

# 2004 ANNUAL RESIDENT HATCHERIES REPORT



IDFG 05-01  
February 2005

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## **RESIDENT FISH HATCHERIES**

### **2004 ANNUAL REPORT**

Resident fish hatcheries reared and stocked nearly 23 million fish weighing over a million pounds. More than 2,500 stocking trips were made to plant fish in over 500 waters in the state. There were a total of 18 species and strains raised by the resident hatcheries during 2004.

Resident hatchery program costs were about \$2.1 million for an average cost of \$2.05 per pound or \$0.09 per fish.

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

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

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

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

The Engineering Bureau coordinated major construction at the Hayspur, Ashton, Grace, Hagerman, Nampa and Sandpoint hatcheries this fiscal year. The medium raceways at the Hayspur Hatchery were replaced; a shop was constructed at Ashton Hatchery; the garage at Hagerman was added on to; and the design of the Sandpoint Waterlife Center was completed. A new residence was constructed at the Grace Hatchery and work was done on the springs at American Falls to exclude the New Zealand Mud Snail from this water supply. A new generator was installed at the Nampa Hatchery, and heat pumps were installed in the residences at Nampa Hatchery.

**Idaho Department of Fish and Game**  
**Resident Hatcheries Fish Production**  
**01/01/04 - 12/31/04**

Production Hatchery	Put-and-Take Number	Pounds	Put-Grow-and-Take Number	Pounds	Average Fish/pound	Feed Pounds	Feed Costs	Average Length	Total cost	Cost 1,000 fish	Cost/Pound
American Falls	210,903	90,144	200,709	4,350	4.4	95,124	\$29,107	7.7	\$204,494	\$496.81	\$2.16
Ashton	227,452	53,964	240,438	1,305	12.5	46,751	\$16,135	5.6	\$153,410	\$327.87	\$2.77
Cabinet Gorge			13,909,234	35,942	387.0	35,060	\$21,105	1.78	\$290,328	\$20.87	\$9.73
Grace	136,746	41,429	702,088	12,316	15.6	57,817	\$22,851	5.22	\$244,274	\$234.72	\$3.08
Hagerman	781,074	352,411	2,068,976	60,450	6.9	500,796	\$168,727	6.8	\$553,896	\$194.34	\$1.34
Mackay	90,513	49,350	2,600,634	36,830	31.0	97,061	\$33,933	4.5	\$255,126	\$94.81	\$2.96
McCall			150,680	63	2,380.0	95	\$104	1.5	\$7,341	\$49.32	\$116.48
Nampa	811,838	272,531	711,242	11,206	5.4	308,918	\$93,180	7.4	\$409,293	\$268.74	\$1.44
N Sandpoint <sup>a</sup>			79,900	32	2,500						
Sawtooth			30,765	11	2,800						
<b>TOTAL</b>	<b>2,258,526</b>	<b>859,829</b>	<b>20,694,666</b>	<b>162,505</b>	<b>22.45</b>	<b>1,141,622</b>	<b>\$385,142</b>		<b>\$2,118,162</b>	<b>\$91.41</b>	<b>\$2.05</b>
Total cost for each hatchery is that hatchery's total budget minus capital outlay expenditures											
Redistribution of catchables											
Hatchery											
Clearwater	102,651	34,861			2.8	300	\$164		\$21,873	\$213.09	\$0.63
McCall	93,980	30,000			3.1	500	\$180		\$9,163	\$97.49	\$0.31
Mullan	35,275	9,960			3.4	0	\$0		\$35,884	\$1,020.00	\$3.60
Sandpoint	125,410	36,505			3.4	0	0		\$38,396	\$306.16	\$1.05
Sawtooth	44,600	12,850			3.5	750	\$208		\$6,174	\$82.10	\$0.48
Hayspur	41,940	13,362			3.1	0	\$0		\$5,855	139.60	\$0.44

<sup>a</sup> The high mountain lake planting costs were not calculated

**IDAHO DEPARTMENT OF FISH AND GAME**

**2004 ANNUAL RESIDENT REPORT**

**AMERICAN FALLS FISH HATCHERY**

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

## INTRODUCTION

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

The primary mission of the AFFH is to rear approximately 200,000 catchable sized (10-inch) rainbow trout *Oncorhynchus mykiss*. The AFFH also produced 15-inch catchable rainbow trout for Springfield Lake as well as Blackfoot Reservoir; Yellowstone cutthroat *O. clarki* catchables were also reared. 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 significantly from year to year.

Two permanent employees and eleven months of temporary employee time staffed the AFFH during 2004. Volunteers are utilized for special projects as needed and when available.

Funding for the AFFH operation comes from license monies and from the proceeds of mitigation fish stocked into the Gem State Hydropower Project at Idaho Falls from the city of Idaho Falls.

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

Water for the AFFH comes from Rueger Springs, which is located on AFFH property. These springs flowed an average of 19.02 cubic feet per second (cfs) at a water temperature of 54°F to 56°F during 2004.

In September 2002 the AFFH Fish Culturist position was transferred to the Ashton Fish Hatchery. A 3-month increase in temporary time was associated with this FTE transfer for FY04 and forward.

## FISH PRODUCTION

The AFFH raised triploid Hayspur strain rainbow trout (T9), triploid Hayspur Kamloop trout (KT), triploid Troutlodge Kamloops (TT), Henrys Lake cutthroat trout (C3), and Westslope cutthroat (C2) from the Westslope Trout Co. as well as Conner Lake Westslope cutthroat trout from the Hayspur Hatchery for the 2004 production year.

The AFFH reared, and is holding overwinter, 80,630 Westslope cutthroat trout fingerlings (1,615 lbs) for northern Idaho waters. The AFFH stocked 210,903 catchable trout (90,144 lbs) as well as 200,709 fingerling rainbow trout (4,350 lbs). Total fish stocked was 411,612 fish, weighing 94,494 lbs (Appendix 1). Net production for the year (lbs stocked + lbs on hand 12/31/2004 – lbs on hand 1/1/2004) was 106,533 lbs. Net number of fish produced, using the same basic formula, was 559,965 fish.

Cost in 2004 for various types and sizes of fish food was \$29,107.85 (Appendix 2). Feed costs for the year were \$0.273 per lb of fish produced, or \$0.052 per fish. Production costs overall were \$1.92 per lb of fish produced. This cost includes all AFFH personnel and operating costs and the cost of transportation of AFFH fish to stocking waters using fish transports stationed at the Hagerman Fish Hatchery during 2004. This figure does not include capital outlay or capital construction/repair costs.

Feed conversion for the year averaged 0.9 lbs of feed per lb of fish produced.

The number of fish stocked this year was up from last year mostly due to the production of fingerling rainbow trout. Pounds of fish stocked increased by 10,872 lbs. Net production was up 43,170 lbs over last year, a net increase of 59.5%. The shift in a portion of our stocking timing, mentioned in last years report, from the spring to the fall for 2004 was realized this rearing season which is reflected in production numbers for this year.

### **HATCHERY IMPROVEMENTS**

- The overhead garage door was replaced on residence # 3.
- Large cobble was hauled into Rueger Springs to put surface water underground.
- All three vehicles on station were replaced.
- A 10,000 lb flatbed trailer was purchased and fitted with the old one ton tank.
- A new one-ton fish transport tank was fabricated.
- Two of the four settling pond weirs received temporary reinforcements to prevent blow out.

### **HATCHERY NEEDS**

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

## **PUBLIC RELATIONS**

The AFFH received an estimated 3,000 visitors during the year. This included organized tours for schools, scout groups, and families consisting of 540 children and 50 adults. The AFFH staff also gave presentations at several camps, group meetings, and off-site school events which were attended by approximately 210 children and adults. Other visitors include bird-watchers, drop-in visitors, hunters, and fishermen.

## **VOLUNTEER PROGRAM**

Multiple volunteers were utilized throughout the year to assist in scatter-planting catchable fish and hand-loading fish onto transport trucks. Volunteer contributions have been documented by the Region 5 volunteer coordinator.

## **ACKNOWLEDGMENTS**

During this year employees at AFFH were: Steve Wingert, Hatchery Manager I; David Billman, Assistant Fish Hatchery Manager; and Biological Aides Paul Wert, Brian Kopp, and Farren Porath.

## **APPENDICES**

Appendix 1. Swimming Inventory with fish transferred or stocked by month, American Falls Fish Hatchery, 2004.

Month	Fish on Hand	Pounds on Hand	Fish Stocked	Pounds Stocked
December 2003	176,356	8,749	0	0
	20,969*	1,048*		
January 2004	205,340	21,249	0	0
	20,950*	2,229*		
February 2004	199,503	31,514	0	0
	20,880*	3,116*		
March 2004	189,970	29,775	7,175	2,900
	20,820*	4,338*		
April 2004	150,467	28,808	34,085	13,125
	33,862*	4,995*	4,313*	1,135*
May 2004	129,092	28,706	21,115	7,038
	54,570*	2,117*	8,253*	2,435*
June 2004	139,576	23,145	42,770	15,484
	50,849*	145*	7,830*	2,700*
July 2004	445,160	32,173	8,435	3,055
	44,950*	17.4*	537*	185*
August 2004	370,619	35,278	8,730	3,685
	82,256*	392*		
September 2004	408,053	37,982	16,645	6,462
	82,128*	577*		
October 2004	195,074	9,755	243,965	31,950
	82,049*	974*		
November 2004	185,137	10,424	7,760	4,340
	80,800*	1,619*		
December 2004	184,785	20,312	0	0
	80630*	1,615*		
<b>Total Rainbow</b>			<b>390,679</b>	<b>88,039</b>
<b>Total Cutthroat</b>			<b>20,933*</b>	<b>6,455*</b>
<b>Grand Total</b>			<b>411,612</b>	<b>94,494</b>

\*Denotes cutthroat trout, all others are rainbow trout.

Appendix 2. Fish feed fed during the 2004 production year, American Falls Fish Hatchery.

Source	Size/Type	Pounds	Cost
Rangen Dry	OO Swim-up/Starter	6.0	
Rangen Dry	O Swim-up/Starter	46.5	
Rangen Dry	#1	184.5	
Rangen Dry	#2	1,056.75	
Rangen Dry	#3	3,628.0	
Rangen Dry	1/16"	4,273.5	
Rangen Dry	1/8" Extruded Floating	49,766	
Rangen Dry	3/32 OTC	150.0	
Rangen Dry	1/8 OTC	1,803.0	
Rangen Dry	5/32 OTC	274.5	
Silver Cup	O Swim-up/Starter	29.0	
Silver Cup	#1	18.0	
Silver Cup	#2	59.5	
Silver Cup	#3	10.5	
Silver Cup	3.5mm	32,727.5	
Skretting	0	109.0	
Skretting	#1	143.0	
Skretting	#2	664.75	
Skretting	1.2mm	174.0	
<b>TOTALS:</b>		<b>95,124</b>	<b>\$29,107.85</b>

**IDAHO DEPARTMENT OF FISH AND GAME**

**2004 ANNUAL RESIDENT REPORT**

**ASHTON FISH HATCHERY**

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

## INTRODUCTION

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

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

## FISH PRODUCTION

### General Overview

A total of 467,890 fish (55,269 lbs) were produced at AFH this year, consisting of 240,438 fingerlings (1,305.1 lbs), and 227,452 catchable sized fish (including holdovers) (53,964 lbs). Total numbers and total lbs were up from the previous year (Appendix 1). Production costs (excluding capital outlay) were \$153,410.96 with \$16,135.21 spent on fish feed and the remaining \$137,275.75 spent on general hatchery operations and personnel costs. Fish transportation cost for 2004 was \$10,945.90. The average cost per lb of fish produced (less transportation cost) was \$2.57 (Appendix 1). All production costs are down from last year.

All of the fish reared at AFH were received as eyed-eggs (Appendix 2).

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

Demand feeders were utilized in outdoor raceways for the catchables and holdovers. Feed conversion for catchables and holdovers was 1.06 in 2004 (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 85.9%. This is an increase of 23% primarily due to decreased bird predation now that we have constructed covers for all outdoor raceways.

## **Rainbow Trout**

Ashton Fish Hatchery produced and stocked 100,452 9-inch catchable rainbow (36,420 lbs) for distribution into area lakes and streams (Appendix 1). In December 2003, we received 142,000 Hayspur triploid rainbow trout (T9) eggs. From these eggs, 5,604 T9 fingerlings, averaging 3-inches, were planted in a number of Upper Snake Region waters. An additional 127,000 (17,544 lbs) of 6-inch T9 holdovers were produced for stocking in 2005.

## **Westslope Cutthroat Trout**

The AFH reared Westslope Cutthroat Trout for the first time in 2004. In July we received 100,000 eyed-eggs from Westslope Trout Company of Ronan, MT. In October we transferred 91,990 fish (1.9-inch) weighing a total of 220.6 lbs to Cabinet Gorge Hatchery.

## **Henry's Lake Cutthroat Trout**

No cutthroat were reared at Ashton Hatchery during 2004.

## **Rainbow x Cutthroat Hybrid**

No rainbow x cutthroat hybrids were reared at Ashton Fish Hatchery during 2004.

## **Arctic Grayling**

No Arctic Grayling were reared at Ashton Fish Hatchery during 2004.

## **Brook Trout**

We received 133,000 triploid brook trout from Henry's Lake Hatchery during 2003. From these eggs 117,300 (788 lbs) triploid brook trout were stocked into Henry's Lake.

We received 255,000 eyed triploid eggs from Kootenay Trout Hatchery, British Columbia for stocking as fingerling during the autumn of 2005.

## **Brown Trout**

In November we received 26,280 brown trout eggs from Dubois, WY. From these eggs 25,544 (248 lbs) fingerling were transferred to Hagerman Hatchery for stocking in Region 4. We received 37,000 brown trout eggs from Dubois, Wyoming for stocking during 2005 in Region 4.

## **HATCHERY IMPROVEMENTS**

1. We built covers for all outdoor rearing areas to reduce or eliminate severe bird predation.
2. We completed construction of a heated shop/garage north of the raceways.
3. New siding and windows were installed in both residences.
4. We purchased additional land where the springs are.

Future needs include:

1. Replacement of hatchery outlet structure.
2. Installation of collection pipes and a cover for the recently purchased spring area.
3. Improve the existing collection area, which has become overgrown, resulting in quality and quantity of water available for fish rearing.
4. Our 17-year-old snow-blower will need replacement soon.

## **FISH STOCKED AND TRANSFERRED**

The stocking program at AFH remained similar to last year's program. The numbers of catchable rainbow trout on-station exceeded 2004 requests. Excess fish were stocked in Region 6 and Montpelier Reservoir in Region 5.

## **ASHTON FISH SPAWNING**

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

## **FISH FEED**

A total of 46,751 lbs of fish feed were fed (Appendix 5) to produce 44,013 lbs of gain (Appendix 1), for an average conversion of 1.06. All fish were fed Rangens dry.

## **PUBLIC RELATIONS**

Approximately 1,000 people visited AFH this past year. About 100 elementary students from as far away as Idaho Falls visited the hatchery during the spring, summer, and fall for tours. We did not have our Free Fishing Day event, due to construction and lack of restroom facilities.

## **SPECIAL PROJECTS**

No special projects were undertaken this year.

## **APPENDICES**

Appendix 1. Fish production and cost, Ashton Fish Hatchery, 2004

Species	Size	Number Fish	Pounds Planted or transferred	Weight Gained In 2004	Cost/lb	Cost/fish	Total Cost
<b>Fingerlings Produced and Stocked</b>							
Hayspur triploid Rainbow	2.8	5,604	48.5	46.5	18.72	\$0.162	\$907.85
Westslope Cutthroat Trout	1.9	91,990	220.6	194.0	64.63	\$0.155	\$14,258.45
Brown Trout	2.9	25,544	248.0	208.0	16.99	\$0.165	4,214.76
Brook Trout Triploids	2.7	117,300	788.0	756.25	23.97	\$0.161	\$18,885.30
<b>Totals/Ave</b>	<b>2.8</b>	<b>240,438</b>	<b>1,305.1</b>	<b>1,204.75</b>	<b>29.32</b>	<b>\$0.159</b>	<b>\$38,266.36</b>
<b>Catchables Produced and Stocked</b>							
Hayspur triploid Rainbow	9.7	100,452	36,420	25,312	1.71	\$0.620	\$62,288.70
<b>Totals/Ave</b>	<b>9.7</b>	<b>100,452</b>	<b>36,420</b>	<b>25,312</b>	<b>1.71</b>	<b>\$0.620</b>	<b>\$62,288.70</b>
<b>Catchables Produced For 2005</b>							
Hayspur triploid Rainbow	7.0	127,000	(17,544) On hand	17,497	2.39	\$0.330	\$41,910.00
<b>Totals/Ave</b>	<b>7.0</b>	<b>127,000</b>	<b>17,544</b>	<b>17,497</b>	<b>2.39</b>	<b>\$0.330</b>	<b>\$41,910.00</b>
<b>GRAND TOTAL *</b>		<b>467,890</b>	<b>55,269.1</b>	<b>44,013.75</b>	<b>2.57</b>	<b>\$0.304</b>	<b>\$142,465.06</b>

\* Includes fish on hand

Appendix 2. Eggs and fish received and transferred, Ashton Fish Hatchery, 2004

<b>Species</b>	<b>Eggs Received</b>	<b>Fish Received</b>	<b>Fish Transferred</b>	<b>Destination</b>
Hayspur triploid rainbow	<sup>a</sup> 134,912	0	0	Region 6
Westslope cutthroat	100,000	0	91,990	Cabinet Gorge
Brown trout	<sup>a</sup> 37,125	0	0	Region 4
Brown trout	26,280	0	25,544	Region 4
Henrys Lake triploid brook trout	<sup>a</sup> 250,000	0	0	Henrys Lake
<b>TOTALS</b>	<b>548,317</b>	<b>0</b>	<b>117,534</b>	

<sup>a</sup>For stocking in 2005.

Appendix 3. Comparative growth rates, feed conversion, and percent survival for all species reared at Ashton Fish Hatchery, 2004.

<b>Species</b>	<b>Average Monthly Length Increase</b>	<b>Average Conversion</b>	<b>Percent Survival</b>
Brown Trout	.558	.820	97.1
Brook Trout Triploid	.513	.560	88.1
Rainbow (catchables) Hayspur	.474	1.28	55.6
Rainbow (fingerlings)	.522	0.74	89.4
Westslope Cutthroat	.333	0.61	91.9
Holdover for 2005 stocking			
Rainbow	.549	0.89	93.3

Appendix 4. Origin of fish stocked or transferred, Ashton Fish Hatchery, 2004

Species	Source	Eggs	Fish	Destination	Stocked	Transferred	Size (inches)
Brown Trout	Dubois, WY	<sup>a</sup> 26,280		Region 4		25,544	2.9
Brook Trout Triploid	Henry's Lake	<sup>a</sup> 133,000		Henry's Lake	117,300		2.7
Westslope Cutthroat	Ronan, MT	100,000		Cabinet Gorge		91,990	1.9
Hayspur triploid rainbow	Hayspur	<sup>a</sup> 199,000	--	Region 6	100,452	--	9.7
Hayspur Triploid rainbow	Hayspur	142,000	--	Region 6	5,604	--	2.8
<b>Total stocked or transferred</b>					<b>233,356</b>	<b>117,534</b>	

<sup>a</sup> Received prior to 2004

Appendix 5. Feed use, Ashton Fish Hatchery, 2004

Size	Source	Pounds	Cost/lb	Total Cost
Swim-up	Rangens	208	0.5566	115.78
#1 Starter	Rangens	350	0.4584	160.45
#2 Starter	Rangens	838	0.4786	401.09
#3 Starter	Rangens	2000	0.4377	875.50
3/32 Pellet	Rangens	4,000	0.3675	1,470.00
1/8 Pellet	Rangens	39,355	0.3332	13,112.39
<b>TOTALS</b>		<b>46,751</b>	<b>0.3451</b>	<b>\$16,135.21</b>

**IDAHO DEPARTMENT OF FISH AND GAME**

**2004 ANNUAL RESIDENT REPORT**

**CABINET GORGE FISH HATCHERY**

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

## INTRODUCTION

Cabinet Gorge Fish Hatchery (CGFH) is located on the south bank of the Clark Fork River in Bonner County, approximately eight miles southeast of the community of Clark Fork. The hatchery was constructed in 1985 and was co-funded by Avista (formerly Washington Water Power), Bonneville Power Administration (BPA), and the Idaho Department of Fish and Game (Department). The primary purpose for CGFH is to produce late-spawning Kokanee salmon *Oncorhynchus nerka kennerlyi* fry for release into 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 2-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 fish culturist is housed at a residence at the Clark Fork Hatchery.

### Water Supply

Cabinet Gorge Dam is located about one mile upstream from the hatchery. After its completion in 1952, artesian springs began appearing along the Clark Fork River at the present site of the hatchery. The CGFH water supply consists of approximately 5.4 cubic feet per second (cfs) from a spring and approximately 20 cfs from a wellfield. The temperatures of the lower spring and upper wellfield vary inversely with each other over a 12-month period. The cooler water from the lower springs (pumps #7 and #8) was utilized for the entire Kokanee incubation and early rearing period. Incubation and early-rearing water temperatures were maintained around 49°F (range 44°F to 53°F). Production water ranged from 36°F to 45°F.

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

### Rearing Facilities

Rearing facilities at the hatchery include 128 upwelling incubators and 64 concrete raceways. The incubators are 12-inches in diameter by 24-inches high with a maximum capacity of 150,000 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 cuft. The hatchery building encloses approximately one-third of each raceway. The adult Kokanee holding area consists of two holding ponds (10-ft x 30-ft each) at the head of the fish ladder. Additional adult holding is available in three holding ponds (10-ft x 30-ft each).

## **PRODUCTION**

The CGFH produced a total of 13,909,234 fish in 2004 weighing 35,942 lbs (Appendix 2). On January 1, 2005, an estimated 19,369,260 Lake Pend Oreille Kokanee eggs were on hand (Appendix 1). In addition 27,878 fall Chinook fry and 977,186 early-spawning Kokanee alevin were also on hand at the end of the year.

A total of 35,060 lbs of feed produced 29,839 lbs of gain for an overall (all species reared) feed conversion of 1.17. Total production cost (including Nampa's transportation costs) was \$290,328, resulting in a cost per lb of fish of \$9.73, cost per inch of fish of \$0.0107, and \$20.87 per thousand fish (Appendix 2).

### **Lake Pend Oreille Kokanee**

#### **General Rearing**

Fertilized eggs were brought to the CGFH and disinfected in 100-ppm iodine for 10 minutes. After enumeration, the green eggs were placed into upwelling incubators and rolled until eye-up. At eye-up, the eggs were shocked, sorted and counted with the Jentsorter JHC-114 model sorter and Jentsorter JX-42 model sorter (on loan from Clearwater Hatchery). Fry were allowed to volitionally swim out of the incubators into the raceways at 1,500 temperature units (TU). All fry were thermally mass-marked via temperature manipulation in the raceways. Feed training began at 1,700 to 1,720 TUs.

Initial early-rearing loading rates averaged 250,000 swim-up fry per raceway. With the new rearing protocols and lower rearing densities, Kokanee growth rates were equivalent to 29 monthly temperature units (MTUs) per inch of growth even though 28 MTUs (30 MTUs in 2003) had been used for fish rearing projections. Fish health was excellent throughout rearing and no Bacterial Gill Disease was encountered in 2004.

Kokanee were feed trained at approximately 49°F to 52°F using Skretting (formerly Moore-Clark) Nutra Plus #0 starter for 10 days. Feed training continued from day 11 to day 28 utilizing a 50:50 mix of Skretting Nutra Plus and Rangen Trout and Salmon starter diets in sizes from swim-up to starter #1. On day 18, raceways were extended to full length and on day 25 the fry were placed on Rangen Trout and Salmon starter #1 only. On day 29, water temperatures were lowered to emulate natural production in Lake Pend Oreille. The fry remained on Rangen Trout and Salmon starter #1 for the duration of rearing. This was the same rearing protocol that was initiated on brood year 2002 with very favorable results.

A total of 12,077,586 late Kokanee fry (including Lake Whatcom stock) were produced at an average length of 1.90 inches and an average weight of 491 fish per pound (fpp). These fish gained 22,481 lbs from 25,745 lbs of feed, resulting in a conversion rate of 1.15:1.0. Fish production cost was \$9.48 per lb, \$0.0093 per inch, and \$17.65 per thousand (Appendix 2).

Survival of Lake Pend Oreille green eggs to feeding fry was estimated at 80.3% (2003, 80.2%). Survival from first feeding to release was estimated at 97.6% (2003, 99.0%), resulting in survival from green egg to release of 78.3% (2003, 79.3%).

Survival of Whatcom Lake eyed-eggs to feeding fry was estimated at 98.1%. Survival from first feeding to release was estimated at 96.1%, resulting in survival from eyed-egg to release of 94.3%.

A total of 1,517,618 early Kokanee fry were produced at an average length of 2.10 inches and an average weight of 360 fpp. These fish gained 3,941 lbs from 4,700 lbs of feed, resulting in a conversion rate of 1.19:1.0. Fish production cost was \$9.88 per lb, \$0.0122 per inch and \$25.65 per thousand. Of these 1,182,613 (3,400 lbs) were stocked into Lake Pend Oreille (Appendix 2).

Survival of early Kokanee eyed-eggs to feeding fry was estimated at 94.4%. Survival from first feeding to release was estimated at 97.2%, resulting in survival from eyed-egg to release of 91.8%.

## **Fish Marking**

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

Analysis of pre-release fish specimens (Grimm et al. 2004) verified the presence of a recognizable otolith mark on all thermally treated fry.

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

All of the adults that returned to the Sullivan Springs Kokanee trap in the fall of 2003 were T-marked. With results from the Washington Department of Fish and Wildlife otolith lab in Olympia, Washington, Department 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 2003 Kokanee spawning run, 86.4% were hatchery three-year-olds (1999 brood year) and 13.6% were four-year-olds of wild origin. No four-year-old (1998 brood year) hatchery fish were detected. To date, no results have been received from the 2004 spawning adults.

## **Fish Liberation**

On March 25, 2004, 232,000 unfed late Kokanee fry (Whatcom Lake stock) were released into Spring Creek. The next day, another 174,000 unfed late Kokanee fry (Whatcom Lake stock) were released into Garfield Bay. On May 25 and 26, 2004, 1,182,613 early

Kokanee fry and 326,882 late Kokanee fry were released into Sullivan Springs. On June 8, 2004, 975,331 late Kokanee fry were released into Spring Creek. On June 9, 2004, 928,808 late Kokanee fry were released into the Clark Fork River at a new stocking location known locally as Foster Bar. On June 10, 2004, 977,008 late Kokanee fry were released into Twin Creek. The last of the hatchery Kokanee were released from June 15 through June 18, when 8,463,556 late Kokanee fry were released into Sullivan Springs.

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.

The unfed fry (Whatcom Lake stock) were released utilizing the 1-ton truck and 300-gallon tank from Sandpoint Hatchery. The early Kokanee fry release group was transported in one 3,000-gallon capacity Department tanker. Two trips were made to Sullivan Springs on May 25 and another trip on May 26, 2004 (which included 700 lbs of late Kokanee "to top off the load").

All of the Twin Creek, Foster Bar (Clark Fork River), and most of the Spring Creek release groups were liberated at dusk. The fish were planted in three trips each utilizing the 2-ton stocking truck from the Sandpoint Fish Hatchery. About 523,000 of these fish were Whatcom Lake stock.

The Sullivan Springs release group was transported in two (3,000-gallon capacity) Department tankers and the 2-ton stocking truck from Sandpoint Hatchery. Loading densities of small fish in all of the tankers was kept below 0.60 pounds per gallon. Fish were planted below the bridge on the access road to the Department patrol cabin. Two tankers made two releases on June 15, 16 and 17, 2004. Three additional releases were made each day with the 2-ton stocking truck. One tanker released the last of the fish on June 18, 2004. No Whatcom Lake Kokanee stock was released at Sullivan Springs.

## **Other Species**

On December 31, 2004, a total of 27,878 fall Chinook salmon sac-fry were on-station. The Chinook stock came from Garrison Dam National Fish Hatchery in Riverdale, North Dakota. Fall Chinook salmon survival of eyed eggs to feeding fry was estimated at 60.4% (2003, 79.1%). These fish are scheduled for transfer to Nampa Hatchery on January 26, 2005. Production costs will be reported on the 2005 annual report.

During April 2004, a total of 176,478 Westslope cutthroat were released into numerous Panhandle lowland lakes. These fish averaged 29 fpp and had attained an average length of 4.60 inches at release.

On October 20, 2004, the hatchery received 92,000 Westslope cutthroat weighing 221 lbs from Ashton Hatchery. On December 31, 2004, the hatchery had on hand a total of 91,068 Westslope cutthroat weighing 932 lbs and averaging 3.08 inches in length (Appendix 2).

During May 2004, a total of 335,005 early spawning Kokanee were released into several lowland lakes in Regions 1 and 2. These fish averaged 413 fpp and had attained a length of 2.0 inches at release.

On December 31, 2004, the hatchery had 977,186 early spawning Kokanee sac-fry on hand. This stock came from Kootenay Trout Hatchery in Canada. These fish will be used to start a run of early spawners in Sullivan Springs.

## **HATCHERY IMPROVEMENTS**

### **Repairs and Improvements**

- A new road was built to access pumps #4 and #5 and provides additional parking for residence #1.
- A preventive maintenance program for the hatchery electrical system was initiated.
- Large rocks were removed from the west end of the hatchery building.
- New gravel was added to the lower section of the hatchery road from the settling pond to the fish ladder. This was a cooperative project with Avista Corp.
- Avista Corp. expanded the road around the fish ladder and trap.
- A Direcway satellite system was installed at the hatchery.

## **HATCHERY RECOMMENDATIONS**

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

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

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.

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

An additional 14 doors need to be purchased to replace the existing rusted-out doors on the hatchery building.

If the Westslope cutthroat brood stock program is moved to CGFH, holding ponds for the brood stock and raceways for fingerlings will need to be built.

## **FISH SPAWNING**

### **Fish Trapping**

The Clark Fork River fish trap was in operation from June 2 to December 1, 2004. The first adult Kokanee entered the trap on October 21, 2004, and trapping continued through the end of November. There were 8,082 adult Kokanee trapped. Of these, 3,977 adults were transported to Spring Creek to spawn naturally. The remaining 4,105 fish were held for spawning, of which 1,358 or 33.1% (29.7% in 2003) were female. From June to October 16, 2004 the trap was used by Avista Corp. personnel to collect and sample bull trout. A total of 12 adult bull trout were trapped, tagged, held for genetic results, and released. Avista used electrofishing and hook-and-line to collect bull trout that were staged on spawning beds. Thirty-nine adults (nine from the hatchery ladder) were trucked around the Cabinet Gorge Dam and released into the mouth of the 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, the out-migrating adults were recaptured and trucked back to the hatchery ladder and released.

The Sullivan Springs trap was in operation from October 19 to December 30, 2004. The Sullivan Springs trap collected 165,187 (129,102 in 2003) adult Kokanee salmon. Of these, 11,555 (15,089 in 2003) adults were passed above the trap to spawn naturally in Sullivan Springs Creek. In addition, an estimated 30,000 to 35,000 adults escaped up Granite Creek during high water to spawn naturally. Spawntaking records showed that 36.6% (39.5% in 2003) of the run was female (56,281).

An attempt was also made to trap Kokanee adults returning to Twin Creek. About 50 to 100 adults were captured. High water washed this trap out in early-November and trapping efforts were discontinued. In mid-December, research personnel estimated about 5,000 adults were spawning naturally in Twin Creek.

## **Spawntaking and Eggs Received**

An estimated total of 19,369,260 green fertilized Kokanee eggs were collected during the 2004-2005 spawning season. Of the 57,600 total females trapped, 50,350 female Kokanee were spawned at the Sullivan Springs and hatchery ladder traps (Appendix 1).

A total of 46,178 eyed fall Chinook eggs were received from Garrison Dam National Fish Hatchery on November 19, 2004.

A total of 990,730 eyed early spawning Kokanee eggs were received from Canada's Kootenay Trout Hatchery on October 25, 2004.

## **FISH FEED**

The fish produced during 2004 were fed a total of 35,060 lbs of feed. Fish feed was acquired from Rangen's Inc. and Skretting USA, Inc. (formerly Moore-Clark USA, Inc.) The overall conversion was 1.17 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 200 people signed our guest register book this year. An estimated 600 visitors toured the hatchery during the 2004 season. In addition, 10 tours were given to local school groups.

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

## **ACKNOWLEDGEMENTS**

The CGFH staff would like to thank the Cabinet Gorge Dam and Northern Lights personnel for their continued cooperation with hatchery operations. Thanks also to the Lake Pend Oreille Idaho Club, Bonner County Sportsmen's Association, numerous volunteers, and various regional and hatchery Department personnel for their cooperation during the spawning season. The staff would also like to thank Zach Olson- Fish Culturist, CGFH Maintenance Craftsman- John Suhfras, Mullan Hatchery Biological Aide- Mary Van Broeke and CGFH Biological Aides; Beth Brown, Steve Lowe, Rauno Raiha (Bonner County Sheriff's boat operator), Christina Suhfras, Tyler Long, Taneesha Smith and Laura Censky for their dedication and hard work in making 2004 a successful year.

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## **APPENDICES**

Appendix 1. Lake Pend Oreille Kokanee Spawntaking Summary, 2004.

<b>Spawntaking Site</b>	<b>Total Fish</b>	<b>Females Spawned</b>	<b>Green Eggs</b>	<b>Fecundity</b>	<b>Percent Females *</b>
-	-	-	-	-	-
Sullivan Springs	153,632	49,006	18,875,760	385	36.6%
Cabinet Gorge	8,082	1,344	493,500 **	367	33.1%
-	-	-	-	-	-
<b>Totals/Ave:</b>	<b>161,714</b>	<b>50,350</b>	<b>19,369,260</b>	<b>385</b>	<b>35.6%</b>

\* includes male/female prespawn mortality and female spawn-outs (7,250)

\*\* Note: 3,977 adults were transported to Spring Creek after 11/23/04 to spawn naturally in available spawning gravels.

Appendix 2. Production Summary, all species, 2004.

Species	Number	Pounds	Length	Fish/lb	Feed Fed	Feed Cost <sup>b</sup>	Annual Cost <sup>c</sup>	Cost/lb of Fish	Cost/1,000 Fish	Cost/inch of Fish	Conversion
PdO KL	11,148,020	23,604	1.92	472	24,843	\$14,976.73	\$205,725.08	\$9.51	\$18.45	\$0.0096	1.15
Whatcom KL	929,566	1,017	1.54	914	902	\$567.42	\$7,469.47	\$8.78	\$8.04	\$0.0053	1.06
Can. KE	1,517,618	4,210	2.10	360	4,700	\$2,807.83	\$38,920.74	\$9.88	\$25.65	\$0.0122	1.19
Ore. FC	46,384	168	2.29	276	87	\$89.05	\$720.45	\$5.85	\$15.53	\$0.0068	0.71
03-WS Cutt.	119,043	2,556	3.94	47	2,363	\$1,378.56	\$19,563.88	\$15.94	\$164.34	\$0.0417	1.93
03-WS Cutt. (C.L.)	57,435	3,455	5.56	17	1,514	\$619.11	\$12,537.45	\$9.27	\$218.29	\$0.0393	1.12
04-WS Cutt <sup>a</sup>	91,168	932	3.08	98	651	\$666.30	\$5,390.94	\$7.58	\$59.13	\$0.0192	0.92
<b>Totals/Ave:</b>	<b>13,909,234</b>	<b>35,942</b>	<b>1.96</b>	<b>387</b>	<b>35,060</b>	<b>\$21,105.01</b>	<b>\$290,328.00</b>	<b>\$9.73</b>	<b>\$20.87</b>	<b>\$0.0107</b>	<b>1.17</b>

<sup>a</sup> Currently on-station.

<sup>b</sup> Includes freight, shipping & handling.

<sup>c</sup> Includes transportation costs for truck transportation from Nampa Hatchery - \$7,473.00.

**IDAHO DEPARTMENT OF FISH AND GAME**

**2004 ANNUAL RESIDENT REPORT**

**CLEARWATER FISH HATCHERY**

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

## 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 is using all available rearing space; therefore, the facility had no excess rearing space for catchable rainbow trout *Oncorhynchus mykiss* production.

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

## FISH PRODUCTION

### Release Year 2004

### Catchable Rainbow Trout

The CFH did not produce catchables in 2004 because spring Chinook and steelhead occupied all available rearing space. The CFH was strictly a redistribution center for Nampa State Fish Hatchery (NSFH) reared rainbow trout catchables in 2004.

## FISH FEED

### Catchable Rainbow Trout

The CFH redistributed catchable rainbow trout into Region 2 waters during 2004. Because these fish were stocked in local waters as fast as they arrived, little supplemental feed was needed to maintain overall health and size of the fish.

A total of 300 lbs of EXSL 470 1/8" "sinking" Rangen feed was fed to the rainbows through the summer of 2004 (Appendix 2). This food was purchased with state money during 2004.

## **FISH STOCKED AND TRANSFERRED**

### **Catchable Rainbow Trout**

The CFH redistributed 102,651 rainbow trout during 2004 (Appendix 1). They averaged 2.94 fish per pound (fpp) and weighed 34,861 lbs. A total of 75 fish plants were conducted at 25 different plant sites. Included in this total were 4,533 (Shasta strain) rainbow trout that were reared at Dworshak and Kooskia national fish hatcheries for their annual open house. These fish were stocked by CFH personnel into Spring Valley Reservoir and Karolyn's Pond.

High water delayed some of the stream stocking in early-June. The CFH also had some problems in July and early August of 2004 with water temperatures getting too warm. Flexibility in release dates and fish numbers during these times was imperative for a successful stocking season. This flexibility would not have been possible without the cooperation of regional fisheries biologist, Robert Hand. Due to these warm water temperatures, some plants did not happen in July and August. There were no surplus rainbows this year for additional plants at the end of the planting season.

## **PUBLIC RELATIONS**

The CFH and its satellites were open to visitors during the year. Tours at the main hatchery were given to various groups throughout the year for approximately 535 people as well as for 510 people in drop-in tours. These groups consisted of local grade school, high school and college students. Other groups included teachers with Sustainable Forests and the Boy Scouts of America. Tours at the satellites occurred mainly during the summer months with 1,280 people visiting Powell, 800 people visiting Red River and 75 people visiting the Crooked River facilities. We had visitors from many states, as well as other countries.

Brad George, Theresa Elliott and three summer youth employees assisted Dworshak Hatchery during their annual open house on June 10, 2004.

On August 6, Mike Tetwiler hauled 445 catchable rainbow trout (2.6 fpp) and 12 trophy-size trout to Orofino Creek near Pierce for their annual 1860 Days Celebration.

On June 11, Chris Shockman planted 500 catchable rainbow trout (2.6 fpp) and 13 trophy-size trout into Camp Grizzly Pond.

On July 14, Mike Tetwiler planted 480 rainbows into Jaype Mill Pond for sixth graders on a 4-H forestry tour.

## **SPECIAL PROJECTS**

A total of 155 adult size fish, ranging in weight from 3 lbs to 8 lbs, were recovered from the CFH total flow pond. The planting crew supplemented eight fish stocking trips to seven different sites with these large fish.

## **FISH HEALTH**

In general, fish health at CFH was good this year. The catchable rainbow trout 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. All fish at CFH are monitored daily by hatchery personnel to detect any early signs of fish health problems.

### **New Zealand Mud Snail Information**

All fish at CFH came from the 100-foot and 200-foot sections of C Bank at NSFH where some New Zealand mud snails (NZMS) were found. Some fish from the CFH total flow pond were caught and examined for NZMS and no snails were found.

## **ACKNOWLEDGEMENTS**

The CFH would like to thank the Nampa Fish Hatchery crew for raising the rainbows and Dick Bittick and Gary Ady for transporting the rainbows to CFH for distribution. The CFH would also like to thank Robert Hand and Larry Barrett for their cooperation in redistributing fish to different plant sites due to warm water temperatures in August and September. Bio Aides who aided in rainbow distribution included Robert Schloss, Theresa Elliott, Gary Duke, Lacey Alberts, Daryn Call, Becky Haag, Brittney Hicks, Mike Tetwiler, Max Bausch; Fishery Technicians Chad Hensen and Ron Hopper; Maintenance Craftsman Fred Hough; as well as three youths who were involved in the Clearwater Youth Program.

## **APPENDICES**

Appendix 1. Clearwater Hatchery resident fish redistribution, January 1 to December 31, 2004.

**2004 Catchable Rainbow Trout**

			<b>Number of Fish</b>	<b>Weight (lbs)</b>
2004 catchable RBT on hand January 1, 2004			0	0
2004 catchable RBT on hand December 31, 2004			0	0
<b>Date</b>	<b>Number Released</b>	<b>Pounds</b>	<b>Fish per Pound</b>	<b>Type of Fish</b>
4/1-4/30	2,210	650	3.4	Hayspur T9
5/1-5/31	33,414	9,125	3.7	Hayspur T9
6/1-6/30	42,819	13,203	3.2	Hayspur T9/Troutlodge TT
7/1-7/31	7,493	5,458	1.4	Troutlodge TT/Shasta*
8/1-8/31	455	175	2.6	Troutlodge TT
9/1-9/30	16,260	6250	2.6	Troutlodge TT
10/1-10/31	0	0	0	
<b>Totals</b>	<b>102,651</b>	<b>34,861</b>	<b>Average fpp 2.8</b>	

\*Includes 4,533 Shasta strain rainbow trout at one fpp raised at Dworshak and Kooskia National Fish Hatcheries.

Appendix 2. Fish feed costs and amount fed for the CFH rainbow programs, January 1 - December 31, 2004.

DATE	BRAND	FEED TYPE	WEIGHT (lbs)	COST PER LB	TOTAL
7/15-8/31	Rangen	EXSL 470 1/8" sinking	300	\$0.55	\$164.03

**Total Summary of Catchable Rainbow Trout Redistributed.**

NUMBER FISH	WEIGHT (lbs)	FEED FED	CONVERSION	COST PER LB FOR REDISTRIBUTION	COST/1000 FISH FOR REDISTRIBUTION
102,651	34,861	300 lbs	1.0	\$0.63*	\$213.09**

Estimated costs include 50% of the FY03 & FY04 budgets and do not include permanent salaries or feed cost @ NSFH. Redistribution expenditure by CFH \$13,333.88.

\*Cost/lb equals total budget divided by total lbs produced, 1/1/04-12/31/04.

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

1/1/04 to 12/31/04	CFH Cost for Redistribution	\$13,333.88
	Transport cost to deliver fish from NSFH to CFH	\$8,540.00
	Total Cost	\$21,873.88

**IDAHO DEPARTMENT OF FISH AND GAME**

**2004 ANNUAL RESIDENT REPORT**

**GRACE FISH HATCHERY**

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

## INTRODUCTION

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

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

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 GFH is supplied by gravity flow from Middle and West Whiskey Creek springs located on private property owned by Robert Harris. Flow for 2004 was an annual average of 11.30 cubic feet per second (cfs), approximately 86% of the ten year average. There is a natural fluctuation in water quantity basically opposite of run-off and GFH biomass. Flows are at a minimum during May and June and peak in October and November. The GFH biomass is at a maximum in May and at minimum in October. Water temperature fluctuates from 52°F to 54°F.

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

## FISH PRODUCTION

The GFH cultured sterile Hayspur strain rainbow (T9), Sterile Kamloop rainbow (KT), Troutlodge Triploid rainbow (TT), and sterile lake trout (LT) in 2004.

The GFH began the 2004 calendar year with 179,811 fish weighing 27,122 lbs. A total of 838,834 fish weighing 64,760 lbs were reared and planted by GFH in 2004. There were 203,999 fish weighing 16,107 lbs on hand December 31, 2004. This accounts for a total production of 863,022 fish and 53,745 lbs (Appendix 1).

The GFH received eyed-eggs from various state and private hatcheries in 2004. During the year, 1,180,767 eyed-eggs of various species were received (Appendix 2).

Production costs at GFH for 2004, excluding capital outlay, were \$244,274 (Appendix 3). Production costs were calculated for pondside and streamside amounts. Pondside cost is total budget minus capital outlay minus transportation. Streamside cost includes transportation.

Rainbow trout (fingerlings and catchables combined) accounted for 92.3% of the total lbs produced and 93.5% of total cost. The average cost to produce a rainbow trout at GFH in 2004 was \$3.08 per lb or \$234.72 per 1,000 fish. Triploid lake trout accounted for the remaining 7.7% of the lbs produced and 6.5% of total cost (Appendix 4).

### **Catchable Rainbow Trout**

During 2004, the GFH planted tributaries of the Bear River and Snake River watersheds with sterile catchable rainbow trout. Sterile Hayspur rainbow (T9) and sterile Kamloop rainbow (KT) were the strains of rainbow catchables planted. Sterile rainbows were planted in the Bear River Watershed to prevent hybridization with the native Bear River cutthroat trout. The GFH achieved 99% of the 2004 catchable request.

The GFH started out this calendar year with 119,186 triploid catchable trout. Over the course of the year 136,746 (52,469 lbs) triploid catchable trout averaging 9.86-inches were planted. On December 31, 147,285 (16,039 lbs) fish remain on the station for future planting. Total production for the year is 164,845 triploid catchable rainbows at a weight of 41,429 lbs. These fish converted 47,280 lbs of fish food at a feed conversion of 1.14. The average cost to plant a 9.86-inch catchable was approximately \$1.52 per lb, or \$583.66 per 1,000 fish (Appendices 1, 4).

### **Rainbow Trout Fingerlings**

Triploid fingerlings were stocked into Blackfoot Reservoir, Daniel's Reservoir, Treasureton Reservoir, Twenty-Four Mile Reservoir, Hayden Lake, and Bloomington Lake. Sterile Hayspur rainbow (T9), sterile Kamloop rainbow (KT), and Troutlodge Triploid rainbow (TT) were the strains of rainbow fingerlings planted.

A total of 64,457 3.35-inch fingerlings were green grit marked and stocked into Hayden Lake in May of 2004. Another 56,387 3.35-inch fingerlings were red grit marked and stocked into Hayden Lake in May of 2004. The fish with the red grit mark were exposed to catchable-size predator fish for 15 days before planting. A total of 37,368 6.22-inch fingerlings were orange grit marked and planted into Hayden Lake in September 2004. Department research biologists plan to sample these fingerlings in Hayden Lake in the spring of 2005 to evaluate the predator study and also evaluate survivability of 3-inch spring fingerlings versus 6-inch fall fingerlings.

During 2004, 665,906 (8,127 lbs) triploid rainbow trout fingerlings were planted. From that total, 65,818 (5,296 lbs) fish were planted as 5.86-inch fingerlings. The average cost of planting a 5.86-inch fingerling was approximately \$4.31 per lb, or \$346.88 per 1,000 fish. A total of 477,189 (996 lbs) fish were planted as 1.74-inch fingerlings into Blackfoot Reservoir. The average cost of planting a 1.74-inch fingerling was approximately \$49.35 per lb, or \$103

per 1,000 fish. The remaining 122,899 (1,835 lbs) fish were planted as 3.34-inch fingerlings. The average cost of planting a 3.34-inch fingerling was approximately \$13.24 per lb, or \$197.71 per 1,000 fish. Triploid fingerlings converted 7,165 lbs of food at a feed conversion of 0.88 (Appendices 1, 4).

## **Lake Trout**

During 2004, a total of 36,182 (4,164 lbs) were planted as 7.72-inch triploid LT into Bear Lake. These fish received an adipose and right ventral fin clip prior to stocking. The average cost of planting a 7.72-inch triploid LT was \$3.97 per lb, or \$456.98 per 1,000. Triploid LT converted 3,371 lbs of food at a feed conversion of 0.81 (Appendices 1 and 4).

The GFH completed the third year of a cooperative agreement with the Utah Department of Wildlife Resources (UDWR). The agreement has the objective for GFH to stock 50,000 triploid LT into Bear Lake over a three-year period. Research biologists and hatchery personnel developed a successful recipe for making triploid lake trout. For the year 2005 the GFH is moving from the experimental phase to the hatchery production phase in making triploid LT. In October 2004, GFH personnel along with Story Fish Hatchery personnel with the Wyoming Game and Fish Department (WGFD) produced 55,796 eyed-eggs. These fish will be stocked into Bear Lake as 8-inch marked fish in November 2005.

## **FISH FEED**

The fish produced during 2004 were fed a total of 57,817 lbs of feed from Rangen Inc and Skretting (Appendix 5). The net weight gained during 2004 was 53,745 lbs, which resulted in an overall conversion of 1.08 lbs of feed to produce one lb of fish (Appendix 1).

## **REPAIRS AND IMPROVEMENTS**

- Erected a new residence #4 at the hatchery.
- Replaced leaky plumbing in residence #2.
- Fixed and replaced broken windows in residences #1 and #3.
- Trimmed trees on hatchery grounds.
- Completed repairs around siding on 2-stall garage.
- Fixed and made improvements on belt feeders.
- Installed flashing on chimney in vat building and residence #2.
- Acquired new John Deere utility tractor.

- Installed new "hatchery rules" sign at the handicap access.
- Repaired cover on main hatchery spring headbox.
- Acquired new tires for 2-ton truck.
- Cleaned, updated MSDS sheets, and put fireproof container in chemical storage room.
- Reclaimed some lost water from East Spring.
- Placed cracked rock on hatchery driveway.
- Built new shade covers for small and medium raceways.

### **NEEDED RENOVATIONS**

- Install pressure tank in residences #1 and #3.
- Install an auxiliary water supply pipe from the main supply line to a head box with new line going to the small raceways.
- Create an offline settling pond for the large raceways.
- Dredge existing settling pond and build new concrete settling pond with a sump basin.
- Build a doublewide garage and storage area for 2-ton, snowplow, and feeding tractor.
- Put landscaping around new residence #4.
- Install storm windows and siding, and remodel kitchen, dining area, and bathroom in residence #1.
- Rebuild hatchery driveway and place Geotech Fabric to maintain stability.

## **PUBLIC RELATIONS**

The GFH staff gave three scheduled tours to 200 kids and teachers from local area schools. The GFH staff also gave formal tours to Boy Scout troops as well as informal tours to 30 people visiting the facility. Self-guided tour signs and informative tri-fold packets are available to the public at our visitor kiosk. It is estimated about 400 people in 2004 took self-guided tours around the hatchery. 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. An estimated 200 kids, 14 and under, fished the escapement pond on Free Fishing Day. The GFH staff helped with law enforcement during the muzzleloader deer season and helped work county and state fairs. Staff of GFH also handled many questions from personal contacts and phone calls.

## **ACKNOWLEDGEMENTS**

During 2004, the Grace Fish Hatchery crew included: Dwight Aplanalp, Hatchery Manager I, Jeffrey D. Seggerman, Assistant Hatchery Manager, Thomas Kent, Fish Culturist, and Chad Smith, Biological Aide. The GFH would like to give special thanks to Terri Bergmeier, Region 5 volunteer coordinator, for coordinating all volunteer efforts at GFH this year. Volunteers helped with the fin clipping of the lake trout, fish stocking, and Free Fishing Day activities.

## **APPENDICES**

Appendix 1. Number and pounds of fish produced, reared and stocked by Grace Fish Hatchery, 2004.

<b>Species/ strain Lot #</b>	<b>Number (pounds) on hand 01/01/04</b>	<b>Number Reared &amp; planted (pounds)</b>	<b>Number (pounds) on hand 12/31/04</b>	<b>Pounds produced</b>	<b>Conversion</b>
Tripliod Rainbow Catchables	119,186	136,746	147,285		
	(27,079)	(52,469)	(16,039)	41,429	1.14
Tripliod Rainbow Fingerlings	60,625	665,906	56,714		
	(43)	(8,127)	(68)	8,152	0.88
Lake Trout (LT)	0	36,182	0		
	(0)	(4,164)	0	4,164	0.81
<b>Total</b>	<b>179,811</b>	<b>838,834</b>	<b>203,999</b>	<b>863,022</b>	
	<b>(27,122)</b>	<b>(64,760)</b>	<b>(16,107)</b>	<b>53,745</b>	<b>1.08</b>

Appendix 2. Eyed eggs received at Grace Fish Hatchery 2004.

<b>Species/strain</b>	<b>Source</b>	<b>Number Received</b>	<b>Date Received</b>
Sterile rainbow trout (T9)	IDFG Hayspur	69,041	01/22/04
Troutlodge Triploid rainbow (TT)	Troutlodge	190,000	01/26/04
Troutlodge Triploid rainbow (TT)	Troutlodge	250,000	02/11/04
Sterile rainbow trout (T9)	IDFG Hayspur	38,310	03/23/04
Sterile Kamloops rainbow (KT)	IDFG Hayspur	28,364	03/23/04
Sterile rainbow trout (T9)	IDFG Hayspur	8,289	04/27/04
Sterile Kamloops rainbow (KT)	IDFG Hayspur	21,711	04/27/04
Sterile rainbow trout (T9)	IDFG Hayspur	12,683	05/04/04
Sterile Kamloops rainbow (KT)	IDFG Hayspur	17,317	05/04/04
Troutlodge Triploid rainbow (TT)	Troutlodge	50,000	05/05/04
Troutlodge Triploid rainbow (TT)	Troutlodge	50,000	07/28/04
Sterile Kamloops rainbow (KT)	IDFG Hayspur	72,884	11/02/04
Sterile rainbow trout (T9)	IDFG Hayspur	8,214	11/02/04
Triploid Lake Trout	WGF D Story	55,796	11/17/04
Sterile Kamloops rainbow (KT)	IDFG Hayspur	251,786	12/07/04
Sterile Kamloops rainbow (KT)	IDFG Hayspur	56,372	12/30/04
<b>TOTAL</b>		<b>1,180,767</b>	

Appendix 3. Pondside and streamside production cost at Grace Fish Hatchery, 2004. Streamside costs include \$8,540 of Nampa's transportation costs.

<b>Pounds Produced</b>	<b>Production Cost</b>	<b>Pond side Cost</b>	<b>Pond side Cost/lb</b>	<b>Streamside Cost</b>	<b>Stream-side Cost/lb</b>
53,745	\$244,274	\$235,073	\$4.37	\$252,814	\$4.70

Appendix 4. Costs of fish produced at Grace Fish Hatchery, 2004. Costs reflect all costs budgeted except capital outlay, and include \$8,540 of Nampa's transportation costs.

Species/Strain	Length/ inches	Number Produced	Weight Pounds	Costs produce and plant	Cost/1000	Cost/lb
<b>Fish on Hand Jan 1, 2004</b>						
Hayspur rainbow (T9,KT)	8.26	119,186	27,079			
Hayspur rainbow (T9)	1.20	60,625	42.81			
<b>TOTAL</b>	<b>7.27</b>	<b>179,811</b>	<b>27,121.81</b>			
<b>Fish Planted</b>						
Triploid lake trout (LT)	7.72	36,182	4,164	\$16,534.60	\$456.98	\$3.97
<b>SUBTOTAL</b>	<b>7.72</b>	<b>36,182</b>	<b>4,164</b>	<b>\$16,534.60</b>	<b>\$456.98</b>	<b>\$3.97</b>
Hayspur rainbow (T9,KT)	9.86	136,746	52,469	\$79,813.32	\$583.66	\$1.52
Hayspur rainbow (T9,KT)	5.86	65,818	5,296	\$22,831.06	\$346.88	\$4.31
Hayspur rainbow (T9,KT)	3.34	122,899	1,835	\$24,298.46	\$197.71	\$13.24
Troutlodge Triploids (TT)	1.74	477,189	996	\$49,150.00	\$103.00	\$49.35
<b>SUBTOTAL</b>		<b>802,652</b>	<b>60,596</b>	<b>\$176,092.84</b>	<b>\$219.39</b>	<b>\$2.91</b>
<b>TOTAL</b>		<b>838,834</b>	<b>64,760</b>	<b>\$192,627.44</b>	<b>\$229.64</b>	<b>\$2.97</b>
<b>Fish on Hand Dec 31, '04</b>						
Hayspur rainbow (T9,KT)	7.30	70,730	11,021	\$30,564.01	\$432.12	\$2.77
Troutlodge Triploids (TT)	5.47	76,555	5,018	\$24,788.19	\$323.80	\$4.94
Hayspur rainbow (T9,KT)	1.44	56,714	68	\$4,834.33	\$85.24	\$71.09
<b>TOTAL</b>	<b>5.82</b>	<b>203,999</b>	<b>16,107</b>	<b>\$60,186.53</b>	<b>\$295.03</b>	<b>\$3.74</b>
<b>GRAND TOTAL</b>						
Planted in 2004		838,834	64,760	\$192,627.44	\$229.64	\$2.97
(+)On Hand Dec. 31, 2004		1,042,833	80,867	\$60,186.53	\$295.03	\$3.74
<b>TOTAL</b>				<b>\$252,813.98</b>	<b>\$242.43</b>	<b>\$3.13</b>
(-)On Hand Jan. 1, 2004		179,811	27,121.81			
<b>TOTAL GAINED</b>		<b>863,022</b>	<b>53,745</b>	<b>\$252,813.98</b>	<b>\$292.94</b>	<b>\$4.70</b>

Appendix 5. Fish food fed and cost, Grace Hatchery, 2004.

Source	Diet	Size	Cost/lb.	Pounds	Total Cost
Rangens	Dry	00	\$0.47	176.0	\$82.72
Rangens	Dry	# 0	\$0.47	380.0	\$178.60
Rangens	Dry	#1	\$0.47	575.0	\$270.25
Rangens	Dry	#2	\$0.47	1,610.0	\$756.70
Rangens	Dry	#3	\$0.37	1,587.0	\$587.19
Rangens	Dry	#4	\$0.35	2,950.0	\$1,032.50
Rangens	Extr. 450	3/32 sink	\$0.38	3,900.0	\$1,482.00
Rangens	Extr. 450	1/8 sink	\$0.31	3,130.0	\$970.30
Rangens	Extr. 450	1/8 floating	\$0.28	110.0	\$30.08
Rangens	Extr. 450	1/8 bulk	\$0.29	30,440.4	\$8,827.72
Rangens	med OTC*	1/8	\$0.66	2,094.4	\$1,382.30
<b>SUBTOTAL</b>				<b>+++++++</b>	<b>\$15,600.36</b>
Skretting	med. OTC*	2.5mm	\$0.79	546.0	\$431.34
Skretting	Dry	Mash	**\$0.33	66.0	\$21.78
Skretting	Dry	#0	**\$0.82	264.0	\$216.48
Skretting	Dry	#1	**\$0.84	308.0	\$258.72
Skretting	Dry	#2	**\$0.76	572.0	\$434.72
Skretting	Dry	1.2mm	**\$0.22	1,056.0	\$232.32
Skretting	Dry	1.5mm	\$0.75	1,452.0	\$1,089.00
Skretting	Dry	2.0mm	\$0.71	2,640.0	\$1,874.40
Skretting	Dry	2.5mm	\$0.68	3,960.0	\$2,692.80
<b>SUBTOTAL</b>				<b>10,864.0</b>	<b>\$7,251.56</b>
<b>GRAND TOTAL</b>				<b>57,816.4</b>	<b>\$22,851.92</b>

\*OTC is Oxytetracycline

\*\*A total of 1,056 lbs of Skretting food was free for participating in a feed study so cost/lb does not reflect actual Skretting food cost.

# **IDAHO DEPARTMENT OF FISH AND GAME**

## **2004 ANNUAL RESIDENT REPORT**

### **HAGERMAN FISH HATCHERY**

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

## INTRODUCTION

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

Funding is provided primarily through Department license money. The HFH used approximately \$553,896 this year: \$301,722 from Hagerman's budget, \$208,783 from Dingell-Johnson (DJ) monies, and \$43,391 from the fish transportation budget, to rear and stock fish in the 2004 production year, not including capital outlay expenditures (Appendix 1).

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

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

## HATCHERY PRODUCTION

During 2004, the HFH reared and stocked 2,850,050 fish weighing 412,861 lbs. Of these, 781,074 were stocked 6-inches or longer and 2,068,976 were stocked smaller than 6-inches (Appendix 1). About 45.7% 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. Approximately 59,000 steelhead were also stocked. The 3-inch to 6-inch fish consisted of rainbow trout 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 412,861 lbs stocked included 352,411 lbs of put-and-take fish averaging 10.2 inches, and 60,450 lbs of fingerlings that averaged 4.0 inches. The cost of planting the average 6.9 fish per pound (fpp) (7.0 inches) fish was approximately \$0.92 per lb, or \$132.73 per 1,000 fish (Appendix 1).

In addition to the fish reared and planted, 1,423,733 fish (107,460 lbs) were on hand at the HFH on December 31, 2004. These consisted of 1,143,200 fish (105,783 lbs, average 10.8 fpp, or 5.9 inches) in the large raceways and 280,533 fingerlings (1,677 lbs, average 167 fpp, or 2.4 inches) in the west raceways. The cost of producing the larger fish was \$1.51 per lb or \$140.05 per 1,000, and \$9.24 per lb or \$55.26 per 1,000 for the fingerlings (Appendix 1).

On hand January 1, 2004 were 1,491,704 fish (118,168 lbs). The HFH also received 996,708 fish (5,340 lbs) of fish from other hatcheries. Consequently, these subtractions yielded a net production for 2004 of 1,785,371 fish (396,813 lbs), mortality excluded (Appendix 1).

A total of 8,787,537 eggs and fry were acquired to yield the fish produced. Approximately 3,470,208 eggs were purchased and the balance was acquired from government sources at no cost (Appendix 4). Of the 7,790,829 eggs received, 4,872,143 were received for the fish planted and the balance was used for 2004 production. Eggs were sent to Magic Valley Fish Hatchery (MVFH) to alleviate overcrowded conditions here. They were then transferred to Hagerman Fish Hatchery (HFH) when they were about 186 fpp (2.3-inches). Because of last year's success, eggs were again shipped to MVFH for early rearing and will be transferred here in February 2005.

The overall survival rate of fish stocked was 49%, up from 45% survival last year (Appendix 3). Some of this difference can be attributed to the use of hydrogen peroxide in the hatchery building which resulted in less Coldwater Disease there. Once again, mortality due to IHNV *Infectious Hematopoietic Necrosis Virus* decreased.

Fish transport operator Ken Taylor logged 25,498 miles delivering fish to state waters, while the rest of the crew logged 14,484 miles. This amounted to a total of 39,982 miles and 302 stocking trips during 2004, and included 35 trips for the private sector. In addition, hatchery personnel witnessed, but did not stock, another 39 releases by the private sector.

In addition to the annual requests by regional fisheries managers, the HFH crew made 35 trips to haul and stock 391,967 fish weighing 94,185 lbs from other sources (Appendix 7). These included eight trips for the American Falls Fish Hatchery (AFFH) to stock 280,024 trout weighing 42,975 lbs; four trips to stock 15,605 channel catfish weighing 3,255 lbs; five trips to stock 18,392 brown trout weighing 1,533 lbs and 300 rainbow trout weighing 1,382 lbs from the University of Idaho Fish Culture Station; five trips for Ashton Fish Hatchery (AFH) to stock 24,589 rainbow trout and brook trout weighing 3,163 lbs; and 13 trips for several commercial hatcheries to stock 69,846 rainbow trout weighing 62,040 lbs. In addition, the crews from HFH and Niagara Springs Fish Hatchery (NSFH) witnessed 39 trout stockings totaling 167,858 fish weighing 57,760 lbs by the commercial hatcheries in the Magic Valley region.

## **FISH FEED**

The fish produced during 2004 were fed a total of 500,796 lbs of feed from Rangen Inc and Moore-Clark (Appendix 5). The net weight gained during 2004 was 396,813 lbs, which resulted in an overall conversion of 1.26 lbs of feed to produce one lb of fish, not including the weight of the mortalities.

## HATCHERY IMPROVEMENTS

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

- Replaced all domestic water lines within the residences and office.
- Installed an automatic gate with timer on the lower roadway.
- Replaced some raceway dam boards.
- Completed construction of buildings over the chiller and new water chiller tank.
- Added reclaimed asphalt to the parking lot in front of the office.
- Constructed a new two-vehicle storage area.
- Repaired the floor in the west raceways, W11-18.
- Constructed concrete walls at the bottom of L1-8 to keep ducks out.
- Covered the lower roadway tailrace.
- Constructed and installed new Riley Creek aluminum intake racks.
- Enclosed and sided the garage on residence #3.
- Installed new cabinets in residence #4 and installed a fence in the yard.
- Completed a drain for chiller water spillover.
- Constructed and installed water treatment supports for the hatchery building.
- Installed an automatic garage door opener on the shop door.
- Installed a dishwasher in the dormitory.

## **PUBLIC RELATIONS**

The HFH received a large number of visitors and sportsmen throughout the year. An estimated 30,000 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 14 tours to 565 school kids during the spring and fall, 4 tours for area scouts, and 3 tours to other groups. The hatchery sponsored a Free Fishing Day clinic here for over 300 participants. The Hagerman Boy Scouts, Hagerman National Hatchery personnel, and personnel from the Department assisted. Pepsi-Cola, Falls Brand Meats, Eagle Claw, 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 one tagging operation during the year in which 194,185 trout weighing 7,450 lbs were marked (Appendix 6). These fish were stocked into Lake Walcott on May 18 and 19. This study was to evaluate the success of the predator training experiment.

## **ACKNOWLEDGMENTS**

Thanks to the permanent HFH staff of Walt Rast, Dave May, Brian Thompson, and Tim Klucken; to transport operator Ken Taylor; and to temporaries Paul Gaulin, Deskin Waters, and Jessica Hurley.

Regional personnel Doug Megargle, Chuck Warren, Richard Holman, Dean Grissom, 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 2004. Costs reflect all costs budgeted, except capital outlay, and include \$43,391 of the fish transportation budget.

<u>Species/Strain</u>	<u>Length/ Inches</u>	<u>Number Produced</u>	<u>Weight/ Pounds</u>	<u>Cost to produce and plant</u>	<u>Cost/ 1,000</u>
<b>FISH ON HAND JANUARY 1, 2004</b>					
Rainbow trout, yellow (YT,SP,01)	19.1	269	897		
Kamloops rainbow trout (KT)	10.9	53,725	29,848		
Steelhead (SA)	6.9	73,888	10,721		
Hayspur rainbow trout (T9)	6.6	35,796	4,838		
Kamloops rainbow trout (TL,TT,00)	6.4	610,773	70,190		
Kamloops rainbow trout (KT)	1.8	553,201	1,400		
Hayspur rainbow trout (T9)	1.6	<u>164,052</u>	<u>274</u>		
	<b>5.15</b>	<b><u>1,491,704</u></b>	<b><u>118,168</u></b>		
<b>Totals</b>	<b>5.15</b>	<b>1,491,704</b>	<b>118,168</b>		
<b>FISH PLANTED</b>					
Rainbow trout, yellow (YT,SP,01)	21.2	154	616	\$77.07	\$500.43
Kamloops rainbow trout (KT)	11.0	145,017	81,175	\$37,654.88	\$259.66
Kamloops rainbow trout (TL,TT)	10.1	576,903	250,720	\$137,541.54	\$238.41
Steelhead (SA)	9.5	<u>59,000</u>	<u>19,900</u>	<u>\$13,370.05</u>	<u>\$226.61</u>
<b>Subtotals</b>	<b>10.2</b>	<b>781,074</b>	<b>352,411</b>	<b>\$188,643.54</b>	<b>\$241.52</b>
Hayspur rainbow trout (T9)	4.2	511,735	16,750	\$50,734.59	\$99.14
Kamloops rainbow trout (KT)	4.2	1,132,641	38,600	\$113,094.73	\$99.85
Kamloops rainbow trout (TL,TT)	3.0	359,700	4550	\$25,812.12	\$71.76
Kamloops rainbow trout (KT)	2.7	<u>64,900</u>	<u>550</u>	<u>\$4,136.36</u>	<u>\$63.73</u>
<b>Subtotals</b>	<b>Average</b>	<b><u>4.0</u></b>	<b><u>2,068,976</u></b>	<b><u>60,450</u></b>	<b><u>\$189,641.43</u></b>
<b>Total Planted</b>	<b>Average</b>	<b>7.0</b>	<b>2,850,050</b>	<b>412,861</b>	<b>\$378,284.97</b>
				<b>\$189,641.43</b>	<b>\$91.66</b>
				<b>\$378,284.97</b>	<b>\$132.73</b>
<b>FISH ON HAND DECEMBER 31, 2004</b>					
Rainbow trout, yellow (YT,SP,03)	13.4	3,490	3,490	\$1,099.81	\$315.13
Kamloops rainbow trout (KT)	9.0	29,946	9,361	\$6,361.96	\$212.45
Steelhead (SA)	6.3	100,350	9,300	\$14,923.39	\$148.71
Kamloops rainbow trout (TL,TT)	5.8	1,009,414	83,632	\$137,723.13	\$136.44
Kamloops rainbow trout (KT)	2.5	230,299	1,556	\$13,427.61	\$58.31
Hayspur rainbow trout (T9)	<u>1.8</u>	<u>50,234</u>	<u>121</u>	<u>\$2,075.13</u>	<u>\$41.31</u>
	<b>5.6</b>	<b>1,423,733</b>	<b>107,460</b>	<b>\$175,611.03</b>	<b>\$123.35</b>
<b>Totals</b>	<b>5.6</b>	<b>1,423,733</b>	<b>107,460</b>	<b>\$175,611.03</b>	<b>\$123.35</b>
<b>TOTAL FISH PRODUCED</b>					
Planted in 2004		2,850,050	412,861		
On Hand December 31, 2004		<u>1,423,733</u>	<u>107,460</u>		
<b>Totals</b>		<b>4,273,783</b>	<b>520,321</b>	<b>\$553,896.00</b>	<b>\$129.60</b>
From other hatcheries		996,708	5,340		
<b>On Hand January 1, 2004</b>		<u>1,491,704</u>	<u>118,168</u>		
<b>TOTAL GAINED</b>		<b>1,785,371</b>	<b>396,813</b>		

Appendix 2. Fish distribution from Hagerman Fish Hatchery, 2004.

**Percent of number planted by Region**

	Number	Pounds	1	2	3	4	5	6	7
<b>Catchables &gt;6 inches</b>									
Rainbow trout, yellow	154	616				100.0			
Kamloops rainbow trout (TT)	576,903	250,720	-	12.4	46.9	33.0	2.5	5.2	-
Kamloops rainbow trout (KT)	145,017	81,175		46.1	5.4	48.5			
Steelhead (SA)	59,000	19,900	-	-	100.0	-	-	-	-
<b>Subtotal</b>	<b>781,074</b>	<b>352,411</b>	<b>-</b>	<b>17.7</b>	<b>43.2</b>	<b>33.4</b>	<b>1.9</b>	<b>3.8</b>	<b>-</b>
<b>Fingerlings &lt;6 inches</b>									
Hayspur rainbow trout (T9)	511,735	16,750	-	-	2.0	40.5	57.5	-	-
Kamloops rainbow trout (KT)	1,132,641	38,600	-	-	15.8	46.2	20.1	17.9	-
Kamloops rainbow trout (KT)	64,900	550	-	-	-	-	-	100.0	-
Kamloops rainbow trout (TT)	359,700	4,550				86.7		13.3	
<b>Subtotal</b>	<b>2,068,976</b>	<b>60,450</b>	<b>0.0</b>	<b>0.0</b>	<b>9.2</b>	<b>50.4</b>	<b>25.2</b>	<b>15.2</b>	<b>0.0</b>
<b>TOTAL</b>	<b>2,850,050</b>	<b>412,861</b>	<b>0.0</b>	<b>4.9</b>	<b>18.5</b>	<b>45.7</b>	<b>18.8</b>	<b>12.1</b>	<b>0.0</b>

Appendix 3. Fish survival from eyed-egg to stocking, 2004.

Species/Strain	Number Stocked	Eggs and Fry Received	Percent Survival
Rainbow trout, Yellow	154	3,288	11.56*
Rainbow trout, Hayspur (T9)	511,735	994,218	51.47
Kamloops, Troutlodge (TT)	936,603	1,967,578	47.60
Kamloops, Hayspur (KT)	1,342,558	2,415,348	55.58
Steelhead (SA)	59,000	488,419	12.08
<b>TOTAL</b>	<b>2,850,050</b>	<b>5,868,851</b>	<b>48.56</b>

\* Plus 226 stocked in 2003.

Appendix 4. Number of eyed-eggs and fry received, species, and source for fish produced in 2004.

Species/Strain	Eggs/Fry received		
	For Fish	For fish on hand	Source
	Planted	December 31, 2004	
<b>Received as eggs</b>			
Rainbow/Yellow (YR)	3,288*	5,436	Clear Lakes (ITP)
Rainbow/Kamloops (KT)	1,929,032	609,303	IDFG Hayspur
Rainbow/Hayspur (T9)	483,826	613,749	IDFG Hayspur
Rainbow/sterile Troutlodge (TT)	1,967,578	1,502,630	Troutlodge, WA
Steelhead	488,419	187,568	IDFG Pahsimeroi, Oxbow
<b>Subtotal eggs</b>	<b>4,872,143</b>	<b>2,918,686</b>	
<b>Received as fry</b>			
Rainbow from Magic Valley (T9)	510,392	0	IDFG Hayspur
Kamloops (Hayspur) from Magic Valley (KT)	486,316	0	IDFG Hayspur
<b>Subtotal fry</b>	<b>996,708</b>	<b>0</b>	
<b>TOTAL</b>	<b>5,868,851</b>	<b>2,918,686</b>	

Appendix 5. Fish feed used during 2004 at Hagerman Fish Hatchery.

Size	Source	Pounds	Cost/pound	Cost
Str	Rangen	200	\$0.44	\$87.20
S.M. Str	Rangen	150	\$0.86	\$128.85
#1	Rangen	5,100	\$0.49	\$2,468.40
#1 TM	Rangen	600	\$0.62	\$369.24
#2	Rangen	19,700	\$0.49	\$9,534.80
#2 TM	Rangen	1,250	\$0.62	\$769.25
#3	Rangen	40,950	\$0.35	\$14,250.60
#3 TM	Rangen	3,400	\$0.62	\$2,092.36
3/32 in, EXT450Float	Rangen	122,340	\$0.33	\$40,127.52
5/32 in, EXT450Float	Rangen	288,360	\$0.30	\$85,931.28
5/32 in, TM	Rangen	17,200	\$0.53	\$9,177.92
5/32 in. Romet	Rangen	1,150	\$0.83	\$956.69
<b>Subtotal</b>		<b>500,400</b>	<b>\$0.33</b>	<b>\$165,894.11</b>
#0	Moore-Clark	308	\$0.95	\$289.52
#1 ProActive	Moore-Clark	88	\$0.45	\$39.60
<b>Subtotal</b>		<b>396</b>	<b>\$0.83</b>	<b>\$329.12</b>
<b>TOTAL</b>		<b>500,796</b>	<b>\$0.33</b>	<b>\$166,223.23</b>
<b>Freight charges</b>				<b>\$2,504.00</b>
<b>Total cost</b>				<b>\$168,727.23</b>

Appendix 6. Summary of fish marked at Hagerman Fish Hatchery in 2004.

Date Stocked	Species	Water	Number	Pounds	Clip
05/18	KT	Lake Walcott	103,885	3,950	Grit-mark-green
05/18 & 19	KT	Lake Walcott	90,300	3,500	Grit-mark-red
<b>TOTALS</b>			<b>194,185</b>	<b>7,450</b>	

Appendix 7. Fish stocked or witnessed by Hagerman Fish Hatchery from other sources, 2004.

Hatchery Stocking	Species	Number	Pounds	Source	Destination
Hagerman	TT,T9	272,194	20,275	American Falls Hatchery (IDFG)	Blackfoot Res.; Am. Falls Res., Arrowrock Res., Isl. Park Res., Snake R.
Hagerman	C3	7,830	2,700	American Falls Hatchery (IDFG)	Golden Lake and Isl. Park Res.
Hagerman	BN	16,789	163	Ashton Hatchery	Billingsley and Rock Creek
Hagerman	BN	1,603	1,370	U of ID	Billingsley Creek
Hagerman	T9	7,800	3,000	Ashton Hatchery	Montpelier Res.
Hagerman	CC	15,605	3,255	Fish Processors, Buhl, ID	Herman Anderson #3, Dog Creek Res. Alexander Res.
Hagerman	R1	300	1,382	U of ID	Riley Creek, Gooding Pond, Frank Oster #1
Hagerman	R1	20,580	4,200	Whitewater Ranch	Cascade Res.
Hagerman	R1	38,600	47,000	Crystal Springs Hatchery	Salmon Falls Creek Res., Crystal Lake, Dierkes Lake, Riley Creek, Frank Oster #1, Empire Pond #1 & #2,
Hagerman	YT	500	2,000	Idaho Trout Processors (Clear Lakes)	Crystal Lake, Dierkes Lake
Hagerman	R1	7,360	2,300	Idaho Trout Processors (Clear Lakes)	Emerald Lake
Hagerman	R1	<u>2,806</u>	<u>6,540</u>	Clear Springs Foods	Martin Farm pond, Dierkes Lake, Frank Oster 1-4, Riley Creek, Freedom Park Pond
<b>SUBTOTAL:</b>		<b>391,967</b>	<b>94,185</b>		

Appendix 7. Continued

Hatchery Stocking	Species	Number	Pounds	Source	Destination
CSI Hatchery	R1	5,109	1,728	C.S.I. Hatchery	Rock Creek (Victory Bridge & County Park)
Hagerman National Hatchery	T9	45,183	13,575	Hayspur Hagerman National Hatchery	Snake River, Salmon Falls Creek Res., Lower Deep Creek Res., Arrowrock Res.
Clear Springs Foods	R1	3,474	6,799	Clear Springs Foods	Crystal Lake
Idaho Trout Processors	R1	114,092	35,658	Idaho Trout Processors	Crystal Lake, Snake River, Riley Creek, Frank Oster #1
Crystal Springs	R1	38,914	32,573	Crystal Springs Hatchery	McTucker P 1,2,4,5,8, Devil's Creek Res., Rose P., Crowther's Res.
<b>SUBTOTAL:</b>		<b>206,772</b>	<b>90,333</b>		
<b>TOTALS:</b>		<b>598,739</b>	<b>184,518</b>		

**IDAHO DEPARTMENT OF FISH AND GAME**

**2004 ANNUAL RESIDENT REPORT**

**HAYSPUR FISH HATCHERY**

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

## INTRODUCTION

Hayspur Fish Hatchery (HSFH) is a license-funded resident salmonid broodstock facility. The mission of the HSFH is production of eyed eggs that are made sterile or triploid by heat shocking technique. Two captive rainbow trout *Oncorhynchus mykiss* brood stocks and one Westslope cutthroat *O. clarki lewisi* broodstock are maintained on station. These are the Hayspur strain rainbow trout, Kamloops strain rainbow trout and Westslope cutthroat strain trout from Conners 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, 15 covered 24-foot circular ponds, 4 small raceways, and 6 large production raceways. Other buildings include a fish spawning equipment storage building, two generator buildings, three residences for permanent employees, an office building, shop, a three bay garage, a barn, and dormitory for temporary employees.

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

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

## RAINBOW AND KAMLOOPS EYED EGG PRODUCTION

The 2004 rainbow trout spawning season was a nine-month project, beginning in August and ending in May with an egg-take of 8,792,448 green eggs from 3,331 females during the year (Appendix 1). Photoperiod manipulation, or light control, has expanded "normal" spawn timing to more closely match egg production with eyed egg requests. Only three-year-old and older Hayspur rainbows and Kamloops rainbows were manipulated. We have found two-year-olds respond poorly to photoperiod manipulation. Hayspur rainbow trout triploid eyed-egg production totaled 2,761,379 with 1,697 females spawned. Kamloop triploid eyed-egg production totaled 2,695,292 with 1,634 females spawned. All eggs produced, except for broodstock replacement eggs, were heat shocked for triploidy. American Falls, Ashton, Cabinet Gorge, Eagle, Grace, Hagerman, Magic Valley, McCall, Sandpoint, and Nampa hatcheries were shipped eggs per their requests. Magic Valley Fish Hatchery (MVFH) received 1,538,444 trout eggs destined for Hagerman. In addition, the Tuccanon National Fish Hatchery in Washington and the Hagerman National Fish Hatchery in Idaho received 75,000 Kamloop trout eggs and 194,037 Hayspur rainbow trout eggs, respectively, for mitigation purposes. Value to the Department, at the current contract price of \$28.00/1,000 for sterile triploid rainbow trout eggs and \$38.00/1000 for Westslope trout eggs, equates to \$155,737.15 (Appendix 2).

In 2004, all rainbow trout eggs produced for shipping were heat shocked and made sterile. Replacement broodstock eggs were not heat shocked and were utilized exclusively at HSFH for replacement broodstock needs. This was the fourth year of full production using the heat shock

method refined during the previous six years of research. Washington State University performed induction rate sampling on thirteen randomly selected lots of eggs reared at the Eagle Fish Health Lab (EFHL). After the eggs had hatched and fish reached approximately three inches in length, blood samples were sent to the lab. A total of 519 individuals were sampled. Sample results indicated that 500 out of 519 were verified as being triploid. The overall induction rate was 96.3%, down slightly from 97.88% the previous year. The Hayspur rainbow trout induction rate was 96.55% (308 out of 319). The Kamloop rainbow trout induction rate was 96.00% (192 out of 200).

## **WESTSLOPE CUTTHROAT TROUT EYED EGG PRODUCTION**

The 2004 spawning season was a four-month project beginning in February and ending in May (the parental high mountain lake stock spawns in June). The first spawn occurred on February 27, 2004. Spawning was completed on May 14, 2004. A total of 12 egg collections resulted in 223 females being spawned. Average fecundity was 647 eggs per female. The overall eye-up rate was 58.82% (up from 34.23% in 2003). A total of 131,995 green eggs were collected and eyed-egg production equaled 77,641 (Appendix 1). All eyed-eggs produced were shipped to American Falls Hatchery for early rearing.

## **FISH LIBERATIONS**

Fish requested for the Big Wood and Little Wood drainages were reared at Nampa Fish Hatchery (NFH) and transported to HSFH for redistribution by HSFH personnel. Semi-tank and trailer loads were hauled as needed to complete HSFH 2003 plant request. A total of 43 stocking trips into the Big Wood and Little Wood drainages were stocked with 41,940 catchable sized rainbow trout (Appendix 3). In addition, a total of 9,196 surplus diploid rainbow trout fingerlings were stocked into Salmon Falls Creek Reservoir during 3 stocking trips.

## **FISH FEED**

Rangen provided the 1/4-in brood feed. This food was ordered with 150 grams per ton of canthaxathin red additive to enhance egg color and other possible health benefits. Rangen and Skretting were the sources of early rearing feeds. Rangen was the primary food source utilized for catchables and for replacement broodstock retained on station (Appendix 4). The Westslope cutthroat trout were fed Rangen and Skretting during the season.

## **HATCHERY IMPROVEMENTS AND NEEDS**

Improvements to the HSFH during 2004 included:

- New linoleum was installed in the kitchen and dining area of residence #3.
- Two large willow trees behind residence #3 were removed and other smaller trees trimmed.
- The carpets in all of the residences and the dormitory were professionally cleaned in the spring and the fall.

- All the garage doors in the office building were serviced and repaired, as necessary.
- Vegetation was removed from large raceways A through F.
- Two clusters of aspen trees were planted adjacent to Gavers Lagoon.
- A footbridge was constructed on Butte Creek to provide access to a small island in the trophy stream section.
- Russian olive trees in the campground were pruned.
- Three new round ponds were constructed where small raceways #3 and #4 used to be.
- Additional predator covers were constructed and installed over small raceways #1 and #2.
- Fencing was placed around pump #4.
- New carpet was installed in two bedrooms of residence #1.
- Genplus, a division of Cummins Intermountain Generator Service, serviced both generators in November.
- New crowd racks were constructed for use in the large raceways.
- The spawning building heater was repaired.
- Additional adult round pond crowd racks were constructed. In addition, several crowd rack extensions were constructed for round pond segregation.
- A new computer was delivered by IT during February.
- Scott Tabor serviced the generator #2 louver motors and installed a new light by the diesel fuel tank.
- All of the chimneys were professionally cleaned.
- Scott Tabor, Fish and Game electrician repaired the Parma pump during the summer. In addition, Scott serviced and repaired all of the round pond lighting and installed new light control timers for round ponds 9-12.
- The engineering crew excavated two additional mort pits. In addition, the crew dug up two round pond control valve cylinders and reset them.
- The metal culvert to Gavers Lagoon was removed and concrete boat slabs installed to prevent willow tree roots from plugging the pipeline.
- Eighteen old tires, several metal barrels, and a large automobile axle were removed from the grounds area adjacent to the campground.
- New auto glass was installed in the ½ -ton pickup and the Kubota tractor.
- Swenke Lawn Service fertilized and applied weed control to the hatchery grounds in the spring and summer.
- The throttle and running light problems on the 1-ton pickup were repaired.
- Eight new picnic tables were purchased and constructed for use on the Hayspur grounds.
- The park restrooms were pumped and serviced.
- New ranges and dishwashers were purchased and installed in residences #2 and #3.
- A couch, loveseat, coffee table, two end tables, two dressers, and a new refrigerator were purchased for the hatchery temporary employee dormitory.
- A new ½-ton pickup vehicle was purchased by the Fleet program and the old ½-ton pickup was transferred to the Salmon region.
- The dormitory dryer was repaired.

Needs of the HSFH are:

- Replace the roof on residence #2.
- Repair the hatchery building walls.
- Remove several willows behind residence #1.
- Repair and/or replace numerous concrete areas around the HSFH.
- Replace the sewage lift station electrical panel components.

- Replace and enlarge the Gavers Lagoon outlet pipe.
- Resurface the HSFH entrance road and reduce the asphalt in front of the office building.
- Repair the flapper valve associated with pump #4.
- Repair the broken spring on the flapper valve on pump #3.
- Replace the linoleum in the bathrooms of residences #1 and #2, and replace the linoleum in the kitchen and dining room of residence #2.
- Overhaul pump #2.

## **BROODSTOCK MANAGEMENT**

The Hayspur rainbow trout (R9) replacement population is perpetuated by using year-class crosses. Using one male with one female, 192 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; rarely are they used again for development of a replacement population.

Hayspur's Kamloops rainbow (K1) broodstock replacement population is perpetuated by using year-class crosses. Using one male with one female, 113 pairs of fish were crossed. The adult fish utilized were adipose clipped. Marked fish are generally used for production egg lots; rarely are they used again for development of a replacement population.

Isolation incubators were used to separate individual families. In 2004, seven R9 and three K1 families tested positive for Bacterial Kidney Disease (BKD) and were culled. Isolation trays, constructed of disinfectable metal and plastic, were tested and used as isolation incubators. Each stainless steel tray was capable of holding 10 families segregated from one another. Each plastic tray was capable of holding 1 family. Trays were placed in Heath stacks and eggs were added for isolation incubation. Similar results occurred regardless of the method used.

A total of 7,000 Westslope cutthroat trout eggs were obtained in 2004. Cutthroat eggs are available on even years from Conners Lake, British Columbia, Canada. Two more groups will be obtained in 2006 and in 2008 to provide a reasonable amount of genetic material from the Conners Lake population. These fish, along with the Brood Year 2000, Brood Year 2002, and Brood Year 2004 fish on-station will be used as an adfluvial broodstock to provide fry for the high mountain lake program.

## **PUBLIC RELATIONS**

Many people used the Hayspur campground and the popular fishing pond, Gavers Lagoon, during the spring, summer, and fall period. The HSFH campground benefited from the efforts of volunteer Camp Hosts Kenneth and Mary Robbins, who volunteered their 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, Hemingway Elementary School (Ketchum), Valley School, and the Wood River Middle School were exposed to the history of the hatchery, the life cycle of trout, water sources and water treatment, followed by a question and answer period (Appendix 5).

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 300 surplus diploid eyed-eggs. Eggs were delivered to Darren Beckley on February 4, 2004.

## **MISCELLANEOUS**

Kelton Hatch recorded a spawning video on January 8, 2004.

Brad Dredge and Jarrett Page attended a Hatchery Manager's meeting in Jerome on January 22, 2004. The meeting addressed catchable and fingerling statewide requests.

Joe Kozfkay performed pressure shocking experiments on January 21, 2004 and again on November 4, 2004.

Brad Dredge attended a USFWS Fish Genetics class in Portland, Oregon in May 2004. Jarrett Page attended the Northwest Fish Culture Conference held in Victoria, British Columbia in December 2004.

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

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

## **ACKNOWLEDGEMENTS**

In 2004, the Hayspur Fish Hatchery benefited from the capable assistance of fish technician Ryan McHugh and biological aides Kenyon Roark, Shane Claborn, and Deanna Byington. The HSFH would like to thank the people who helped out during the spawning season: Darlene Snyder, Bryan Grant, Phil Coonts, Steve England, Tim Klucken, Glenn Owsley, and Tom Frew. Special thanks go to Gary Ady and Dick Bittick for transporting catchables to HSFH from NFH during 2004. Hatchery personnel would also like to thank the Department engineering crew: Keith Samson, Buck Peak, Ed Wright, John Wray, Ed Terry, Brent Jackson, Dave Farmer, Scott Tabor, and Tony Ross. In addition, we would like to thank Chris James from the University of Idaho for assisting hatchery personnel with mud snail evaluations at Big Wood River stocking sites.

## **APPENDICES**

Appendix 1. Egg production summary of Hayspur Fish Hatchery, 2004.

<b>Species</b>	<b><sup>a</sup>Eggs Taken</b>	<b>Eggs Shipped</b>
T9s (R9s 3N)	4,504,348	2,761,379
KTs ( K1s 3N)	4,288,100	2,695,292
C2s	131,995	77,641
<b>Totals</b>	<b>8,792,448</b>	<b>5,534,312</b>

<sup>a</sup>Total is displaced (gram weight) of both good and bad eggs taken in 2004.

Appendix 2. Eyed egg shipment summary from Hayspur Fish Hatchery, 2004.

Hatchery	<sup>a</sup> Species	Total eggs shipped	<sup>b</sup> Estimated value
American Falls	T9	63,119	\$1,767.33
	**C2	77,641	\$2,950.36
Ashton	T9	134,912	\$3,777.54
Eagle	T9	1,000	\$28.00
Grace	T9	136,637	\$3,825.84
	KT	439,721	\$12,312.19
Hagerman	T9	680,377	\$19,050.56
	KT	1,092,911	\$30,601.51
Mackay	T9	-	\$0.00
	KT	-	\$0.00
Magic Valley	T9	1,090,355	\$30,529.94
	KT	448,089	\$12,546.49
McCall	T9	31,320	\$876.96
	KT	52,743	\$1,476.80
Nampa	T9	301,221	\$8,434.19
	KT	635,683	\$17,799.12
Sandpoint	KT	62,514	\$1,750.39
	T9	14,332	\$401.30
<sup>c</sup> Other	T9	800	\$22.40
	KT	1,900	\$53.20
Hagerman NFH	T9	194,037	\$5,433.04
Tuccanon NFH	KT	75,000	\$2,100.00
<b>Totals</b>		<b>5,534,312</b>	<b>\$155,737.15</b>

<sup>a</sup>T9=sterile R9, KT=sterile Kamloops

<sup>b</sup>At contract value of \$28.00/1,000 sterile rainbow trout eggs.

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

<sup>c</sup>Eggs used for trout in the classroom programs, exchanged for laboratory work, out of state hatcheries, and research purposes.

Appendix 3. Hayspur Fish Hatchery stocking summary, 2004.

<b>Fish size</b>	<b>Number of fish</b>	<b>Pounds of fish</b>	<b>Fish per pound</b>
3N Catchables	41,940	13,362	3.14
2N Rainbow fingerlings	9,196	487	18.88
<b>Total</b>	<b>51,136</b>	<b>13,849</b>	

Appendix 4. Hayspur Fish Hatchery Feed Summary, 2004.

		<b>Rangens</b>	
<b>Date</b>	<b>Size</b>	<b>Amount /pounds</b>	<b>Cost</b>
1/23/2004	1/4 in. Brood pellet	11,880	\$3,914.08
6/7/2004	1/4 in. Brood pellet	10,360	\$3,578.80
10/4/2004	1/4 in. Brood pellet	11,480	\$4,281.57
<b>Totals</b>		<b>33,720</b>	<b>\$11,774.45</b>

		<b>Rangens</b>	
<b>Date</b>	<b>Size</b>	<b>Amount /pounds</b>	<b>Cost</b>
1/7/2004	Extruded 450 1/8"	1,000	\$257.00
	Extruded 450 5/32"	1000	\$257.00
4/2/2004	Trout/Salmon Starter #1	50	\$21.80
	Trout/Salmon Starter #2	50	\$21.80
5/3/2004	Trout/Salmon Starter #2	100	\$43.60
	Trout Grower #4	300	\$95.70
	Extruded 450 5/32"	1,000	\$278.00
6/17/2004	Trout/Salmon Starter #2	50	\$21.80
	Trout Grower #4	100	\$31.90
7/19/2004	Trout Grower #4	250	\$79.75
8/12/2004	Trout Grower #4	200	\$69.60
	Extruded 450 1/8"	500	\$154.00
9/20/2004	Trout Grower #4	50	\$17.40
	Extruded 450 1/8"	1,000	\$308.00
10/4/2004	Trout/Salmon Starter #2	50	\$24.20
11/4/2004	Extruded 450 5/32"	1,000	\$308.00
12/1/2004	Extruded 450 5/32"	300	\$92.40
	Trout/Salmon Starter #1	50	\$24.20
	Trout/Salmon Starter #0	50	\$24.20
<b>Totals</b>		<b>7,100</b>	<b>\$2,130.35</b>

		<b>Skretting</b>	
<b>Date</b>	<b>Size</b>	<b>Amount /pounds</b>	<b>Cost</b>
1/19/2004	Nutra Plus #1	44	\$40.92
1/30/2004	Nutra Plus #2	44	\$41.80
2/12/2004	Nutra Plus #1	44	\$63.92
	Nutra Plus #2	44	\$63.92
4/7/2004	Nutra Fry 2.5mm	176	\$215.34
4/13/2004	Nutra Fry 4.0mm	264	\$304.32
8/31/2004	Nutra Fry 2.5mm	132	\$168.16
	Nutra Fry 4.0mm	132	\$168.16
11/29/2004	Nutra Fry 3.0mm	132	\$150.66
	Nutra Fry 4.0mm	88	\$123.04
<b>Totals</b>		<b>1,100</b>	<b>\$1,340.24</b>

Appendix 5. Hayspur Fish Hatchery Tour Group Summary, 2004.

<b>Month</b>	<b>Name of Tour Group</b>	<b>Number in Group</b>
April	Wood River Middle School (WRMS)	20 children
May	Several area schools	100 children
June	Environmental Research Center Blaine County Recreation District Free Fishing Day Event	10 - 8 yr olds 90 - 6-13 yr olds 50 children
July	WRMS Hailey Preschool Natural Resource Camp-U of I	20 children 10 children 70 children
August	Little River Preschool	10 children
October	Mountain Adventures Valley Elementary Minidoka High School	7 - 3-4 yr olds 60 - 5th graders 15 children
Jan - Dec	Visitors	1,000

**IDAHO DEPARTMENT OF FISH AND GAME**

**2004 ANNUAL RESIDENT REPORT**

**HENRYS LAKE HATCHERY**

**Damon Keen, Assistant Hatchery Manager**

## INTRODUCTION

The 2004 spawning operations at Henrys Lake produced 1,123,790 eyed Yellowstone cutthroat trout eggs and 76,210 eyed hybrid trout eggs. Yellowstone cutthroat trout in the Hatchery Creek run showed a mean length of 490 mm; the hybrid trout mean was 588 mm. The percentages of adipose fin clipped Yellowstone cutthroat were recorded throughout the 2004 spawning run.

Pathology reports for viral or bacterial presence detected one positive result from one family of cutthroat eggs (bacterial presence), which was subsequently destroyed.

Fry trapping was initiated on Targhee, Howard, and Duck creeks. The fry traps were started, checked, and maintained throughout the summer and early fall to estimate natural spawning success. Additionally, adult Yellowstone cutthroat counts were taken on the aforementioned tributaries to collaborate with the fry monitoring. During May and June, adult Yellowstone cutthroat spawners were captured at the highway 87 culvert obstructions and subsequently translocated to the Targhee Dry Fork trailhead.

Riparian fencing, fish diversion structures, and screening were maintained on the tributaries of Henrys Lake. Tributaries maintained were Howard Creek, Targhee Creek, Duck Creek, and Timber Creek. Additionally, fencing was maintained on the shoreline on the west side of Henrys Lake. The Kelly Creek fence was dismantled and salvaged and the lower Duck Creek fence salvage and dismantling project was begun. The process of dismantling and salvage was likewise begun on the west shoreline fence. Additionally, a new fence was installed along the Henrys Lake shoreline, south of the county boat dock.

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. In early January 2004, oxygen depletion analysis predicted critical oxygen levels by the end of February. Aeration was deployed, both land based and portable, in attempts to reduce oxygen depletion and enhance survivability in the hatchery vicinity.

Author:

Damon Keen  
Assistant Hatchery Manager

## INTRODUCTION

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

The hatchery continues to function as an egg-taking station and ships eyed-eggs of Yellowstone cutthroat trout *Oncorhynchus clarki*, sterile rainbow trout *O. mykiss* x Yellowstone cutthroat trout *O. clarki* hybrids, and sterile 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 finally into Henrys Lake via a 150-foot long fish ladder. The spawning/trapping facility was rebuilt in its entirety in 2003.

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

## METHODS

### Spawning Operation

The Hatchery Creek fish ladder was initially opened for the spring run on January 10 and remained in operation until January 14, 2004. The ladder was opened again on March 2 and remained open until April 30, 2004. Fish ascending the ladder were identified as Yellowstone cutthroat or hybrid trout and were enumerated. Sub-samples of approximately 10% of each group were measured (total length - mm) on a random basis. Additionally, sub-samples of the Yellowstone cutthroat were taken to detect the presence or lack thereof, of an adipose fin. Yellowstone cutthroat trout were produced using ripe females spawned into seven-fish pools and fertilized with pooled milt from four to seven males. Hybrid trout were produced with Yellowstone cutthroat trout eggs from the Henrys Lake run and Kamloops rainbow trout milt obtained from Hayspur Hatchery. The hybrid contribution was sterilized by inducing a triploid condition by pressure shocking the eggs post-fertilization. Hybrid eggs were placed in the pressure treatment machine 47 minutes and 45 seconds post-fertilization at 10,000 psi and held at this level of pressure for 5 minutes. Random samples of the hybrid eggs were sent to the Eagle Fish Health Laboratory (EFHL) to test induction rates of sterilization. Hybrid production eggs were shipped to Mackay Fish Hatchery (MFH) for hatching, rearing, and subsequent release back into Henrys Lake and other local waters. Yellowstone cutthroat eggs were also shipped to MFH for hatching, rearing, and release back into Henrys Lake.

Disease samples were taken from the spring spawning run. Ovarian fluids were collected from Yellowstone cutthroat during spawning at Henrys Lake Hatchery. Ovarian samples were taken from egg pools of seven females. All female egg pools were tested. Viral samples were taken randomly from 25 seven-female egg pools in the spring run. A mixed-sex group of 60 adult Yellowstone cutthroat trout were sacrificed for disease testing during the spring run. All samples were sent to the EFHL.

The fish ladder was opened for the fall run of brook trout on October 1, 2004. Low water conditions and a gap in year classes prevented sufficient brook trout numbers for egg take. Consequently, sterile brook trout eggs were purchased from British Columbia and the eggs were shipped to Ashton Fish Hatchery for hatching, rearing, and release back into Henrys Lake.

### **Riparian Fencing and Fish Screening**

Electric fencing has been in place at Henrys Lake since the early 1990s. Fencing was stretched and solar panels, batteries, and connections were installed in May 2004 at ten sites on the tributaries of Henrys Lake as established in routine maintenance guidelines. Fencing was checked routinely during the summer and fall months for proper voltage and function. Voltage was checked using a voltmeter at each of the ten sites.

Conservation agreements completed during the summer of 2004 allowed for dismantling several fences on the west side of Henrys Lake. The fence on Kelly Springs was subsequently dismantled and salvaged and the Lower Duck Creek fence was taken out of service and the dismantling process begun. Additionally, the shoreline fence will no longer be in service and the dismantling process was begun.

The salvaged Kelly Springs fence was installed at a previously unfenced site located south of the county boat dock. The new county boat dock fence will prevent grazing and erosion along a strip of property owned by Fremont County that has been grazed in the past without an agreement. The new fence will provide a benefit to water quality, as well as esthetic benefit, as it is in close proximity to the county campground.

Fish diversion screens are located at nine sites on the tributaries of Henrys Lake. Screens were maintained, cleaned and checked for proper operation on a daily basis during the summer and fall months of 2004.

### **Fry Trapping and Adult Spawner Evaluation**

Fry trapping was initiated at three tributaries of Henrys Lake: Targhee, Howard, and Duck creeks. The traps were installed at historical locations in close proximity to the mouths of the mentioned tributaries, except in the case of the Howard Creek trap. The Howard Creek trap was moved from its historical location, downstream to the mouth of that tributary, in an attempt to enhance capture of fry downstream of the historical site.

Krey Meekin traps were installed at the aforementioned sites during the early summer months to approximate time of swim-up and subsequent migration from the tributaries to the lake. The traps were installed initially within the main flow of the channel of the respective

tributaries to capture the avenue of the bulk of the movement of the fry. Additionally, channel flow bypassing the traps was blocked and diverted into the traps. A flow of ¼-inch to 1-inch was maintained over the trap to functionally trap the fry in the holding box and to minimize mortality or escapement. The fry traps were normally checked, cleaned, and maintained daily during the duration of the respective trapping timeframe. Yellowstone cutthroat trout, brook trout, hybrid trout, and nongame species numbers were recorded and sample length data tabulated. Additional information in regards to trap function and efficiency was likewise recorded.

Adult spawner counts were initiated on the same tributaries where fry trapping occurred. The three tributaries were walked in their entirety along the known spawning habitat and evaluated using physical observation and with the help of polarized sunglasses. Numbers and species were recorded.

Adult spawners were captured and moved around a highway obstruction on Targhee Creek during May and June. The spawners were moved utilizing a backpack shocker and volunteer netters. The captured spawners were enumerated, loaded onto an oxygenated fish tank, moved upstream from the obstruction approximately 1.5 miles and released to complete the spawning process in that under-utilized habitat.

### **Water Quality**

Winter (January, February, and March 2004) 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 were drilled in the ice prior to sampling using a gas-powered ice auger. Dissolved oxygen samples were taken using a YSI model 550A oxygen probe and by sampling at each site at ice bottom and subsequent one-meter intervals to the bottom of the lake. Total g/m<sup>2</sup> of oxygen was calculated for each site.

## **RESULTS AND DISCUSSION**

### **Spawning Operation**

A total of 4,403 Yellowstone cutthroat trout ascended the spawning ladder between January 12 and April 30, with 2,112 males (Figure 1) and 2,291 females (Figure 2) enumerated. Hybrid trout totaled 791 fish, of which 428 were males (Figure 3) and 363 were females (Figure 4). Yellowstone cutthroat trout male and female total length averaged 498 and 482 mm (Figure 5), respectively. Combined mean Yellowstone cutthroat trout length was 490 mm. Hybrid trout males and females averaged 571 mm and 605 mm (Figure 6), respectively. Combined mean hybrid trout length was 588 mm.

Yellowstone cutthroat green eggs totaled 3,386,400 from 1,196 females for a mean fecundity of 2,748 eggs per female (Table 1). Eyed Yellowstone cutthroat eggs totaled 1,123,790 for an overall eye-up rate of 34.2% (Table 1). All of the production of eyed Yellowstone cutthroat eggs was shipped to the Mackay facility where they were hatched, reared, and subsequently released back into Henrys Lake in the fall of 2004. A total of ten spawn days during this year's spring run were devoted to Yellowstone cutthroat spawning.

Hybrid trout green eggs totaled 1,436,650 from 517 females for a mean fecundity of 2,800 eggs per female (Table 2). Eyed hybrid trout eggs totaled 76,210 for an overall eye-up rate of 5.3% (Table 2). All of the production of eyed hybrid eggs was shipped to Mackay for hatching, rearing, and subsequent release into Henrys Lake in the fall of 2004. Four spawn days were devoted to production of hybrid eggs during this year's spawn. Sterilization induction rates for the hybrid production indicated a mean of 98.5%.

Sub-samples of the identified Yellowstone cutthroat trout were inspected for the presence or lack of an adipose fin. The purpose of this was to collect data on run timing relative to spawn timing. For the last several years, 10% of the Henrys Lake cutthroat fry have had an adipose fin removed to estimate hatchery contribution to the total lake population. This information is obtained during routine creel checks. However, the 10% total has been taken solely from the earliest spawned fry. Therefore, a correlation between spawn timing and run timing at adult stage might be established by examining adult clips at the ladder. Results of the data (Figure 7) indicated a slight decrease in percentage of adipose clipped fish as the run progressed, but still indicated a higher than expected component throughout the run. Increased survival of the earlier spawned fish might be indicated by this data. Additional data will be gathered in the future in attempts to further quantify this relationship. Further analysis can be found in the regional report.

Serious oxygen depletion (see water quality section) and subsequent diminished fish health probably impacted egg quality during the spring 2004 spawning run. Egg quality (Table 1) of Yellowstone cutthroat eggs during January was at or near historical means, but diminished correspondingly as oxygen levels reached the critical stage. Although, the collection and analysis of oxygen depletion during the winter months at Henrys Lake is a relatively new venture, historical evidence exists that oxygen depletion levels have reached a level that impacts fish health and egg quality throughout history.

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

Bacterial disease sampling taken during spawning from ovarian fluid was negative for all samples in both the spring and fall runs. A positive result on Tray 7, Lot 13 of the hybrid production was noted and subsequently destroyed. Additional analysis and results are available in the resident fisheries pathology report.

### **Riparian Fencing and Fish Screening**

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

A new conservation agreement between landowners along Duck and Kelly creeks and the Nature Conservancy and the BLM, provided for removal of three fences that have been maintained by the Department. The new agreements provide for wetland enhancements, development restrictions, and voluntary grazing restrictions. Subsequently, labor intensive fences on the west shoreline of Henrys Lake, Kelly Springs, and Lower Duck Creek were determined to be unnecessary and their removal deemed beneficial. Additionally, a new fence

agreement was initiated with Fremont County officials and the Department, along a section of the Henrys Lake shoreline that had been previously unprotected and subject to grazing degradation.

It was determined that the fences deemed no longer necessary be removed and salvageable parts saved to be used on other projects. At the request of the landowner, some wooden posts were to be left in place to provide structure for birdhouses along the newly reclaimed wetland. The Kelly Springs fence removal project was completed, the Lower Duck fence project and the west shoreline project were started, but neither was completed and those projects will continue in the next seasons.

The decommissioned fences on Kelly Springs, Lower Duck Creek, and the west shoreline will result in time and labor savings to the Department. The new fence is located in close proximity to the county boat dock and should only add a minimal increase in the workload which will be more than offset by the decommissioned fences. The new county boat dock fence was constructed entirely with the salvaged Kelly Springs fence for a significant cost savings. The county boat dock fence should provide new vegetation growth to approximately ¼-mile of the west shoreline of Henrys Lake.

### **Fry Trapping and Adult Spawner Counts**

Fry trapping was initiated at Henrys Lake during the 2004 season. Trapping began on Duck Creek on June 14, Howard Creek on June 21, and on Targhee Creek July 1. Fry were enumerated at the three sites until the end of the seasonal migration was determined. Actual Yellowstone cutthroat fry numbers were: Targhee: 423, Duck: 59, and Howard Creek: 69. Due to low numbers of migrating fry, efficiency results were difficult if not impossible to evaluate. Trapping efficiency normally runs within the 25-50% range if traps are functioning well. Traps functioned relatively well with the exception of the Howard trap, which plugged with debris on a regular basis. Virtually all the flow of Targhee and Duck creeks was successfully sampled throughout the trapping timeframe. Further evaluation is available in the regional report.

Adult spawner counts were taken on the aforementioned tributaries during the estimated time of ascension. 134 adults were counted in Duck Creek, 109 adults in Targhee Creek, and no adults were recorded in Howard Creek. Additionally, 84 adults were removed from the vicinity of the highway 87 culvert and moved to the Targhee Dry Fork trailhead.

Adult spawner counts vary from year to year depending upon the runoff and resulting visibility, year class strength, lake level, and other environmental factors. Throughout the 1990s and early 2000s, fry were planted in the major tributaries of Henrys Lake. Due to concerns of competition between natural fry and hatchery fry, the practice of planting hatchery fry within the tributaries of Henrys Lake is no longer taking place. Additionally, a historically long and unfettered drought has ensued within the Henrys Lake watershed. Therefore, adult spawner counts may fluctuate or diminish, but current established planting protocol has been followed during the last three yearly planting events.

### **Water Quality**

Oxygen profiles for December 2003 to March 2004 were recorded for the four sites (Pittsburgh Creek, Hatchery, County boat dock, and Wild Rose). Total oxygen diminished from 21.2g/m<sup>2</sup> to 4.73g/m<sup>2</sup> at the Pittsburgh site, 7.4 g/m<sup>2</sup> to 3.24 g/m<sup>2</sup> at the County dock, 16.3 g/m<sup>2</sup> to 3.43 g/m<sup>2</sup> at the Wild Rose site. The Hatchery site was monitored on December 18 and again on January 2. The levels recorded on those dates were 11.8 g/m<sup>2</sup> and 11.96 g/m<sup>2</sup>, respectively. Oxygen profiles were not collected again at the hatchery site due to deployment of the aeration systems and the resulting unsafe conditions from the aeration activity. Due to slushy ice conditions throughout most of the winter, the Outlet site was not monitored.

Historically, the level of concern has been established at 10g/m<sup>2</sup>. However, that level of concern is somewhat arbitrary due to the lack of a full understanding of critical dissolved oxygen levels in this environment in relation to the Yellowstone cutthroat species. The 2004 event provided for a better understanding of critical conditions and their subsequent impact on fish health and egg quality. Due in part to the water quality event in 2004, regional spawning protocol and regional management plans are being developed for the lake. Additional water quality information, analysis, and 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 Lake program. Department personnel from around the state, as well as entire Department programs including: Mackay Fish Hatchery, Ashton Fish Hatchery, Nampa Fish Hatchery, and the Hayspur Fish Hatchery, assisted in spawning, rearing, and/or transportation. Additionally, several hundred hours of volunteer time were devoted to the Henry's Lake program, mostly during the spawning cycle. Worthy of special consideration is Basic American Foods, located in Blackfoot. Basic American Foods donates hundreds of hours annually to the Henry's Lake program. Special thanks are given to that business, as well as to the other volunteers and 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.

The Henry's Lake facility remains an important avenue for disseminating information to the public. Hundreds of fisherwomen and fishermen, as well as the general public, stop by the facility to ask questions or to help with the processes of collecting data and spawning fish. Additionally, many public tours are given during the spawn season. Last season, approximately 50 guided tours were given during the spawn season, mostly in March. In future years, tour participants will be asked to sign a register to assess public involvement.

## LITERATURE CITED

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

## **APPENDICES**

Table 1. 2004 Henrys 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
1/21/2004	1	211	569,700	2,700	352,419	Neg.	61.9%
1/26/2004	2	105	283,500	2,700	162,097	Neg.	57.2%
1/28/2004	3	174	469,800	2,700	253,226	Neg.	53.9%
3/10/2004	6	210	588,000	2,800	108,870	Neg.	18.5%
3/15/2004	7	140	392,000	2,800	58,871	Neg.	15.0%
3/18/2004	8	98	264,600	2,700	53,226	Neg.	20.1%
3/22/2004	9	68	190,400	2,800	15,625	Neg.	8.2%
3/25/2004	10	70	196,000	2,800	35,484	Neg.	18.1%
3/29/2004	11	48	134,400	2,800	21,875	Neg.	16.3%
4/27/2004	14	72	198,000	2,750	62,097	Neg.	31.4%
<b>TOTALS</b>		<b>1,196</b>	<b>3,286,400</b>	<b>2,748</b>	<b>1,123,790</b>		<b>34.2%</b>

Table 2. 2004 Henrys 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
3/1/2004	4	151	422,800	2,800	0	Neg.	0.0%
3/4/2004	5	147	411,600	2,800	0	Neg.	0.0%
4/8/2004	12	135	371,250	2,750	62,500	Neg.	16.8%
4/15/2004	13	84	231,000	2,750	13,710	Pos. (7)	5.9%
<b>TOTALS</b>		<b>517</b>	<b>1,436,650</b>	<b>2,800</b>	<b>76,210</b>		<b>5.3%</b>

Figure 1. Henrys Lake 2004 Run Timing of Male Yellowstone Cutthroat Trout

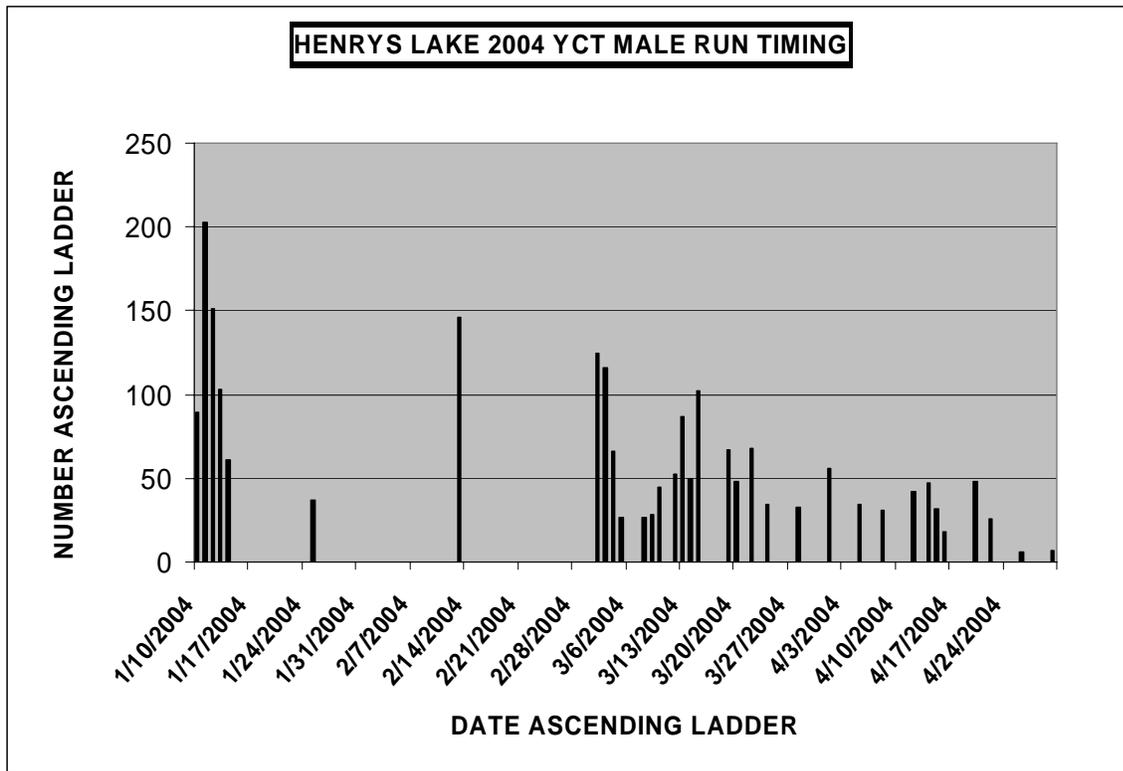


Figure 2. Henrys Lake 2004 Run Timing of Female Yellowstone Cutthroat Trout

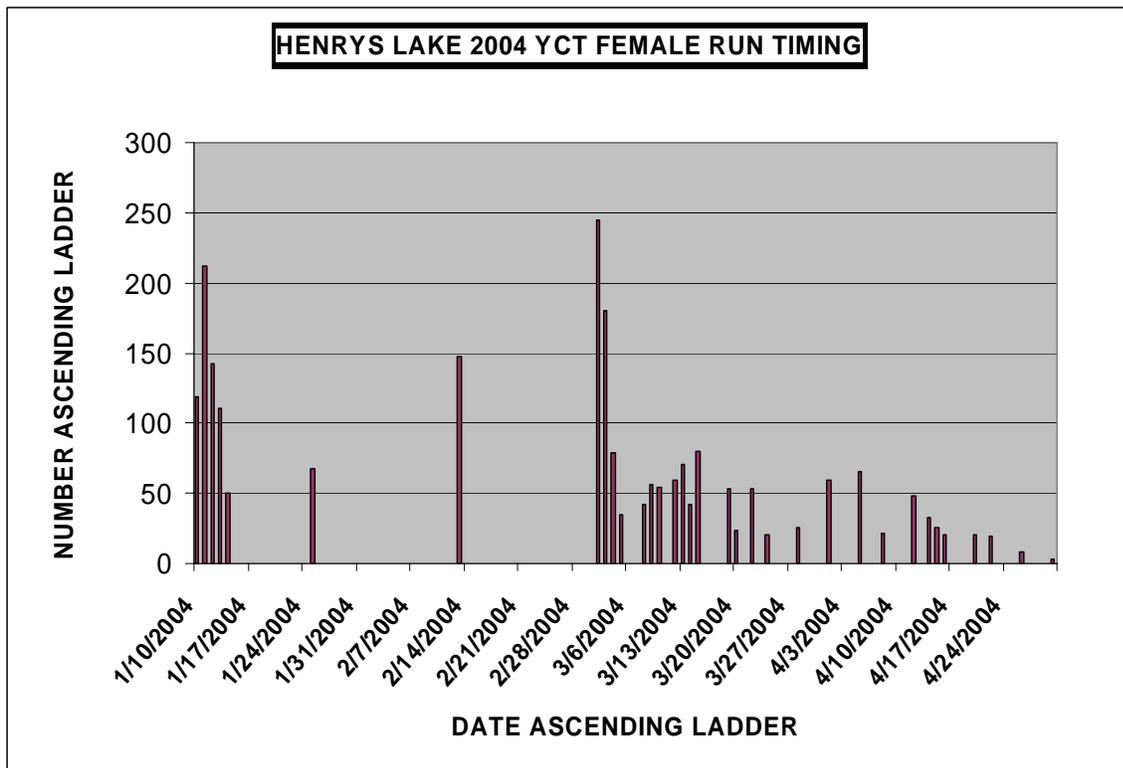


Figure 3. Henrys Lake 2004 Run Timing of Male Hybrid Trout

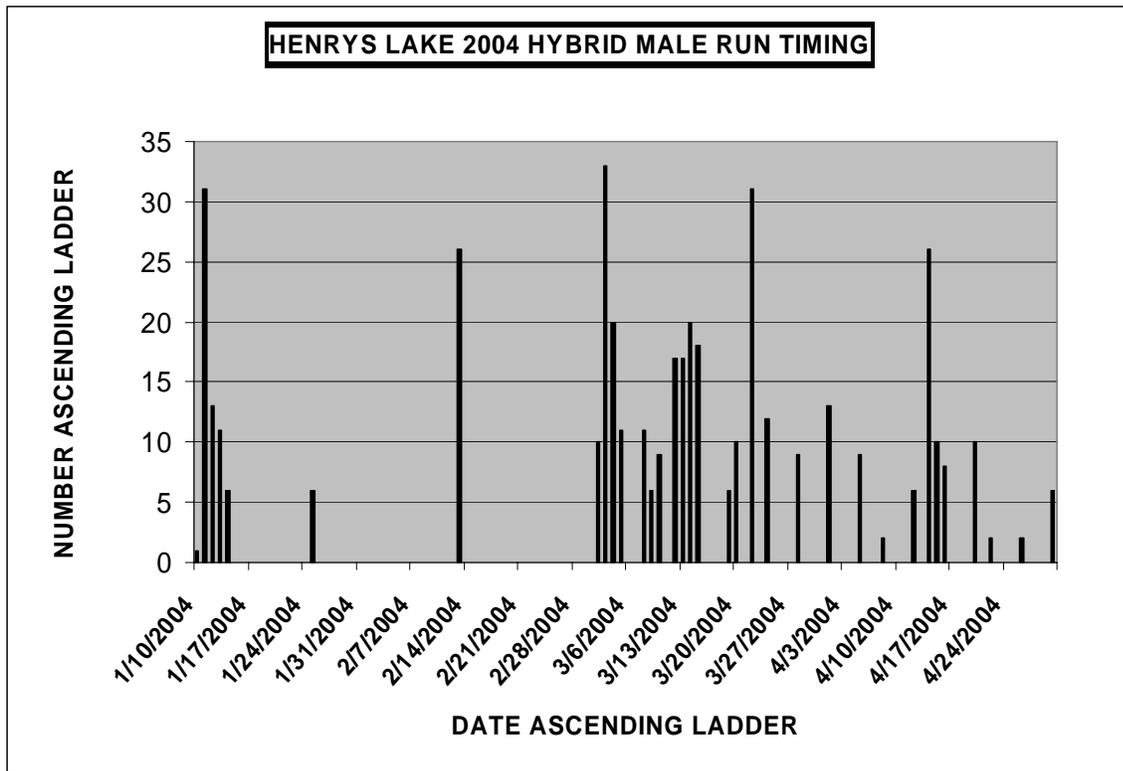


Figure 4. Henrys Lake 2004 Run Timing of Female Hybrid Trout

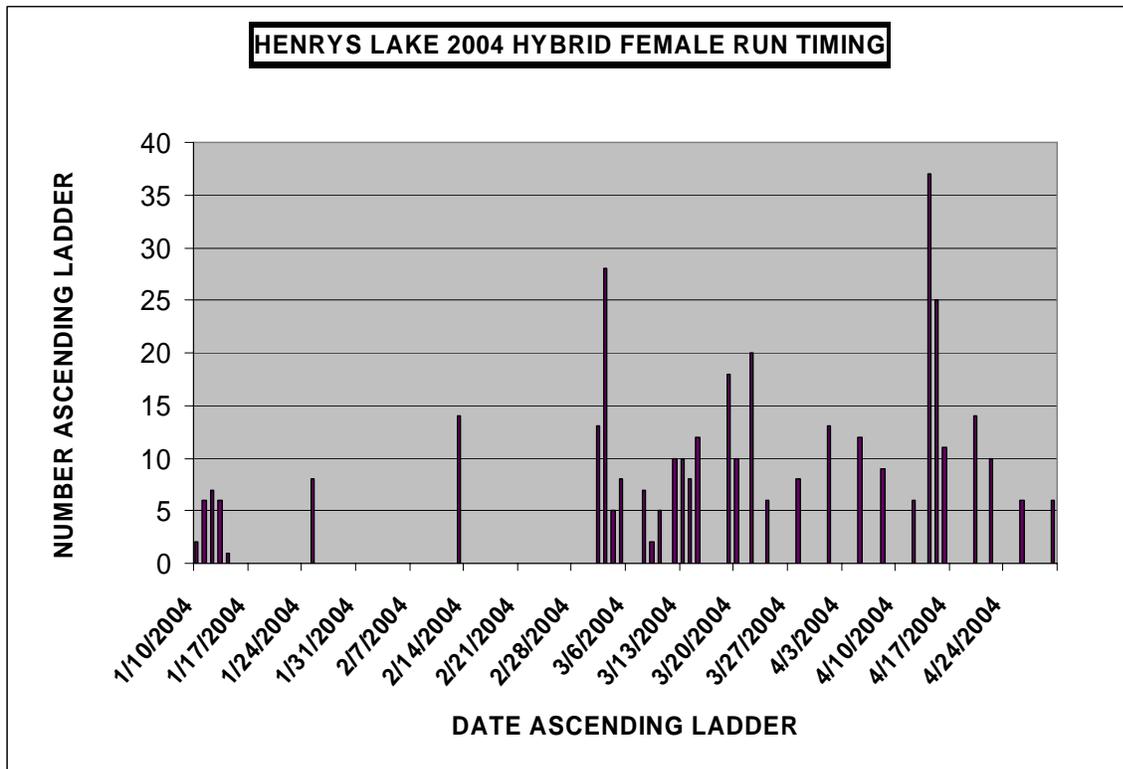


Figure 5. Henrys Lake 2004 Length Frequencies of Yellowstone Cutthroat Spawning Run

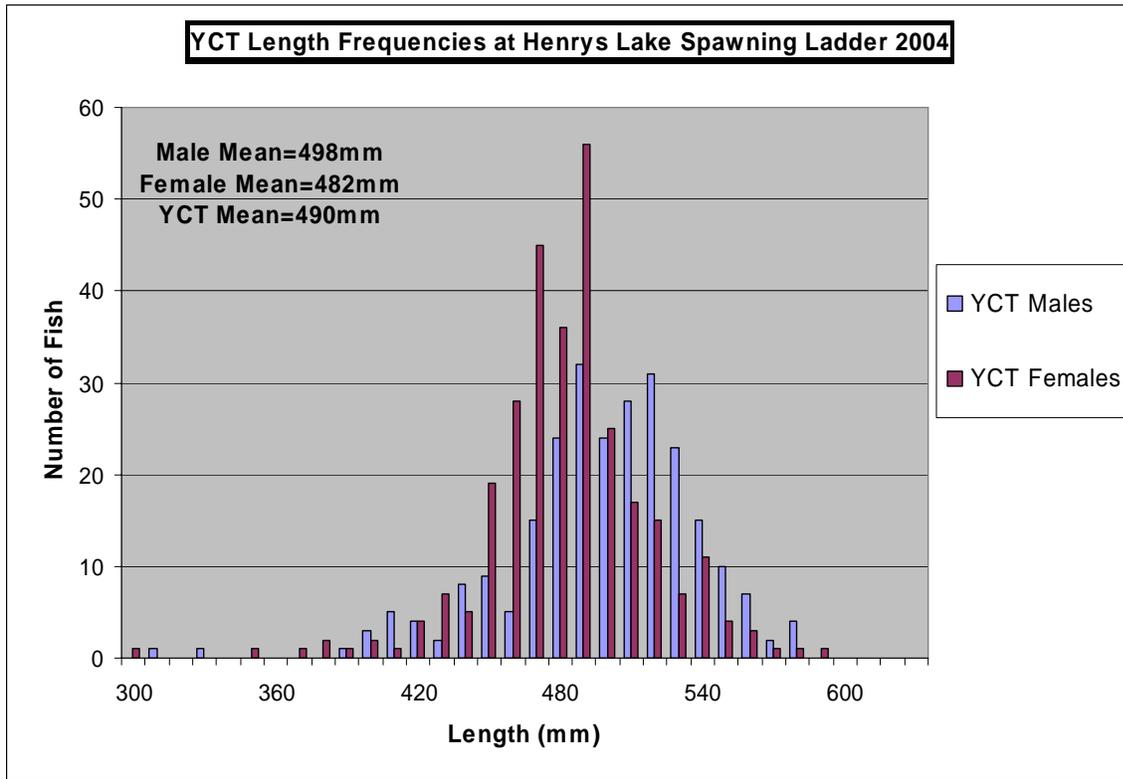


Figure 6. Henrys Lake 2004 Length Frequencies of Hybrid Trout Run

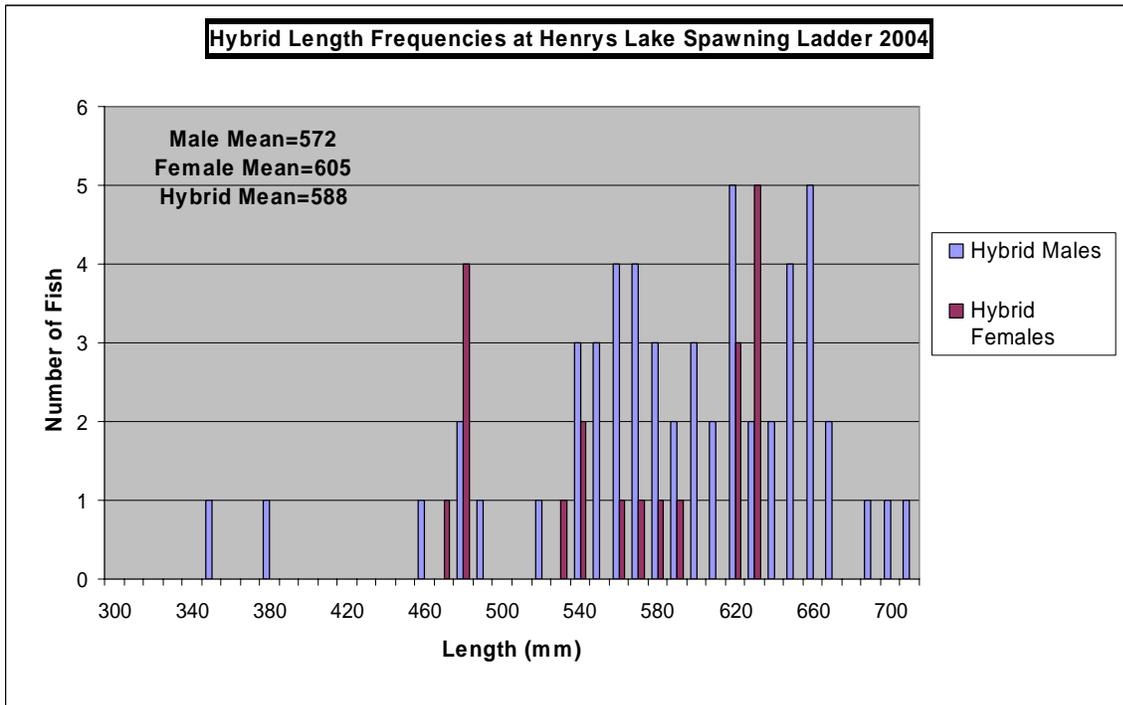
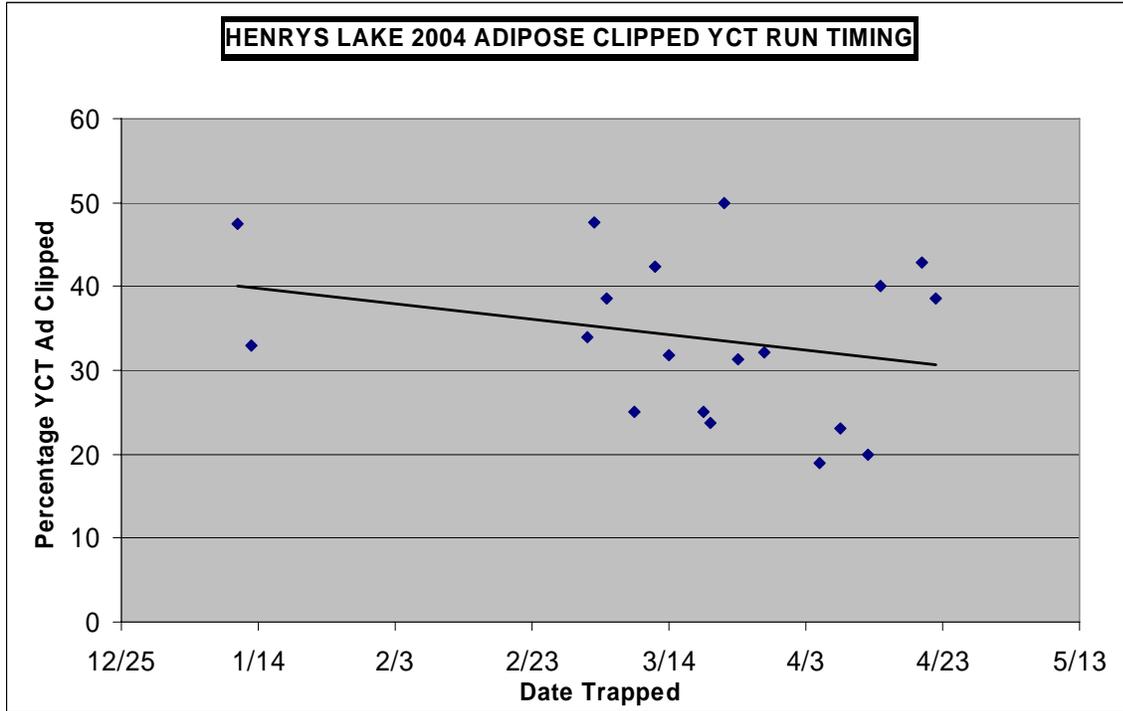


Figure 7. Henrys Lake Adipose Clipped Yellowstone Cutthroat Run Timing



**IDAHO DEPARTMENT OF FISH AND GAME**

**2004 ANNUAL RESIDENT REPORT**

**MACKAY FISH HATCHERY**

**Phillip Coonts, Fish Hatchery Manager 1  
Robert Hoover, Assistant Fish Hatchery Manager  
Bryan Grant, Fish Culturist**

## INTRODUCTION

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

The hatchery is staffed with three full-time and two part-time employees. The part-time employees share 16 months of temporary time. Wages, including benefits, cost \$180,308 for all personnel. The operating budget for the calendar year was \$89,320. This year's fish production included four species and eleven strains (Appendix 1).

### Rainbow trout (*Oncorhynchus mykiss*)

Hayspur triploid (Hayspur SFH) 3 year classes

Troutlodge triploid (Troutlodge, WA)

Kamloops triploid (Hayspur SFH)

### Golden trout (*Oncorhynchus mykiss aquabonita*)

Mt. Whitney SFH, CA

### Cutthroat trout (*Oncorhynchus clarki*)

Henry's Lake (Henry's Lake SFH)

Snake River fine spot (Jackson NFH) 3 year classes

### Rainbow x Cutthroat hybrid triploids

Henry's Lake cutthroat females x Hayspur SFH rainbow males

### Kokanee salmon (*Oncorhynchus nerka*)

Early (Deadwood Reservoir) 2 year classes

Early (New Fork Lake, WY)

Early (Kootenay Lake, BC) 2 year classes

October (Strawberry Reservoir, UT)

## **WATER SUPPLY**

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

## **HATCHERY IMPROVEMENTS**

Some physical improvements completed by hatchery personnel include:

- Installed new waste valves for the large and small raceways.
- Sheathed the inside walls of the residence 2 garage and the new single-bay garage.
- Replaced all wooden raceway frames with welded aluminum ones.
- Installed jump screens on all of the large raceway sections.
- Spread gravel around the hatchery driveways.
- Installed new vault toilet.
- Moved the overhead fuel tank and installed protective crash barriers.
- Insulated the south wall and installed bath fan in residence 2.
- Restored the lawn at residence 3.
- A private contractor rebuilt the earthen flood berm after a flash flood washed a section of the berm away.
- Repainted the interior of residence 2.
- Repaired deteriorated large and small raceway walls.

## **FISH STOCKED**

Fingerlings were stocked in six regions across the state. These put-grow-and-take fish numbered 2,597,782 and weighed 36,793 lbs.

Catchable rainbow were planted into Regions 6 and 7. These fish numbered 71,383 and weighed 36,352 lbs. Catchable cutthroat planted in Region 6 numbered 19,130 and weighed 12,998 lbs.

The hatchery also reared 17,522 cutthroat, 7,000 sterile rainbow and 4,000 golden fry for planting 18 mountain lakes in Regions 4 and 6. Department personnel and volunteers planted these fish by foot, 4-wheeler and horseback (Appendices 2 and 3).

## **TRANSPORT COSTS**

The three fish transport trucks assigned to MFH made 98 separate stocking trips during the year and planted 27 different waters. We traveled over 24,300 miles doing this, averaging 248 miles per trip. The fleet rental charges are \$289.62/month for each of the two 2-ton trucks and \$0.32/mile. Fleet rental for the 1-ton truck is \$254.95/month and \$0.25/mile. All of these expenses totaled \$16,716.

The fish transport tanker trucks from Nampa Fish Hatchery made 7 trips to 7 different waters, traveling 4,806 miles for MFH during the year. For the use of the two tanker trucks, Nampa Hatchery expenses were \$9,607, bringing our total fish transportation cost to \$26,323.

## **FISH FEED**

A total of 97,061 lbs of fish feed was used during the year, costing \$31,041 for the feed and \$2,892 in shipping costs. Conversions ranged from a low of 0.81 for the 2004 Hayspur sterile rainbow trout to a high of 1.2 for the 2003 Snake River fine spot cutthroat. The average conversion for all lots of fish combined during the year was 1.0 (Appendix 4).

## **FISH MARKING**

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

## **PUBLIC RELATIONS**

Approximately 800 people toured the hatchery during the year. Most of these visitors came to fish the diversion pond by the hatchery. Signs were posted designating the pond for youth fishing only and most people complied. Scheduled tours were given to area schools, an assisted living home and a soil conservation group. Hatchery personnel assisted the Mackay High School aquaculture program. The hatchery crew participates in the *Adopt a Highway* program by clearing the litter from 6 miles of Highway 93 biannually.

## **ACKNOWLEDGEMENTS**

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

## APPENDICES

Appendix 1. Fish Production at Mackay Fish Hatchery, January 1 to December 31, 2004

<u>Species/Strain</u>	<u>Lot</u>	<u>Source</u>	<u>Received as</u>	<u>Fish Received or Carried into 2004</u>	<u>Pounds Received or Carried into 2004</u>	<u>Number Planted</u>	<u>Pounds Planted</u>	<u>Destination</u>
Hayspur rainbow triploid	02-ID-T9	Hayspur SFH	eyed eggs	1,935	2,875	1,935	2,875	04 catchables
Hayspur rainbow triploid	03-ID-T9	Hayspur SFH	eyed eggs	85,018	19,903	69,448	33,477	04 catchables
Hayspur rainbow triploid	04-ID-T9	Hayspur SFH	eyed eggs	122,584	eyed eggs	72,225	685	05 catchables
Troutlodge rainbow triploid	04-WA-TT	Troutlodge	eyed eggs	16,665	eyed eggs	7,000	7.5	04 mtn. lake
Kamloops rainbow triploid	04-ID-KT	Hayspur SFH	eyed eggs	85,486	eyed eggs	32,025	105	05 catchables
Yellowstone cutthroat	02-WY-C4	Jackson NFH	eyed eggs	19,875	4,861	19,130	12,998	04 catchables
Yellowstone cutthroat	03-WY-C4	Jackson NFH	eyed eggs	157,411	1,609	132,100	5,100	04 fingerlings
Yellowstone cutthroat	04-WY-C4	Jackson NFH	eyed eggs	200,048	eyed eggs	0	0	05 catchables 05 fingerlings 06 catchables
Henrys Lake cutthroat	04-ID-C3	Henrys Lake SFH	eyed eggs	1,127,642	eyed eggs	958,484	11,903	04 fingerlings
Deadwood Reservoir kokanee	03-ID-KE	Deadwood Res	green eggs	622,000	green eggs	267,760	5,598	04 fingerlings
Deadwood Reservoir kokanee	04-ID-KE	Deadwood Res	green eggs	1,488,266	green eggs	0	0	05 fingerlings
Strawberry Res kokanee	03-UT-KO	White Rocks SFH	eyed eggs	248,620	eyed eggs	72,775	1,025	04 fingerlings
New Fork Lake kokanee	03-WY-KE	Dubois SFH	eyed eggs	711,234	eyed eggs	580,095	7,449	04 fingerlings
Kootenay Lake kokanee	03-BC-KE	Kootenay Hatchery	eyed eggs	732,730	eyed eggs	461,590	4,579	04 fingerlings
Kootenay Lake kokanee	04-BC-KE	Kootenay Hatchery	eyed eggs	1,442,784	eyed eggs	0	0	05 fingerlings
rainbow/cutthroat hybrid/triploid	04-ID-TH	Henrys Lake SFH	eyed eggs	67,385	eyed eggs	38,250	375	04 fingerlings
California golden	04-CA-GN	Mt. Whitney	eyed eggs	4,900	eyed eggs	4,000	3.6	04 mtn lake

Appendix 2. Mackay Fish Hatchery Stocking Summary, 2004

<u>Species/Strain</u>	<u>Lot</u>	<u>Number Planted</u>	<u>Pounds Planted</u>	<u>Size at Release</u>
Yellowstone cutthroat	02-WY-C4	19,130	12,998	catchable
Yellowstone cutthroat	03-WY-C4	132,100	5,100	fingerling
Henry's Lake cutthroat	04-ID-C3	940,962	11,877	fingerling
Henry's Lake hybrids	04-ID-TH	38,250	375	fingerling
Deadwood Reservoir kokanee	03-ID-KE	267,760	5,598	fingerling
Utah kokanee	03-UT-KO	72,775	1,025	fingerling
Wyoming kokanee	03-WY-KE	580,095	7,449	fingerling
BC kokanee	03-CAN-KE	461,590	4,579	fingerling
Hayspur rainbow triploids	02-ID-T9	1,935	2,875	catchable
Hayspur rainbow triploids	03-ID-T9	69,448	33,477	catchable
Hayspur rainbow triploids	04-ID-T9	72,225	685	fingerling
Hayspur rainbow triploids	04-ID-KT	32,025	105	fingerling
Troutlodge rainbow triploid	04-WA-TT	7,000	7.5	fry
Golden trout	04-CA-GN	4,000	3.6	fry
Henry's Lake cutthroat	04-ID-C3	17,522	26.1	fry

Appendix 3. Hatchery Production and Costs, 2004

**Total Fish Stocked 2004**

	<b><u>Number of Fish</u></b>	<b><u>Pounds of Fish</u></b>
mountain lake fry	28,522	37
fingerlings	2,597,782	36,793
cutthroat catchables	19,130	12,998
rainbow catchables	<u>71,383</u>	<u>36,352</u>
<b>Totals</b>	<b>2,716,817</b>	<b>86,180</b>
	Pounds of fish stocked =	86,180
	plus pounds of fish on hand 12/31/03 =	<u>29,248</u>
	<b>TOTAL pounds produced, 2004 =</b>	<b>115,819</b>
	Minus pounds on hand, 12/31/04 =	<u>34,381</u>
	<b>NET pounds produced, 2004 =</b>	<b>81,438</b>

**Production Costs**

6 months FY 2004 budget  
 personnel - \$ 90,821  
 operating - \$ 31,371  
 \$122,192

6 months FY 2005 budget  
 personnel - \$88,274  
 operating - \$44,660  
**\$132,934**

**Total 2004 Costs - \$255,126**

Cost per 1,000 fish -  $\$255,126 / 2,716,817 = \$0.094$

Cost per pound of fish -  $\$255,126 / 86,180 = \$ 2.96$

Appendix 4. Feed Used at Mackay Fish Hatchery, 2004

<u>Rangen Feeds</u>	<u>Cost/lb.</u>	<u>Lbs. Used</u>	<u>Cost</u>
TSS swim-up	.436 -.484	1,255	\$601.00
TSS #1	.436 -.484	3,103	\$1,371.00
TSS #2	.436 -.484	9,750	\$4,631.00
Trout Grower #3	.319-.348	19,509	\$6,750.00
Trout Grower #4	0.319	650	\$202.00
Ext. 450 3/32 sinking	.308	5,861	\$1,805.00
Ext 450 5/32 sinking	.257 -.308	51,873	\$13,713.00
<b><u>Skretting Feeds</u></b>			
Apollo #0	0.93	924	\$859.00
Apollo #1	0.83	3,124	\$269.00
Apollo #2	0.83	<u>1,012</u>	<u>\$840.00</u>
	<b>Totals</b>	<b>97,061</b>	<b>\$31,041.00</b>

**IDAHO DEPARTMENT OF FISH AND GAME**

**2004 ANNUAL REPORT**

**McCALL FISH HATCHERY**

**Steven T Kammeyer, Assistant Hatchery Manager**

## INTRODUCTION

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

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

Incubation capacity consists of 26 eight-tray Heath style incubation stacks. Additional incubators may be plumbed into six of the early rearing vats if more incubation space is required. Rearing of resident fry is accomplished utilizing several of the 14 indoor vats. Each early rearing vat is 40-feet long and 4-feet wide. Outside rearing space consists of two concrete ponds 196-ft x 101-ft x 4-ft which 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. aquabonita* and to rear grayling *Thymallus arcticus* fry for stocking into mountain lakes in the Panhandle, Clearwater, Southwest, and Salmon regions.
- Redistribute up to 101,000 catchable-size rainbow trout.
- Maintain the statewide high mountain lakes stocking request database.
- Provide assistance to the anadromous program as needed and when available.

## **FISH PRODUCTION**

### **Mountain Lake Stocking**

A total of 152 mountain lakes were stocked with 150,680 fry in 2004 (Appendix 1). Of these, 137 lakes were stocked with 111,380 fry using fixed-winged aircraft at a cost of \$6,325 in flight time. Nine flights were flown from August 9 through September 26, 2004 and approximately 3,162 miles were flown. No grayling were available statewide in 2004. All stocking requests, with the exception of grayling, were met. The average cost, based on flight time, to stock a mountain lake in 2004 was \$46.17 and ranged from \$31.47 to \$231.00 for individual regions. Volunteers stocked nine lakes in the McCall area, which saved the Department approximately \$400 in comparable flight time.

Additional fry stocking included 15,000 Westslope cutthroat trout into Deer Creek Reservoir, 400 Westslope cutthroat trout to the Morrison Knudsen Nature Center, 5,775 Westslope cutthroat trout into the Gold Fork River and 2,875 sterile domestic Kamloop into the North Fork Payette River and are included in totals.

### **Catchable Rainbow Trout Redistribution**

A total of 93,980 sterile Trout Lodge rainbow trout triploids were stocked into 36 water bodies in the McCall vicinity, between May 18 and September 9, 2004. These fish were reared at Nampa Fish Hatchery (NFH) and then transferred to MCFH. Transport costs to bring catchable size trout from NFH totaled \$4,270 with 2,058 miles driven. Hatchery personnel drove approximately 4,490 miles on 101 stocking trips to complete requests at an approximate cost of \$4,892.50. To maximize efficiency, multiple sites were stocked on 27 occasions eliminating the need to make additional separate stocking trips. Combined transport distribution cost was \$97.49 for each 1,000 fish stocked. To maintain the condition of fish received from Nampa Hatchery 500 lbs of 4.0 mm BioDry trout feed was purchased to provide intermittent feeding at a cost of \$180.

Approximately 526 smallmouth bass, collected in Oxbow Reservoir, were transported and released into Little Payette Lake on July 28, 2004 to provide increased diversity of fishing opportunities for sport anglers.

### **Lake Cascade Perch Relocation**

Hatchery personnel transported a total of 48,025 yellow perch, collected at Phillips Reservoir, OR, to Lake Cascade on six trips during the period of April 2-12, 2004. In doing so, approximately 1,800 miles were driven using the resident 2-ton truck at a projected cost of \$2,250. Assistance was also given for perch recovery efforts in the form of transporting trapping equipment back from Montpelier Reservoir and providing personnel to help with the installation of an electric weir across a section of the North Fork Payette River. Similar assistance will be provided during the spring of 2005.

### **Payette Lake Net Pens**

Negotiations between the City of McCall and Department Regional Fish Manager Dale Allen have resulted in a cost-sharing agreement to build a new multipurpose dock to be located at Mill Park, which will include space to set up two net pens. In 2004, the existing net pens were modified and dock structures were built, but legal actions brought by a nearby landowner prevented placement of the docks. This problem has been resolved and placement of the docks and net pens is scheduled to be completed by the spring of 2005. Primary operation of the net pens will be directed out of the McCall sub-Regional Office with assistance provided by the hatchery staff.

### **Special Projects**

Sampling for the presence of the New Zealand Mud Snail (NZMS) was conducted while stocking catchable rainbow trout in 19 water bodies of interest. Although this snail has been detected in the gut of catchable rainbow trout received from NFH, no NZMS were found in any of the sampling locations or in the MCFH collection basin and settling pond.

Detailed directions to catchable rainbow trout stocking sites were compiled into a booklet to assist new personnel in locating these areas. During the summer an effort was made to error-check the directions.

### **Public Relations**

Fish stocking opportunities were provided to seven groups of volunteers, coordinated through Mary Dudley, Department Volunteer Coordinator, who brought fry into nine mountain lakes in the McCall area. Numerous hatchery tours were given to visitors as well as to several school groups throughout the summer.

## **ACKNOWLEDGEMENTS**

All resident program tasks in 2004 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 2004 included: Joel Patterson (MCFH Fish Culturist) and seasonal employees Jerry Harris, Bud Forsythe, Joey Ishida Jr., Nathan Parker, Dan Jindrich, Karl Sandquist, Steve Rioux, and Morgan Bessaw.

## APPENDICES

Appendix 1. Fry redistribution by Region, MCFH, 2004.

Species	Panhandle	Clearwater	Southwest (Nampa)	Southwest (McCall)	Salmon	Subtotal
Golden Trout (Mt Whitney FH, CA)	4,300		950	1,275	3,075	9,600
Kamloop Triploid (Hayspur – KT)		2,000		18,375		20,375
Rainbow Triploid (Hayspur – T9)			11,080	3,500	5,300	19,880
Westslope Cutthroat (Westslope Cutthroat Trout Co.)	4,900	38,000	16,900	41,025		100,825
Region Subtotal	9,200	40,000	28,930	64,175	8,375	150,680
# Lakes Stocked by Plane	5	26	45	48	13	137
Lakes Stocked by Other Means		1	1	13		15
Approximate Flight Costs	\$1,155.00	\$1,092.00	\$1,845.00	\$1,510.50	\$722.50	\$6,325.00
Average Cost to Stock Each Lake by Plane	\$231.00	\$42.00	\$41.00	\$31.47	\$55.58	\$46.17

Appendix 2. Resident feed usage and conversion data, MCFH, 2004.

	# Stocked/ Transferred	Feed Used (lb)	Lbs Gained	Conversion	Cost per Lb Gain	Cost per 1000 fish	Total Feed Cost
Golden Trout (Mt Whitney FH, CA)	9,600	9.7	6.0	1.62	\$1.77	\$1.11	\$10.64
Kamloop Triploid (Hayspur – KT)	20,375	22.7	6.5	3.49	\$3.83	\$1.22	\$24.90
Rainbow Triploid (Hayspur – T9)	19,880	15.9	9.8	1.62	\$1.78	\$0.88	\$17.44
Westslope Cutthroat (Westslope Cutthroat Trout Co.)	100,825	47.3	41.5	1.14	\$1.25	\$0.51	\$51.89
Total	150,680	95.6	63.8	1.50	\$1.64	\$0.70	\$104.87

Appendix 3. Total production and distribution costs, MCFH, 2004.

Species	Eggs/ fish Received	Fish Stocked	Transportation Cost	Pounds Gained	Cost per lb Gained	Cost per 1000 Stocked
<b>Fry Redistribution <sup>a</sup></b>						
Golden Trout (Mt Whitney FH, CA)	10,808 eyed	9,600	\$1,286.67	6.0	\$214.44	\$134.03
Kamloop Triploid (Hayspur – KT)	52,743 eyed	20,375	\$709.94	6.5	\$109.22	\$34.84
Rainbow Triploid (Hayspur – T9)	31,320 eyed	19,880	\$1,009.53	9.8	\$103.01	\$50.78
Westslope Cutthroat (Westslope Cutthroat Trout Co.)	125,000 eyed	100,825	\$4,425.56	41.5	\$106.64	\$43.89
<b>Subtotal</b>	<b>219,871 eyed</b>	<b>150,680</b>	<b>\$7,431.70</b>	<b>63.8</b>	<b>\$116.48</b>	<b>\$49.32</b>
<sup>a</sup> Breakdown includes flight (\$6,325.00) and vehicle redistribution (\$1,106.70) costs, fry stocked by volunteers (9 lakes) included at no associated cost.						
<b>Catchable Rainbow Trout Redistribution</b>						
Trout Lodge Rbt Triploid (Reared at Nampa FH)	94,088	93,980	\$9,162.50	N/A		\$97.49
Note: <sup>b</sup> Cost based on transportation costs of \$ 9,162.50 (MCFH \$ 4,892.50 and \$ 4,270.00 Nampa FH).						
<b>Grand Total</b>		<b>244,660</b>		<b>63.8</b>	<b>\$873.67</b>	<b>\$227.83</b>
Note: Grand total cost based on resident program expenditures (Nov 03 to Nov 04) of \$ 55,740; no capital outlay is included.						

**IDAHO DEPARTMENT OF FISH AND GAME**

**2004 ANNUAL RESIDENT REPORT**

**MULLAN FISH HATCHERY**

**Mary Van Broeke, Bio-Aide**

## INTRODUCTION

The Mullan Fish Hatchery (MUFH) is a resident species redistribution station located four miles east of Mullan. The Shoshone County Sportsmen's Association owns the MUFH and funds to maintain the physical plant are provided by Shoshone County. The Idaho Department of Fish and Game (Department) provides additional 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 10-ft x 60-ft concrete raceways and three 30-ft x 100-ft dirt ponds 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. Daily trips are made from this location from May to September to the Coeur d'Alene and St. Joe river drainages to stock ponds and lakes, providing the frequent stocking service necessary to support such a fishery. The proximity to a Shoshone County park encourages the highest visitor attendance rate of any hatchery in the Panhandle Region.

Mullan Fish Hatchery personnel were also involved with the Kokanee spawning operation at Granite Creek.

## HATCHERY IMPROVEMENTS

Hatchery improvements during 2004 included:

1. Replacing the old wiring in the main hatchery and shops #1 and #2. This was a joint project with the Department and Shoshone County.
2. The domestic water reservoir was drained and silt was removed. A Shoshone County work crew did this project.
3. The main hatchery building was painted.

## **FISH STOCKED OR TRANSFERRED**

A total of 35,275 catchable-size rainbow trout were released into numerous lakes and ponds of the Coeur d'Alene and St Joe river drainages from May to September to support a put-and-take fishery. All of the stocking sites received sterile rainbow trout (Trout Lodge Triploids) which were reared to size at Nampa Fish Hatchery (NFH) and then delivered to MUFH via large fish transport trucks. Hatchery personnel loaded the fish into a 500-gallon pickup truck-mounted tank and delivered them to individual lakes and ponds. The distribution schedule requires three to five hour trips, four to five days each week during the summer season.

Mullan Hatchery has an annual operating budget of \$16,179. If employee wages of \$13,300 and transportation costs of \$6,405 for NFH to deliver fish to MUFH are included, the streamside cost for MUFH to stock fish was \$1.02/fish.

## **PUBLIC RELATIONS**

The MUFH is located adjacent to a popular Shoshone County "day use" park. As a result, the hatchery receives a much higher volume of visitors than would be expected in this remote location. The hatchery serves the greatest number of visitors of any hatchery in the Panhandle Region, with over 10,000 people touring the grounds in 2004. The hatchery also hosted the Chrysler/Jeep Jamboree and the Silver Valley Good Samaritan RV rally. People from across the nation attended these functions. Four 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 drainages.

**IDAHO DEPARTMENT OF FISH AND GAME**

**2004 ANNUAL RESIDENT REPORT**

**NAMPA FISH HATCHERY**

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

## INTRODUCTION

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

## FISH PRODUCTION

During 2004, the NFH net fish production was 1,523,080 at a net weight of 283,737 lbs (Appendix 1). The net cost for rearing fish at the NFH from grow-out through stocking was \$409,293 (Appendix 2). Fish transferred to other hatcheries are included in the total number and lbs produced. Kamloops and rainbow trout *Oncorhynchus mykiss* comprised 86.4% 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 2004 (Appendix 3). Another 3,300 fish weighing 1,075 lbs were produced at NFH and given to schools for educational purposes and to department personnel for various research programs. These fish were not included in overall production numbers. A total of 2,273,086 eyed-eggs were received during 2004 (Appendix 4).

In October, the NFH experienced numerous brownouts that affected the 480 power to the hatchery and the pumps on well #1 (incubation) and well #2 (production). The pump failures resulted in a loss of approximately 90,000 Troutlodge rainbow sac fry and 8,900 rainbow fingerlings. These losses were not program threatening and the sac fry were replaced with free eggs from Hayspur Hatchery.

In September, NFH received 28,829 Hayspur triploid fingerlings weighing 32 lbs from Sandpoint Hatchery. These fish were sent to Sandpoint Hatchery as eggs to slow their development. This should aid our ability to produce the correct size catchable for release into Stanley Basin lakes as per ESA permit number 1188.

## FISH STOCKED/TRANSFERRED

The NFH personnel stocked or transferred 2,039,074 fish, weighing 300,613 lbs, during 2004. These fish included warm water transfers as well as fish reared in non-Department hatcheries to waters in Idaho. The NFH made 195 stocking trips to 379 planting waters during 2004.

The NFH stocked or transferred a total of 240,216 fry (Appendix 5), 866,336 fingerlings (Appendix 6), and 876,354 catchables (Appendix 7) which are listed by species/strain in each table. A total of 454,776 catchables (137,985 lbs) (Appendix 8) were transferred to six other hatcheries throughout the state.

The NFH participated in the Cascade restoration project by transporting perch from Phillips Reservoir, OR to Cascade Reservoir. The project is tentatively planned again for 2005.

## **FISH TRANSPORTATION**

Fish transport operators stationed at NFH stocked waters in all seven regions of the state. They transported fish to and from 16 different state and federal fish hatcheries. The transport operators made 123 trips totaling 50,830 miles during 2004.

The NFH transport operators stocked rainbow trout fingerlings from Lyons Ferry Fish Hatchery (171,287 fish, 6,199.2 lbs) into Clearwater Region waters. They also stocked spring Chinook salmon and B-run steelhead smolts from Clearwater Fish Hatchery and assisted with the transportation of summer Chinook salmon smolts from McCall Fish Hatchery. They stocked channel catfish purchased from Fish Breeders of Idaho to lakes in the Panhandle, Clearwater and Southwest regions. In the fall of 2004, the transport operators assisted in transporting and stocking 1,000 surplus A-run adult steelhead from Oxbow Fish Hatchery into the Boise River.

During the summer of 2004 NFH received a new Kenworth transport truck to replace Dick Bittick's old transport truck. Dick spent most of the fall converting the tank from his old truck to the new truck in preparation for fish hauling in 2005.

## **LAHONTAN CUTTHROAT TROUT**

During the 2004 fish year, NFH stocked 240,216 Lahontan cutthroat trout (379.5 lbs) into lakes and reservoirs in the Southwest and Upper Snake regions. The Lahontan cutthroat eggs were received from Omak Fish Hatchery, WA. Southwest Region and Upper Snake Region fish were stocked as fry (Appendix 5). Estimated survival from eyed-egg to stocking was 67.4%. Due to past shipping and handling problems, NFH personnel picked up the cutthroat eyed-eggs from Omak personnel at Pendleton, OR.

## **FALL CHINOOK**

In 2004, fall Chinook was again reared at NFH. The fry were transferred to NFH from Cabinet Gorge Fish Hatchery (CGFH) in January and reared through June. A total of 46,047 fingerlings were stocked in Coeur d'Alene Lake, meeting the June fish request (Appendix 6).

## **SPECIAL STUDIES**

The NFH again assisted Joe Kozfkay, resident research biologist, with the predator avoidance study. This year the study concentrated on large reservoir systems. Joe used grit marking of the fingerlings as a means of distinguishing study fish when they were later recaptured. Due to complications with the marking technique a high mortality was observed in the study fingerlings. Four raceways of fingerling were used in this study: two control raceways and two test raceways in which predator fish were introduced during the rearing cycle. The study was set up to compare whether fingerlings that had predators introduced into the raceways during the rearing cycle survived better than the control raceways with no predators once they are released into the lakes. Results of this study and further information can be obtained from Joe Kozfkay at the Department Research Office in Nampa.

The NFH assisted Brett High, resident research biologist, with a hooking mortality study. In this study, various sizes and brands of hooks using a variety of baits were used to catch various sizes of fish out of the raceways. The fish were then held in separate raceways and monitored for delayed mortality. No significant data was attained from this study due to the lack of fish mortality. Results from this study and further information can be obtained from Brett High at the Department Research Office in Nampa.

## **FISH FEED**

A total of 308,918 lbs of feed was fed during 2004 at a cost of \$93,180.79 (Appendix 9). The average cost per lb of feed was 30.16 cents. Rangen Inc. made up 98.33% of the feed purchased by weight. An additional 1,800 lbs of feed was received from other hatcheries and fed throughout the year. The overall feed conversion was 1.10 lbs of feed fed to produce one lb of fish.

Skretting feed continues to outperform other starter feeds. The NFH continued to use their starter feeds for starting fry on feed in 2004. Rangen continues to carry the feed contract and is used throughout the remainder of the rearing cycle. Skretting feed was used throughout the rearing cycle of the Lahontan cutthroat trout and fall Chinook salmon. The cutthroat were stocked as fry this year and were only on feed about three weeks before stocking.

## **FISH SPAWNING**

### **Early Kokanee**

The NFH continues to operate the early Kokanee salmon *O. nerka kennerlyi* trapping and spawning project. Numbers of Kokanee at Deadwood Reservoir are still on the rebound. The fish trapped at the weir decreased in average size from 17.5 inches last year to 12.56 inches this year. The egg-take goal for 2004 was 2 million green eggs for Mackay Fish Hatchery (MFH) production.

The Kokanee population continues to slowly increase, but has not yet reached a number sufficient to meet both escapement goals and egg-take goals. Following the direction of Southwest Regional biologists no fish were intentionally released above the weir for natural spawning. All fish that entered the trap and ripened were spawned. The trap was installed on August 10 and the first fish arrived in the trap that evening. With another low water year in 2004, the weir was installed just below Wild Buck Creek. Early in the spawning run the water level in the river and reservoir dropped steadily due to the Bureau of Reclamation (BOR) releasing water at the dam. By the end of the run the water remained relatively constant.

The KE run started about the same time as in the past few years. There were a total of seven spawning takes this year. The first spawn date was August 19 and the last was on September 10. All fish were spawned at the trap site. A green egg yield of 1,504,119 eggs was taken from 2,419 females for a fecundity rate of 622 eggs/female (Appendix 11). Average total length of Kokanee females was 309 mm, with males averaging 325 mm (Appendix 12). Eggs were shipped to Mackay Fish Hatchery via fixed-wing aircraft. The shipping techniques were similar to those used in previous years. The Department contracted the flying service with McCall Air Taxi.

Early in the spawning season, heavy rains in the Deadwood Reservoir area caused the water in the river to go off-color several times. On August 18, with sudden heavy thunderstorms in the area, the river rose approximately two feet and containment was lost at the weir at approximately 6:00 pm by pulling pickets along the weir. By 11:00 pm the flows in the river stabilized enough to put the weir back into operation. The weir was cleaned of debris every hour throughout the night. The majority of the debris and sediment seemed to come down from Basin creek. The first spawn take was on August 19 and the river and Basin Creek remained off-color enough that the fish in the trap were not visible. Approximately 350 Kokanee being held in the live boxes died during the high water event. Trap tenders could not make a good estimate of how many fish escaped upstream while the weir was not in operation. The trap was removed on September 12, and per instruction from the Southwest Regional biologist the few fish that remained in the trap were destroyed.

Deadwood Reservoir continues to be a popular fishing spot during the Kokanee run. With the low number of returning Kokanee, the Department again issued an emergency fishing closure from August 10 through September 15 to protect the fish in the Deadwood River. The closure area was from the weir in the river to the slack water of the Deadwood Reservoir. Informational and No Fishing signs were installed on both sides of the river from the weir every 100 yards down river to the mouth to inform the public about the fishing closure. The trap tenders also spoke with all visitors to the trap and explained the purpose of the closure. Most of the people contacted seemed to think it was a good idea.

The weir across Trail Creek was not installed again this year due to the low number of returning fish. This year the crew assisted regional personnel in walking Trail Creek and the other tributaries throughout the spawning season conducting adult spawning surveys.

With low fish numbers returning to the North Fork of the Payette River no trapping and spawning operation was conducted this year.

The Morrison Knudsen Nature Center received 60 adult Kokanee for viewing at the Nature Center ponds. Salmon and Steelhead Days received 100 spawned out Kokanee kelts for educational purposes

## HATCHERY IMPROVEMENTS

Several important improvements were implemented at NFH during 2004:

- Replaced windows in residences #1, #2 & #3 and the hatchery office.
- Replaced old 1-ton pick-up with new 1-ton pick-up.
- Installed front entry door in residence #2
- Built new deck on residence #3
- Installed new French and entry doors on the back of residence #3.
- Replaced roof on residence #2.
- Installed new degassing towers on wells #4 & #5.
- Refurbished flagpole.
- Built deck at residence #1.
- Repaired all gates around the B & C ponds and mended holes in the bird screen.
- Received new Kenworth transport truck to replace Dick Bittick's old Kenworth.
- Converted transport tank from old truck to new truck.
- Ordered new Kenworth transport truck to replace Gary's Freightliner truck.
- Cleaned up bone pile by well #6
- Converted transport trucks oxygen systems from using GP 45 to using "T"-sized hard bottles.
- Extended concrete pads by feed towers and the truck fill.
- Installed duct work into residences #2 & #3 for the heat pump installation.
- Purchased new backup generator for wells #7 & #8 and started installation.

NFH improvements scheduled for 2005 include:

- Purchase and install Jib Crane for loading oxygen bottles on to transport trucks or acquire forklift.

- Develop pamphlets for self-guided hatchery tours.
- Budget for aluminum screens and dam boards for B & C raceways.
- Purchase new Kenworth transport truck.
- Get transport tank switched from old truck to new truck.
- Receive new 1-ton pick-up to replace 1998 1-ton pick-up.
- Install new carpet in residences #2 & #3.
- Build new deck on residence #2.
- Install new back doors in residence #2
- Finish installation of new backup generator for wells #7 & #8.
- Replace old alarm system and connect it to the new backup generator and well #1.
- Finish installation of heat pumps in residences #2 & #3.
- Repair domestic well for residences # 2 & #3.
- Install water softeners for hatchery residences
- Build new storage building for storing wood and metal.
- Repair broken key ways in the C ponds.

## **PUBLIC RELATIONS**

As in past years, the NFH was a focal point for many visitors, tours, and special groups. An estimated 3,500 tourists visited the NFH in 2004. Most visits came during the late spring and summer months, although with year-round schooling, tours were scheduled spring, summer and fall. A total of 63 guided tours were given to area school, church, and Boy Scout groups. The NFH participated in two job shadows during 2004. Disabled veterans were invited to fish the settling pond five times during the summer months. Six other disabled groups from the Nampa area were allowed to fish the settling pond through the summer. The settling pond was also opened to fishing on Free Fishing Day. The NFH, with the help of regional personnel, reservists and local Boy Scouts, hosted the Free Fishing Day clinic, which saw 544 visitors/fishermen, with an estimated 650 fish caught. The largest fish caught was a five-pound rainbow trout and several more weighed over three pounds. Free Fishing Day at NFH was a big success and will be continued in the future. We felt the “kids only” session from 8:00 am to noon continued to be very popular and successful. The Gem State Fly Fishing Group continues to hold a 3-day fly fishing instructional class (no hooks allowed) at the hatchery. Assistance on fish culture programs was provided to many area schools. Eggs, fry and fingerlings were provided for living streams and catchables were provided for dissection in several classes.

## **ACKNOWLEDGEMENTS**

The 2004 NFH staff included Rick Alsager, Fish Hatchery Manager II; Brian Malaise, Assistant Fish Hatchery Manager; Bob Turik, Fish Culturist; Gary Ady and Dick Bittick, Fish Transport Operators. Bio-aides for 2004 included: Ken Felty, Chris Gustavis, Travis Balls and Aaron Sterk. Chuck Kiester assisted with the kokanee spawning operation and fish marking. Three high school students assisted hatchery personnel through a work-study program. Volunteers have also helped on a number of projects throughout the year, by donating approximately 404 hours of their time.

## **APPENDICES**

Appendix 1. Total net fish production at Nampa Fish Hatchery, 1994 through 2004

Year	Put-and-Take		Put-grow-and-take		Total		Feed		Feed
	Number	Pounds	Number	Pounds	Number	Pounds	Pounds	Costs	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
2003	981,383	285,537	535,119	16,239	1,516,502	301,776	337,630	\$91,742	1.12
2004	811,838	272,531	711,242	11,206	1,523,080	283,737	310,718	\$93,818	1.10

\* 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 2004.

Year	Total cost through grow - out				Mean Length in inches	Total cost through stocking			
	Total Cost	Cost/1000 Fish	Cost/Pound	Cost/Inch		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	\$379,398	\$182.49	\$1.02	\$0.027	7.75	\$440,031	\$211.66	\$1.23	\$0.032
2003	\$408,764	\$269.63	\$1.35	\$0.037	7.22	\$441,840	\$291.45	\$1.46	\$0.040
2004	\$391,145	\$256.83	\$1.38	\$0.036	7.07	\$409,293	\$268.74	\$1.44	\$0.037

Appendix 3. Fish Requested and produced at Nampa Fish Hatchery, 2004

Species/Strain	Size	Production	Actual	% of Goal
		Goal	Production	Achieved
Lahontan cutthroat trout (C6)	1-3 inches	140,000	240,216	171.6%
Triploid rainbow trout (T9)	3-5 inches	300,000	367,935	122.6%
Triploid kamloops trout (KT)	3-5 inches	400,000	452,354	113.1%
Fall Chinook(FC)	6-8 inches	40,000	46,047	115.1%
Triploid kamloops x steelhead trout (TT)	8-12 inches	900,000	857,261	95.3%
Triploid rainbow trout (T9)	8-12 inches	18,000	18,277	101.3%
<b>Totals:</b>		<b>1,798,000</b>	<b>2,098,980</b>	<b>116.7%</b>

Appendix 4. Eyed- eggs received at Nampa Fish Hatchery, January 1 to December 31, 2004

Date	Species/Strain	Source	Number	Destination	Cost/1000
Received					fish
12/17/03	Triploid rainbow trout	Hayspur	181,000	SW/Reg.	N/C
12/23/03	Triploid rainbow trout	Hayspur	181,000	SW/Reg.	N/C
1/13/04	Triploid rainbow trout	Hayspur	83,399	SW/Reg.	N/C
1/13/04	Triploid kamloops trout	Hayspur	110,326	C Reg.	N/C
1/28/04	Triploid kamloops trout	Hayspur	234,729	SW/Reg. & US Reg.	N/C
2/18/04	Triploid rainbow trout	Hayspur	61,105	SW/Reg. & Salmon Reg.	N/C
2/25/04	Triploid kamloops trout	Hayspur	87150	Salmon Region	N/C
3/2/2004	Triploid rainbow trout	Hayspur	25,398	SW Reg., Salmon Reg.	N/C
3/9/04	Triploid rainbow trout	Hayspur	46,724	C Reg.	N/C
4/6/04	Triploid kamloops trout	Hayspur	40,374	MV/Reg.	N/C
4/20/04	Triploid kamloops trout	Hayspur	45,601	MV/Reg.	N/C
4/27/04	Triploid kamloops trout	Hayspur	51,946	MV/Reg	N/C
4/28/04	Lahontan cutthroat trout	Omak	356,569	SW/Reg & US Reg	N/C
6/3/04	Triploid kamloops x steelhead trout	Trout Lodge	400,000	SW Reg, MV Reg., P Reg & Salmon Reg.	\$25.00
6/23/04	Triploid kamloops x steelhead trout	Trout Lodge	400,000	SW Reg, MV Reg., P Reg & Salmon Reg.	\$25.00
9/30/04	Triploid kamloops x steelhead trout	Trout Lodge	209,231	SW Reg, MV Reg., P Reg & Salmon Reg.	\$25.00
10/19/04	Triploid kamloops trout	Hayspur	85,433	SW/Reg	N/C
10/26/04	Triploid kamloops trout	Hayspur	35,101	SW/Reg	N/C
<b>Total:</b>			<b>2,635,086</b>		

**Destination Key**

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

Appendix 5. Fry production at Nampa Fish Hatchery, 2004

<b>Species/Strain</b>	<b>Source and Date Received</b>	<b>Number Received</b>	<b>Number Produced</b>	<b>Pounds Produced</b>	<b>% Survival Egg to Plant</b>	<b>Destination</b>
Lahontan cutthroat trout	Omak 4/03	240,820	161,350	250	67.0%	Southwest Region
Lahontan cutthroat trout	Omak 4/03	115,749	78,866	129.5	68.1%	Southeast Region
<b>Totals:</b>		<b>356,569</b>	<b>240,216</b>	<b>379.5</b>	<b>67.4%</b>	

Appendix 6. Fingerlings produced at Nampa Fish Hatchery, 2004

<b>Species/Strain</b>	<b>Source</b>	<b>Date Received</b>	<b>Number Received</b>	<b>Number Produced</b>	<b>Pounds Produced</b>	<b>% Survival Egg to Plant</b>	<b>Designation</b>
Triploid Kamloops Trout	Hayspur	1/04, 2/04 & 4/04	691,880	452,354	5,263	60.4%	Southwest, Magic Valley & Clearwater Regions
Triploid Rainbow Trout	Hayspur	12/03, 1/04 & 2/04	578,626	367,935	3,148	63.6%	Southwest Region
Fall Chinook	Cabinet Gorge	1/03	46,384	46,047	3,000	99.3%	Panhandle Region
<b>Totals:</b>			<b>1,315,670</b>	<b>866,336</b>	<b>12,631</b>		

Appendix 7. Catchables produced at Nampa Fish Hatchery, 2004

<b>Species/Strain</b>	<b>Source</b>	<b>Date Received</b>	<b>Number Received</b>	<b>Number Produced</b>	<b>Pounds Produced</b>	<b>% Survival Egg to Plant</b>	<b>Designation</b>
Triploid rainbow trout	Hayspur	10/03	25,439	18,227	8,411	71.6%	Salmon Region
Triploid kamloops x Steelhead	Troutlodge	6/03 & 10/03	1,148,499	858,127	270,321	74.7%	Panhandle, Clearwater, Southwest, Southeast Magic Valley & Salmon Regions
<b>Totals:</b>			<b>1,173,938</b>	<b>876,354</b>	<b>278,732</b>		

Appendix 8. Catchables transferred from NFH to other hatcheries throughout the state in 2004.

<b>Hatchery</b>	<b>Species</b>	<b>Number</b>	<b>Pounds</b>	<b>Fish/pound</b>
Clearwater Fish Hatchery	TT	107,899	33,800	3.19
Hayspur Fish Hatchery	TT	43,020	13,250	3.25
McCall Fish Hatchery	TT	94,088	30,000	3.14
Mullan Fish Hatchery	TT	33,696	9,960	3.38
Sandpoint Fish Hatchery	TT	125,095	38,125	3.97
Sawtooth Fish Hatchery	TT	50,978	12,850	3.97
<b>Totals:</b>		<b>454,776</b>	<b>137,985</b>	

Appendix 9. Nampa Fish Hatchery Feed cost, 2004

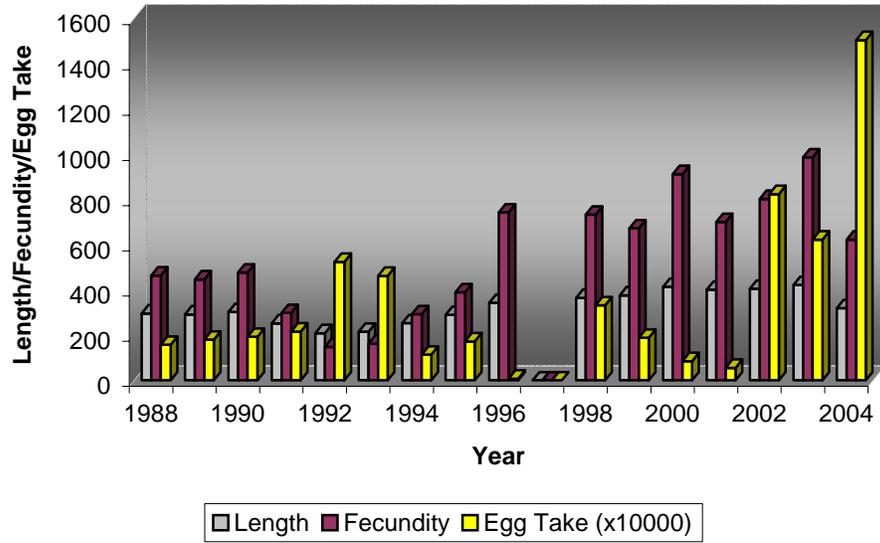
Supplier/Source	Size/Type	# Boxes /Bags	Pounds	Price/lb.	Feed Charges
<b>Moore-Clark</b>					
Nutra Plus	Starter #0	22	968	\$0.951	\$920.57
Nutra Plus	Starter #1	28	1232	\$0.949	\$11.69.52
Nutra Plus	Starter #2	4	176	\$0.930	\$163.68
Nutra Fry	Grower 1.2 mm	5	220	\$0.0399	\$87.81
Nutra Fry	Grower 1.5 mm	48	2112	\$0.696	\$1469.60
Nutra Fry	Grower 2.0 mm	10	440	\$0.670	\$294.80
<b>Total:</b>		117	5,148		<b>\$4,105.98</b>
<b>Freight:</b>					<b>\$1,230.50</b>
<b>Grand Total:</b>					<b>\$5,336.48</b>
<b>Rangen</b>					
Dry Crumble	Starter #0	7	350	\$0.450	\$157.40
Dry Crumble	Starter #1	28	1,400	\$0.443	\$620.00
Dry Crumble	Starter #2	100	5,000	\$0.439	\$2,194.00
Dry Crumble	Starter #3	20	1,000	\$0.436	\$436.00
Dry Crumble	Grower #3	295	14,750	\$0.330	\$4,867.25
450 floating	1/16 in. pellet	225	11,200	\$0.420	\$4,725.75
450 floating	3/32 in. pellet	60	3,000	\$0.328	\$984.00
450 floating	1/8 in. pellet	287	14,350	\$0.284	\$4,079.30
450 floating	5/32 in. pellet	11	550	\$0.278	\$152.90
450 floating	3/32 in. pellet	Bulk	18,540	\$0.328	\$6,081.12
450 floating	1/8 in. pellet	Bulk	236,960	\$0.268	\$63,550.52
Dry Crumble med.	Starter #2	3	150	\$0.585	\$87.81
Dry Crumble med.	Grower #3	45	2,250	\$0.601	\$1351.65
Dry Crumble med.	Grower #4	20	1,000	\$0.568	\$568.30
<b>Total:</b>		965	303,770		<b>\$86,884.60</b>
<b>Freight:</b>					<b>\$6296.19</b>
<b>Grand Total:</b>			308,918		<b>\$93,180.79</b>

Appendix 10. Kokanee egg-take at Deadwood Reservoir by Nampa Fish Hatchery, 2004

<u>Lot Number</u>	<u>Spawn Date</u>	<u>Females Spawmed</u>	<u>Green Eggs</u>	<u>Eyed Eggs</u>	<u>Percent Eye-up</u>
04-U-ID-KE-1 (2N)	8/19/04	337	197,307	126,338	64.1%
04-U-ID-KE-2 (2N)	8/23/04	263	148,670	91,418	61.5%
04-U-ID-KE-2 (3N)	8/23/04	204	109,465	45,709	41.8%
04-U-ID-KE-3 (2N)	8/26/04	187	120,532	68,061	56.5%
04-U-ID-KE-3 (3N)	8/26/04	135	87,167	30,560	35.1%
04-U-ID-KE-4 (2N)	8/30/04	391	242,098	131,933	54.5%
04-U-ID-KE-4 (3N)	8/30/04	221	161,827	41,650	25.7%
04-U-ID-KE-5 (2N)	9/2/04	314	177,494	93,069	54.1%
04-U-ID-KE-5 (3N)	9/2/04	104	64,498	35,525	55.1%
04-U-ID-KE-6 (2N)	9/7/04	124	81,708	53,195	65.1%
04-U-ID-KE-5 (3N)	9/7/04	61	47,498	27,502	57.9%
04-U-ID-KE-7 (2N)	9/10/04	78	65,855	44,986	68.3%
<b>Totals:</b>		<b>2,419</b>	<b>1,504,119</b>	<b>792,996</b>	<b>52.7%</b>

Appendix 11. Kokanee spawning length, fecundity, egg-take Nampa Fish Hatchery, (1992-2004)

**Deadwood Kokanee Spawning  
Spawning Summary (1988-2004)**



**IDAHO DEPARTMENT OF FISH AND GAME**

**2004 ANNUAL RESIDENT REPORT**

**SANDPOINT HATCHERY**

**Zach Olson, Fish Culturist**

## INTRODUCTION

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

Duties at this facility include the put-and-take stocking program of catchables in lowland lakes and fry stocking for high mountain lakes in the northern section of Region 1. After the closure of Clark Fork Hatchery in 2000 Sandpoint Fish Hatchery took over the annual stocking of 22 lakes with sterile catchable rainbow trout *Oncorhynchus mykiss*. Due to cool water temperatures and available rearing space, SPFH has taken on incubation and early rearing of T-9 rainbows for Nampa Hatchery. On even-numbered years, high mountain lakes are stocked with sterile Kamloop (KT) rainbow and Westslope cutthroat *O. clarki* trout fry. This program involves receiving eyed-eggs from state and private sources, incubating, and then stocking the swim-up fry.

On even-numbered years McCall Fish Hatchery stocks golden trout *O. aquabonita* and arctic grayling *Thymallus arcticus* into four additional high mountain lakes in the northern portion of Region 1 via a fixed wing aircraft.

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

## WATER SUPPLY

The hatchery receives water from Murphy Springs which flows into a pipeline located one-quarter mile southwest of the hatchery. The spring is covered and supplies the facility with 400 to 450 gallons per minute (gpm) of water. Temperatures range from 44°F to 48°F.

There are four water control valves within the supply pipeline system. These valves are located in the parking lot area at the hatchery. Two of the valves operate as isolation valves. The two remaining valves allow water to be diverted into the outdoor raceways or the Water Life Discovery Center stream and viewing pond, construction of which started in the summer of 2003. A valve located at Murphy Springs can compensate for overflow situations by spilling water back into Murphy Creek. An additional valve is located at the tail end of the outdoor raceways. This valve can be used to supply second-use water to the Nature Center viewing pond. All valves are adjusted to allow water levels at the spring to remain full while maintaining maximum flow to the hatchery.

## REARING FACILITIES

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

## FISH STOCKING

Catchable size triploid rainbow trout (~9.0-10.0 inches) were stocked in the Kootenai, Pend Oreille, and Spokane river drainages to support a put-and-take fishery. All of the lakes and reservoirs stocked are located within the northern portion of Region 1. Fish supplied for redistribution in 2004 were Troutlodge triploid rainbows from Nampa Fish Hatchery (NFH). A total of 125,410 fish weighing 36,505 lbs (3.43 fpp) were stocked between the first week of April and the third week of September. Fish scheduled for stocking in late-March were cancelled due to road restrictions and were added to April's stocking request. Twenty-two different bodies of water received catchable rainbows in 2004. Kalispell Pond was dropped from Sandpoint's stocking schedule due to poor habitat conditions and the Clark Fork Lodge Pond was permanently added for future requests. In addition to normal plants, the hatchery provided fish for a fishing clinic at Wal-Mart shopping center, and Free Fishing Day events at Rathdrum Boy Scout Park, Priest Lake golf course, and Clark Fork Pond. Streamside cost to redistribute fish was \$0.306 per fish (Appendix 1). The cost of stocking fish from SPFH included employee wages, transportation cost from NFH, and operating expenses that totaled \$38,396.

A total of 29 high mountain lakes in the northern portion of Region 1 were stocked with swim-up trout fry. Five lakes received a mix of T-9 and KT rainbows, and 24 lakes received Westslope cutthroat. Surplus cutthroat fry were stocked into the three lowland lakes of Lower Twin, Granite, and Antelope lakes to finish off the program. All fry stocking requests were met, with the exception of Roman Nose Lake, which was stocked with an alternate species of cutthroat rather than rainbow fry. A total of 61,000 cutthroat and 18,900 rainbow fry were stocked. All high mountain lake fry were stocked one to four weeks after being ponded. The high mountain lake program is dependent upon additional Department personnel, reservists, and volunteers to backpack fry into the requested lakes. In 2004, a total of 336 hours were donated by reservists and volunteers for completion of the project.

## PRODUCTION

Sandpoint Fish Hatchery received three lots of eyed-eggs from Hayspur Fish Hatchery (HFH) during April and May of 2004. Two shipments of T-9 rainbows which totaled 46,000 eggs were received on April 6 and April 20 for incubation. Fish were kept on 46°F water and were fed a reduced diet between 1.25-1.5 percent bodyweight to minimize growth before being sent to NFH for final rearing. A total of 41,955 swim-up fry were ponded. After swim-up mortality, 40,750 juveniles were sent to NFH on August 25 (Appendix 2). Survival to shipping was 91%. A total of 31.8 lbs of Skretting Nutra-Plus feed was fed which produced 51.4 lbs of growth for a conversion factor of 0.61:1 (Appendix 3).

On May 25 a mixed shipment of 16,200 T-9 and 14,300 KT sterile rainbow eggs was received from HFH for high mountain lake stocking in Region 1. A total mortality of 550 eggs and 10,000 swim-up fry resulted in 19,950 fry available for stocking (Appendix 4).

On July 6 a shipment of 75,000 eyed Westslope cutthroat eggs was received for high mountain lake stocking from the Westslope Trout Company (WSTC) located in Ronan, Montana. A total mortality of 8,385 eggs and 4,200 swim-up fry resulted in 62,415 fry available for stocking (Appendix 5). All rainbow and cutthroat fry were fed a maintenance diet for minimum growth.

### **HATCHERY IMPROVEMENTS**

- Purchased a new 2-ton Ford, diesel which replaced the old GMC 2-ton.
- Installed new bird netting over outside raceways.
- Replaced the domestic sewer line.
- Installed a privacy fence between neighbors and the hatchery.
- Landscaped around outdoor raceways and front of office.

### **HATCHERY NEEDS**

- Repair hatchery building interior ceiling panels, windows, repaint floors.
- Install new siding on exterior of main hatchery building.
- Catwalk over headbox and tailbox of new raceways
- Relocate power pole by kiosk to accommodate tractor trailer loads of catchables from Nampa Fish Hatchery.
- Replace wooden dam boards with aluminum dam boards for outdoor raceways.

### **PUBLIC RELATIONS**

The hatchery receives a fair number of visitors because of its proximity to Sandpoint and US Highway 95. A kiosk, built by the Lake Pend Oreille Idaho Club (LPOIC), serves as an information center for self-guided tours and natural history of the area. SPFH is a one-person fish distribution station. When available, the hatchery personnel conduct educational tours, provide information to the public, and attend community events on the Department's behalf. In addition, hatchery personnel attend meetings with LPOIC and other sportsmen's groups to communicate department/hatchery information and issues to them.

Construction has continued on the Water Life Discovery Center, which will increase public educational opportunities in the future. The Center will include a pond with viewing windows, spawning channel, interpretive trail system, and educational building for visitors. Thus far, the pond and spawning channel have been dug and fully landscaped with indigenous plants.

## **ACKNOWLEDGEMENTS**

The SPFH staff would like to thank the staff at CGFH: John Rankin (Fish Hatchery Manager1), Bruce Thompson (Assistant Manager), and John Suhfras (Maintenance Craftsman) for their assistance when additional manpower was needed. Thanks to Gary Ady and Dick Bittick, who transported catchable rainbows from Nampa Fish Hatchery throughout the stocking season. Appreciation is also given to Regional Department staff, reservist, and volunteers who make high mountain lake stocking possible.

## **APPENDICES**

Appendix 1. Catchable Redistribution Cost.

Wages	\$12,500
Transportation cost from Nampa Hatchery	\$10,675
Operating	\$15,221
Total	\$38,396

Cost	Number of Catchables	Streamside Cost Per Fish
\$38,396	125,410	\$0.306

Appendix 2. T-9 for Nampa Fish Hatchery Survivability.

Lot Number	1	2
Date Received	4-6-04	4-20-04
# Eyed Eggs Received	31,000	15,000
Number Poned	27,850	14,105
% Survivability to Ponding	89.8%	94.0%
# Transferred to Nampa	26,860	13,890
Overall % Survive	86.6	92.6

Appendix 3. Hayspur T-9 for Nampa Fish Hatchery Conversions.

Lot Number	1	2
Total Feed Fed	8,955 gr = 19.7 lbs	5,500 gr = 12.1 lbs
Begin Weight	7.7 lbs @ 3,600 fpp	3.8 lbs @ 3,600 fpp
End Weight	44.4 lbs @ 605 fpp	18.4 lbs @ 755 fpp
Growth	36.8 lbs	14.6 lbs
Feed Conversions	.53	.82
Daily Water Temperature	46°F	46°F

Appendix 4. Hayspur T-9 and KT Rainbow Fry for High Mountain Lakes.

Date Received	5-26-04
Number Eyed Eggs Received	30,500
Number at Ponding *	20,950
% Survival	68.6%
Pond Mortality	1,000
Number Available for Stocking	19,950
% Survival to Release	65.0%

\* A single tray containing 9,000 swim-up fry was accidentally left in the Heath Stack.

Appendix 5. Westslope Cutthroat Fry for High Mountain Lake Stocking.

Date Received	7-6-04
Number Eyed Eggs Received	70,000
Number at Ponding	66,615
% Survival	95.1%
Pond Mortality	4,200
Number Available for Stocking	62,415
% Survival to Release	89.1%

**IDAHO DEPARTMENT OF FISH AND GAME**

**2004 ANNUAL RESIDENT REPORT**

**SAWTOOTH FISH HATCHERY**

**Roger Elmore, Fish Hatchery Assistant Manager  
Lars Alsager, Bio Aide**

## INTRODUCTION

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

## FISH STOCKING

Sawtooth Fish Hatchery met its stocking request in 2004 with the exception of the following: 100 fish into Grouse Lake eliminated due to warm water.

Nampa Fish Hatchery (NFH) supplied SFH with Troutlodge triploid rainbow for stocking. A total of 50,978 fish were received at SFH on three shipping days from May 17 through September 8. Based on 14 sample counts fish averaged 3.39 fish per pound (fpp) and 9 inches in total length (225 mm). SFH personnel drove approximately 2,400 miles on 66 stocking trips and stocked a total of 44,600 fish in lakes and streams in the area. Nampa Fish Hatchery stocked Stanley, Pettit, Perkins and Alturas lakes in 2004.

National Marine Fisheries Service NMFS permit #1188, which expired Dec 31, 2004, outlines resident rainbow trout releases in anadromous waters in the Salmon River drainage. Permit #1188 dictates hatchery-reared rainbow trout to be released in rivers, streams, and lakes with ESA-listed fish should have an average size not greater than 250 mm with 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. The permit also dictates fish in the upper Salmon River cannot be stocked until after June 15 and must be adipose fin clipped. Only fish with the adipose fin clip may be kept, thereby protecting wild rainbow trout. All rainbow trout received at SFH in 2004 were adipose clipped by personnel at NFH and then delivered to SFH 21 days later to allow for withdrawal of MS-222 to comply with label directions.

The catchable-size rainbow trout were fed a maintenance diet of Rangen's 450 extruded pellet in the 5/32 size throughout the summer. A total of 750 lbs was purchased at a cost of \$208.50. Transport costs to bring catchable sized trout from Nampa totaled \$2,135. Approximate cost for 66 stocking trips was \$2,208.

Weekly notices informing the public of the whereabouts of the latest stocking locations are distributed to the local businesses and are posted at SFH. An updated version of the "Fishing Sawtooth Valley" brochure was re-printed. Copies are distributed to local businesses where they are readily available to summertime visitors. A repeating message can be heard over the local radio transmitter containing stocking information and current news about SFH. Stocking information can also be found on the Department web site.

## **High Mountain Lake Stocking**

The SFH personnel resumed high mountain lake stocking of Westslope cutthroat trout by fixed-wing aircraft in the Salmon Region. Two flights flown by McCall Air Taxi occurred on August 29 and Sept. 2. A total of 30,765 fish were stocked into 32 different lakes. Size of the fish was between 2,500 and 3,000 fpp. Flight time was 7.4 hours at a cost of \$1,831.00.

## **Free Fishing Day**

Sawtooth Fish Hatchery sponsored another Kid's Fishing Day at the Sawtooth Pond on Free Fishing Day, June 12, 2004. Between the hours of 10:00 am and 3:00 pm thirty-two kids and 16 adults participated in fishing activities. Most of the kids were very young and needed assistance. Over 100 catchable-sized rainbow trout were stocked by hatchery staff prior to Free Fishing Day. Cold soda pop and a packet of information containing the fishing regulations, "Fishing Sawtooth Valley" brochure, and information on fish identification geared towards identifying bull trout were handed out to participants. However, most of the kids were only interested in catching fish, which they did with regularity. The weather was ideal, and thanks to all who participated.

## **PLANS FOR 2005**

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

In 2005, SFH plans to continue high mountain lake stocking of Westslope cutthroat trout *O. clarki lewisi* by airplane in the Salmon Region. Also, SFH personnel will attend flight safety training as required.

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

## **ACKNOWLEDGEMENTS**

The SFH would like to thank Rick Alsager and the Nampa Fish Hatchery crew for their cooperation in making 2004 successful. Special thanks go to Gary Ady for transporting fish from Nampa and stocking the big lakes in the Stanley Basin; and Bio Aide Lars Alsager did a good job of stocking fish, delivering stocking notices, and entering the weekly data for SFH. Also, Vicki Runnoe and Renai Brogdon helped to produce the "Fishing Sawtooth Valley" brochure.

## **APPENDICES**

Appendix 1. Planting sites and numbers of catchable rainbow trout stocked in the Salmon Region by Sawtooth Fish Hatchery from May through September 2004.

Site	Number
Little Bayhorse Lake	2,000
Kelly Creek Pond	1,500
Salmon River	31,400
Yankee Fork Dredge Ponds	4,000
Valley Creek	4,000
Blue Mountain Meadow Pond	900
Squaw Creek Pond	800
<b>Totals</b>	<b>44,600</b>

Appendix 2. Planting sites and numbers of cutthroat fry stocked in the high mountain lakes by Sawtooth Fish Hatchery in late August and early September 2004.

**High Mountain Lakes Stocking:**

<b>Site</b>	<b>Number</b>
Basin Creek Lake #05	1,000
Bear Valley Lake #03	150
Birdbill Lake	500
Broncho Lake	725
Devils Lake	350
Everson Lake	1,500
Harbor Lake	3,000
Heart Lake	1,675
Hidden Lake #01	1,125
Hidden Lake	1,000
Hindman Lake #01	500
Iron Lake #01	1,000
Line Lake	350
Lower Valley Creek Lake	750
MF Hat Creek Lake #05	1,075
McNutt Lake (Basin Creek Lake #04)	350
Paragon Lake (Wilson Creek Lake #03)	275
Park Fork Creek Lake	150
Patterson Creek Lake #01	125
Patterson Creek Lake #02	200
Puddin Mtn. Lake #10 (Turquoise Lake)	275
Puddin Mtn. Lake #15 (Sky High Lake)	675
Ramshorn Lake (Wilson Creek Lake #02)	350
NFEF Reynolds Lake #02	1,325
NFEF Reynolds Lake #04	1,000
RF Big Eight Mile Lake	150
Ship Island Lake #05 (Airplane Lake)	1,000
Ship Island Lake #07 (Sheepeater Lake)	325
UPL Lake	1,000
Welcome Lake	1,225
Wilson Lake	1,000
Yellowbelly Lake	6,640
<b>Totals</b>	<b>30,765</b>

**IDAHO DEPARTMENT OF FISH AND GAME**

**2004 ANNUAL RESIDENT REPORT**

**FISH HEALTH REPORT**

**Douglas R. Burton  
Fishery Pathologist**

## INTRODUCTION

The Resident Hatchery Pathologist's (RHP) primary duties are to provide fish health inspection and diagnostic services to Idaho Department of Fish and Game (Department) resident fish hatcheries and to assist hatchery personnel in maintaining good health in cultured resident fish. These same services are provided to Department fishery managers and biologists and occasionally to private individuals or companies when the information or relationship is of benefit to the State of Idaho. The author, Douglas R. Burton, has held the RHP position since 1993. The RHP and the Anadromous Hatchery Pathologist (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. Both individuals are certified by the American Fisheries Society 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 (USFWS), Aquatic Animal Drug Approval Partnership Program in 1998. This group administers INAD programs for State, Tribal, and private aquaculture across the United States. Chemical compounds used under this program by Department resident hatcheries during 2004 included Oxytetracycline (OTC) and Chloramine-T (CHLOR-T). Oxytetracycline is used to treat fish with systemic bacterial infections, and Chlor-T is used to treat bacterial gill infections. Statewide, the single most significant fish disease in the Department resident hatchery program continued to be bacterial coldwater disease (CWD). The bacterium that causes CWD, *Flavobacterium psychrophilum*, is usually susceptible to OTC but requires an INAD protocol for such treatment to be legal. The total of 23 INAD protocols needed to use OTC at resident hatcheries in 2004 was identical to the number needed in 2003. In addition, the RHP monitored an INAD research project by Department Research Biologist Joe Kozfkay to test Calcein as a marking agent for juvenile fish.

Another responsibility of the RHP is to issue import/transport permits when the fish or fish eggs involved are of resident species and the goal of the movement is the noncommercial release of fish into surface waters of the state. Such permits are issued to Department personnel, other governmental agents, and private individuals. This duty involves collecting fish health inspection and certification information from various sources. The goal of the program is to reduce jeopardy to Idaho's fishery resources by limiting the probability of importing unwanted pathogens or other exotic species. An additional aspect to this duty in 2004 was the coordination of the Federal Title 50 certifications for the import of Westslope cutthroat trout eggs, Kokanee salmon eggs, and sterile brook trout eggs into Idaho from British Columbia, Canada.

The RHP and EFHL personnel examined 81 cases for Department resident hatchery programs during 2004 (46 diagnostic cases, 19 routine hatchery inspections, and 16 inspections of feral brood fish). Compared to the previous year, these numbers reflect a decrease in inspections (29 routine and 24 feral brood in 2003) and an increase in diagnostics (34 in 2003). In addition, the RHP was responsible for 1 inspection done on fish from the Idaho Springs Hatchery (rainbow trout purchased from the University of Idaho by Idaho Power Co. for release

in American Falls Reservoir), and 31 various research tests. A single diagnostic inspection was done on privately-owned Koi carp at the request of the Idaho Department of Agriculture, from which Koi herpes virus was confirmed for the first time in Idaho.

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**

Five of six diagnostic examinations documented CWD as the most significant infectious disease at American Falls Hatchery in 2004 (Appendix A). One of those cases also detected a carrier infection of an *Aeromonas*. Two forms of CWD were observed at American Falls Hatchery. One form is an acute systemic bacteremia with the primary signs being an enlarged spleen, swollen grey kidney, ascites, and occasionally a necrotic lesion on the lateral body wall over the spleen. Mortalities tend to climb rapidly. This form generally responds well to OTC-medicated feed at the standard dose and duration (3.75 grams OTC/100 lbs of fish/day for 10 days). The other form of CWD appears in larger fish, with less severe internal signs but external lesions very similar to the blisters of Furunculosis (FUR) caused by *Aeromonas salmonicida*. Mortality rates from this manifestation of CWD are usually lower but persistent. Successful treatment of the second form usually requires use of a higher dose and duration OTC-treatment (10 grams/100 lbs of fish/day for 14 days). If the opportunity arises in 2005, we may try to compare Florfenicol, another INAD drug, to OTC as a treatment for CWD at American Falls.

### **ASHTON HATCHERY**

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

## CABINET GORGE HATCHERY

Spawning kokanee adults were examined at the Sullivan Springs Trap at the end of November (Appendix C). No fish were available for sampling in the Clark Fork River trap. As in previous years, the adult kokanee were tested for replicating viruses, for RS by both the direct fluorescent antibody test (FAT) and the enzyme-linked immunosorbant assay test (ELISA), and for *Myxobolus* spores. No pathogens were detected. A light infection of encysted cestodes was evident in the pyloric caecae of about half of the fish. These are seen every year at about the same intensity and prevalence, and do not appear to have any adverse effect upon the hosts.

## GRACE HATCHERY

Grace Hatchery was at near full production levels in 2004, while continuing to experience a drought that significantly reduced water flow from the hatchery springs. In spite of these conditions, general fish health problems were better than in 2003. Specifically, CWD was the confirmed diagnosis in two cases versus five in 2003 (Appendix D). Treatments with OTC-medicated feed under INAD protocols were generally successful in reducing mortalities.

The triploid lake trout were inspected because the hatchery personnel observed abnormal swimming behavior in a significant portion of the population. Neither replicating viruses nor bacteria were detected. It is speculated that the behavior was related to the genetics of the population or as a result of the treatment of the eggs that induced triploidy.

## HAGERMAN STATE HATCHERY

A total of 23 diagnostic cases were examined from Hagerman State Fish Hatchery in 2004 (Appendix E). The severity of infectious hematopoietic necrosis (IHN) virus continues to decline, with minor losses in only a few lots. Two significant bacterial diseases caused fish losses this year, CWD and columnaris disease (COL) caused by *Flavobacterium columnare*. These bacteria were often detected in conjunction with each other or with a motile *Aeromonas*. These pathogens are so prevalent at Hagerman State Fish Hatchery that they can even be isolated from fish in the healthiest appearing populations. Actual disease epizootics were treated with OTC-medicated feed when the situation warranted, and the treatments were generally successful. The number of OTC-INAD protocols to treat CWD and/or COL at Hagerman State Fish Hatchery in 2004 was identical (15) to that in 2003. All were applied to fingerling or larger fish and were generally successful. One production stage where antibiotic use has been significantly reduced was in the vat building. A daily 1/2-hour bath treatment with 100-mg/l hydrogen peroxide is now given to every egg incubator, beginning the day after the eggs arrive and continuing until the fish are moved out of the vat building. To date, the hatchery manager reports that the improvement in survival far outweighs any cost in time or chemical.

The protozoan parasite *Ichthyophthirius multifiliis* (ICH) had a significant impact on several lots of fish in December. The source has been much speculated upon, but has not been confirmed. Alternating treatments of formalin and potassium permanganate have been used to date to control the parasite. This was the first time that ICH has caused documented mortality on the hatchery.

## HAYSPUR HATCHERY

Intensive sampling of the replacement rainbow (R9) and Kamloops (K1) brood stock pairings continued to be the health priority at Hayspur Hatchery (Appendix F). 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). Lethal sampling of a portion of the females was resumed, taking tissues for virology, kidney smears for direct FAT, and kidney tissues for ELISA. This practice had been discontinued because the loss of the BY2001 replacement populations made every live female on station too valuable. Ample numbers of BY2002 fish matured and contributed to this year's egg production, relieving this situation. In addition, good reagents for the ELISA test are again available making lethal sampling for kidney tissues more valuable. Eggs from individual females were held in isolation until the test results were complete. Using established protocol, if a parent female tested positive for any virus, for RS by any FAT method, or for RS antigen by ELISA at an optical density (OD) above 0.200, the resulting group of eggs was culled.

The R9 brood stock replacement spawning was done on six days between October 14 and December 29, 2004. A total of 192 females were tested. No viruses were detected from any ovarian fluid or tissue samples. The RS tests were as follows: 3 of 192 ovarian fluid samples were RS-positive by OCP-FAT, 12 of 60 ELISA tests were positive (5 with OD >0.200), and 0 of 60 kidney smears were positive by FAT. As a result, 8 groups of eggs were culled.

Kamloops brood stock replacement spawning was done on four days from October 28 to November 15. A total of 113 females were tested. No viruses were detected from any ovarian fluid or tissue samples. The RS tests were as follows: 3 of 113 ovarian fluid samples were RS-positive by OCP-FAT, 4 of 34 ELISA tests were positive for RS antigen (1 with OD >0.200), and 1 of 34 kidney smears was positive by FAT. As a result, three groups of eggs were culled.

Sixty-fish inspection samples (lethal) were taken from both BY2002 R9 and K1 populations. The majority of the fish in these samples were excess males. No replicating viruses, RS by FAT, or *Myxobolus* spores were detected from either population. *Flavobacterium psychrophilum* bacteria were isolated from individuals in both populations although no signs of clinical disease were observed. *Renibacterium salmoninarum* antigen was detected by ELISA from 16 individual K1s (10 low OD, 6 high OD) and from 1 R9 male (low OD). These results, as well as those from the replacement parent spawning fish, indicate an increasing incidence of RS in these populations. This is of concern, even though no signs of clinical bacterial kidney disease (BKD) were observed. This trend may be a result of changing fish culture practices as well as the inability to cull eggs based on ELISA test results for several years when reliable ELISA reagents were not available. The presence of non-clinical RS in these populations has never affected Department programs, but could have an impact on any plans to move the eggs out of state.

This was the third year that eggs were taken from the BY2000 Westslope cutthroat trout, originating from Connor Lake, Canada. Ovarian fluids from 29 females were tested for viruses and for RS by OCP-FAT, with no pathogens detected. A major problem with spawning the Connor Lake cutthroat continues to be that the males do not produce significant quantities of sperm early in the season, when the first females become ripe. This may contribute to poor fertilization rates in the early egg takes. To solve this problem, dried and sterilized pituitary glands harvested from mature male steelhead trout were reconstituted in sterile saline and injected into a portion of the Connor Lake cutthroat males. Within two weeks these males successfully produced more sperm, by volume, than uninjected males. The fish soon ceased to produce sperm, but by that time, the uninjected males had become ready. This technique will continue to be used in the future to allow for better fertilization of early eggs.

The use of sterile rainbow trout in all Department hatcheries has become an important part of statewide fishery management. With the exception of replacement brood stock groups, all eggs taken at Hayspur Hatchery are treated so that the resulting fish will be sterile triploids. To accomplish this, groups of eggs are shocked 20 minutes post-fertilization in a 26°C water bath. A goal of 95% triploid induction has been set for this treatment. Hatchery personnel randomly selected lots of heat-treated eggs and gave the RHP subsamples of eyed-eggs from those groups for incubation and rearing at the EFHL wet lab. When the resulting fish were large enough, the RFP took blood samples from 40 randomly selected individuals. The samples were then sent to the University of Washington for analysis. Thirteen groups were tested from the 2003-2004 spawning season (Appendix F). A total of 519 individual fish were tested of which 500 (96.3%) were triploid. Nine of the 13 groups met or exceeded the 95% goal, while 2 deficient groups were at 92.5%, and the other 2 were at 90%. It has become evident that temperature shocking is not 100% effective in inducing triploidy, but an overall average of 95% is not an unreasonable expectation.

## HENRYS LAKE HATCHERY

Fish health inspection samples were taken from spawning Yellowstone cutthroat trout at Henrys Lake Hatchery from January 21 through April 27, 2004 (Appendix G). Ovarian fluids were collected by hatchery personnel and shipped to EFHL where they were tested for viruses (182 females in 26 seven-fish pools) and RS by OCP-FAT (1,575 females in 225 seven-fish pools). No viruses were detected in any of the ovarian fluid samples, but one ovarian fluid sample tested positive for RS, so the corresponding pool of eggs was discarded. A group of 60 fish (both males and females) were sacrificed for kidney FAT, tissue virology, bacteriology (12 fish) and *Myxobolus* tests. No viruses were detected. Kidney smears were all negative for RS by FAT, but 11 of 12 five-fish pooled kidney tissue samples were positive by ELISA at low OD levels. This finding is consistent with testing from previous years. Bacteriology samples showed carrier-level infections of *Aeromonas salmonicida*, the causative agent of FUR. This is the first time this bacterium has been detected in cutthroat from Henrys Lake in over 10 years, although brook trout from the same source have frequently tested positive. No *Myxobolus* spores were detected in 12 five-fish pools by the PTD method, although MC has been previously confirmed in this population.

## **MACKAY HATCHERY**

The AHP filled in to sample rainbow trout and Yellowstone cutthroat trout July (Appendix H) when the RHP was on vacation. No replicating viruses were detected in either population. No bacteria were isolated from the cutthroat, but the rainbow trout were diagnosed with CWD and motile *Aeromonad* septicemia (MAS). Losses in the rainbow population were elevated for this station, but not extremely high. Unfortunately, the effected fish were in the top section of a raceway with a different lot of larger fish in the downstream sections. Any treatment of the fish in the upper section would have impacted the fish below. Management programs dictated that the fish from the lower sections had to be stocked out for fishing (i.e., human consumption), before the withdrawal period for OTC could be met. Therefore, no treatment was recommended for the effected lot of rainbow. A 60-fish group of rainbow trout were sampled by the hatchery personnel in December to be tested for MC. Results from this test are pending.

Mackay Hatchery received green eggs from the early-spawning Kokanee in Deadwood Reservoir. A 60-fish inspection was done on the spawning population on August 23. No viruses were detected from tissue samples. Direct FAT tests of kidney smears detected no RS, but 2 of 12 pooled samples were positive (low) for RS antigen by ELISA. This population had not been tested by ELISA since 2000 due to a lack of good reagents, but this year's results are very similar in prevalence and intensity to results from the 1990s. Kidney smears from 4 fish whose kidneys appeared somewhat swollen were tested for the presence of *Tetracapsula bryosalmonae*, the causative agent of proliferative kidney disease (PKD). None was detected. Large *Myxobolus* spores were detected by PTD in 7 of 12 five-fish pools of adult Deadwood Kokanee. Similar samples were tested in 2003 by polymerase chain reaction (PCR). Those tests confirmed that the species present in Deadwood Reservoir is the unnamed neurotropic (having an affinity for nervous tissue) *Myxobolus* that has been identified in many waters of Idaho (Hogge, Campbell, and Johnson, 2004). At the same time, PCR did not detect the presence of MC in the same fish.

## **MCCALL HATCHERY RESIDENT PROGRAM**

The McCall Resident Program experienced only minor disease problems in 2004. The Westslope cutthroat trout fry for mountain lakes had experienced episodes of CWD in previous years, so the RHP was called to look at the BY2004 fry when losses seemed to be increasing. No bacterial pathogens were detected (Appendix I), and the fish were stocked out before further tests or treatments could be applied.

## **NAMPA HATCHERY**

The RHP examined 10 diagnostic cases at Nampa Hatchery in 2004 (Appendix J). Six episodes of clinical CWD and/or MAS were diagnosed. Treatments of OTC-medicated feed were applied using either the existing label or an INAD protocol when appropriate and response to treatment was generally good. Nampa Hatchery also experienced 2 episodes of bacterial gill

disease (BGD) that were treated under INAD protocol with Chlor-T. Considering the very high production levels at Nampa, it is surprising that BGD is not a bigger problem on this station.

The protozoan parasite *Ichthyobodo* (formerly *Costia*) was diagnosed in rainbow trout fry that had been transferred from Sandpoint Hatchery. The fish were probably infected before transfer, but the parasite was able to flourish in the warmer water at Nampa. Formalin treatments were applied with success.

Catchable-sized rainbow trout were examined late in December. Filamentous organisms were observed in the lower gut similar to those diagnosed in the 1990s as blue green algae. However, numerous efforts to confirm that diagnosis failed. Michel et al., 2002 reported a very similar organism causing almost identical epidemiology in France. This organism was identified as a filamentous bacterium and given a tentative name of *Candidatus*.

### **OTHER ACTIVITIES**

The RHP completed a series of field trials exposing rainbow trout fry in live boxes around Hayspur Hatchery, in Loving Creek, in Silver Creek, and in the Big Wood River. A separate report is pending. In summary, no MC could be detected in any fish exposed on the hatchery, or in Loving or Silver creeks. The only infected fish in the trials were those exposed to the Big Wood River and in the irrigation canal that carries Big Wood River water to the fields directly above the Loving Creek springs. This work may identify a possible source for the historic infections on the hatchery and explain why the detection of those infections has been only intermittent. But the results also raise questions about why the parasite does not seem to be established in Loving Creek or in the hatchery's earthen ponds.

## **ACKNOWLEDGEMENTS**

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

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Appendix A. Summary report of Eagle Fish Health Laboratory results for American Falls Hatchery, January 1 – December 31, 2004.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
2003	Troutlodge	Rainbow trout--3N	04-025	1/6/04	-	-			-	-	+	-			DX: CWD; VIRO 0/5 <i>Flavobacterium psychrophilum</i> 4/4
2003	Troutlodge	Rainbow trout--3N	04-053	1/14/04					-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 4/4
2003	Troutlodge	Rainbow trout--3N	04-097	2/19/04					-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 8/8
2003	Troutlodge	Rainbow trout--3N	04-098	2/19/04					-	-	+	+			DX: CWD, MAS; <i>F. psychrophilum</i> 3/6, <i>Aeromonas sobria</i> 1/6
2003	Troutlodge	Rainbow trout--3N	04-099	2/19/04					-	-	-	-			DX: NPD; BACTE 0/4
2004	Troutlodge	Rainbow trout--3N	04-511	10/25/04					-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 2/8

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Appendix B. Summary report of Eagle Fish Health Laboratory results for Ashton Hatchery, January 1 – December 31, 2004.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
2003	Hayspur	Rainbow trout--3N	04-151	3/31/04	-	-		-					-		IX: NPD; VIRO 0/60, FAT 0/48, PTD-MYXOB 0/60

Appendix C. Summary report of Eagle Fish Health Laboratory results for Cabinet Gorge Hatchery, January 1 – December 31, 2004.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
Brood	Sullivan Springs	Kokanee	04-552	11/29/04	-	-	-	-					-		IX: NPD; VIRO 0/60, NAVHS 0/10, FAT 0/60, ELISA 0/60, PTD-MYXOB 0/60

Appendix D. Summary report of Eagle Fish Health Laboratory results for Grace Hatchery, January 1 – December 31, 2004.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
2003	Storey (WY)	Lake trout--3N	04-295	7/21/04	-	-			-	-	-	-			DX: NPD; VIRO 0/20, BACTE 0/10
2004	Hayspur	Rainbow trout--3N	04-544	11/16/04	-	-		-	-	-	+	-	-		DX: CWD; VIRO 0/60, FAT 0/60, <i>Flavobacterium psychrophilum</i> 3/6, PTD-MYXOB 0/60
2004	Hayspur	Rainbow trout--3N	04-558	12/6/04					-	-	+	+			DX: CWD, MAS; <i>F. psychrophilum</i> 3/8, <i>Aeromonas</i> spp. 1/8

Appendix E. Summary report of Eagle Fish Health Laboratory results for Hagerman State Hatchery, January 1 – December 31, 2004.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
2003	Hayspur	Rainbow trout--3N	04-054	1/14/04					-	-	-	-			DX: FLAVOBACTERIOSIS; <i>Flavobacterium indologenes</i> / <i>F. meningosepticum</i> 5/8, <i>Hafnia alvei</i> 2/8, <i>Serratia liquefaciens</i> 2/8
2003	Troutlodge	Rainbow trout--3N	04-064	2/4/04	-	-			-	-	+	-			DX: CWD, BACTEREMIA; VIRO 0/3, <i>F. psychrophilum</i> 1/3, <i>Citrobacter/Enterobacter</i> 3/3
2003	Hayspur	Rainbow trout--3N	04-065	2/4/04	-	-			-	-	-	+			DX: MAS: VIRO 0/2, <i>Aeromonas hydrophila</i> 2/2, PCR-PKX 0/1
2003	Troutlodge	Rainbow trout--3N	04-100	2/19/04					-	-	-	+			DX: COL, MAS; <i>Flavobacterium columnare</i> 4/4, <i>A. caviae</i> 4/4, <i>A. sobria</i> 1/4
2003	Hayspur	Rainbow trout--3N	04-101	2/19/04					-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 1/4
2004	Hayspur	Kamloops trout--3N	04-122	3/16/04	-	-			-	-	-	+			DX: COL, MAS; VIRO 0/5, <i>F. columnare</i> 2/4, <i>Pseudomonas fluorescens</i> 3/4 <i>Xanthomonas maltophilia</i> 3/4

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Appendix E. Continued.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
2003	Troutlodge	Rainbow trout--3N	04-123	3/16/04					-	-	+	+			DX; BGD, COL, MAS, CWD; <i>A. hydrophila</i> --gills 4/4, kidney 1/4, <i>F. psychrophilum</i> 1/4, <i>F. columnare</i> 1/4
2003	Pahsimeroi	Steelhead A-group	04-124	3/16/04					-	-	-	+			DX: MAS; <i>A. hydrophila</i> 3/4, <i>Sphingomonas paucimobilis</i> 2/4
2004	Hayspur	Rainbow trout--3N	04-153	4/1/04	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, <i>F. psychrophilum</i> 3/4, <i>A. hydrophila</i> 2/4
2003	Hayspur	Rainbow trout--3N	04-154	4/1/04	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, <i>F. psychrophilum</i> 3/4, <i>Pseudomonas spp.</i> 1/4
2004	Hayspur	Kamloops trout--3N	04-187	4/26/04	-	-			-	-	-	+			DX: MAS; VIRO 0/5, <i>A. hydrophila</i> 1/4, <i>A. sobria</i> 1/4
2003	Troutlodge	Rainbow trout--3N	04-188	4/26/04	+	-			-	-	-	+			DX: IHN, COL, MAS; IHN 1/1(X5), IPNV 0/5, <i>F. columnare</i> 3/4, <i>P. fluorescens</i> 3/4, <i>Sphingomonas paucimobilis</i> 1/4
2004	Hayspur	Rainbow trout-3N	04-211	5/11/04	-	-			-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 4/4

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Appendix E. Continued.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
2003	Hayspur	Kamloops trout-3N	04-255	6/24/04	+	-			-	-	-	+			DX: IHNV, COL, MAS; IHNV 1/1(X5), IPNV 0/5, <i>F. columnare</i> 3/4, <i>P. vesicularis</i> 1/4
2004	Hayspur	Kamloops trout-3N	04-307	8/11/04	-	-			-	-	+	-			DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 2/4
2004	Troutlodge	Rainbow trout-3N	04-308	8/11/04	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, <i>F. psychrophilum</i> 2/4, <i>P. diminuta</i> 1/4, <i>P. mallei</i> 1/4
2003	Hayspur	Kamloops trout-3N	04-309	8/11/04	-	-			-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 3/4
2003	Hayspur	Kamloops trout-3N	04-310	8/11/04	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/3, <i>F. psychrophilum</i> 2/3, <i>Pseudomonas spp.</i> 3/3
2004	Troutlodge	Rainbow trout-3N	04-360	8/26/04	-	-			-	-	+	-			DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 1/4
2004	Troutlodge	Rainbow trout-3N	04-361	8/26/04	-	-			-	-	+	-			DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 3/4
2004	Troutlodge	Rainbow trout-3N	04-532	11/4/04					-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 4/4
2004	Troutlodge	Rainbow trout-3N	04-563	12/10/04					-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 1/4, <i>Ichthyophthirius multifiliis</i> 4/4

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Appendix E. Continued.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
2004	Troutlodge	Rainbow trout-3N	04-582	12/17/04	-	-			-	-	+	-			DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 2/7 <i>Ichthyophthirius multifiliis</i> 4/4

Appendix F. Summary report of Eagle Fish Health Laboratory results for Hayspur Hatchery, January 1 – December 31, 2004.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
Brood	Hayspur	Rainbow trout	04-056	1/21/04	-	-		-			-				IX: NPD; VIRO 0/4, FAT 0/2, ELISA 0/4, BACTE 0/12
Brood	Hayspur	Rainbow trout	04-057	1/21/04	-	-		+							IX: BKD; VIRO 0/43, OCP-FAT 0/13, DFAT 0/30, ELISA 11/30 (7 low, 4 high)
2003	Hayspur	Kamloops trout-3N	04-060	1/27/04											RESEARCH: Triploid induction 39/40 (97.5%)
2003	Hayspur	Kamloops trout-3N	04-061	1/27/04											RESEARCH: Triploid induction 40/40 (100%)
2003	Hayspur	Kamloops trout-3N	04-062	1/27/04											RESEARCH: Triploid induction 36/40 (90%)
Brood	Hayspur	Kamloops trout	04-067	2/5/04	-	-	-	+							IX: BKD; VIRO 0/30, NAVHS 0/15, FAT 0.30, ELISA 1/30 (high)
2003	Hayspur	Rainbow trout-3N	04-135	3/22/04											RESEARCH: Triploid induction 40/40 (100%)
2003	Hayspur	Rainbow trout-3N	04-136	3/22/04											RESEARCH: Triploid induction 39/40 (97.5%)
2003	Hayspur	Rainbow trout-3N	04-137	3/22/04											RESEARCH: Triploid induction 37/40 (92.5%)
2003	Hayspur	Rainbow trout-3N	04-138	3/22/04											RESEARCH: Triploid induction 37/40 (92.5%)

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Appendix F. Continued

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Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
2000 Brood	Connor Lake (CAN)	Cutthroat trout (WS)	04-167	4/15/04	-	-	-	-							IX: NPD; VIRO 0/19, NAVHS 0/6, OCP-FAT 0/19
2000 Brood	Connor Lake (CAN)	Cutthroat trout (WS)	04-210	5/06/04	-	-		-							IX: NPD; VIRO 0/10, OCP-FAT 0/10
2004	Hayspur	Rainbow trout-3N	04-224	5/24/04											RESEARCH: Triploid induction 36/40 (90%)
2004	Hayspur	Rainbow trout-3N	04-225	5/24/04											RESEARCH: Triploid induction 40/40 (100%)
2004	Hayspur	Rainbow trout-3N	04-226	5/24/04											RESEARCH: Triploid induction 38/40 (95%)
2004	Hayspur	Kamloops trout-3N	04-227	5/24/04											RESEARCH: Triploid induction 40/40 (100%)
2003	Hayspur	Rainbow trout	04-254	6/24/04					-	-	-	+			DX: MAS; <i>Pseudomonas</i> spp. 3/4, <i>Pseudomonas vesicularis</i> 2/5, <i>Vibrio hollisae</i> 3/4
2004	Hayspur	Rainbow trout-3N	04-339	8/16/04											RESEARCH: Triploid induction 40/40 (100%)
2004	Hayspur	Rainbow trout	04-340	8/16/04											RESEARCH: Triploid induction 38/39 (97.4%)

Appendix F. Continued.

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Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
Brood	Hayspur	Rainbow trout	04-498	10/14/04	-	-	-	+							IX: BKD; VIRO 0/20, NAVHS 0/2, OCP-FAT 2/20
Brood	Hayspur	Kamloops trout	04-520	10/28/04	-	-	-	+							IX: BKD; VIRO 0/25, NAVHS 0/2, OCP-FAT 2/25, ELISA 4/15 (3 low, 1 high)
Brood	Hayspur	Rainbow trout	04-528	11/3/04	-	-	-	+							IX: BKD; VIRO 0/30, NAVHS 0/3, OCP-FAT 1/30,
Brood	Hayspur	Kamloops trout	04-541	11/10/04	-	-	-	-							IX: NPD; VIRO 0/34, NAVHS 0/4, OCP-FAT 0/34, ELISA 0/15 ELISA 8/15 (6 low, 2 high)
Brood	Hayspur	Rainbow trout	04-545	11/17/04	-	-	-	-							IX: NPD; VIRO 0/50, NAVHS 0/5, OCP-FAT 0/50, ELISA 0/15
2002	Hayspur	Kamloops trout (males)	04-550	11/23/04	-	-	-	+	-	-	+	-	-		IX: BKD, CWD; VIRO 0/60, NAVHS 0/30, FAT 0/60, ELISA 16/60 (10 low, 6 high), PTD-MYXOB 0/60, <i>F. psychrophilum</i> 1/20
Brood	Hayspur	Rainbow trout	04-554	12/2/04	-	-	-	+							IX: BKD; VIRO 0/50, NAVHS 0/5, OCP-FAT 0/50, ELISA 2/15 (1 low, 1 high)
Brood	Hayspur	Kamloops trout	04-555	12/2/04	-	-		+							IX: BKD; VIRO 0/24, OCP-FAT 1/24

Appendix F. Continued.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
2002	Hayspur	Rainbow trout (males)	04-559	12/8/04	-	-		+	-	-	+	-	-		IX: RS, CWD, MAS; VIRO 0/60, FAT 0/60, ELISA 1/60 (low), <i>F. psychrophilum</i> 5/15, <i>Pseudomonas</i> spp. 1/15, PTD-MYXOB 0/60
Brood	Hayspur	Rainbow trout	04-577	12/15/04	-	-	-	+							IX: BKD; VIRO 0/29, NAVHS 0/5, OCP-FAT 0/29, ELISA 2/15 (1 low, 1 high)
Brood	Hayspur	Kamloops trout	04-578	12/15/04	-	-	-	-							IX: NPD; VIRO 0/30, NAVHS 0/6, OCP-FAT 0/30, ELISA 0/4
Brood	Hayspur	Rainbow	04-584	12/29/04	-	-									IX: NPD; VIRO 0/13, OCP-FAT 0/13

Appendix G. Summary report of Eagle Fish Health Laboratory results for Henrys Lake Hatchery, January 1 – December 31, 2004.

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Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
Brood	Henrys Lake	Cutthroat Trout (YS)	04-058	1/21/04	-	-	-	-							IX: NPD; VIRO 0/28, NAVHS 0/14, OCP-FAT 0/210
Brood	Henrys Lake	Cutthroat Trout (YS)	04-059	1/26/04	-	-		-							IX: NPD; VIRO 0/21, OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat Trout (YS)	04-063	1/28/04	-	-		-							IX: NPD; VIRO 0/28, OCP-FAT 0/175
Brood	Henrys Lake	Cutthroat Trout (YS)	04-113	3/4/04	-	-		-							IX: NPD; VIRO 0/21, OCP-FAT 0/147
Brood	Henrys Lake	Cutthroat Trout (YS)	04-128	3/10/04	-	-		-							IX: NPD; VIRO 0/21, OCP-FAT 0/210
Brood	Henrys Lake	Cutthroat Trout (YS)	04-129	3/15/04	-	-		-							IX: NPD; VIRO 0/14, OCP-FAT 0/140
Brood	Henrys Lake	Cutthroat Trout (YS)	04-132	3/18/04	-	-		-							IX: NPD; VIRO 0/7, OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat Trout (YS)	04-133	3/22/04	-	-		-							IX: NPD; VIRO 0/7, OCP-FAT 0/70
Brood	Henrys Lake	Cutthroat Trout (YS)	04-146	3/25/04	-	-		-							IX: NPD; VIRO 0/7, OCP-FAT 0/70
Brood	Henrys Lake	Cutthroat Trout (YS)	04-147	3/29/04	-	-		-							IX: NPD; VIRO 0/7, OCP-FAT 0/49

Appendix G. Continued.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
Brood	Henrys Lake	Cutthroat Trout (YS)	04-152	4/1/04	-	-		+	+	-	-	-	-		IX: RS, FUR; VIRO 0/60, FAT 0/60 ELISA 11/12 (X5, all low), PTD-MYXOB 0/60, <i>Aeromonas salmonicida</i> 5/12
Brood	Henrys Lake	Cutthroat Trout (YS)	04-164	4/8/04	-	-		-							IX: NPD; VIRO 0/21, OCP-FAT 0/140
Brood	Henrys Lake	Cutthroat Trout (YS)	04-174	4/15/04				+							IX: BKD; OCP-FAT 1/12 (X7)
Brood	Henrys Lake	Cutthroat Trout (YS)	04-191	4/27/04				-							IX: NPD; OCP-FAT 0/70

Appendix H. Summary report of Eagle Fish Health Laboratory results for Mackay Hatchery, January 1 – December 31, 2004.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
2004	Hayspur	Rainbow trout-3N	04-275	7/8/04	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, <i>Flavobacterium salmoninarum</i> 5/5, <i>Aeromonas sobria</i> 2/5
2004	Henrys Lake	YS Cutthroat trout	04-276	7/8/04	-	-			-	-	-	-			DX: NPD; VIRO 0/5, BACTE 0/5
Brood	Deadwood Reservoir	Kokanee salmon	04-346	8/23/04	-	-		-					-	+	IX: RS, NEURO; VIRO 0/60, FAT 0/60, ELISA 2/12 (X5, 2 low), PTD-NEUROTROPIC MYXOBOLUS 7/12 (x5), PKX 0/4
2004	Hayspur	Rainbow Trout-3N	04-586	12/30/04											OPEN CASE

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Appendix I. Summary report of Eagle Fish Health Laboratory results for McCall Hatchery Resident Program, January 1 – December 31, 2004.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
2004	Hayspur	Rainbow trout-3N	04-296	7/22/2004				-	-	-	-				DX: NPD; BACTE 0/10

Appendix J. Summary report of Eagle Fish Health Laboratory results for Nampa Hatchery, January 1 – December 31, 2004.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
2003	Troutlodge	Rainbow trout--3N	04-055	1/20/04					-	-	+	-			DX: CWD; <i>Flavobacterium psychrophilum</i> 6/7
2003	Hayspur	Rainbow trout--3N	04-125	3/17/04					-	-	-	+			DX: MAS; <i>Aeromonas caviae</i> 6/8
2004	Hayspur	Kamloops trout--3N	04-139	3/29/04					-	-	-	-			DX: MAS; <i>A. sobria</i> 3/6, <i>Pseudomonas</i> spp. 2/6
2003	Troutlodge	Rainbow trout--3N	04-239	6/10/04					-	-	+	-			DX: CWD, BGD; <i>F. psychrophilum</i> 2/2, <i>A. hydrophila</i> 2/2, <i>Shewanella putrefaciens</i> 1/2
2004	Troutlodge	Rainbow trout--3N	04-359	8/26/04					-	-	+	+			DX: CWD, MAS; <i>F. psychrophilum</i> 2/4, <i>A. hydrophila</i> 4/4, <i>Plesiomonas shigelloides</i> 4/4
2004	Troutlodge	Rainbow trout--3N	04-388	9/3/04	-	-			-	-	-	+			DX: MAS; VIRO 0/10, <i>A. hydrophila</i> 10/10, <i>Shewanella putrefaciens</i> 10/10
2004	Hayspur	Rainbow trout--3N	04-493	10/12/04	-	-			-	-	+	-			DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 1/8, <i>Flavobacter</i> spp. 1/8

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Appendix J. Continued.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	NEURO	Diagnoses
2004	Hayspur	Rainbow trout--3N	04-524	10/30/04											DX: COS; <i>Ichthyobodo</i> 4/4
2004	Troutlodge	Rainbow trout--3N	04-551	11/30/04	-	-			-	-	-	-			DX: BGD; VIRO 0/8, BACTE 0/8
2004	Hayspur	Rainbow trout--3N	04-585	12/30/04											DX: ENTERIC BACTERIA; <i>Candidatus Arthromitus</i> 2/2

Appendix K. List of acronyms used in this report.

BACTE	Bacteriology test results
BGD	Bacterial Gill Disease, caused by a number of bacterial species
BKD	Bacterial Kidney Disease, caused by <i>Renibacterium salmoninarum</i>
CHLOR-T	Chloramine-T
COL	Columnaris disease, caused by <i>Flavobacterium columnare</i>
COS	<i>Ichthyobodo necator</i> ; external protozoan parasite formerly classified as <i>Costia spp.</i>
CWD	Coldwater Disease, caused by <i>Flavobacterium psychrophilum</i>
Department	Idaho Department of Fish and Game
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 <i>Yersinai ruckeri</i>
FAT	Fluorescent antibody test
FUR	Furunculosis, caused by <i>Aeromonas salmonicida</i>
ICH	<i>Ichthyophthirius multifiliis</i> ; external protozoan parasite
IHN	Infectious Hematopoietic Necrosis disease, caused by IHN virus
IHNV	Infectious Hematopoietic Necrosis virus; also used in diagnoses to indicate presence of virus without clinical disease
INAD	Investigational New Animal Drug
IPN	Infectious Pancreatic Necrosis disease, caused by IPN virus
IPNV	Infectious Pancreatic Necrosis virus; also used in diagnoses to indicate presence of virus without clinical disease
IX	Inspection examination
K1	Kamloops trout of generic origin
MAS	Motile Aeromonad Septicemia caused by a number of motile <i>Aeromonas</i> and <i>Pseudomonas</i> bacteria.
MC	<i>Myxobolus cerebralis</i> ; myxosporidean parasite that attacks cartilage
MYXOB	<i>Myxobolus</i> of unidentified species
NAVHS	North American Viral Hemorrhagic Septicemia; viral disease not yet detected in Idaho
NEURO	Neurotropic <i>Myxobolus</i> species, as yet unnamed
NPD	No Pathogens Detected
OCP-FAT	Ovarian cell pellet fluorescent antibody test
OTC	Oxytetracycline

Appendix K. Continued

PCR	Polymerase chain reaction test
PKD	Proliferative kidney disease, caused by <i>Tetracapsula bryosalmonae</i>
PKX	<i>Tetracapsula bryosalmonae</i> , causative agent of PKD
PTD	Pepsin/trypsin digest method for detecting <i>Myxobolus</i> spores
R9	Hayspur-strain rainbow trout
RHP	Resident Hatchery Pathologist
RS	<i>Renibacterium salmoninarum</i> , causative agent of BKD; also used in diagnoses to indicate presence of bacteria without clinical disease
VIRO	Virology test results
WHD	Whirling Disease, caused by <i>Myxobolus cerebralis</i>

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