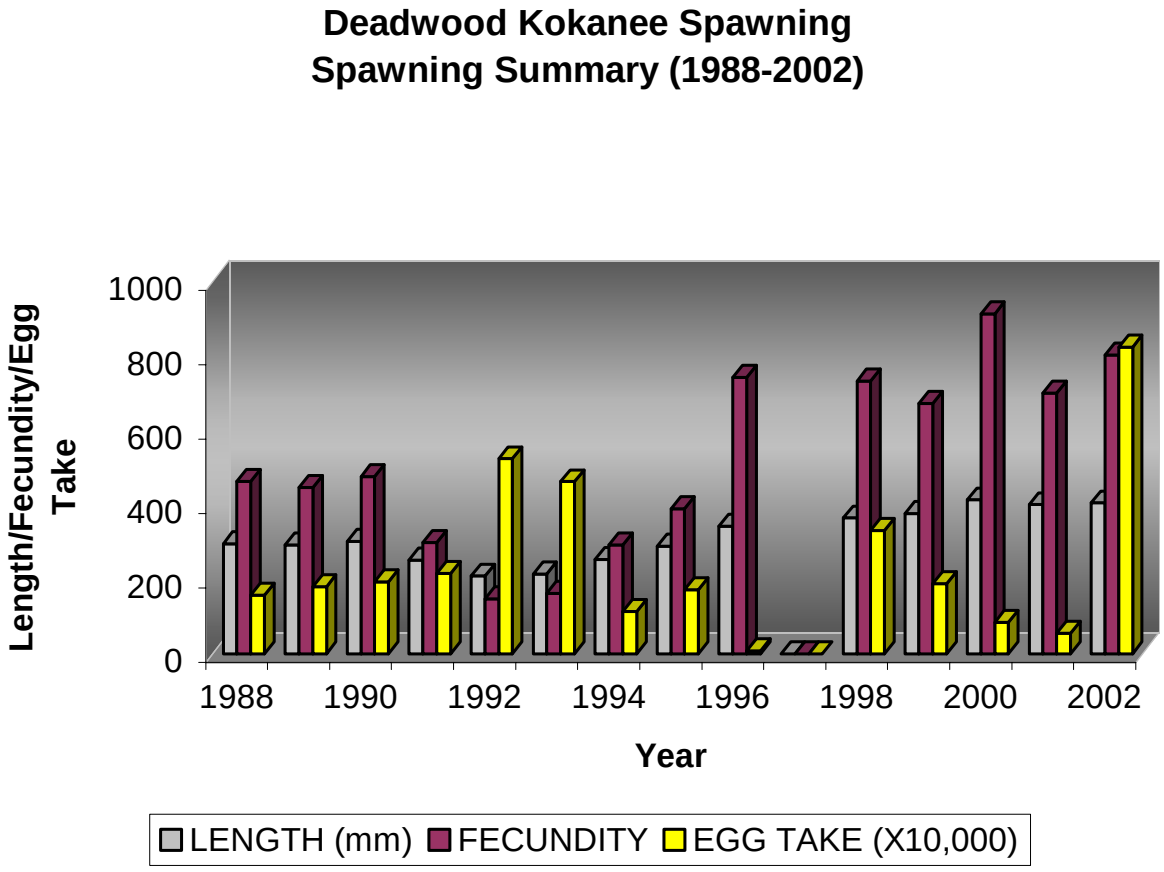
Appendix 10. Nampa Fish Hatchery Feed cost, 2002

Supplier/Source	Size/Type	# Boxes/Bags	Pounds	Price/lb.	Feed Charges
Moore-Clark					
Apollo	Starter #2		352	0.82	$288.64
Apollo	1.2 mm		528	0.60	$316.80
Apollo	1.5 mm		1,452	0.40	$580.80
Nutra Plus	Mash		88	0.93	$81.84
Nutra Plus	Starter #0		660	0.91	$600.60
Nutra Plus	Starter #1		748	0.91	$680.68
Nutra Plus	Starter #2		1,364	0.86	$1,173.04
Nutra Plus	1.5 mm		2,200	0.62	$1,364.00
Nutra Plus Proactive	Starter #3		528	0.97	$512.16
Nutra 2000	Starter #0		176	1.06	$186.56
Nutra 2000	Starter #1		352	1.06	$373.12
Nutra 2000	Starter #2		220	1.01	$222.20
Nutra 2001	Starter #3		176	0.95	$167.20
Nutra 2000	Grower 1.2 mm		660	0.91	$600.60
Clark's Fry	Grower 1.2 mm		528	0.74	$390.72
Clark's Fry	Grower 1.5 mm		528	0.50	$264.00
Clark's Fry Proactive	Grower 1.2 mm		572	0.76	$434.72
Clark's Fry Proactive	Grower 2.0 mm		1,760	0.53	$932.80
Nutra Sustain	Starter #0		176	0.92	$161.92
Nutra Sustain	Starter#1		44	0.91	$40.04
Total:			**13,112**		**$9,372.44**
Freight:					**$1,366.10**
Grand Total:					**$10,738.54**
Rangen					
Dry Crumble	Swim-up	3 Sacks	150	0.43	$64.50
Dry Crumble	Starter #1	31 Sacks	1,550	0.38	$592.10
Dry Crumble	Starter #2	88 Sacks	4,400	0.38	$1,680.80
Dry Crumble	Starter #3	340 Sacks	17,000	0.26	$4,460.80
450 floating	1/16 in. pellet	130 Sacks	6,500	0.37	$2,428.40
450 floating	3/32 in. pellet	71 Sacks	3,550	0.26	$926.91
450 floating	1/8 in. pellet	531 Sacks	26,550	0.26	$6,932.21
450 floating	3/32 in. pellet	Bulk	18,620	0.25	$4,655.00
450 floating	1/8 in. pellet	Bulk	253,120	0.25	$63,558.43
Dry Crumble	Starter #4	52 Sacks	2,600	0.57	$1,486.68
450 floating med.	3/32 in. pellet	40 Sacks	2,000	0.47	$944.40
Total:			**336,040**		**$87,730.22**
Freight:					**2,258.15**
Grand Total:			**349,152**		**$89,988.37**

Appendix 11. Kokanee egg-take at Deadwood Reservoir by Nampa Fish Hatchery, 2002

Lot Number	Spawn Date	Females Spawned	Green Eggs	Eyed Eggs	% Eye-up
1	20-Aug-02	334	311,239	139,995	45.0%
2	23-Aug-02	387	306,239	174,994	57.1%
3	27-Aug-02	237	191,505	136,506	71.3%
4	30-Aug-02	69	14,293	11,904	83.3%
Totals:		**1,027**	**823,276**	**463,399**	**56.3%**

Appendix 12. Kokanee spawning length, fecundity, egg-take (x1000), Nampa Fish Hatchery, (1992-2002)



IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL REPORT

SANDPOINT FISH HATCHERY

Zach Olson, Fish Culturist

INTRODUCTION

Sandpoint Fish Hatchery (SPFH) is located two miles west of the town of Sandpoint in Bonner County, on the south side of the Pend Oreille River. The Idaho Department of Fish and Game (Department) constructed SPFH in 1908, with additional funding provided from the Bonner County Sportsmen's Club. The hatchery is currently owned and operated by the Department and is funded with revenues 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 Fish Hatchery in 2000, the SPFH has taken over the annual stocking of 22 lakes with catchable sterile rainbow trout *Oncorhynchus mykiss*. In even-numbered years, high mountain lakes are stocked with sterile kamloop (KT) rainbow and westslope cutthroat *O. clarki* trout fry. This program entails 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 27 lakes.

In even-numbered 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. In odd-numbered years, MFH is responsible for stocking all high mountain lakes in the southern portion of Region 1 via fixed-wing aircraft.

Sandpoint Fish Hatchery is in operation from mid-March through October and is staffed with one 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 I position at CGFH oversees operations at SPFH and supplies additional labor when necessary. Even during the off-season, there is a great deal of yard maintenance at SPFH that needs to be completed on a regular basis due to its location in a residential neighborhood.

Water Supply

The hatchery receives its water from Murphy's Spring, which flows into a pipeline located a quarter-mile southwest of the hatchery. The spring supplies the hatchery with 500-600 gallons per minute (gpm) of water. Temperatures range from 44ºF to 48ºF 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 hatchery building can divert flows between the indoor vats and the outdoor raceways. Four new valves were recently installed in the parking lot at the hatchery. Two of the valves operate as isolation valves and the two remaining valves allow water diversion into new outdoor raceways and/or the Nature Center planned for construction in 2003. An additional valve at the spring compensates for overflow situations by spilling water back into Murphy Creek. All valves are adjusted to allow water levels in 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), 18 concrete vats (15-ft x 2.5-ft x 3-ft) inside the hatchery building, and two outdoor concrete raceways (100-ft x 5-ft x 2-ft). The carrying capacity of these raceways is 25,000 fish 10-inches in length.

FISH STOCKING

Catchable size triploid rainbow trout (~9-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. The fish supplied for redistribution in 2002 were Troutlodge Triploids from Nampa Fish Hatchery (NFH). No production number was notated in 2002, as the redistribution fish were not fed. A total of 104,200 fish weighing 31,575 lbs (3.3 fpp) were stocked between April and July. The fish planting scheduled for late March was cancelled due to road restrictions and was added to April's stocking request. September rainbow stocking was done from CGFH, as SPFH water supply was being renovated. A total of 6,885 fish weighing 2,087 lbs (3.2 fpp) were planted. Twenty-two different bodies of water received 111,085 catchable rainbows. In addition, the hatchery provided fish for a number of fishing clinics including Free Fishing Day and a clinic held at the Wal-Mart shopping center. The cost of stocking fish from SPFH, based on employee wages, vehicle mileage rates, and transportation from NFH was $16,264.64. Redistribution streamside cost per fish at was $0.1464 (Appendix 1).

Eyed-egg shipments were received from Hayspur Fish Hatchery (HFH) and West Slope Trout Company (WSTC) of Ronan, Montana, for the stocking of 27 high mountain lakes in Region 1 with swim-up fry. Five lakes were stocked with KT rainbows, and 22 lakes were stocked with westslope cutthroat. High mountain lake stocking started on July 29 and was completed by September 4. A total of 34,700 KT rainbow eggs were received on June 4 from HFH. Due to poor survival, only 18,150 (52%) fry were stocked. Sandpoint Fish Hatchery fell 3,450 fish short of the 21,600 stocking request for rainbow fry. A shipment of 65,000 westslope cutthroat eggs was received on July 12 from WSTC. After swim-up, a total of 56,150 cutthroat fry were stocked. All stocking requests for 49,000 fry were met. Two thousand cutthroat fry were stocked into Hidden Lake to make up for the shortfall from rainbow fry stocking. All swim-up fry were stocked within two weeks after ponding. Fish were fed just enough feed to get them started and prevent pinheading. The total cost of stocking high mountain lake fry from SPFH, including employee wages and vehicle mileage, was $4,794.27. Average cost for high mountain lake plantings was $0.0675 per fish (Appendix 2).

All high mountain lake fish plants from SPFH were accomplished by backpack or on horseback. Department personnel from CGFH, staff from Region 1, reservists, and volunteers assisted in stocking high mountain lakes.

Streamside cost for SPFH stocking was $21,058.91 for 185,385 fish. The cost per fish was $0.1136 (Appendix 3).

HATCHERY IMPROVEMENTS

Hatchery improvements in 2002 included:

- A new John Deere front-deck riding lawn mower was purchased.
- Improved hatchery intake at Murphy's Spring by excavating the area where the spring empties into the collection basin, installing a liner with perf-pipe, and covering up the spring.
- Installed four new valves at SPFH to divert or shut down water to the hatchery building, future outside raceways, and future Nature Center needs.
- The Nature Center Committee began construction of walking trails on the south side of Lake Shore Drive.
- A new 2001 ¾-ton Dodge 4x4 pickup was acquired for catchable hauling.
- A new 12 cubic foot chest freezer for storing ice was purchased.

HATCHERY NEEDS

- Construction of larger outdoor raceways to accommodate truck and trailer loads of catchable-size fish. This will reduce the number of trips from NFH. Work is scheduled for summer 2003.
- Repair the hatchery building interior ceiling panels, windows, and re-paint the floors.
- Paint the exterior of hatchery building.

PUBLIC RELATIONS

The hatchery receives a fair number of visitors because of its proximity to Sandpoint. 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 tours and provide information to the public. Hatchery personnel have more contacts 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 club meetings to communicate hatchery information and issues to them

ACKNOWLEDGEMENTS

The SPFH staff would like to thank the staff at CGFH: John Rankin (Fish Hatchery Manager I), Bruce Thompson (Assistant Hatchery Manager), and John Suhfras (Maintenance Craftsman) for their assistance when additional manpower was needed. Special thanks should be given to reservists Scott Cress, Darrell Broadhurst, and Conrad Lar who each made multiple trips during high mountain lake stocking. In addition, appreciation is given to Region 1 personnel and volunteers for their knowledge and manual assistance during high mountain lake stocking.

APPENDICES

Appendix 1. Sandpoint Fish Hatchery redistribution cost of catchable rainbow trout, 2002

Expenditure	Cost Per Mile	Miles Driven	Total
Employee Wages			$ 8,442.00
¾-ton GMC	$.288	2,297	$ 661.53
¾-ton Dodge	$.288	4,833	$ 1,391.90
2-TON GMC	$.396	3,897	$ 1,543.21
Nampa Hauling	$1.91	2,216	$ 4,226.00
TOTAL COST			**$16,264.64**

Appendix 2. Cost of high mountain lake stocking (rainbow & cutthroat fry).

Cost Per Mile	Miles Driven	Miles Driven	Total
Employee Wages			$3,968.00
¾-ton GMC	$.288	2,869	$ 826.27
TOTAL COST			**$4,794.27**

Appendix 3. Sandpoint Fish Hatchery operating cost of fish at streamside.

Program	Distribution Cost	# Fish	Cost/Fish
Catchables	$16,264.64	111,085	$0.1464
Mountain Lake	$ 4,794.27	74,300	$0.0675
TOTALS	**$21,058.91**	**185,385**	**$0.1136**

IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL REPORT

SAWTOOTH FISH HATCHERY

Brent Snider, Hatchery Manager II
Jeff Heindel, Assistant Hatchery Manager
Jeff Seggerman, Fish Culturist
Mel Hughes, Fish Culturist

INTRODUCTION

Sawtooth Fish Hatchery (SFH) is a US Fish and Wildlife Service (USFWS) Lower Snake River Compensation Plan (LSRCP) hatchery that has been in operation since 1985. The Idaho Department of Fish and Game (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 request in 2002 with the exception of the following: 100 fish to Grouse Lake at the request of the Region because of warm water, 600 fish to Squaw Creek Pond, 2,000 fish to Yankee Fork Dredge ponds at the request of the Region because of an abundance of residual steelhead in the ponds, and 5,500 fish to the Salmon River because of fish shortages.

Nampa Fish Hatchery (NFH) supplied SFH with sterile Hayspur rainbow triploids (T9s) for stocking. A total of 46,540 T9s were received at SFH on three shipping days in June and July of 2002. Based on 15 sample counts and 55 fish plants, SFH personnel stocked a total of 44,300 fish in lakes and streams in the area. Due to rearing space limitations at SFH, Nampa Fish Hatchery stocked Stanley, Pettit, and Alturas lakes in 2002. In addition to what was stocked, SFH picked 637 fish as mortalities (1.4% overall mortality) throughout the course of the summer.

The National Marine Fisheries Service (NMFS) permit #1188, which will expire on December 31, 2004, outlines resident rainbow trout releases in anadromous waters in the Salmon River drainage. Permit #1188 dictates that 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 44 fish plants from SFH to the Salmon River, Valley Creek, and Yankee Fork Dredge ponds, fish averaged 3.8 fish per pound (fpp) and 9.08 inches (230 mm) in total length. The permit also dictates that fish in the Upper Salmon River cannot be stocked until after June 15 and should have an adipose fin clip. Only fish with the adipose fin clip may be kept, thereby protecting wild rainbow trout and anadromous smolts. All T9s received at SFH in 2002 were adipose clipped by personnel at NFH and delivered to SFH 21 days later to allow for withdrawal of MS-222 per chemical label requirements.

The catchable-size rainbow trout were fed a maintenance diet throughout the summer. A total of 176 lbs of Bio-Oregon 3.0 mm soft moist, 968 lbs of Rangen's 3/32 soft moist grower, and 300 lbs of Rangen's 1/8-inch extruded pellets were fed throughout the course of the summer. The soft moist Bio-Oregon 3.0 mm and soft moist Rangen's 3/32 soft moist grower were left over from the chinook and sockeye programs. The value of these diets was $732.16. The Rangen 1/8-inch extruded pellets cost $129.80. Total cost for fish feed for 2002 catchable rainbow trout was $861.96.

For the fourth consecutive year, fish were stocked in Blue Mountain Meadow Pond, located on the Challis Golf Course in Challis. The pond was built as a cooperative effort between the Department and the City of Challis as a children's fishing pond. Hatchery personnel stocked 900 fish into this pond over a period of four months.

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

The *Fishing Sawtooth Valley* brochure is distributed from the SFH visitor center and surrounding businesses to provide information about where to catch fish in the area, as well as color pictures to educate the public about protected species such as bull trout. A short narrative describing the plight of anadromous fish is included. The entire back of the brochure is a map indicating where SFH stocks fish. This helpful brochure serves the approximately one million visitors to the Sawtooth National Recreation Area each year.

Another Kid's Fishing Day was sponsored by SFH at the Sawtooth Display Pond on Free Fishing Day, June 8, 2002. An estimated 60 children participated in fishing activities between the hours of 11:00 am and 3:30 pm. Hatchery staff stocked over 200 catchable-size rainbow trout prior to Free Fishing Day. Fish were slow in cooperating with angler intentions early on, but by the end of the day the vast majority of the kids had landed fish. Thanks to all who participated.

PLANS FOR 2003

Due to a full production year for BY02 chinook, SFH will only plant flowing water sites in 2003.

In 2003, SFH plans to resume high mountain lake stocking of westslope cutthroat trout *Oncorhynchus clarki lewisi*, by airplane in the Salmon Region.

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

ACKNOWLEDGEMENTS

The SFH would like to thank Rick Alsager and the Nampa Fish Hatchery crew for their cooperation in making 2002 successful. Special thanks go to Dick Bittick and Gary Ady for transporting fish from Nampa and stocking the big lakes in the Stanley Basin. Jacob Shull, Bio Aide, developed the stocking schedule, performed daily stocking, and entered the weekly data for SFH in a manner that exceeded expectations.

IDAHO DEPARTMENT OF FISH AND GAME

2002 ANNUAL REPORT

RESIDENT HATCHERIES

FISH HEALTH REPORT

Douglas R. Burton, Resident Hatchery Pathologist

INTRODUCTION

The primary duties of the Resident Hatchery Pathologist (RHP) 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 Department. The author, Douglas R. Burton, has held the RHP position since 1993. The RHP and the Anadromous Hatchery Pathologist (AHP) 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 (AFS) 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's (USFWS) INAD program in 1998. Chemical compounds used by resident hatcheries under this program during 2002 included Oxytetracycline (OTC), Aqui-S (isoeugenol), and luteinizing hormone-releasing hormone analogue (LHRHa). Oxytetracycline is used to treat systemic bacterial infections in many hatcheries; Aqui-S is an experimental fish anesthetic tested at Henry's Lake; and LHRHa was used to speed maturation of male cutthroat trout at Hayspur Hatchery. Statewide, the single most significant fish disease in the Department's resident hatchery program was bacterial coldwater disease (CWD), caused by *Flavobacterium psychrophilum*. This is 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 increased from 12 in 2001 to 36 in 2002 (25 at Hagerman State Hatchery, alone). The impact of the disease seems to cycle every other year, and this was the year for an increase, but that only partially explains the three-fold increase in INADs. A large portion of the increase was due to a more aggressive approach to treating first-feeding fish in the Hagerman State Hatchery vat building that required more documented treatments.

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. This was the second year that we have required all Department personnel to seek such permits and compliance has been very good. The goal of the program is to increase our ability to track fish imports, eliminate the appearance of a double standard between the Department and the general public, and reduce the risk of adversely impacting Idaho's fishery resources.

The RHP and EFHL personnel examined 105 cases for Department resident hatchery programs during 2002 (19 routine hatchery inspections, 22 inspections of feral brood fish, and 64 diagnostic cases). In addition, one inspection was done for Rangen's Aquaculture (rainbow trout purchased by Idaho Power Company [IPC] for release in American Falls Reservoir); one inspection was done on rainbow trout at the University of Idaho's Hagerman Fish Culture Experiment Station; 19 research cases were examined for various hatchery programs; and 42

wild salmonid inspections were done for various Department programs around the state. The majority of the wild fish inspections concentrated on the presence or intensity of *Myxobolus cerebralis* (MC), the causative agent of whirling disease (WHD).

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

Four of four diagnostic examinations documented CWD as the single significant clinical disease at American Falls Hatchery in 2002 (Appendix A). Disease episodes followed a pattern typical for CWD, i.e., a rapid onset of clinical signs and mortality in 4-inch to 6-inch rainbow trout, and pathology that included swollen and necrotic kidney and spleen, ascites, and muscular lesions that start from the abdominal cavity and progress outward. In contrast, episodes in 2000 and 2001 involved larger fish (10-inch to 12-inch), and the signs included numerous large, sub-dermal furuncles, randomly distributed over the body. The 2002 episodes also appeared to be much more acute and threatened significantly higher mortality rates than in previous years. The fish were treated with OTC under six separate INAD protocols at the standard dosage and duration. Response to the treatments was good, with mortality rates returning to near normal.

ASHTON HATCHERY

The RFP visited the hatchery in January 2002 to sample the coming year's rainbow trout catchable 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 Fish Hatchery continues to be at risk for MC contamination, because the hatchery's 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.

CABINET GORGE HATCHERY

The RFP sampled spawning kokanee adults at the Sullivan Springs trap on December 2 (Appendix C). No replicating viruses, RS organisms, or *Myxobolus* spores were detected. The condition of those fish appeared very good, with an observed occurrence of encysted cestodes in the pyloric cecae similar to past years, but no nematodes were noted in the swim bladders. There have never been any gross signs indicating that these parasites cause significant adverse effects on the fish.

A single *Myxobolus* spore was detected in the pepsin/trypsin digest test (PTD) from 1 of 12 five-fish pools taken in 2001 from the spawning kokanee at Sullivan Springs. Pepsin/trypsin digest is a relatively quick and easy test, but it only detects spores without enough sensitivity to identify their species. Polymerase chain reaction (PCR) testing was done on this archived

sample in August 2002 in an attempt to confirm the species of *Myxobolus* through detection of specific genetic material. The test was negative for both MC and *M. neurobius*. Thus, while we do not know what species the spore was, we are reasonably certain of what it was not. The State of Montana has confirmed MC in Whitepine Creek, a tributary of the Lower Clark Fork River between Thompson Falls and Trout Creek (personal communication from Jim Peterson, Montana Department of Fish, Wildlife and Parks). The proximity of this site to waters in Idaho is of concern and should stimulate much closer monitoring of wild fish from the region.

Unusually high mortalities were noted in swim-up fall chinook fry late in December. Samples were shipped from Cabinet Gorge Fish Hatchery to EFHL and tested for viruses, but no replicating viruses were detected. Losses declined without treatment and may not have been due to an infectious agent.

CLEARWATER HATCHERY

The production facilities at Clearwater Fish Hatchery were full of anadromous fish in 2002, and are expected to be so for the next few years. A small group of rainbow trout fingerlings were reared for the Panhandle Region, and the hatchery continued to redistribute catchable rainbows reared at Nampa Fish Hatchery. The RHP did not visit Clearwater Fish Hatchery, but the AHP made frequent visits and was available had there been any problems.

GRACE HATCHERY

Grace Fish Hatchery was back to full production in 2002 after a period of reconstruction. At the same time, the region was affected by a drought that significantly reduced the water flow from the hatchery springs. As a result of these factors, more fish health problems were evident. Specifically, CWD was the diagnosis in five of six inspections, with *motile aeromonad septicemia* (MAS) in the sixth (Appendix D). Treatments with OTC-medicated feed under INAD protocols were generally successful in reducing mortalities.

An experiment was set up on August 15 to test the efficacy of Penicillin G (Pen-G) in a static bath to prevent CWD in Westslope cutthroat trout sac-fry. Chronologically, this was the third such trial (see Hagerman State Hatchery and McCall Hatchery). Four vats were available (1, 2, 3 and 10), so two (2 and 3) were selected for treatment and two (1 and 10) for controls. Standpipes were sealed and water re-circulated using electric submersible pumps placed below the tail screens. The pumps are rated to move 18-20 gallons per minute (gpm), and tests confirmed that volume. Pen-G was added to each vat to create a concentration of 10 International Units (IU)/ml). Air stones connected to a compressed oxygen bottle were placed in each vat, and sealed bags of ice were used to maintain water temperatures. The goal was to treat each vat for eight hours. Approximately two hours into the treatment, the fish began to show signs of lethargy and became totally inactive within the next 30 minutes. Fresh water was turned on and the fish slowly recovered. A decision was made to continue the treatment in one vat only (number 3), to reduce the risk of inadvertently killing a large number of fish. The same thing happened following two more hours of treatment, so the trial was discontinued. The final total treatment times were 3.5 hours for vat 2 and 5.5 hours for vat 3. Most of the fish seemed to recover, although losses were slightly elevated in both treated vats for several days.

Discussions with the hatchery manager and others have led me to think that the problems during treatment were from a buildup of carbon dioxide and might be alleviated with a packed column to break out the gas.

The results of Pen-G for bath treatment for CWD inhibition were equivocal, in that clinical disease broke out in the fish in September, but the impact of disease was not uniform among the vats. Losses to disease were greatest in vat 10 (control) followed in order by vats 3 and 2 (treatment), and then least in vat 1 (control). An OTC-medicated feed treatment successfully controlled the episode. Further trials need to be done on fish that are less expensive and less critical to Department programs to determine if the carbon dioxide theory is correct and then to determine if a full 8-hour treatment is more effective. Unfortunately, cutthroat trout from this source are the most predictable when it comes to breaking out with CWD at an early life stage.

HAGERMAN STATE HATCHERY

A total of 46 cases (45 diagnostic and 1 inspection), were examined from Hagerman State Fish Hatchery in 2002, with 35 cases involving some level of *F. psychrophilum* infection (Appendix E). This was a significant increase from 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. If this is true, 2002 was an exceptionally high peak for CWD, while IHN was definitely much less significant until November and December, when the 2003 production cycle was beginning.

Multiple pathogens are usually detected in clinically ill fish at Hagerman Hatchery. This was true in 33 of the 45 diagnostic cases (73%). Because of this, diagnosis and treatment choice is dependent upon the predominant clinical signs. Infectious hematopoietic necrosis virus (IHNV) was detected 13 times, each time in combination with one or more bacterial pathogens (*F. psychrophilum*, *F. columnare,* or an *Aeromonas* species). Approximately half of these cases appeared to be clinical IHN episodes, while the remainder showed signs more typical of bacterial septicemia with the virus in a carrier state. Experience has taught that if the viral infection appears to be in a carrier state, 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 the treatment of other conditions 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, using the existing label or an INAD protocol, whichever was appropriate for the situation. Success of the treatments was highly variable, usually dependent upon the size of the fish and speed of diagnosis. Specifically, the larger the fish and the quicker the application of therapy, the better the response.

A total of 25 INAD protocols were used to treat CWD or COL. The number of protocols was significantly higher 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. Randomly selected vats of fish were

assigned to be untreated controls, in order to provide some means of evaluating the trials. No significant losses were observed in either the control or treated vats. (This was good for the fish and the hatchery manager, bad for the experiment).

The RHP confirmed *Ichthyobodo* parasites on the gills of fry in the hatchery vats one time. This is a common condition at Hagerman, and the hatchery personnel generally diagnose and treat outbreaks without requiring the assistance of the RHP.

A first trial of Pen-G bath treatment was applied to Troutlodge rainbow fry in the upwelling incubators at Hagerman on June 28. A 16-gallon tub was placed below the incubator outlet and a submersible electric pump was used to recirculate the water back through a garden hose into the incubator inlet. Two adjacent vats were set up to run simultaneously. The first problem with the design to become evident was that the lack of a screen on the incubator allowed fry to flow out into the tub and through the pumps. Nets were set to catch the fry, but they were not very efficient and certainly stressful to the fish that they did catch. The fish that were caught in the pumps were killed. Next, the water temperature rapidly increased due to heat generated by the pumps. Since Hagerman's water supply is naturally 59^{o}F (15^{o}C), this rapidly began to stress the fish. Fresh water was reconnected and bags of ice purchased to alleviate this problem. The test was then continued in one incubator because the RHP was convinced that all of the fish in the second were already dead! The test was discontinued after a total of about six hours, because the fish in the final incubator were also becoming lethargic and the RHP was reluctant to kill any more fish for the hatchery. (Remarkably, nearly all of the fish recovered in both incubators). This trial run was intended more to learn the deficiencies in application design than to test the efficacy of the drug in treating disease. Later trials at Grace and McCall hatcheries corrected some of the experimental design problems and were able to provide some data on the efficacy of the drug.

Aeromonas salmonicida, the causative agent of furunculosis (FUR), was again detected at Hagerman State Hatchery. This pathogen, as well as clinical FUR, has been detected at Hagerman for four of the last five years, and so it appears to be established in the Riley Creek system. The epizootics were treated successfully with Romet-30 incorporated in feed, under the existing label for the drug.

An inspection of 16 catchable-size rainbow in a raceway on the Riley Creek water supply was done to determine the presence of the parasite that causes proliferative kidney disease (PKD). Hagerman Hatchery was the first site of detection of this disease in Idaho, in about 1980. Since then, the incidence of the disease has declined, and the presence of the causative organism had not been confirmed since 1992. The nature of the causative organism, known for many years by the acronym "PKX", was not well understood. Only recently was it was given the scientific name *Tetracapsula bryosalmonae* (Canning, et al. 1999). In addition, PCR primers are now available (Saulnier and de Kinkelin 1997) that make detection of *T. bryosalmonae* much easier and more accurate than the old method of microscopically examining kidney smears. Of the fish sampled, one had a slightly swollen kidney, but tested negative by both microscopic examination and PCR. However, 2 of the 16 fish did test positive for *T. bryosalmonae* genetic material by PCR. The continued presence of the organism has been of academic interest, but the notable lack of clinical disease signs has kept it from being viewed as a serious management issue.

HAYSPUR HATCHERY

The RHPs work at Hayspur Hatchery involved considerable effort to inspect brood stock and brood stock replacement lots. The BY2000 replacement rainbow (R9) and Kamloops (K1) populations were inspected in June (Appendix F). No viruses, RS organisms, or *Myxobolus* spores, were detected. No significant bacteria were isolated from the K1 population, but carrier levels of *F. psychrophilum* and *A. hydrophila* were detected in the R9 population. Diagnostic tests were done on R9 adults in June and October. The diagnosis in June was MAS and the fish were treated with OTC-medicated feed. In October, fish were being lost to heavy infestations of *Gyrodactylus*, an external trematode parasite. Treatment with formalin baths removed most of the parasites. The BY2002 Connor Lake cutthroats experienced slightly elevated mortality and were diagnosed with low-level CWD, but losses dropped naturally, so no treatment was applied.

All BY2001 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. Unfortunately, most of these fish were lost to otter depredation during the summer, so there was no chance to evaluate the benefit of the vaccination. Two round ponds of BY2000 fish (one R9 and one K1) were given injection vaccinations prior to spawning. Blood was drawn from a random 60 fish in each population prior to injection, and again at 9 weeks (K1s) and 11 weeks (R9s) post-injection. Serum was harvested from all blood samples and stored at -80^{o}C until the samples could be shipped to the University of Idaho. Dr. Ken Cain's laboratory at the University will run the serum samples using enzyme-linked immunosorbent assay (ELISA) to quantify *F. psychrophilum* antibody titers. Results are pending.

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 this year. Eggs from individual females were held in isolation until the test results were available. Established protocol dictated that if a parent female should test positive for any virus or for RS, the resulting group of eggs was to be culled.

The R9 brood stock replacement spawning began on October 31, 2002 and continued into 2003. This report will include only those results from fish spawned in 2002. Ovarian fluids from 193 females were tested for viruses and RS. No pathogens were detected, so no eggs were culled. The hatchery manager has significant numbers of eggs requested for late winter to spring that he cannot provide from fish that spawn in October to December. So he is trying to take more replacement eggs from the small portion of the population that naturally spawn in January to March, in hopes that the resulting offspring will inherit the late-spawning characteristic. One group was taken in late January and more are planned if the fish cooperate. Disease test results from these groups will be reported in the 2003 Fish Health Report.

Kamloops brood stock replacement spawning ran from October 9 to November 25. Ovarian fluids from 154 females were tested for viruses and RS, no pathogens were detected, and no eggs were culled.

A new population of Westslope cutthroat trout, originating from Connor Lake, Canada, was added to Hayspur Hatchery's egg taking program this year. Fish in the wild population from which this lot originated typically mature about age-4, but a majority of this new captive population (BY2000) was discovered to be mature at age-1+. Sampling of spawning fish began on February 26 and continued to April 23. Ovarian fluids from 519 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.

All the eggs from the cutthroat trout were very small and of questionable quality, but the biggest problem seemed to be that the males were not as mature as the females. On March 5, 94 males were injected with LHRHa in an attempt to increase their sperm output. These males were checked seven days later. It was subjectively concluded that the percentage of the injected males producing an appreciable quantity of sperm was greater than the percentage of uninjected males that were doing so, and that the motility of the sperm, as observed under a compound microscope, was higher. Other options to induce spermatogenesis may be tested in the future.

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^{o}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 individuals, and sent them to the University of Washington for triploid analysis. A total of 12 groups were tested from the 2001-2002 spawning season (Appendix F). Ten of the twelve groups met the 95% or better goal, with the two deficient groups at 88% and 76%. A total of 475 individual fish were tested, of which 448 (94.3%) were triploid. Improvements have been made in the temperature monitoring system in the warm water baths in hopes of improving induction to meet the 95% goal. Similar testing will be done in 2003.

HENRYS LAKE HATCHERY

Fish health inspection samples were taken from spawning cutthroat trout at Henry's Lake Hatchery from March 7 through April 25, 2002 (Appendix G). Ovarian fluids were collected by hatchery personnel and shipped to EFHL where they were tested for viruses (168 females in 25 seven-fish pools) and RS by OCP-FAT (1,421 females in 203 seven-fish pools). A group of 60 fish (both males and females) were sacrificed for kidney FAT, tissue virology, bacteriology (10 fish) and *Myxobolus* tests. No viruses or RS organisms were detected in any of the tissue or ovarian fluid samples. As a result, no eggs were discarded. Bacteriology samples showed a carrier-level infection of *Flavobacter indologenes* species in 5 of 10 fish, but no other bacterial pathogens were detected. Pathogenicity of *F. indologenes* to fish is not well documented, but is probably much less than that of other members of the genus. *Myxobolus* spores were detected in 9 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 22 to November 4, 2002. Ovarian fluids were collected by hatchery personnel and shipped to EFHL where they were tested for viruses (38 females in 6 pools of 6 or 7 fish each) and RS by OCP-FAT (204 females in 7 five-fish, 20 six-fish, and 7 seven-fish pools). A group of 30 fish (both males and females) were sacrificed for kidney FAT, tissue virology, bacteriology (16 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 OCP-FAT. As a result, no eggs were discarded. Bacteriology samples detected *A. salmonicida* (1 of 16), *F. psychrophilum* (6 of 16), and *Pseudomonas fluorescens* (6 of 16). No clinical signs of these bacterial infections were evident. Offspring of this population have experienced clinical furunculosis; therefore it was recommended that rigorous disinfection of these eggs be done with iodophor prior to transfer to Ashton Hatchery. No *Myxobolus* spores were detected by the PTD method, although this population has been confirmed MC-positive in the past.

Aqui-S was tested on adult cutthroat trout at Henry's Lake Hatchery on April 11. Personnel from the USFWS Bozeman Fish Research Center conducted a pivotal study to support the registration of this compound for use as a food fish anesthetic. Hatchery personnel and the RHP assisted. Evidence suggests that Aqui-S may be somewhat less efficient than MS-222 for hatchery applications in that it has both longer induction and recovery times for cultured fish. But there continues to be hope that Aqui-S may be registered with no required withdrawal period before the fish may be available for human consumption. This would make the compound highly desirable from a fish research perspective. Plans have been discussed to repeat this experiment at the EFHL using hatchery chinook salmon, because anadromous fish are not readily available in Bozeman, Montana.

MACKAY HATCHERY

No significant clinical disease or fish losses occurred at Mackay Hatchery in 2002. The RFP visited the hatchery twice in 2002 to put out live-boxes of fish for a whirling disease exposure experiment, but did not sample any production fish. The exposure trial utilized Hayspur-strain rainbow trout that were reared at Mackay from eyed-eggs. Fish from this lot that were kept in an indoor hatchery vat provided the controls for the trial, while live-boxes containing fish were placed in the large raceway head box, the large raceway tailrace, at two positions in the settling pond, and in the outflow creek approximately 150 meters below the settling pond. After 10 days of exposure, the groups of fish were transported to the EFHL wet laboratory for 108 days of rearing/spore development. The separate groups were sampled on September 16 (Appendix H). No spores were detected using the PTD test on fish from the hatchery vat, the large raceway head box, or the large raceway tailrace. Spores were detected in fish from both locations in the settling pond and from the creek below the hatchery. Confirmation that these spores are indeed MC is pending, but the parasite has been confirmed from fish in the settling pond in the past. There are two significant findings from this trial. First is the discovery that infectivity, (i.e., the complete life cycle), has become established in the settling pond as well as in the hatchery branch of Warm Springs Creek. This demonstrates the significant risk for MC contamination to the hatchery production fish by passive vectors like mink or birds that move freely between the creek and the outside raceways. However, the probability of detecting such contamination is almost zero due to the extremely low levels of prevalence and intensity that are likely from such exposures. The second significant finding is that infectivity has not yet become established in the hatchery springs or production raceways at a level that could be detected by PTD. Because the springs and head boxes are covered, they do

not provide habitat for the alternate host worms. So it is reasonable to think that they will remain free of the parasite.

Mackay Hatchery received green eggs from the early-spawning kokanee in Deadwood Reservoir. The spawning population was inspected on August 20. No viruses, RS or *Ceratomyxa shasta* spores were detected. *Myxobolus* spores were detected by PTD in 5 of 12 five-fish pools. Confirmation tests on these samples are pending, but similar tests in the past have indicated the species is not MC.

MCCALL HATCHERY RESIDENT PROGRAM

Westslope cutthroat fry at McCall Hatchery have broken out with CWD shortly after first feeding for the two previous years. In anticipation of a third episode, a recirculating bath treatment of Penicillin G at 10 IU/ml was set up on August 5, 2002 to treat all of these fish while they were still in the incubator trays. The fiberglass trough in the vat room was filled with water and the appropriate amount of drug, and a tub below the drain caught the overflow. An electric submersible pump was used to take water from the tub back to the top of the trough, and bags of ice in the tub kept heat generated by the pump from significantly increasing the water temperature. Trays from the incubator stack were then placed in the trough. As previously reported in the Grace Hatchery section, the fish became lethargic within about 2 hours. Fresh water was applied until the fish recovered, and then the treatment was resumed. Total treatment time was about 6 hours. Unfortunately, due to flight schedules, most of the fish were stocked into high mountain lakes before there was a chance to evaluate the benefit of the treatment or to sample the fish. Steve Kammeyer, the Assistant Hatchery Manager, reported observing no evidence of disease while fish remained on station.

NAMPA HATCHERY

Bacterial CWD and MAS were diagnosed from three lots of Kamloops or rainbow trout at Nampa Hatchery (Appendix I). Two groups of fish were treated with OTC-medicated feed under INAD protocols, and the third group was treated under the existing label. All treatments were successful in reducing losses. Considering the total pounds of production, this was another good year for fish health at Nampa.

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APPENDICES

Appendix A. Summary report of Eagle Fish Health Laboratory results for American Falls Hatchery, January 1 – December 31, 2002

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2001	Trout Lodge	Rainbow trout--3N	02-094	3/20/02	-	-			-	-	+	-			DX: CWD; VIRO 0/5, *Flavobacterium psychrophilum* 4/4
2001	Trout Lodge	Rainbow trout--3N	02-168	4/23/02					-	-	+	-			DX: CWD; *F. psychrophilum* 8/8
2002	Trout Lodge	Rainbow trout--3N	02-431	9/6/02	-	-			-	-	+	-			DX: CWD; VIRO 0/4, *F. psychrophilum* 4/4
2002	Trout Lodge	Rainbow trout--3N	02-623	12/5/02					-	-	+	+			DX: CWD; *F. psychrophilum* 8/8

Appendix B. Summary report of Eagle Fish Health Laboratory results for Ashton Hatchery, January 1 – December 31, 2002.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2001	Hayspur	Rainbow trout--3N	02-015	1/10/02	-	-		-	-	-	-	-	-		DX: NPD; VIRO 0/42, FAT-RS 0/60, 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, 2002.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
Brood	Sullivan Springs	Kokanee	02-620	12/2/02	-	-		-					-		IX: NPD; VIRO 0/60, FAT-RS 0/60, PTD-WHD 0/60
2002	Big Creek	Fall chinook salmon	02-649	12/23/02	-	-	-								DX: VIRO 0/15, NAVHS 0/15

Appendix D. Summary report of Eagle Fish Health Laboratory results for Grace Hatchery, January 1 – December 31, 2002.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2001	Hayspur	Rainbow trout--3N	02-014	1/9/02					-	-	+	-			DX: CWD; *Flavobacterium psychrophilum* 4/4
2002	Hayspur	Kamloops trout--3N	02-043	2/15/02					-	-	-	+			DX: MAS; *Aeromonas hydrophila* 3/4, *Shewanella putrefaciens* 2/4, *Sphingomonas paucimobilis* 2/4
2001	Westslope	Cutthroat trout	02-454	9/13/02					-	-	+	-			DX: CWD; *F. psychrophilum* 4/4
2002	Hayspur	Rainbow trout--3N	02-455	9/13/12	-	-			-	-	+	-			DX: CWD; VIRO 0/4, *F. psychrophilum* 1/4
2002	Hayspur	Rainbow trout--3N	02-593	11/13/02	-	-	-		-	-	+	-			DX: CWD; VIRO 0/9, *F. psychrophilum* 6/8
2002	Hayspur	Rainbow trout--3N	02-621	12/3/02					-	-	+	-			DX: CWD; *F. psychrophilum* 4/4

Appendix E. Summary report of Eagle Fish Health Laboratory results for Hagerman State Hatchery, January 1 – December 31, 2002

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2001	Hayspur	Kamloops trout--3N	02-002	1/4/02	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, *Flavobacterium psychrophilum* 2/4, *Aeromonas hydrophila* 1/4
2001	Hayspur	Kamloops trout--3N	02-003	1/4/02	-	-			-	-	+	+			DX: CWD, MAS, BGD; VIRO 0/5, *F. psychrophilum* 4/4, *Aeromonas caviae* 4/4 (gills)
2001	Troutlodge	Rainbow trout--3N	02-004	1/4/02	-	-	-		-	-	+	-			DX: CWD; VIRO 0/5, NAVHS 0/5, *F. psychrophilum* 4/4
2001	Troutlodge	Rainbow trout--3N	02-005	1/4/02	+	-			-	-	-	+			DX: IHNV, COL, MAS; IHNV 1/1 (x5), IPNV 0/5, NAVHS 0/5, *Aeromonas caviae* 4/4, *F. columnare*-visual on gills
2001	Hayspur	Kamloops trout--3N	02-012	1/9/02					-	-	+	+			DX: CWD, MAS; *F. psychrophilum* 2/4, *Pseudomonas spp.* 1/4
2001	Troutlodge	Rainbow trout--3N	02-013	1/9/02	+	-			-	-	+	-			DX: IHN, CWD; IHNV 1/1(x5), IPNV 0/5, *F. psychrophilum* 3/4

Appendix E. continued

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2001	Troutlodge	Rainbow trout--3N	02-039	1/28/02	+	-			-	-	+	-			DX: IHN, CWD; IHNV 2/2(x3), IPNV 0/6, *F. psychrophilum* 2/6
2001	Troutlodge	Rainbow trout--3N	02-040	1/28/02	+	-			+	-	+	+			DX: IHNV, FUR CWD, MAS; IHNV 1/2 (x4), IPNV 0/4, *F. psychrophilum* 7/7, *A. hydrophila* 4/7
2001	Troutlodge	Rainbow trout--3N	02-042	2/12/02	-	-			-	-	+	-			DX: CWD; VIRO 0/4, *F. psychrophilum* 3/5
2001	Troutlodge	Rainbow trout--3N	02-045	2/21/02	+	-			-	-	+	-			DX: IHNV, CWD, BGD; IHNV 1/1(x4), IPNV 0/4, *F. psychrophilum* 1/4, *A. hydrophila* 1/2 (gills), *Pseudomonas pickettii* 1/2 (gills)
2001	Troutlodge	Rainbow trout--3N	02-046	2/21/02	+	-			+	-	-	+			DX: IHNV, FUR, MAS; IHNV 1/1(x4), IPNV 0/4, *A.salmonicida* 1/4, *A. hydrophila* 1/4
2002	Hayspur	Kamloops trout--3N	02-060	2/27/02	-	-			-	-	+	+			DX: MAS,CWD; VIRO 0/5, *A. hydrophila* 1/4, *F. psychrophilum* 1/4, *Plesiomonas shigelloides* 1/4

Appendix E. continued

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2001	Hayspur	Rainbow trout--3N	02-061	2/27/02	-	-			-	-	+	+			DX: CWD. MAS; VIRO 0/5, *F. psychrophilum* 4/4, *A. caviae* 1/4
2001	Hayspur	Kamloops trout--3N	02-062	2/27/02	-	-			-	-	+	-			DX: CWD; VIRO 0/5, *F. psychrophilum* 4/4
2001	Troutlodge	Rainbow trout--3N	02-063	2/27/02											DX: COL; *Flavobacterium columnare* 6/8 (presumptive)
2002	Hayspur	Rainbow trout-3N	02-075	3/13/02					-	-	+	+			DX: CWD, MAS, BGD, COS: *F. psychrophilum* 3/6, *Ichthyobodo* 1/3, *A. caviae* 2/2 (gills) 2/6 (systemic), *Pseudomonas* 2/2 (gills) 2/6 (systemic)
2001	Hayspur	Rainbow trout-3N	02-076	3/13/02	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/4, *F. psychrophilum* 3/4, *A. caviae* 1/4
2001	Hayspur	Rainbow trout-3N	02-077	3/13/02	-	-			-	-	+	-			DX: CWD; VIRO 0/5, *F. psychrophilum* 3/4

Appendix E. continued

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2001	Troutlodge	Rainbow trout--3N	02-078	3/13/02	-	-			-	-	+	-			DX: CWD. BGD, COL: VIRO 0/4, *F. psychrophilum* 2/4, *F. columnare* 3/3 (presumptive), *A. hydrophila* 1/3 (gills), *Pseudomonas* spp, 2/3 (gills)
2002	Hayspur	Rainbow trout--3N	02-079	3/13/02											DX: COS; *Ichthyobodo* 3/3 (gills)
2002	Hayspur	Rainbow trout-3N	02-116	4/4/02	+	-			-	-	+	+			DX: IHNV, CWD, MAS; IHNV 2/2(x4), IPNV 0/8, *F. psychrophilum* 7/8, *A. hydrophila* 6/8
2000	Moses Lake	Tiger Muskie	02-190	5/1/02	-	-			+	-	-	+			DX: FUR, MAS; *A. salmonicida* 8/8, *A. sobria* 5/8
2002	Hayspur	Kamloops trout-3N	02-233	6/18/02	-	-			-	-	+	+			DX: CWD. MAS; VIRO 0/5, *F. psychrophilum* 5/5, *A. hydrophila* 3/5
2002	Pahsimeroi	Steelhead, A Group	02-234	6/18/02	-	-			-	-	-	-			DX: COL; *F. columnare* 4/5

Appendix E. continued

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2001	Troutlodge	Rainbow trout--3N	02-235	6/18/02	-	-			-	-	+	-			DX: CWD; VIRO 0/5, *F. psychrophilum* 3/5
2002	Troutlodge	Rainbow trout--3N	02-245		-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, *F. psychrophilum* 3/4, *A. hydrophila* 1/4
2002	Hayspur	Kamloops trout--3N	02-246		-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, *F. psychrophilum* 4/4, *A. hydrophila* 3/4, *F. columnare* 1/4
2002	Hells Canyon (Snake River)	Steelhead A Group	02-254		-	-			-	-	-	-			DX: NPD; VIRO 0/5, BACTE 0/4
2002	Troutlodge	Rainbow trout--3N	02-255		-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, *F. psychrophilum* 3/4, *A. hydrophila* 3/4

Appendix E. continued

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2002	Hayspur	Kamloops trout--3N	02-256	7/9/02	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, *F. psychrophilum* 4/4, *A. hydrophila* 2/4
2001	Troutlodge	Rainbow trout--3N	02-257	7/9/02					+	-	-	+			DX: FUR, MAS; *A. salmonicida* 5/6, *A. hydrophila* 1/6, *Tetracapsula* 0/6
2001	Hayspur	Rainbow Trout—3N	02-258	7/9/02											IX: PKX; *Tetracapsula bryosalmonae* Smear 0/1, PCR 2/16
2002	Hells Canyon (Snake River)	Steelhead A Group	02-336	7/31/02					-	-	+	+			DX: CWD, MAS; *F. psychrophilum* 4/4, *A. sobria* 2/4
2002	Hells Canyon (Snake River)	Steelhead A Group	02-337	7/31/02					-	-	-	+			DX: MAS; *A. caviae* 3/4
2002	Troutlodge	Rainbow trout--3N	02-338	7/31/02					-	-	+	+			DX: CWD, BACTEREMIA; *F. psychrophilum* 2/4, *Hafnia alvei* 4/4

Appendix E. continued

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2002	Hayspur	Kamloops trout--3N	02-432	9/6/02	-	-			-	-	+	-			DX: CWD; VIRO 0/5, *F. psychrophilum* 4/4
2002	Troutlodge	Rainbow trout--3N	02-529	10/10/02	-	-			-	-	+	+			DX: MAS, CWD; VIRO 0/5, *A. hydrophila* 4/4, *F. psychrophilum* 3/4
2002	Troutlodge	Rainbow trout--3N	02-530	10/10/02	-	-			-	-	+	+			DX: MAS, CWD; VIRO 0/5, *A. hydrophila* 3/4, *F. psychrophilum* 2/4
2002	Troutlodge	Rainbow trout--3N	02-564	10/27/02	-	-			-	-	+	-			DX: CWD; VIRO 0/4, *F. psychrophilum* 3/4
2002	Troutlodge	Rainbow trout--3N	02-590	11/13/02	+	-			-	-	+	+			DX: IHN. CWD. MAS; IHNV 1/1(x5), IPNV 0/5, *F. psychrophilum* 2/5, *A. caviae* 1/5

Appendix E. continued

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2002	Troutlodge	Rainbow trout--3N	02-591	11/13/02	+	-			-	-	+	-			DX: IHN, CWD; IHNV 1/1(x5), IPNV 0/5, *F. psychrophilum* 4/4
2002	Troutlodge	Rainbow trout--3N	02-592	11/13/02	+	-			-	-	+	-			DX: IHN, CWD; IHNV 1/1(x5), IPNV 0/5, *F. psychrophilum* 3/4
2002	Troutlodge	Rainbow trout--3N	02-644	12/16/02	+	-			-	-	+	-			DX: IHN, CWD; IHNV 2/2 (x5), IPNV 0/10, *F. psychrophilum* 7/8
2002	Troutlodge	Rainbow trout--3N	02-645	12/16/02	+	-			-	-	+	-			DX: IHN, CWD; IHNV 1/1 (x4), IPNV 0/4, *F. psychrophilum* 3/4
2002	Troutlodge	Rainbow trout--3N	02-646	12/16/02	+	-			-	-	+	-			DX: IHN, CWD; IHNV 1/1 (x4), IPNV 0/4, *F. psychrophilum* 4/4
2002	Troutlodge	Rainbow trout--3N	02-647	12/16/02	-	-			-	-	-	-			DX: BACTEREMIA; VIRO 0/4, *Sphingomonas paucimobilis* 1/4

Appendix F. Summary report of Eagle Fish Health Laboratory results for Hayspur Hatchery, January 1 – December 31, 2002

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2000	Hayspur	Rainbow trout	02-016	1/10/02							+				IX: CWD: *Flavobacterium psychrophilum* 3/5 Isolate used for autogenous vaccine.
2001	Hayspur	Kamloops trout	02-047A	2/11/02											RESEARCH: Triploid induction 40/40 (100%)
2001	Hayspur	Kamloops trout	02-047B	2/12/02											RESEARCH: Triploid induction 38/40 (95%)
2001	Hayspur	Kamloops trout	02-047C	2/12/02											RESEARCH: Triploid induction 37/39 (95%)
2001	Hayspur	Rainbow trout	02-047D	2/11/02											RESEARCH: Triploid induction 36/38 (95%)
2000 Brood	Connor Lake (Canada)	Cutthroat trout	02-055	2/26/02	-	-		-							IX: NPD; VIRO 0/74, OCP-FAT 0/74
2000	Connor Lake (Canada)	Cutthroat trout	02-067	3/6/02				-							IX: NPD; FAT-RS 0/10, ELISA 0/10

Appendix F. continued

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2001	Hayspur	Rainbow trout	02-069A	4/22/02											RESEARCH: Triploid induction 39/40 (97.5%)
2001	Hayspur	Rainbow trout	02-069B	4/22/02											RESEARCH: Triploid induction 39/40 (97.5%)
2001	Hayspur	Kamloops trout	02-069C	4/22/02											RESEARCH: Triploid induction 35/40 (87.5%)
2001	Hayspur	Rainbow trout	02-069D	7/8/02											RESEARCH: Triploid induction 39/40 (97.5%)
2001	Hayspur	Kamloops trout	02-069E	7/8/02											RESEARCH: Triploid induction 29/38 (76.3%)
2000 Brood	Connor Lake (Canada)	Cutthroat trout	02-072	3/12/02	-	-	-	-							IX: NPD; VIRO 0/111, NAVHS 0/25, OCP-FAT 0/111
2000 Brood	Connor Lake (Canada)	Cutthroat trout	02-101	3/26/02	-	-	-	-							IX: NPD; VIRO 0/118, NAVHS 0/15, OCP-FAT 0/118

Appendix F. continued

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2000 Brood	Connor Lake (Canada)	Cutthroat trout	02-130	4/9/02	-	-	-	-							IX: NPD; VIRO 0/128, NAVHV 0/25, OCP-FAT 0/128
2000 Brood	Connor Lake (Canada)	Cutthroat trout	02-167	4/23/02	-	-		-							IX: NPD; VIRO 0/88, OCP-FAT 0/88
2000	Hayspur	Rainbow trout	02-240	6/20/02	-	-		-	-	-	+	+	-		IX: CWD, MAS; VIRO 0/60, FAT 0/60, ELISA 0/60, *F. psychrophilum* 3/15, *Aeromonas hydrophila* 2/15, PTD-WHD 0/60
2000	Hayspur	Kamloops trout	02-243	6/25/02	-	-		-	-	-	-	-	-		IX: NPD; VIRO 0/60, FAT 0/60, ELISA 0/60, BACTE 0/15, PTD-WHD 0/60
2002	Hayspur	Rainbow trout	02-074A	9/9/02											RESEARCH: Triploid induction 38/40 (95%)
2002	Hayspur	Kamloops trout	02-074B	9/9/02											RESEARCH: Triploid induction 40/40 (100%)

Appendix F. continued

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2002	Hayspur	Kamloops trout	02-074C	9/9/02											RESEARCH: Triploid induction 38/40 (95%)
1998	Hayspur	Rainbow trout	02-244	6/25/02					-	-	-	+			DX: MAS; *A. hydrophila* 1/1
2002	Connor Lake (Canada)	Cutthroat trout	02-412	8/29/02							+				DX: CWD; *F. psychrophilum* 1/2
Brood	Hayspur	Kamloops trout	02-526	10/9/02	-	-		-							IX: NPD; VIRO 0/34, OCP-FAT 0/34
2000	Hayspur	Rainbow trout	02-527	10/9/02					-	-	+	-			DX: GYROS. CWD (secondary); *Gyrodactylus spp.* 2/2, *F. psychrophilum* 2/2
Brood	Hayspur	Kamloops trout	02-554	10/24/02	-	-	-	-							IX: NPD; VIRO 0/50, NAVHS 0/5, OCP-FAT 0/50
Brood	Hayspur	Rainbow trout	02-571	10/31/02	-	-	-	-							IX: NPD; VIRO 0/43, NAVHS 0/9, OCP-FAT 0/43

Appendix F. continued

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
Brood	Hayspur	Kamloops trout	02-587	11/7/02	-	-	-	-							IX: NPD; VIRO 0/50, NAVHS 0/5, OCP-FAT 0/50
Brood	Hayspur	Rainbow trout	02-596	11/14/02	-	-	-	-							IX: NPD; VIRO 0/50, NAVHS 0/5, OCP-FAT 0/50
Brood	Hayspur	Kamloops trout	02-616	11/25/02	-	-	-	-							IX: NPD; VIRO 0/20, NAVHS 0/2, OCP-FAT 0/20
Brood	Hayspur	Rainbow trout	02-617	11/25/02	-	-	-	-			-				IX: NPD; VIRO 0/50, NAVHS 0/5, OCP-FAT 0/50, BACTE 0/12
Brood	Hayspur	Rainbow trout	02-641	12/12/02	-	-		-							IX: NPD; VIRO 0/30, NAVHS 0/3, OCP-FAT 0/30
Brood	Hayspur	Rainbow trout	02-662	12/30/02											IX: NPD; VIRO 0/20, OCP-FAT 0/20

Appendix G. Summary report of Eagle Fish Health Laboratory results for Henry's Lake Hatchery, January 1 – December 31, 2002

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
Brood	Henrys Lake	Cutthroat trout	02-073	3/7/02	-	-		-							IX: NPD; VIRO 0/14, OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	02-074	3/11/02	-	-		-							IX: NPD; VIRO 0/14, OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	02-092	3/14/02	-	-	-	-							IX: NPD; VIRO 0/12, NAVHS 0/7, OCP-FAT 105
Brood	Henrys Lake	Cutthroat trout	02-093	3/18/02	-	-		-							IX: NPD; VIRO 0/14, OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	02-102	3/25/02	-	-		-							IX: NPD; VIRO 0/7, OCP-FAT 0/77
Brood	Henrys Lake	Cutthroat trout	02-103	3/21/02	-	-		-							IX: NPD; VIRO 0/14, OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	02-108	3/28/02	-	-		-							IX: NPD; VIRO 0/17, OCP-FAT 0/105

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	02-109	3/30/02	-	-		-							IX: NPD; VIRO 0/7, OCP-FAT 0/70
Brood	Henrys Lake	Cutthroat trout	02-110	4/1/02	-	-		-							IX: NPD; VIRO 0/7, OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	02-111	4/2/02	-	-		-	-	-	-	-	+		IX: BACTEREMIA, WHD; VIRO 0/60, FAT-RS 0/60, *Flavobacter indologenes* 5/10, PTD-WHD 9/12
Brood	Henrys Lake	Cutthroat trout	02-131	4/4/02	-	-	-	-							IX: NPD: VIRO 0/14, NAVHS 0/14, OCP-FAT 0/119
Brood	Henrys Lake	Cutthroat trout	02-132	4/8/02	-	-	-	-							IX: NPD: VIRO 0/14, NAVHS 0/14, OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	02-152	4/11/02	-	-	-	-							IX: NPD: VIRO 0/14, NAVHS 0/7, OCP-FAT 0/105

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	02-169	4/18/02	-	-		-							IX: NPD; VIRO 0/14, OCP-FAT 0/136
Brood	Henrys Lake	Cutthroat trout	02-187	4/25/02	-	-		-							IX: NPD; VIRO 0/14, OCP-FAT 0/84
Brood	Henrys Lake	Brook trout	02-561	10/22/02				-							IX: NPD; OCP-FAT 0/35
Brood	Henrys Lake	Brook trout	02-562	10/24/02	-	-		-							IX: NPD; VIRO 0/12, OCP-FAT 0/48
Brood	Henrys Lake	Brook trout	02-562	10/18/02	-	-		-	+	-	+	+	-		IX; FUR, CWD, MAS; VIRO 0/30, FAT 0/30, ELISA 0/30, *Aeromonas salmonicida* 1/16, *Flavobacterium psychrophilum* 6/16, *Pseudomonas fluorescens* 6/16
Brood	Henrys Lake	Brook trout	02-583	10/31/02	-	-	-	-							IX: NPD; VIRO 0/12, NAVHS 0/6, OCP-FAT 0/72

Appendix G. continued

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
Brood	Henrys Lake	Brook trout	02-584	11/4/02	-	-		-							IX: NPD; VIRO 0/14, OCP-FAT 0/49

Appendix H. Summary report of Eagle Fish Health Laboratory results for Mackay Hatchery, January 1 – December 31, 2002.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
Brood	Deadwood Reservoir	Kokanee salmon	02-387	8/20/02	-	-	-	-					-	-	IX: MYXOBOLUS; VIRO 0/60, NAVHS 0/10, FAT-RS 0/60, CSH 0/20 PTD-MYXOB 5/12 (x5), PCR-PENDING
2002	Hayspur	Rainbow trout	02-456	9/16/02									-		RESEARCH: PTD-WHD 0/50 HATCHERY VAT
2002	Hayspur	Rainbow trout	02-457	9/16/02									-		RESEARCH: PTD-WHD 0/47 LARGE RACEWAY HEADRACE
2002	Hayspur	Rainbow trout	02-458	9/16/02									-		RESEARCH: PTD-WHD 0/41 LARGE RACEWAY TAILRACE
2002	Hayspur	Rainbow trout	02-459	9/16/02									+		RESEARCH: PTD-WHD 7/7 (x5) SETTLING POND NEAR SMALL RACEWAY OUTFLOW, PCR-PENDING

Appendix H. continued

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2002	Hayspur	Rainbow trout	02-460	9/16/02									+		RESEARCH: PTD-WHD 2/9 (x5) SETTLING POND NEAR CONCRETE WALL
2002	Hayspur	Rainbow trout	02-461	9/16/02									+		RESEARCH: PTD-WHD 9/9 (x5) CREEK APPROX. 150 METERS BELOW HATCHERY OUTLET

Appendix I. Summary report of Eagle Fish Health Laboratory results for Nampa Hatchery, January 1 –December 31, 2002.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnoses
2001	Troutlodge	Rainbow trout--3N	02-041	2/4/02	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, *Flavobacterium psychrophilum* 4/4 *Aeromonas hydrophila* 1/4
2001	Hayspur	Kamloops trout--3N	02-099	3/22/02					-	-	+	-			DX: CWD; *F. psychrophilum* 5/7
2002	Troutlodge	Rainbow trout--3N	02-499	10/4/02					-	-	+	+			DX: MAS, CWD; *Aeromonas hydrophila 6/8*, *F. psychrophilum* 5/8, *Shewanella spp.* 6/8

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

AHP	Anadromous Hatchery Pathologist
BACTE	Bacteriology test results
BGD	Bacterial Gill Disease, caused by a number of bacterial species
BKD	Bacterial Kidney Disease, caused by *Renibacterium salmoninarum*
COL	Columnaris disease, caused by *Flavobacterium columnare*
COS	*Ichthyobodo necator*; external parasite formerly classified as *Costia spp.*
CSH	*Ceratomyxa shasta*; enteric parasite
CWD	Coldwater Disease, caused by *Flavobacterium psychrophilum*
DX	Diagnostic examination
EFHL	Eagle Fish Health Laboratory
EGD	Environmental Gill Disease, caused by non-infectious processes
ELISA	Enzyme-linked immunosorbant assay;
ERM	Enteric Redmouth Disease, caused by *Yersinai ruckeri*
FAT	Fluorescent antibody test
FUR	Furunculosis, caused by *Aeromonas salmonicida*
GYROS	*Gyrodactylus* species; digenetic trematode; external parasite
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
IU	International Unit; unit of concentration used for various antibiotics, such as Penicillin G
IX	Inspection examination
K1	Kamloops trout of generic origin
LHRHa	Luteinizing hormone/releasing hormone analogue
MAS	Motile Aeromonad Septicemia, caused by a number of motile *Aeromonas* and *Pseudomonas* bacteria.
MC	*Myxobolus cerebralis;* 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

Appendix J. continued

Pen-G	Penicillin G Procaine
PKD	Proliferative kidney disease, caused by *Tetracapsula bryosalmonae*
PKX	*Tetracapsula bryosalmonae*, causative agent of PKD
PTD	Pepsin/trypsin digest method for detecting Myxobolus spores
R9	Hayspur-strain rainbow trout
RHP	Resident Hatchery Pathologist
RS	*Renibacterium salmoninarum*, 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 *Myxobolus cerebralis*

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