



## **1999 ANNUAL RESIDENT HATCHERIES REPORT**

**February 2000  
IDFG 00-16**

## TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION .....	1
AMERICAN FALLS HATCHERY .....	3
ASHTON HATCHERY .....	9
CABINET GORGE HATCHERY .....	15
CLARK FORK HATCHERY .....	28
CLEARWATER HATCHERY .....	37
GRACE HATCHERY .....	45
HAGERMAN HATCHERY .....	53
HAYSPUR HATCHERY .....	65
MACKAY HATCHERY .....	76
MCCALL HATCHERY.....	85
MULLAN HATCHERY.....	96
NAMPA HATCHERY .....	99
SAWTOOTH HATCHERY .....	112
FISH HEALTH REPORT.....	119

## RESIDENT FISH HATCHERIES 1999 ANNUAL REPORT

Resident fish hatcheries reared and stocked nearly 23 million fish weighing 1.2 million pounds. More than 2,500 stocking trips were made to plant fish in over 500 waters in the state.

Resident hatchery program costs were 2.1 million dollars for an average cost of \$1.63 per pound, or \$0.08 per fish. Cost varied greatly between the hatcheries. Cabinet Gorge Fish Hatchery had the lowest cost per fish at \$0.018, and American Falls Fish Hatchery had the highest at \$0.23 per fish. This is due to the great diversity in the resident hatchery system goals. Cabinet Gorge Fish Hatchery produced 9.9 million kokanee *Oncorhynchus nerka* averaging 1.94 inches in length using a seven-month growing season, while American Falls Fish Hatchery used the entire 12 months of fish production and produced an average 5.1-inch rainbow trout *Oncorhynchus mykiss*.

Rainbow trout of catchable size (8- to 12-inches) accounted for approximately one-half of the program costs at approximately \$1 million.

The Resident system continued downsizing the available work force. The Clark Fork Fish Hatchery is slated to be closed down during 2000 and as a result, the Fish Hatchery Manager II and the Fish Culturist positions were lost. Since 1995, the resident hatchery system has lost seven permanent positions.

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

The Idaho Department of Fish and Game Engineering Bureau had limited funds for hatchery maintenance and construction work during 1999. This bureau coordinated emergency repairs to well pumps and other minor repairs.

Idaho Department of Fish and Game  
Resident Hatcheries Fish Production  
01/01/1999 to 12/31/1999

Hatchery	Put and Take		Put Grow and Take		Average	Feed		Average Length	Total Cost	Cost/ 1000 fish	Cost/ pound
	Number	Pounds	Number	Pounds	Fish Per Pound	Pounds	Costs				
American Falls	105,796	52,990	994,635	20,462	15.0	67,956	\$21,397	5.11	\$251,685	\$228.70	\$3.43
Ashton	169,623	46,252	152,891	600	6.9	33,679	\$10,935	6.85	\$64,715	\$200.66	\$1.29
Cabinet Gorge	0	0	9,903,920	28,668	345.0	27,310	\$14,268	1.93	\$186,573	\$18.84	\$6.51
Clark Fork	315,404	53,938	1,730,118	44,379	20.8	121,648	\$47,153	4.73	\$162,223	\$100.26	\$1.65
Clearwater	440,818	52,468	0	0	8.4	68,901	\$11,257	6.21	\$34,975	\$59.14	\$0.66
Grace	328,013	61,945	829,439	14,937	15.1	85,159	\$29,352	5.10	\$150,266	\$129.79	\$1.95
Hagerman	736,069	280,043	1,352,339	52,982	6.3	384,655	\$125,189	7.10	\$465,894	\$223.08	\$1.39
Mackay	185,366	67,977	4,023,262	39,317	39.2	100,580	\$36,380	4.00	\$213,490	\$50.73	\$1.98
McCall	0	0	362,875	273	963.0	325	\$369	1.40	\$36,094	\$99.47	\$132.21
Nampa	1,077,110	336,841	348,962	26,677	3.9	345,200	\$112,022	8.30	\$363,623	\$255.00	\$1.00
Total Produced	3,358,199	952,454	19,698,441	228,295	19.5	1,235,413	\$408,322	4.85	\$1,929,538	\$83.69	\$1.63

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The Clearwater Hatchery costs do not include any permanent salaries  
Total costs for each hatchery is that hatcheries total budget minus capital outlay expenditures.  
The Clearwater feed total includes 35,071 pounds of donated feed.  
The total cost for the McCall production does not include catchable redistribution costs.  
Total production is defined as: Total planted + Total inventory on 12/31/1999 - Total inventory 1/1/1999

**IDAHO DEPARTMENT OF FISH AND GAME**

**1999 ANNUAL REPORT**

**AMERICAN FALLS FISH HATCHERY**

**Bill Doerr, Fish Hatchery Manager  
David Billman, Assistant Fish Hatchery Manager  
Paul Martin, Fish Culturist**

## INTRODUCTION

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

The primary objective of the AFFH is to rear 250,000 catchable-sized (9- to 12-inch) rainbow trout *Oncorhynchus mykiss*. The AFFH also produces fingerling (4- to 6-inch) rainbow trout as requested. The number and lbs of fingerling produced varies from year to year.

Three permanent state employees staff the AFFH. Volunteer hatchery hosts are utilized for the spring and summer tourist season.

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

The physical layout of the AFFH consists of ten single-pass 100-ft x 8-ft x 3-ft concrete raceways, ten reuse 100-ft x 8-ft x 3-ft concrete raceways, and a hatchery building containing fourteen 21-ft x 4-ft x 2.5-ft concrete rearing vats.

Water for the AFFH comes from Rueger Springs located on the AFFH property. These springs flow an average of 20 cubic feet per second (cfs) at a water temperature of 55°F to 59°F.

## FISH PRODUCTION

The AFFH raised Hayspur strain rainbow trout, Hayspur Kamloops trout, and Troutlodge Kamloops trout for the 1999 production year. The Troutlodge strain of fish performs very well at this facility.

The Clark Fork Fish Hatchery (CFFH) received 11,925 catchable Kamloops rainbow trout (5,300 lbs) from AFFH. The AFFH stocked 93,871 catchable rainbow trout (47,690 lbs), and 994,635 fingerlings (20,462 lbs) during this period. Total stocked and transferred is 1,100,431 fish, weighing 73,452 lbs (Appendix 1). Net production for the year (lbs stocked + lbs on hand 12/31/99 - lbs on hand 1/1/99) was 73,748 lbs.

Cost for 1999 for various sizes of fish food was \$21,397.90. Feed costs for the year were \$0.2901 per lb of fish produced, or \$0.019 per fish (appendix 2). Production costs overall were \$1.313 per lb of fish produced, or \$0.0879 per fish. This cost includes income from all sources, the cost of transportation to stocking waters, and the cost of fish transports stationed at the Nampa Hatchery.

Feed conversion for the year averaged 0.92 pounds of feed per lb of fish produced. This low conversion is possible because of the tremendous numbers of flying insects available from May to October at this hatchery.

## **HATCHERY IMPROVEMENTS**

- The public nature trail, begun in 1996, was expanded again this year. An existing bridge over the supply pond spillway was repaired as part of the trail system, and a new bridge was built over a wash. Ten oak trees were planted around the hatchery grounds.
- A "turn-in" pickup truck with 140,000 miles was received from the sale list, allowing us to turn in a 25-year-old pickup that was no longer safe to operate.
- Numerous elm trees that were endangering hatchery buildings were trimmed back or cut down.
- The concrete steps at the entrance of residence #2 were rebuilt, as they had become a hazard.
- The bedroom floors in residence #1 were refinished.
- New carpeting was installed in the bedrooms of residence #3.
- All dam boards at the outflow from the settling pond were replaced.

## **HATCHERY NEEDS**

- Nineteen incubators in the hatchery building are in need of replacement. These incubators were received when a Lower Snake River Compensation Plan (LSRCP) hatchery discarded them in 1989.
- Residence #2 should be remodeled or replaced.
- Metal siding should be installed on the garage for residence #1.
- Metal or vinyl siding should be installed on residence #3.
- The automatic feeding system should be repaired.

## **PUBLIC RELATIONS**

The AFFH received an estimated 5,000 visitors during this period, including public school groups from March through July, and again in October. We also had scout groups, family reunions, bird-watchers, drop-in visitors, hunters, and fishermen. Visitors were noted from nearly every state and from several foreign countries. Hatchery employees taught a "Living Stream" educational project at Indian Hills Elementary School in Pocatello.

## **HATCHERY COMPARISON STUDY**

During the summer of 1999, fisheries research personnel placed reward tags on catchable Kamloops rainbow trout at Hagerman, Nampa, and American Falls fish hatcheries. These fish were stocked in sixteen lakes and reservoirs in regions 3, 4, and 5. Voluntary tag returns from those waters were used to compare relative return-to-creel. The results showed that fish from Nampa return-to-creel at the highest rate, followed by American Falls, and then Hagerman.

## **VOLUNTEER PROGRAM**

The hatchery host program, begun in 1997, was continued this year. Hosts for the 1999 season were Don and Lisa Kottas. They proved to be excellent workers, and helped the hatchery crew with conducting tours of the grounds, and with some general maintenance.

## **HABITAT TRAILS**

The hatchery habitat trail, started in 1996, was expanded this year to approximately twice its original length. A new bridge was built over a wash, and an existing bridge was rebuilt to improve safety. Bird-watchers from all over the United States and Canada are now using the area extensively. The Portneuf Valley Audubon Society became much more involved in use and care of the trail when several rare birds were discovered in the area.

## **ACKNOWLEDGMENTS**

This year employees at AFFH were: Bill Doerr, Hatchery Manager I; David Billman, Assistant Fish Hatchery Manager; Paul Martin, Fish Culturist; and Don and Lisa Kottas, Hatchery Hosts.

Appendix 1. Fish transferred or stocked by region, 1999, American Falls Fish Hatchery.

<b>Region</b>	<b>Species</b>	<b>Number</b>	<b>Pounds</b>	<b>Destination</b>
Panhandle	Kamloops rainbow	11,925	5,300	Clark Fork Hatchery
Clearwater		0	0	
Southwest	Kamloops rainbow	600	195	Region-wide
Magic Valley	Kamloops rainbow	9,043	3,880	Region-wide
Southeast	Kamloops rainbow	1,042,183	47,676.75	Region-wide
Upper Snake	Kamloops rainbow	36,698	16,400	Region-wide
Salmon		0	0	
<b>TOTALS</b>		<b>1,100,449</b>	<b>73,451.75</b>	

Appendix 2. Fish feed used during the 1999 production year, American Falls Fish Hatchery.

<b>Source</b>	<b>Size/type</b>	<b>Pounds</b>	<b>Cost</b>
Rangen	Swim-up, Trout & Salmon Starter	280	\$141.14
Rangen	Trout & Salmon #1 Dry	800	\$350.55
Rangen	Trout & Salmon #2 Dry	4,524.25	\$2,010.58
Rangen	Trout & Salmon #3 Dry	13,799.5	\$4,273.51
Rangen	Trout & Salmon #4 Crumble	1,839.5	\$561.75
Rangen	Extruded 450 Floating 1/8	46,712.75	\$14,060.37
Rangen	Extruded 450 Sinking 1/8		
Silver Cup	Dry Starter		
Silver Cup	#1 Salmon Fry		
Silver Cup	#2 Salmon Fry		
Silver Cup	#4 Salmon Dry		
Silver Cup	#5 Extra Coarse Crumble		
Silver Cup	5/32 Pellets, Vitamin Boosted		
Silver Cup	3/32 Medicated W/Oxytet		
<b>TOTALS</b>		<b>67,956</b>	<b>\$21,397.90</b>

**IDAHO DEPARTMENT OF FISH AND GAME**

**1999 ANNUAL REPORT  
ASHTON FISH HATCHERY**

**Mel Sadecki, Fish Hatchery Manager I  
Bill Stutz, Assistant Fish Hatchery Manager**

## INTRODUCTION

Ashton Fish Hatchery (AFH) is located in Fremont County, Idaho, approximately two miles southwest of the community of Ashton. Constructed in 1920, and funded by fishing license dollars, AFH serves as a "specialty station," rearing four species/strains of trout, char and grayling including rainbow trout *Oncorhynchus mykiss*, cutthroat trout *O. clarki*, golden trout *O. aguabonita*, Arctic grayling *Thymallus arcticus*,r.

The majority of fish produced at AFH are fry and fingerling (1- to 6-inches) that are distributed throughout Idaho as part of various put-grow-and-take management programs. Catchable-size fish (6- 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 320,514 fish (46,851 lbs) were produced at AFH this year, consisting of 152,891 fingerlings (600 lbs), and 169,623 catchable-sized fish (including holdovers) (46,252 lbs). Both numbers and total lbs produced were down from the previous year (Appendix 1). The majority of fish requests were met. Production cost (excluding capital outlay and fish transport) was \$60,605.24, with \$10,935.94 spent on fish feed and the remaining \$49,669.30 spent on general hatchery operations and personnel cost. Fish transportation cost was \$4,110.20 for 1999. The average cost per lb of fish produced was \$1.29 (Appendix 1).

Most 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 0.89 in 1999 (Appendix 3). Lights over the nursery tanks were adjusted to a moderate intensity, and growth rates were maintained by the use of automatic fry feeders and covers when the fish were moved outside to the small raceways.

The average survival for all fish stocked was 75.3% from eyed-egg to distribution.

### **Rainbow Trout**

The AFH produced and stocked 71,723 (33,552 lbs) 10-inch catchable rainbow for distribution into area lakes and streams (Appendix 1). In November 1998, we received 80,000 Hayspur rainbow trout (R9) eggs, and in December 125,675 R9 eggs. From these eggs, 53,598 R9 fingerlings, averaging 3 inches, were planted in a number of Upper Snake Region waters. An additional 97,900 (12,700 lbs) of 7-inch R9 holdovers were produced for stocking in 2000.

### **Henrys Lake Cutthroat Trout**

Henrys Lake shipped 38,000 cutthroat trout eggs to AFH in 1999. From these, 33,383 (112 lbs) of fingerlings were planted in Sublette, Island Park, and Blue Creek reservoirs.

### **Golden Trout**

Golden trout are reared at AFH whenever eggs are available. This year however, the eggs were sent to McCall Fish Hatchery for rearing there.

### **Arctic Grayling**

Arctic grayling are reared at AFH for statewide mountain lake stocking. In May 1999, 208,000 green eggs were transported to AFH from Meadow Lake, Wyoming. The eggs arrived in very good condition. The eggs were placed in 5 upwelling incubators. Approximately 60% eyed up. This resulted in an estimated 124,800 eyed-eggs. Fry were fed 0.4 mm Bio-Kyowa larval fish feed for the first 4 weeks, then switched to Rangen Swim-up. Growth was good throughout the rearing period. Survival was normal for grayling. A total of 65,910 fry (19.95 lbs) were transferred or stocked during the summer of 1999.

## **HATCHERY IMPROVEMENTS**

No major hatchery improvements were undertaken this year. Future needs include:

- A combination storage area/heated shop/garage should be constructed east of the Quonset hut.
- Siding and windows for the three-car garage.
- Septic tank/field work will be needed for both residences.
- A new concrete driveway for residence #1.

## **FISH STOCKED AND TRANSFERRED**

The stocking program at AFH remained similar to last year's program, with the exception of the absence of brook trout (Appendix 4). The survival of the Arctic grayling was the most obvious change. Numbers of catchable rainbow trout on-station were almost sufficient to meet requests. We stocked 552 catchable rainbow trout from American Falls Fish Hatchery (AFFH) to meet our requests for Ashton Reservoir. The only fish transferred from AFH to other facilities in 1999 were Arctic grayling.

## **ASHTON FISH SPAWNING**

Personnel from AFH traveled to Henrys Lake Hatchery to sort and spawn cutthroat trout *Oncorhynchus clarki* and rainbow x cutthroat hybrids *O. mykiss* x *O. clarki*.

## **FISH FEED**

A total of 33,680 lbs of fish feed were fed (Appendix 5) to produce 28,900 lbs of gain (Appendix 1), for an average conversion of 1.16. Arctic grayling were started on Bio-Kyowa larval fish feed and switched to Rangen Swim-up. All other fish were fed Rangen diets from swim-up to stocking.

## **PUBLIC RELATIONS**

Approximately 1,000 people visited AFH this past year. About 500 elementary students from as far away as Idaho Falls visited the hatchery during the spring, summer, and fall. Our visitor information center answered questions about the hatchery, fishing and hunting regulations, and various Idaho Department of Fish and Game (Department) policies.

## **SPECIAL PROJECTS**

### **Regional Efforts**

Hatchery personnel assisted with firearms training for Hunter Education in Ashton.

## HENRYS LAKE HATCHERY

### FISH SPAWNING

The 1999 cutthroat trout run consisted of 4,894 cutthroat and 1,734 hybrid trout totaling 6,628 fish. Cutthroat males numbered 2,749 and cutthroat females numbered 2,145; hybrid males numbered 653, and 1,081 females were counted. The average length for male cutthroat was 440 mm and females averaged 426 mm total length. The combined average cutthroat total length was 435 mm. Hybrid trout males averaged 456 mm and females averaged 432 mm. The combined male and female hybrid average length was 442 mm total length.

Cutthroat green eggs totaled 2,817,968 from 1,162 females, for an average fecundity of 2,430 eggs per female. Eyed cutthroat trout eggs totaled 1,851,438 for an eye-up of 65.7%.

Hybrid trout green eggs totaled 616,000 from 280 female cutthroat for an average fecundity of 2,200 eggs per female. Eyed hybrid trout eggs totaled 265,705 for an eye-up of 43.1%. We used our current heat-shocking method in a production mode for the first time in 1999 to produce sterile hybrids. The triploid induction rate for Henrys Lake hybrids was 74%.

No brook trout were trapped or spawned at Henrys Lake in 1999.

### HATCHERY IMPROVEMENTS

Several hatchery improvement projects were completed in 1999, including:

- Treating the helixing shed, outhouse, and cabin deck with wood preservative.
- Rebuilding the information poster boards in the public parking area.
- Replacing a worn out truck with one in better condition.
- Replacing the septic tank pump.
- Installing an additional power pole to lift a dangerous, low-hanging electric line.
- Replacing the oil stoves in both the cabin and office with modern propane units.
- Removing the old office chimney and patching the roof and ceiling.
- Making minor modifications to the vat room plumbing.
- Replacing a large section of the sewer line running from the office to the septic tank.
- Stabilizing the cabin lawns with cable-anchored logs to reduce shoreline erosion.

- Refinishing the egg sorting tables.
- Graveling the cabin and resident parking areas.
- Trimming back trees.

### **FRY TRAPPING/CREEL CENSUS**

Fry trapping was not conducted this year; however, a creel survey did occupy much time. The survey started May 29 and finished up October 28. Angler counts were conducted twice daily. Anglers were placed into three categories: boat, tube or bank. The results of the Angling Census will be available in the Upper Snake Regional Report.

### **RIPARIAN FENCING**

The riparian sections of the Howard, Targhee, Timber, Kelly, and Duck creeks and of the lake itself were maintained as in past years. Major repairs were made on the Upper and Middle Duck Creek fences. Minor repairs were made on the Timber Creek fence. Currently the Howard, Targhee, and Timber creek fences are in decent shape. Middle and Lower Duck creeks, along with the shoreline fence in this area, will need major repairs next spring.

### **FISH SCREENS**

The fish screens on the Howard, Targhee and Duck creeks were maintained as in previous years. The southern irrigation ditch running off Targhee Creek was rebuilt at its mouth, and a headgate was installed for better control in diverting water. Screens will be thoroughly examined next spring and rubber seals will be replaced if necessary.

**IDAHO DEPARTMENT OF FISH AND GAME**

**1999 ANNUAL REPORT**

**CABINET GORGE FISH HATCHERY**

**Bradford W. Dredge, 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, Idaho approximately eight miles southeast of the community of Clark Fork. The hatchery was constructed in 1985 and was co-funded by Avista Corporation (formerly Washington Water Power), Bonneville Power Administration (BPA), and Idaho Department of Fish and Game (Department). The primary purpose for CGFH is to produce late-spawning kokanee salmon *Oncorhynchus nerka kennerlyi* fry for release into Idaho's Lake Pend Oreille. Kokanee fry are needed to mitigate for the loss of wild kokanee recruitment caused by hydroelectric power projects in the Pend Oreille watershed. The kokanee fry release is timed to coincide with cycles of zooplankton blooms.

Two permanent state employees staff the CGFH. Thirty-three months of temporary labor are available for use during the year. Housing accommodations include two residences for the permanent staff, and crew quarters for two temporary employees.

### Water Supply

Cabinet Gorge Dam is located approximately one mile upstream from the hatchery. After its completion in 1952, artesian springs began appearing along the Clark Fork River at the present site of the hatchery. The CGFH water supply consists of approximately 4.4 cubic feet per second (cfs) from a spring and approximately 20 cfs from a wellfield. The temperatures of the lower spring and upper wellfield vary inversely with each other over a 12-month period. The cooler water from the lower springs (pump #7 and #8) was utilized to incubate eggs until December 14, 1998. At that time, a mixture of the two water sources allowed incubation and early-rearing water temperatures to be maintained around 50°F (range 44°F to 52.4°F). Production water ranged from 39°F to 50.9°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 (cf) of rearing space in the hatchery building and the 1,500 cf of space in the adult holding ponds.

### Rearing Facilities

Rearing facilities at the hatchery include 192 upwelling incubators and 64 concrete raceways. The incubators are 12-inches in diameter by 24-inches high with a maximum capacity of 140,000 kokanee eggs each. In addition, a total of 30 upwelling incubators, 6-inches in diameter and 18-inches high, are available. The smaller incubators have a maximum capacity of 30,000 kokanee eggs each. The 64 concrete raceways have 31,000 cf of rearing space. 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 (10-ft by 30-ft each) holding ponds.

## **PRODUCTION**

Between January 1, 1999 and December 31, 1999, CGFH produced a total of 9,903,920 fish weighing 28,668 lbs (Appendix 1). On January 1, 2000, a total of 17,344,049 Lake Pend Oreille kokanee eggs and newly hatched fry were on hand (Appendix 2). In addition, a total of 1,035,243 early kokanee salmon fry and 44,120 fall chinook salmon fry were on hand.

A total of 27,310 lbs of feed produced 26,727 lbs of gain for an overall feed conversion of 1.02. Total production cost (less capital outlay) was \$186,573.30, resulting in a cost per lb of fish of \$6.51, cost per inch of fish of \$0.0090, and \$18.84 per thousand fish (Appendix 1).

### **Lake Pend Oreille Kokanee**

#### **General Rearing**

Fertilized eggs were brought to the CGFH and disinfected in 100-PPM PVP 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. Fry were allowed to swim out of the incubators into the raceways at 1,300 to 1,520 temperature units (TUs). All fry were thermally mass-marked via temperature manipulation in the raceways. Feed training began at 1,700 to 1,720 TUs.

Kokanee were feed trained at approximately 48°F to 50°F using Rangen Trout and Salmon starter for 17 days. Feed training continued from the 18<sup>th</sup> day to the 34<sup>th</sup> day utilizing a 50:50 mix of Trout and Salmon starter and Trout and Salmon starter #1. On day 35 the fry were placed on Trout and Salmon starter #1 only. The fry remained on Trout and Salmon starter #1 until they reached an average size of 800 fish per lb. The fry were then placed on Trout and Salmon starter #2 for the remainder of the rearing season. Release size objectives have changed from about 1.3 fry inches (1986) when the hatchery began operations to the present request of a 2-inch average size at release. To meet the request, the hatchery capacity has been reduced from 30 million fry to 16 million fry.

Egg collection lasts over two months, and a cross-section of the run is required for each release strategy. Growth rates were not manipulated during the 1999 season to achieve a universally sized 2-inch fry. The fish were reared using 35 monthly TUs per inch of growth. For the fifth consecutive season, fish were not taken off feed or overfed to attain the average 2-inch size parameter at release. After approximately 6 weeks of feed training, the fry were extended in the raceway, and water temperatures were lowered to emulate natural production in Lake Pend Oreille.

A total of 7,127,261 late kokanee fry were produced at an average length of 1.99 inches and an average weight of 427.35 fish per lb. These fish gained 15,445 lbs from 14,825 lbs of feed, resulting in a conversion rate of .96:1.0. Fish feed production cost was \$6.07 per lb, \$0.0071 per inch, and \$14.21 per thousand.

Survival of green eggs to feeding fry was estimated at 79.8% (1998, 76.9%). Survival from first feeding to release was estimated at 99.8% (1998, 98.1%), resulting in survival from green egg to release of 79.6% (1998, 75.0%).

## **Fish Marking**

To evaluate the success of a kokanee *Oncorhynchus nerka kennerlyi* stocking program in Lake Pend Oreille, an otolith thermal mass-marking (Volk et al. 1990) program was utilized at CGFH. All kokanee fry received a thermally induced otolith pattern.

Otolith marking normally occurs between eye-up and button-up stages, but plumbing at CGFH precluded normal procedures due to its inability to accommodate supplying two water sources of different temperatures to the incubating eggs and sac fry. The incubation vessels, however, allowed for volitional swim-up of fry into separate rearing raceways, which were plumbed to accommodate a Tmarking program. This situation provided the impetus to Tmark fry at the end of button-up.

Analysis of pre-release voucher specimens (Grimm et al. 1999) verified the presence of a recognizable otolith mark on all thermally treated fry. Although there was significant variability in the expression of the Tmark, ambiguous marks could be confirmed by carefully observing incremental patterns at the measured area where the Tmark was expected to occur.

Two factors contributed to the success of the Tmarking and recovery of the Tmarks. 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.

Creating and recovering the Tmark for the 1996, 1997, and 1998 CGFH kokanee brood was successful. Adjustments to spacing between thermal events will be made to the 2000 brood Tmarking effort to create artificial patterns less similar to natural daily increments patterns.

Trawl surveys in Lake Pend Oreille were conducted during the fall of 1999. Fry were collected from three areas of the lake. A number of the fry collected were sent to the Washington Department of Fish and Wildlife otolith lab for analysis. By examining their otoliths, they are able to determine wild fry from hatchery fry. To date, no results have been received from last year's samples.

## **Fish Liberation**

On June 14, 1999, 3,067,108 late kokanee fry were released from CGFH into the Clark Fork River. On June 15 and 16, 1999, 4,060,103 late kokanee fry were released into Sullivan Springs. On June 17, 1999, 801,482 early kokanee fry were released into Spring Creek. On June 23, 1999, 319,577 early kokanee fry were released into Trestle Creek.

Numbers at release were based on Jensorter counter/sorter inventory numbers at eye-up, minus mortality. All fish were off feed for three full days 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 or being released into the Clark Fork River. All raceways were displaced onto the transport trucks during the Sullivan Springs release to double-check inventory numbers. Weight displacements were performed to support current fish inventory numbers on hand at the time of release. No weight displacements were conducted prior to releasing the fish into the Clark Fork River.

The Clark Fork River release groups were liberated at night. Only three raceways were released at one time. The entire release took less than two hours.

The Sullivan Springs release group was transported in two 3,000-gallon capacity Department tankers. Loading densities of small fish in the tankers was kept below 0.60 lbs per gal. Fish were planted below the bridge on the access road to the Department patrol cabin. Two tankers made eight releases during the period of June 15 and 16, 1999.

## **Other Species**

On May 19, 1999, a total of 630,932 rainbow trout were transferred to Hagerman State Fish Hatchery. The fry averaged 259.86 fish per lb and had attained a length of 2.13 inches.

On June 8 and 9, 1999, a total of 25,527 fall chinook salmon were planted into Lake Coeur d'Alene. The fish averaged 59 fish per lb and had reached a length of 3.85 inches.

On June 17, 1999, a total of 57,450 fall chinook salmon were planted into American Falls Reservoir and a total of 12,019 fall chinook salmon were planted into Lucky Peak Reservoir. The fish averaged 57 fish per lb and had attained a length of 3.89 inches.

On May 25, 1999, a total of 25,000 early kokanee salmon were distributed into Waha Lake (5,000), Winchester Lake (5,000), Manns Lake (10,000), and Soldiers Meadow Reservoir (5,000). The fry averaged 352 fish per lb and had grown to a length of 2.11 inches.

On June 22 and 23, 1999, a total of 904,672 early kokanee salmon were planted into the North Fork Clearwater River. The majority of the fry originated from Deadwood stock. The fry were 2.44 inches in length and averaged 229 fish per lb. Meadow Creek early kokanee production cost was \$6.85 per lb, \$0.0105 per inch, and \$23.75 per thousand (Appendix 1). Deadwood early kokanee production cost was \$7.13 per lb, \$0.0129 per inch, and \$31.59 per thousand (Appendix 1). Meadow Creek early kokanee survival of green eggs to feeding fry was

estimated at 74.8%. Survival from first feeding to release was estimated at 98.4%, resulting in survival from green egg to release of 73.2%. Deadwood early kokanee survival of green eggs to feeding fry was estimated at 54.5%. Survival from first feeding to release was estimated at 98.49%, resulting in survival from green egg to release of 53.01%.

## HATCHERY IMPROVEMENTS

### Repairs and Improvements

- OSHA safety inspector, Bob Hoop, looked over the facility during 1999, found no violations, and had no recommendations.
- The weatherboards that cover the dam boards at the end of the early rearing portion of the raceway were modified and improved. The new weatherboards are attached to the building frame. The modification will prevent raceways from flooding and will also reduce the number of items handled during cleaning operations.
- Pump indicator lamps were replaced in the generator #1 building.
- Fourteen new raceway catwalks were constructed. The hatchery now has catwalks for each raceway that is utilized outside.
- The partition between the shop and the vat room was painted.
- Two wood duck boxes and one goose-nesting platform were installed near the sedimentation pond.
- All department vehicles, tractors, and small engines were serviced regularly and repaired as needed.
- Back-up generator #1 was load tested weekly and maintenance-checked daily during operations. Generator #2 was operated weekly (with no load) and load tested monthly (with pump #8 only).
- The Okidata printer was cleaned and repaired. In addition, the photocopy machine was serviced, and a new computer monitor was purchased.
- Modifications to the Sullivan Springs/Granite Creek Fish Trap were completed during the summer of 1999. Logs were installed along the bank to prevent erosion during spawning operations
- A new phone line was installed to Residence #2 by GTE.
- All of the hatchery fire extinguishers received annual servicing.

- All of the upwelling incubators were standardized during 1999. In addition, new pads were purchased and installed in each incubator.
- The powerwasher was repaired during the 1999 season. A blown gasket was causing oil to mix with the gas.
- A new heater was installed in the shop to replace red-flagged heaters.
- Cedar Street Electric repaired the hatchery building lighting.
- Bill Armstrong, of Intermountain Generator, repaired the generator #1 block heater, louvers, and fan belts during October of 1999.
- A broken line from the spring area was repaired. The break in the line caused sinkholes near the spring box that will need to be addressed next season.
- The spawn-shed frame was erected during the fall of 1999.
- The batteries in the hatchery alarm system were replaced during December 1999.
- The computer system was upgraded to Internet Explorer 5.0 and Y2K programs downloaded prior to 2000.
- The foundation at the spawning area at CGFH was repaired to prevent erosion during spring runoff.
- Pump #4 (50 H.P.) was removed by R.C. Worst and taken in for repairs.
- Water production lines were modified in the hatchery building.
- Sediment was removed from the sedimentation pond. The removal of excess waste material from the pond should lower our EPA sediment levels.
- Four raceways were sandblasted and painted to test the process.
- Risers were installed on the PAC columns to eliminate sunlight from the column and the Koch rings inside the columns.
- Log structures in Granite Creek were repaired in October 1999.

## **HATCHERY RECOMMENDATIONS**

Inadequate amounts of available warm water (50°F) during the production months remains the limiting factor for fish production. Although the upper wellfield can yield up to 20 cfs, it is too cold during the production cycle. Warmer water from the lower springs must be added to temper the upper wellfield water. Unfortunately, only 4.4 cfs is available from the

lower springs. It has been proposed that an additional pumping station be installed on the lower spring's pipeline to help lift or push the water up to the hatchery headbox. The additional station could add approximately 1.6 cfs of warm water to the current system. The lower springs collects approximately 6 cfs of available water but the means to pump it is not available. Currently generator #1 backs up a total of 17.2 cfs (pumps #8 or #7, and #6, #5, and #4 or pumps #8, #7, and #6 & #5, or #5 & #4, or #4 & #6) and a total of 7.2 cfs is backed up by generator #2 (pumps #3 and #8).

## **FISH SPAWNING**

### **Fish Trapping**

The Clark Fork River fish trap was in operation from August 30, 1999 to December 28, 1999. The first adult kokanee entered the trap on October 25, 1999 and trapping and spawning continued through the end of December. There were 31,625 adult kokanee trapped. Spawntaking records indicated 31.42% of the spawning run was female (9,938). From September 1, 1999 to October 25, 1999 the trap was used to collect and sample bull trout. A total of 34 adult bull trout were trapped, tagged, held, and released. Two male bull trout mortalities were recorded.

The Sullivan Springs trap was in operation from October 19, 1999 to January 6, 2000. The Sullivan Springs trap collected 193,915 (88,120 in 1998) adult kokanee salmon. Of these, 14,476 (6,320 in 1998) adults were passed above the trap to spawn naturally in Sullivan Springs Creek. Spawntaking records showed that 36.2% (37.36% in 1998) of the run was female (64,949).

### **Spawntaking and Eggs Received**

Clark Fork River kokanee spawntaking began on November 9, 1999 and continued to December 28, 1999. Spawntaking activities occurred from November 1, 1999 to January 6, 2000 at the Sullivan Springs collection facility.

A total of 21,436,808 green fertilized kokanee eggs were collected during the 1999-2000 spawning season. Of those, 2,188,146 (324,926 in 1998) were obtained from 7,326 female kokanee at CGFH, and 19,248,662 (8,631,046 in 1998) were obtained from 57,971 female kokanee at the Sullivan Springs trap. A total of 2,468,875 green fertilized kokanee eggs from Sullivan Springs were shipped to Clark Fork Fish Hatchery.

## **FISH FEED**

The fish produced during 1999 were fed a total of 27,310 lbs of feed. Fish feed was acquired from Rangen Inc, and a feed study was conducted with Moore-Clark Nutra Feeds. The overall conversion was 1.02 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 the major contributor of kokanee to the Lake Pend Oreille fishery. The importance of this fishery to the local economy is presently estimated at over 5 million 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 500 visitors toured the hatchery during the 1999 season. In addition, tours were given to school groups and other organizations.

## **ACKNOWLEDGMENTS**

The CGFH staff would like to thank the Cabinet Gorge Dam and Northern Lights personnel for their continued cooperation with hatchery operations. Thanks also to the Lake Pend Oreille Idaho Club, Bonner County Sportsmen's Association, numerous volunteers, and various regional and hatchery Department personnel for their cooperation during the spawning season.

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## Appendix 1. Production Summary, all species, Cabinet Gorge Fish Hatchery, 1999

Species	Number	Pounds	Length	Fish /lb	Feed Fed	Feed Cost A	Annual Cost B	Cost/lb Of fish	Cost/1000 Fish	Cost/inch Of fish	Conversion
PdO KL	7,127,261	16,678	1.99	427	14,825	\$7,646.74	\$101,278.79	\$6.07	\$14.21	0.0071	0.96
Can. KE	1,248,121	4,326	2.26	289	4,339	\$2,420.02	\$29,638.99	\$6.85	\$23.75	0.0105	1.06
Dwd. KE	802,610	3,556	2.45	226	3,711	\$1,914.26	\$25,353.86	\$7.13	\$31.59	0.0129	1.09
Ore. FC	94,996	1,680	3.89	57	1,738	\$896.20	\$11,869.94	\$7.07	\$124.95	0.0321	1.09
Hayspur RB	630,932	2,428	2.13	260	2,698	\$1,391.63	\$18,431.72	\$7.59	\$29.21	0.0137	1.24
<b>TOTALS/ AVERAGE</b>	9,903,920	28,668	2.09	345	27,310	\$14,268.84	\$186,573.30	\$6.51	\$18.84	0.0090	1.02

Appendix 2. Lake Pend Oreille Kokanee Spawntaking Summary, 1999

<b>Spawntaking Site</b>	<b>Total Fish</b>	<b>Females Spawned</b>	<b>Green Eggs</b>	<b>Fecundity</b>	<b>Percent Females</b>
Sullivan Sps.	193,915	57,971	19,248,662	332	36.20%
Cabinet Gorge	31,625	7,326	2,188,146	299	31.42%
<b>Totals/ Average:</b>	<b>225,540</b>	<b>65,297</b>	<b>21,436,808</b>	<b>328</b>	<b>35.48%</b>

Includes male/female prespawn mortality

**IDAHO DEPARTMENT OF FISH AND GAME**

**1999 ANNUAL REPORT**

**CLARK FORK FISH HATCHERY**

**John Rankin, Assistant Hatchery Manager**

## INTRODUCTION

The Clark Fork Fish Hatchery (CFFH) is a resident species hatchery located on Spring Creek, 1.5 miles northwest of Clark Fork, Idaho. Construction was begun in 1934 by the Works Project Administration (WPA) and completed in 1938. Approximately 15,000 westslope cutthroat trout *Oncorhynchus clarki lewisi* broodstock are held on station, providing the state's largest captive source of westslope cutthroat eggs. In addition to westslope cutthroat, brook trout *Salvelinus fontinalis*, brown trout *Salmo trutta*, golden trout *O. aguabonita*, Kamloops rainbow trout *O. mykiss*, Arctic grayling *Thymallus arcticus*, and kokanee *O. nerka kennerlyi* are reared for distribution in the waters of the Panhandle Region. A target goal of 125,000 rainbow trout >9 inches are distributed to the put-and-take fishery from March through October. For the 1999 plants, 45,710 of these trout were transported from production hatcheries in southern Idaho and 136,767 fish were grown locally. The CFFH is now funded for operation by Idaho Department of Fish and Game (Department) license fees. Water diverted from Spring Creek provides for incubation and rearing, with flows of 8 to 15 cubic feet per second (cfs) at temperatures averaging 41°F in winter and 48°F in summer. A well provides approximately 100 gallons per minute (gpm) of 45°F water to one bank of incubators. The wellwater can be directed to fiberglass rearing troughs and concrete vats or mixed with Spring Creek water in the head box. Rearing units include Heath incubator stacks, concrete and fiberglass early rearing vats, concrete raceways, and earthen broodstock ponds.

## FISH PRODUCTION

Trout production at the CFFH now addresses three different objectives: 1) maintenance of a captive westslope cutthroat trout broodstock of 15,000 adults to spawn at age-4 and age-5; 2) production of 286,000 westslope cutthroat trout and 295,000 domestic Kamloops trout to six inches or greater for large lake stocking; and 3) rearing 140,000 rainbow trout for the put-and-take fishery in the Panhandle Region (Appendix 1). Eggs are collected on-station (Appendix 2), as well as received from public and private sources.

The broodstock management plan has been altered over the past several years to better serve changing management programs. The broodstock population is an adfluvial strain of westslope cutthroat originally obtained from north Idaho waters. Eggs were collected from April 26 to May 27, 1999. The spawning operation was stopped after 1.8 million eggs had been collected, although additional ripe females remained. Current protocol includes a final spawn session where all females are stripped to remove ripe eggs. The average length of the broodstock population observed in 1999 was 12.5 inches (range 11.08 inches to 14.19 inches).

During March 1999, 100,034 (8,550 lbs) BY97 six-inch plus westslope cutthroat trout were released into Lake Pend Oreille. In October, Hayden Lake was stocked with 93,813 (5,395 lbs) BY98 5- to 6-inch westslope cutthroat trout. Growth rates in 1999 were less than in previous years due to colder than normal water temperatures. In October, 245,112 (12,000 lbs) of domestic Kamloops rainbow trout were released into Hayden Lake.

The mountain lake stocking program of westslope cutthroat trout and domestic Kamloops rainbow trout was transferred to McCall Fish Hatchery in 1999 due to disease concerns at CFFH. All North Idaho mountain lakes were stocked directly from McCall Hatchery using fixed-wing aircraft.

There were 182,477 (68,360 lbs) rainbow trout >9 inches long stocked or transferred by the CFFH in 1999. Of these, 136,767 (53,125 lbs) trout were reared on-station, while another 45,710 were transferred in from the American Falls Fish Hatchery (AFFH).

There were no rainbow trout eggs received from off-station in 1999 in anticipation of CFFH being closed in 2000, and catchable fish production for northern Idaho being moved to another location.

Annual costs to rear fish from CFFH are listed in Appendix 3. The total cost to rear fish for 1999 was calculated by averaging the FY98 and FY99 budgets to obtain a cost for calendar year 1999. The costs at CFFH included transportation of all put-and-take rainbow trout to the Mullan Hatchery for redistribution, and the use of large semi trucks to haul fingerlings in the fall. The cost to rear fish on-station and the additional costs incurred to deliver these fish to the release site are separated in Appendix 3.

### **SANDPOINT HATCHERY**

There was minimal fish production at Sandpoint Hatchery during 1999 before it was closed in June. A total of 10,312 (113 lbs) 2- to 3-inch Kamloop rainbow trout, and 19,555 (106 lbs) 2- to 3-inch westslope cutthroat trout were produced and stocked in northern Idaho lakes and streams.

Total operational costs for Sandpoint Hatchery in 1999 were \$833.00, which consisted primarily of utility charges.

### **HATCHERY IMPROVEMENTS**

There were no major improvements to operations during 1999 due to budget concerns and the possibility of the hatchery being closed in the year 2000.

- There were no funds for construction, repairs, or modifications during 1999.
- Major construction needs include:
  - A high priority requirement for a pump and piping to supply pathogen-free water for rearing broodstock, eggs, and fry from the well that was drilled in 1989, tested at 1,000 gpm, and then capped.
  - Construction of concrete broodstock ponds to replace the earthen ponds now in use.
  - The construction of a heated, weather-tight garage for storage of vehicles and grounds maintenance equipment. The requirement for a covered area for vehicle maintenance still exists. At this time, repairs and modifications on truck-size vehicles must be performed out in the open without even a paved surface under the vehicle.

## **FISH STOCKED AND TRANSFERRED**

The CFFH program distributes fish in the Panhandle Region as directed by Department fishery management. The program includes distributing rainbow trout for put-and-take fisheries; distributing rainbow trout and cutthroat trout fingerlings for put-grow-and-take fisheries; and redistributing warm and cool water game fish into the Panhandle Region.

Personnel from CFFH stocked 130,116 (48,733 lbs) size three (>9 inches) rainbow trout to waters of the Panhandle Region, north of Coeur d'Alene, from March to October 1999. Of these, 45,710 (15,235 lbs) trout were received from the AFFH and 84,406 trout were reared from egg to release at the CFFH and stocked to the put-and-take fishery. In 1999, 52,361 (19,611 lbs) rainbow trout were reared at the CFFH for release from the Mullan Hatchery.

There were no westslope cutthroat trout transferred for rearing in net pens on Lake Pend Oreille in 1999. Problems with predators had made the program non-productive in prior years. Subsequent reductions in staffing made it impossible to devote time to off-station projects.

## **FISH SPAWNING**

The CFFH maintains a captive westslope cutthroat trout broodstock population to provide for needs within the Panhandle Region. Inability to maintain a disease-free population prevented transfer of eggs or fish to other regions. Presently, approximately 25,000, two- to five-year-old brood fish are held to spawn in their fourth and fifth year. This provides a potential for taking two million green eggs, yielding from 1 to 1.5 million eyed-eggs. During past years, the egg requirement has varied substantially. Fish requirements have ranged from over one million "button-up" fry for nursery stream release to 150,000 to 350,000, two-year-old, six-inch fish for release in large lakes. To maintain a broad range of flexibility for fishery management staff, the broodstock population has been held to meet the high-end requirement. Excess fry are released to comply with regional preference, when annual population analysis and stocking requirements have been completed.

During the 1999 spawning season, 1,833,927 eggs were collected (Appendix 2). Average fecundity of 3,013 females was 610 eggs/female. A saline diluent was utilized during fertilization, and buffered iodophor disinfection solutions were used to water-harden eggs. A 65.5% eye-up occurred, resulting in 1,200,687 eyed-eggs.

## **FISH FEED**

Production feed was purchased from Rangen Inc (Buhl, ID) in compliance with Idaho State contracting procedures. The feed projection program uses Haskell's formula with Delta L adjusted for expected monthly water temperature. Data on Spring Creek daily water temperature has been collected since 1980, and feed tests utilizing a variety of diets, feed delivery techniques, and rearing densities since 1989 have been utilized to institute the current program. Feed utilized and total cost during 1999 is found in Appendix 4. A feed study was started in 1999 on the BY99 cutthroat using EWOS, Moore-Clark, and Rangen feeds. All of the

feed from EWOS was donated to the hatchery. Results from the study are yet to be determined.

## **PUBLIC RELATIONS**

Public relations efforts in 1999 were similar to those of previous years with a high level of interaction with the public. Hatchery personnel made active efforts to talk with as many of them as possible. As always, numerous tours were provided to public and private school groups as well as to families. A visitor information pamphlet provides a summary of information to complement the Visitor Information Center and has been well received by the public.

The CFFH was utilized again as a site for a Free Fishing Day angler's clinic with approximately 200 participants. Staff from the two local hatcheries, the local Conservation Officer, and volunteers took part in the all-day event. The public actively participated in this Free Fishing Day experience, with many young anglers catching their first fish.

The hatchery staff attended public hearings and sportsmen's club meetings in an effort to get the Department's programs and policies out.

## **FISH HEALTH/CONDITION PROFILE**

There were no viruses detected in any of the fish reared at CFFH during 1999. Cold Water Disease (CWD) was detected in early 1999 in both the rainbow and cutthroat trout fingerlings. Feeding Oxytetracycline (OTC) successfully treated it.

## **ACKNOWLEDGMENTS**

The CFFH would like to thank hatchery staff Bio-aides Sarah Aavedal, John Suhfras, Marc Garst, Kim Bopp, and also Coeur d'Alene tribal member volunteer Jeff Jordan for their help in making 1999 a successful year.

## Appendix 1. Fish production at the Clark Fork Hatchery, January 1, 1999 to December 31, 1999.

Species/Strain	Source	Beginning Number	Beginning Pounds	Ending Number	Ending Pounds	Number Stocked	Pounds Stocked	Destination
Westslope cutthroat, BY94	Clark Fork	1,921	2,233	0	0	0	0	Broodstock
Westslope cutthroat, BY95	Clark Fork	9,422	8,888	4,490	5,102	0	0	Broodstock
Westslope cutthroat, BY96	Clark Fork	9,941	1,778	8,668	3,994	0	0	Broodstock
Westslope cutthroat, BY97	Clark Fork	125,094	8,935	9,909	2,202	122,645	10,570	Lake Pend Oreille
Westslope cutthroat, BY98	Clark Fork	405,993	2,081	126,726	10,303	138,839	7,039	Lowland Lakes
Westslope cutthroat, BY99	Clark Fork	0	0	417,259	2,396	646,306	1,389	Lowland Lakes
Arctic grayling, BY95	Wyoming	200	54	0	0	175	55	Antelope Lake
Kamloops rainbow, BY96	Trout Lodge	2,080	2,375	0	0	2,716	3,260	Bonner Lake
Kamloops rainbow, BY97	Trout Lodge	18,323	4,759	0	0	15,756	6,734	Put and Take
Kamloops rainbow, BY97	American Falls	63,293	7,535	0	0	59,456	21,994	Put and Take
Kamloops rainbow, BY97	Hayspur	62,102	5,308	2,971	1,707	58,839	21,137	Put and Take
Kamloops rainbow, BY97	American Falls	40,571	13,524	0	0	45,710	15,235	Put and Take
Kamloops rainbow, BY98	Hayspur	453,779	159	0	0	270,151	13,185	Lowland Lakes
Hayspur rainbow, BY98	Hayspur	172,126	51	82,721	7,193	0	0	Put and Take
Hayspur sterile rainbow, BY98	Hayspur	103,422	30	32,185	3,219	0	0	Put and Take
Kamloops rainbow, BY98	AF/Nampa	0	0	37,497	17,440	0	0	Put and Take

## Appendix 2. Spawning summary, Clark Fork westslope cutthroat, January 1, 1999 to December 31, 1999.

Stock	Females spawned	Number of eggs collected	Average fecundity	Percent eye-up	Eyed-eggs
Clark Fork	3,013	1,833,927	610	65.5	1,200,687

## Appendix 3. Cost of fish produced at the Clark Fork Hatchery, January 1, 1999 to December 31, 1999.

Species	Numbers Produced	Pounds Produced	Pondside Cost to Produce	Pondside Cost/1,000	Pondside Cost/lb	Streamside Delivery Cost	Streamside Cost/1,000	Streamside Cost/lb
Westslope cutthroat,BY94,BY95, BY96,BY97 >6 inches	23,067	3,232	\$6,993	\$303.16	\$2.16	0	0	0
Westslope cutthroat, BY97, 6-7 inches	122,645	2,591	\$6,993	\$57.02	\$2.70	\$2,500	\$77.42	\$2.93
Westslope cutthroat, BY98, 2-5 inches	265,565	15,261	\$27,974	\$105.34	\$1.83	\$1,043	\$112.85	\$1.98
Westslope cutthroat, BY99, <2 inches	1,063,565	3,785	\$13,990	\$13.15	\$3.70	\$0	\$0	\$0
Grayling,>2 inches	175	1	\$140	\$800	\$140	\$25	\$942.86	\$140.45
Hayspur Kamloops AF BY97	59,456	14,459	\$18,183	\$305.82	\$1.26	\$5,000	\$389.91	\$1.49
Hayspur Kamloops CF BY97	61,810	17,536	\$18,183	\$294.2	\$1.04	\$6,000	\$396.2	\$1.32
Hayspur Kamloops CF BY98	270,151	13,026	\$18,183	\$67.3	\$1.40	\$2,000	\$74.7	\$1.55
Trout Lodge Kamloops, BY96	2,716	885	\$4,196	\$1,545.01	\$4.74	\$300	\$1,655.50	\$4.83
Trout Lodge Kamloops, BY97	15,756	1,975	\$6,993	\$443.83	\$3.54	\$2,000	\$570.76	\$3.84
Trout Lodge Kamloops, AF,BY97	45,710	15,235	\$2,797	\$61.2	\$.18	\$3,888	\$146.26	\$.44
Hayspur rainbow, BY98	82,721	7,142	\$11,050	\$133.6	\$1.55	\$0	\$0	\$0
Hayspur sterile rainbow , BY98	32,185	3,189	\$4,196	\$130.40	\$1.32	\$0	\$0	\$0
Total	2,045,522	98,317	\$139,871	\$68.40	\$1.42	\$22,756	\$100.26	\$1.65

Appendix 4. Fish feed used in 1999 at the Clark Fork Fish Hatchery.

<b>Size</b>	<b>Source</b>	<b>Pounds</b>	<b>Cost/lb</b>	<b>Total Cost</b>
EWOS starter #1	EWOS	978.0	\$ .03	\$ 29.34
EWOS starter #2	EWOS	296.5	\$ .03	\$ 8.90
EWOS starter #3	EWOS	346.0	\$ .03	\$ 10.38
Moore-Clark #1	Moore-Clark	629.9	\$ 1.01	\$ 636.24
Moore-Clark #2	Moore-Clark	130.0	\$ .92	\$ 119.61
Moore-Clark #3	Moore-Clark	173.0	\$ .86	\$ 148.78
Rangen starter #0	Rangen	803.5	\$ .527	\$ 423.44
Rangen starter #1	Rangen	1,167.1	\$ .527	\$ 615.06
Rangen starter #2	Rangen	3,377.8	\$ .527	\$ 1,780.08
Rangen crumbles #3	Rangen	8,050.8	\$ .386	\$ 3,107.61
Rangen crumbles #4	Rangen	9,880.8	\$ .386	\$ 3,814.00
Rangen coarse crumbles #4	Rangen	8,311.0	\$ .386	\$ 3,208.05
Rangen grower 3/32	Rangen	10,049.0	\$ .38	\$ 4,818.62
Rangen grower 1/8	Rangen	39,635.9	\$ .38	\$15,061.64
Rangen grower 5/32	Rangen	31,469.6	\$ .38	\$11,958.45
Rangen brood 3/16	Rangen	6,349.6	\$ .38	\$ 2,412.85
<b>TOTALS</b>		<b>121,648.50</b>		<b>\$47,153.05</b>

**IDAHO DEPARTMENT OF FISH AND GAME**

**1999 ANNUAL RESIDENT REPORT**

**CLEARWATER FISH HATCHERY**

**By:**

**CalLee Davenport, Fish Culturist**

## INTRODUCTION

The Clearwater Fish Hatchery (CFH) is located in the community of Ahsahka in Clearwater County, Idaho. Ahsahka is a Native American word meaning "where two 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. The hatchery is operated by the Idaho Department of Fish and Game (Department).

The primary purpose for CFH is mitigation for anadromous fish losses due to hydroelectric dams. Anadromous fish production has yet to reach full capacity; therefore, the facility can use excess rearing containers for rainbow trout *Oncorhynchus mykiss* production.

The Department funded the resident trout program with \$35,014. Permanent staff salaries (estimated at \$32,000) were funded by the LSRCP project.

The hatchery water source is a double pipeline from Dworshak Dam, which can supply over 70 cubic feet per second (cfs) of reservoir water to the facility. Two intakes are at the dam. The primary intake is adjustable (5- to 50-ft) to collect surface water, and the secondary intake is about 200-ft below full pool level. This design allows mixing of water to target a specific temperature. About 12% of the rearing capacity is used for rainbow trout (RBT) production.

## FISH PRODUCTION

### Release Year 1999

#### **Catchable Rainbow Trout**

The CFH produced 124,947 catchable-sized, 3.16 fish per pound (fpp), rainbow trout (R9) that were released in 1999. Survival from January 1, 1999 to release was 89%. Due to space constraints at CFH, Nampa Fish Hatchery (NFH) raised the remainder of Clearwater's rainbow trout allotment to sub-catchables, and shipped them to CFH in two shipments. The first shipment of 33,235 (5.5 fpp) rainbow was received in March, and the second shipment of 43,346 (6.9 fpp) was received in April. Survival of these fish from arrival to release was 98% (75,068, 2.85 fpp).

A total of 201,508 catchables were released from CFH during 1999; therefore, 96% of the original requested allocation was met. Dobbys Pond, Blue Lake, and Cold Springs Pond were not planted and their allotments were reallocated to other sites.

## **Fingerling Rainbow Trout**

### **Release Year 2000**

A total of 216,399 rainbow trout (Hayspur stock) weighing 29,325 lbs (7.55 fpp) are on hand for catchable allocations during 2000 (Appendix 1). Of this total, 65,973 are sterile RBT (T9) destined for Moose Creek Reservoir, Elk Creek Reservoir, and all flowing water plants in the region. The eggs were heat-shocked at Hayspur Hatchery to induce sterility.

#### **Hayspur Stock**

The CFH received three groups of eyed-eggs from Hayspur. Survival from the first group of 112,918 eggs (R9 early group) was 96% to hatch. Survival from the second group of 101,250 eggs (T9 sterile group) was 83% to hatch, and 65% to date. Survival from the third group of 194,680 eggs (R9 late group) was 94% to hatch. The early group and the late group were merged together after transfer to the outside raceways when their sizes were comparable. The early and late groups combined survival to date is 56%.

Starting these fish on feed was difficult, with most mortalities occurring during the first six weeks of feeding.

### **Release Year 2001**

#### **Hayspur Stock**

The CFH received shipments of eyed-eggs from Hayspur Hatchery on November 9, November 30, and December 21. Survival of the first group of 187,766 eggs (R9) to ponding was 87%. These fish, a total of 163,356, were ponded on December 7. The second group of 51,580 eggs (T9 sterile) has hatched, but as of this writing, has not been ponded. A portion of the third shipment of eyed-eggs was jumbled in transport when an R9 group and a sterile T9 group inadvertently mixed as a result of a broken egg transport case. These eggs, therefore, could not be utilized for sterile water allocations, but could still be utilized for regular RBT allocations. A portion of these eggs (199,502 on hand) was kept for Panhandle region plants (Clark Fork Fish Hatchery [CFFH] allocation). Upon determining that no other hatchery had a need for the remaining mixed R9/T9 eggs (approximately 110,000), the remainder of the eggs were destroyed and disposed of on December 22.

A total of 151,272 fish (2,617 fpp) have been ponded and 240,254 fry/eggs have yet to be ponded. Additional shipments of sterile (T9) and Kamloops RBT eyed-eggs are scheduled for the middle of January 2000 to make up for the mixed shipment.

## **FISH FEED**

A total of 33,800 lbs of feed was purchased in 1999 for rainbow trout (Appendix 2). Bulk feed, medicated feed, and starter feed were purchased from Rangen Inc. (Buhl, ID), at an average cost of \$0.3328 per lb. Feed conversion for the year was estimated at 1.33. An additional 35,071 lbs of surplus feed was transferred to this project at no cost (leftover steelhead and chinook feed from CFH, leftover feed from Dworshak National Fish Hatchery [DNFH] and Kooskia National Fish Hatchery [KNFH]), for a total of 68,901 lbs of feed fed. Moore-Clark donated one bag of starter feed

## **FISH STOCKED AND TRANSFERRED**

Personnel at CFH stocked 201,508 rainbow trout in streams and reservoirs of the Clearwater Region in 1999. The rainbows averaged 3.06 fpp, weighed 65,953 lbs, and averaged 9.4 inches in length. An additional 1,658 rainbow (1.0 fpp) reared at Kooskia Hatchery were stocked in Campbells Pond, Fenn Pond and Spring Valley Reservoir.

Hatchery personnel also assisted Cabinet Gorge Hatchery by distributing kokanee to Mann's Lake, Soldiers Meadows Reservoir, Waha Lake, and Winchester Lake on May 25. Hagerman Hatchery personnel planted a total of 22,911 fish (37.2 fpp) excess fingerling rainbow trout (2000 allocation) in Mormon Reservoir on September 15.

This year was difficult for fish stocking. High water delayed most of the stream stocking until late June or early July. High temperatures prevented stocking in August and September in Lewiston's Levee Pond and Fenn Pond on the Selway River. These allotments were reallocated to other sites per regional fisheries personnel recommendations. Flexibility in release dates and fish numbers were imperative for successful stocking of 28 sites in 101 trips.

## **PUBLIC RELATIONS**

The CFH and its satellites had several visitors during the year.

- 1) Hatchery personnel set up a booth at the Kiwanis Kids Spring Fair at Orofino Elementary School.
- 2) Brad George assisted Dworshak Hatchery during their annual open house on June 11.
- 3) A local Boy Scout troop helped build a gravel path around the total flow-settling pond. This path aided in the recovery of escapee fish that were used in regular fish plants.
- 4) Karolyn's Pond was the site of two events this year. Jerry McGehee hosted a fishing clinic for a group of 14- to 18-year-old children from Team Adventure/Casey Family Program. For many of these kids it was the first time they had ever fished. A special educational fishing permit was issued by Fish and Game to hold a fishing clinic, so the kids did not need to purchase a fishing license to participate in the clinic. Another clinic was held there for 50 kids for Free Fishing Day.

- 5) Jerry McGehee and Renee Hedrick gave a presentation of Karolyn's Pond to the Orofino Kiwanis on January 12, 1999. After the presentation, comments were gathered from meeting participants regarding the building of a fishing pond near Orofino.

### **SPECIAL PROJECTS**

- 1) A total of 385 adult size fish, ranging in weight from 3 to 8 lbs, were recovered from the settling pond. The crew supplemented 16 release sites in 21 trips with these large fish.
- 2) Hatchery personnel hauled 405 excess hatchery steelhead from Dworshak Hatchery to Mann's Lake on March 4, and 101 steelhead from Kooskia Fish Hatchery to Robinson Pond on March 5.
- 3) CalLee Davenport assisted University of Idaho graduate student Sue Izard with a presentation of Spring Valley Reservoir's "put-and-take-fishery".

### **FISH HEALTH**

Fish allocated for 2000 stocking were given a 14-day treatment of Oxytetracycline (TM) at the rate of 10g TM/100 pounds of fish, i.e., INAD levels, for coldwater disease, in August. Fish responded well to the treatment and mortality counts declined.

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Appendix 1. Clearwater Hatchery resident fish production, January 1 through December 31, 1999.

	Number	Weight	Feed Fed	Conversion	Cost/pound	Cost/1000 fish
Rainbow on hand: 1/1/99	140,382	31,124				
Rainbow received from Nampa	76,581	12,302				
Total Catchable RBT Liberated	201,508	65,953				
Fingerling RBT Liberated	22,911	616				
<b>1999 Subtotal</b>	<b>224,419</b>	<b>23,143</b>				
2000 Catchable Rainbow on hand: 12/31/99	216,399	29,325				
2001 Catchable Rainbow on hand: 12/31/99*	151,272	56				
<b>Total Production**</b>	<b>592,090</b>	<b>52,524</b>	<b>68,901</b>	<b>1.31</b>	<b>\$0.6666</b>	<b>\$59.14</b>

Estimated costs include 50% of the FY-1999 and FY-2000 budgets, and do not include permanent salaries.

\*2001 Catchable number does not include 240,254 eggs/fry not yet ponded.

\*\*Total production=Catchable/fingerling RBT liberated+2000 RBT on hand+2001 RBT on hand

\*\*Total wt.= total wt fish on hand 12/31/99 + (wt. fish liberated-wt received-wt on hand 1/1/99)

\*\*Cost/lb. = total budget/pounds produced.

\*\*Cost /1000fish=(total budget/total production) x 1000

Appendix 2. Fish feed purchased and costs for the Clearwater Hatchery rainbow program, January 1 through December 31, 1999.

<b>Source</b>	<b>Feed size</b>	<b>Pounds</b>	<b>Cost/Lb</b>	<b>Total cost</b>
Rangen	3/32	22,530	\$0.33	\$7,434.90
Rangen	#4 - Med TM	1200	\$6.86	\$823.92
Rangen	1/8	10,000	\$0.295	\$2950.00
Rangen	Swim-up	50	\$0.4827	\$24.14
Rangen	#1 Starter	50	\$0.4827	\$24.14
<b>TOTALS</b>		<b>33,830</b>	<b>\$0.3328</b>	<b>\$11,257.10</b>

**IDAHO DEPARTMENT OF FISH AND GAME**

**1999 ANNUAL REPORT**

**GRACE FISH HATCHERY**

**Steve Wingert, Fish Hatchery Manager  
Dwight Aplanalp, Assistant Hatchery Manager**

## INTRODUCTION

Grace Fish Hatchery (GFH) is owned and operated by the Idaho Department of Fish and Game (Department) and is funded by license sales. The GFH was constructed in 1946 and is located seven miles south of Grace, Idaho.

The objective of the GFH is to produce catchable and fingerling rainbow trout *Oncorhynchus mykiss* for stocking primarily in Southeast Regional waters. The GFH also produces several specialty species of trout of various sizes to meet statewide requests.

Middle and West Whiskey Creek springs supply water to the GFH. Flow was down approximately 45 gallons per minute (gpm) from last year with an annual average of 15.0 cubic feet per second (cfs). There is a natural fluctuation in water quantity basically opposite that from run-off, and GFH biomass. Flows are at a minimum during May and June, and peak in October and November. The GFH biomass is at a maximum in May and at minimum in October. Water temperature is a constant 52°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 14-ft x 2-ft x 300-ft large raceways. The water for the large raceways is second-use water from the vats and small and medium raceways that is mixed with fresh water from the middle spring. All GFH water flows through a settling pond before being discharged into Whiskey Creek.

The GFH is staffed by a Fish Hatchery Manager I, and an Assistant Fish Hatchery Manager. The GFH Culturist position has been left vacant indefinitely due to budget constraints. Up to two temporary employees may be hired to assist with the various projects.

The Blackfoot River fish trap, which used to be operated by GFH, is no longer being operated due to budget constraints.

## FISH PRODUCTION

The GFH began the 1999 calendar year with 167,832 fish weighing 47,435 lbs. During 1999, a total of 1,288,715 eggs of various species were received. A total of 959,914 fish weighing 92,400 lbs were planted. At the end of the year there were 197,538 fish weighing 31,917 lbs on hand. This accounts for a total production of 1,157,452 fish and 76,882 lbs (Appendix 1,3).

All of the fish produced at Grace were received as eyed-eggs from various state and private hatcheries (Appendix 2).

Rainbow trout, fingerlings, and catchables combined, accounted for 94% of the total lbs produced but only 87% of total cost, or \$1.79 per lb. The specialty species combined for the remaining 6% of the lbs produced and 13% of total cost, or \$3.88 per lb (Appendix 3). This increased cost is due to the higher cost of soft-moist fish food the specialty species require.

Production costs, excluding capital outlay, were \$147,633.

Production costs were calculated for pondside and streamside amounts. Pondside cost is total budget minus capitol outlay minus transportation; streamside includes transportation costs (Appendix 4). These are bottom line figures and not broken out by species.

There were 972,200 fish requested and 961,921, or 99% were planted. See Appendix 5 for a breakdown by species.

### **Catchable Rainbow Trout**

The GFH started out this calendar year with 144,480 catchable trout. During the year 142,092 (71,920 lbs.) of catchable trout were planted into area waters. The GFH produced 261,935 catchable rainbow at a weight of 48,621 lbs. On December 31, 119,843 fish (20,873 lbs.) remained on-station for future planting. Two different strains of rainbow were planted: Hayspur (R9), and Kamloop (K1). These fish converted 68,189 lbs of fish food at a rate of 1.42 to produce 48,021 lbs of flesh. The total cost of production was \$85,628.

During the year, the GFH received sterile eggs which resulted in 52,300 sterile fish (10,109 lbs), which are being held over for stocking into area waters as catchables next year.

### **Rainbow Trout Fingerlings**

During 1999, 767,504 (12,515 lbs.) rainbow trout fingerlings were planted. All were Hayspur strain (R9) or Trout Lodge (K1). At the end of the year there were 7,500 fish (8 lbs) on hand. These fish converted 10,347 lbs of food at a rate of .83 to produce 12,523 lbs of fish.

During the year the GFH also received sterile eggs, some of which were used to make 11,250 (1,308 lbs) sterile fingerlings for Daniels Reservoir.

### **Bear River Cutthroat**

In 1999, 74,860 Bear River cutthroat trout *O. clarki ssp. (C7)* eggs were received from Daniels Fish Hatchery in Wyoming. There were 2,000 fish planted as fry into Bloomington Lake. A total of 23,300 Bear River Cutthroat Trout were planted into Daniels Reservoir, leaving 17,885 fish on hand.

### **Splake**

Splake *Salvelinus fontinalis x S. namaycush* were reared at GFH this year. They were received as eyed-eggs from Wyoming's Story Hatchery in 1997, and are a cross between a Soda Lake brook trout male and a Lewis Lake-lake trout female. Splake appear to survive well when planted at lengths greater than nine inches.

A total of 13,768 brood year 97 fish were planted into Ririe Reservoir and Island Park Reservoir.

## **HATCHERY IMPROVEMENT**

- Needed projects include:
- Cover or bury the spring pond (scheduled for FY2000).
- Install new main line from the spring pond to a head box with new lines going to the vats, small, and medium raceways.
- Replace the large raceway headrace with a pipeline and controlling inlet valves to the raceways (scheduled for FY2000).
- Replace large raceways or recap concrete walls.
- Install an auxiliary water supply pipe from the main supply line to the small raceway header to increase flow.
- Install a cleaning line on the medium raceways similar to that on the small raceways (scheduled for FY2000).
- Replace domestic water lines in residence #1 and residence #3 (scheduled for FY2000).
- Paint the 2-stall garage.
- Install baffles or extend air cleaning to the medium raceways.
- Install culverts and grade the driveway.
- Install an underground irrigation system.
- Rewire residences #1 and #3.
- There were no capitol purchases or budget for FY99.

## **FISH FEED**

Rangen was the only brand of feed fed this year. A total of 85,1590 lbs, at a cost of \$29,352.29, was fed. A total of 4,255 lbs of soft-moist feed at a cost of \$3,242.42 was fed to the specialty species (Appendix 6).

## **PUBLIC RELATIONS**

The GFH staff gave several scheduled tours to local area schools and numerous informal tours to interested general public visiting the facility.

The GFH staff conducted a Free Fishing Day clinic at the hatchery.

Appendix 1. Number and pounds of fish produced and stocked at Grace Fish Hatchery, 1999.

<b>Species/strain Lot #</b>	<b>Number (Pounds) On hand 01/01/99</b>	<b>Number Planted (Pounds)</b>	<b>Number (Pounds) On hand 12/31/99</b>	<b>Pounds Produced</b>	<b>Conversion</b>
Rainbow Catchables	144,480 (44,772)	142,092 (71920)	119,843 (20,873)	48,021	1.42
Rainbow Fingerlings	9,500 (28)	767,504 (12,515)	7,500 8	12,495	0.83
Splake 97-WY-SP	13,852 (2,635)	13,768 (6,450)	0 0	3,815	1.1
Sterile Rainbow Catchables	0 0	0 0	52,310 (10,109)	10,109	1.02
Sterile Rainbow Fingerlings	0 0	11,250 (1,308)	0 0	1,308	1.03
Cutthroat / Bear R. 99-WY- C7	0 0	25,300 (207)	17,885 (927)	1,134	1.33
<b>TOTALS</b>	<b>167,832 (47,435)</b>	<b>959,914 (92,400)</b>	<b>197,538 (31,917)</b>	<b>76,882</b>	<b>1.11</b>

Appendix 2. Eyed-eggs received at Grace Fish Hatchery, 1999.

Species/Strain	Source	Number Received	Date Received
Sterile rainbow trout (T9)	IDFG Hayspur	56,838	01/25/99
Hayspur rainbow trout (R9)	IDFG Hayspur	39,632	03/1/99
Hayspur rainbow trout (R9)	IDFG Hayspur	91,245	03/8/99
Hayspur rainbow trout (R9)	IDFG Hayspur	12,402	03/15/99
Sterile rainbow trout (T9)	IDFG Hayspur	7,142	03/15/99
Sterile rainbow trout (TK)	IDFG Hayspur	29,875	03/15/99
Hayspur Rainbow trout (R9)	IDFG Hayspur	103,736	03/22/99
Hayspur Rainbow trout (R9)	IDFG Hayspur	60,000	03/29/99
Trout Lodge Kamloops (K1)	Trout Lodge WA.	804,715	05/27/99
Bear River cutthroat trout (C7)	Daniels, WY	74,860	05/20/99
Hayspur rainbow trout (R9)	IDFG Hayspur	8,270	11/8/99
<b>TOTAL</b>		<b>1,288,715</b>	

Appendix 3. Fish production costs at Grace Fish Hatchery, 1999.

Species	Size Inches	Number Produced	Pounds Produced	Production Cost	Cost/1,000	Cost/lb.
Rainbow Catchables	10	261,935	48,021	\$85,628	\$327	\$1.78
Rainbow Fingerling	3-6	775,004	12,495	\$23,621	\$30	\$1.89
Splake	12	13,768	3,815	\$14,763	\$1,072	\$3.87
Sterile Catchables	10	52,310	10,109	\$17,716	\$339	\$1.75
Sterile Fingerling	6	11,250	1,308	\$1,476	\$131	\$1.13
Cutthroat, Bear R.	3	43,185	1,134	\$4,429	\$103	\$3.91
<b>Total</b>		<b>1,157,452</b>	<b>76,882</b>	<b>\$147,633</b>	<b>\$128</b>	<b>\$1.92</b>
Rainbow		1,100,499	71,933	\$128,441	\$117	\$1.79
Specialty Species		56,953	4,949	\$19,192	\$337	\$3.88

Appendix 4. Pondsides and streamside production cost at Grace Fish Hatchery, 1999.

<b>Pounds Produced</b>	<b>Pond side Cost</b>	<b>Pond side Cost/lb.</b>	<b>Stream side Cost</b>	<b>Stream side Cost/lb.</b>
76,882	\$138,873	\$1.81	\$150,266	\$1.95

Appendix 5. Fish requested and produced at Grace Hatchery, 1999.

<b>Species</b>	<b>Number Requested</b>	<b>Number Planted</b>	<b>% Achieved</b>
Catchable rainbow trout	140,400	142,092	101%
Fingerling rainbow trout	725,100	767,504	106%
Fingerling Bear Lake cutthroat trout	11,250	0	None Available
Bear River cutthroat trout	32,000	25,300	79%
Fine Spotted cutthroat trout	2,000	2,007	100%
Splake	35,000	13,768	39%
Sterile Rainbow Fingerlings	11,250	11,250	100%
Catchable Bear Lake cutthroat trout	15,200	0	None Available
<b>Totals</b>	<b>972,200</b>	<b>961,921</b>	<b>99%</b>

Appendix 6. Fish food fed and cost, Grace Fish Hatchery, 1999.

<b>Source</b>	<b>Diet</b>	<b>Size</b>	<b>Cost/lb.</b>	<b>Pounds</b>	<b>Total cost</b>
Rangen	Dry	Starter	\$0.457	1,100	\$502.70
Rangen	Dry	#1	\$0.457	1,975	\$902.57
Rangen	Dry	#2	\$0.457	2,650	\$1,211.05
Rangen	Dry	#3	\$0.3119	3,300	\$1,029.15
Rangen	Dry	#4	\$0.3149	4,700	\$1,479.95
Rangen	Extr 450 Bulk	1/8	\$0.311	60,380	\$18,777.95
Rangen	Extr 450	3/32	\$0.3245	6,800	\$2206.50
<b>SUB-TOTAL</b>				<b>80,905</b>	<b>\$26,109.87</b>
Rangen	Soft-Moist	3/32	\$0.7375	74.8	\$55.17
Rangen	Soft-Moist	1/8	\$0.7625	4,180	\$3,187.25
<b>SUB-TOTAL</b>				<b>4,254.8</b>	<b>\$3,242.42</b>
<b>GRAND TOTAL</b>				<b>85,159</b>	<b>\$29,352.29</b>

**IDAHO DEPARTMENT OF FISH AND GAME**

**1999 ANNUAL REPORT**

**HAGERMAN FISH HATCHERY**

**Joe Chapman, Fish Hatchery Manager II  
Walt Rast, Fish Hatchery Manager I  
Kevin Price, Fish Culturist**

## INTRODUCTION

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

Funding is provided primarily through Department license money. HFH used approximately \$384,544 from Hagerman's budget, \$28,537 from Dworshak mitigation monies, and \$52,813 from the fish transportation budget to rear and plant fish in the 1999 production year, not including capital outlay expenditures (Appendix 1).

The HFH is staffed with a Hatchery Manager II (Joe Chapman), a Hatchery Manager I (Walt Rast), a Fish Culturist (Kevin Price), and a fish transport operator (Ken Taylor). About 15 months of temporary labor is available 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 of rearing space in the HFH building, 10,530 cubic feet of rearing space in the fingerling ponds, and up to 138,000 cubic feet of rearing space in the large production raceways. Riley Creek water supplies the 165,600 cubic feet of rearing space available in eight additional raceways. The Tucker Springs water is a constant 59°F year-round and Riley Creek fluctuates from 50°F to 67°F annually.

## HATCHERY PRODUCTION

During 1999, HFH stocked 2,961,167 fish weighing 371,638 lbs. Of these, 695,749 were planted 8-inches long and larger, and 2,265,418 were planted smaller than 8-inches long (Appendix 1). About 58% of the total fish planted were stocked in the Magic Valley Region waters (Appendix 2). The majority of the larger fish were Kamloops rainbow trout from Troutlodge Inc., with the balance from Hayspur Fish Hatchery. The 2- to 8-inch fish consisted of rainbow trout, Kamloops trout, steelhead, and Coho salmon (Appendix 1).

The HFH reared and stocked 2,265,418 fingerlings of a 2,733,000 fingerling request, or 82.9% of the request. A total of 695,749 catchables of a requested 637,000 were reared and stocked, for 110% efficiency. The excess catchables were used to compensate for fall fingerling shortages. The combined fingerling and catchable stocking-to-request average was 88%.

The 371,638 lbs planted included 263,348 lbs of put-and-take fish averaging 9.65 inches, and 108,290 lbs of fingerlings that averaged 4.9 inches. The cost of planting the average 8.0 fpp (6.3 inches) was approximately \$0.91 per lb, or \$114.61 per 1,000 fish (Appendix 1).

In addition to the fish reared and planted, an additional 1,581,287 fish (103,604 lbs) were on hand at the HFH on December 31, 1999. These were comprised of 958,489 fish (102,833 lbs) (average 9.32/lb, or 6.20 inches) in the large raceways and 622,798 fingerlings (771 lbs) (average 808/lb, or 1.4 inches) in the west raceways. The cost of producing the larger fish was \$1.06 /lb or \$114.15 /1,000, and \$22.18/lb or \$27.46/1,000 for the fingerlings (Appendix 1).

On hand January 1, 1999 were 1,490,144 fish (139,569 lbs). The HFH also received 2,648 lbs of fish from other hatcheries. Consequently, these subtractions yield a net production for 1999 of 2,088,408 fish (333,025 lbs), mortality excluded (Appendix 1).

A total of 8,734,424 eggs and fry were acquired to yield the fish produced. About 2,671,930 eggs were purchased, and the balance was acquired from government sources at no cost (Appendix 4). Of the 6,599,947 eggs received, 4,232,493 were received for the fish planted, and the balance was used for 2000 production. Eggs were sent to Magic Valley Hatchery to alleviate overcrowded conditions here, then transferred to Hagerman Hatchery when they were about 176/lb. (2.33 inches). Because of the success last year, eggs were again shipped to Magic Valley Hatchery for early rearing and will be transferred here in January and February of 2000.

Eggs were also shipped to Cabinet Gorge Hatchery to slow their development so they could produce fall fingerlings. About 630,932 fry at about 260/lb (2.04 inches) were received from Cabinet Gorge Hatchery in May.

The overall survival rate decreased last year due to higher losses from Infectious Hematopoietic Necrosis Virus (IHNV) (Appendix 3). For the first time in about two years, fish in the nursery raceways became infected and severe losses were common. This resulted in shortages of fall fingerlings and a poorer food-conversion rate, since the weight of the fish mortalities is not added to the weight gain to get the food conversion rate (see Fish Feed section).

In addition to the requests from the regions, the HFH crew also hauled and stocked 626,873 fish from other sources (Appendix 7). These included 390 white sturgeon (College of Southern Idaho origin); 8,000 channel catfish from Oklahoma; 141,740 excess post-smolt steelhead from Niagara Springs Hatchery; 364,923 fingerling steelhead from Niagara Springs Hatchery; and 111,820 steelhead fingerlings from Magic Valley Hatchery. The HFH crew also stocked fish for Grace Hatchery.

## **FISH FEED**

The fish produced during 1999 were fed a total of 384,655 lbs of feed acquired from Rangen Inc, Moore-Clark, and Bioproducts (Appendix 5). The net weight gained during 1999 was 333,025 lbs, which resulted in an overall conversion of 1.16 lbs of feed to produce one lb of fish, not including the weight of the mortalities (Appendix 5).

## **HATCHERY IMPROVEMENTS**

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

- A traveling screen was installed to remove vegetation from Riley Creek. A chain-link fence was installed around the screen and a protective shelter was constructed over it. A trailer was constructed for moss removal.
- One-inch plastic mesh was installed around the perimeter of the west raceways to keep small birds out.
- All the buildings on the facility, including residences, were painted.
- Major plumbing repairs were completed in residences #1, #2, and #5.
- Some of the domestic line was replaced and valves installed.
- A new WMA and hatchery sign was completed and installed.
- Fall prevention screens were installed over the tailraces to comply with OSHA safety regulations.
- The remaining dirt floor in the vehicle storage garage was cemented.
- Aluminum screens were fabricated to assist in loading fish.
- New dam boards were installed in the headrace of the Riley Creek raceways.
- A new hauling trailer was constructed for moving fish from the nursery raceways.

## **PUBLIC RELATIONS**

The HFH received a large number of visitors and sportsmen throughout the year. An estimated 22,000 visitors toured the facility and used the surrounding public grounds this year. The 37 acres of HFH property is 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 uses.

Hatchery personnel were called upon to give numerous school tours during the spring and fall, and several talks were presented to regional personnel and civic groups. The hatchery sponsored a free-fishing day clinic here and had about 300 participants. The Magic Valley Bassmasters, Hagerman Boy Scouts, Hagerman National Hatchery personnel and personnel from the Department helped out. Pepsi, Falls Brand Meats, Zebco, and Trader Jack's Sporting Goods in Hagerman contributed to the event.

A monthly article was contributed to the Hagerman newspaper, the "Fish Wrap" to keep local anglers informed about fishing hotspots, tips, and miscellaneous fishing adventures.

## **FISH TAGGING OPERATIONS**

The HFH crew participated in several tagging operations during the year, in which 223,000 fish were marked. Kamloops rainbow trout (Hayspur origin) were stocked into Brownlee Reservoir at Farewell Bend. The purpose of the right ventral clip (RV) marking was to differentiate fingerling rainbow trout from bull trout. This was paid for and is being investigated by Idaho Power biologists.

About 124,600 six-inch rainbow trout (Hayspur origin) were grit-marked using red and green dyes to evaluate their contribution to the fishery in the Snake River east of American Falls.

Approximately 94,000 coho salmon were also grit-marked to evaluate their contribution to the fishery in Cascade Reservoir.

About 35,370 ad-clipped catchables were stocked into Blackfoot Reservoir in the spring, and another 36,090 were stocked in the fall to determine return-to-creel information.

Another study was initiated to determine harvest returns between three hatcheries: Hagerman, Nampa, and American Falls. Hagerman had two study sites: Tucker Springs and Riley Creek. About 200 fish from each water source (four total) were jaw-tagged and stocked into 16 lakes. The results will be evaluated this winter.

## **ACKNOWLEDGMENTS**

Thanks to the permanent HFH staff of Walt Rast and Kevin Price; to the transport operator Ken Taylor; and to the temporaries Larry Miller, Johnny Fabela, Tom Kent, and Kelly Buhler.

The regional fisheries and enforcement personnel Fred Partridge, Dave Teuscher, Richard Holman, and Gary Hompland also deserve our gratitude. Also, thanks to Niagara Springs and Magic Valley Fish hatcheries personnel for their cooperation this year.

Appendix 1. Costs of fish produced at Hagerman Fish Hatchery 1999. Costs reflect all costs budgeted except capital outlay, and include \$52,813 of the fish transportation budget.

Species/Strain	Length/ Inches	Number Produced	Weight/ Pounds	Cost to produce and plant	Cost/ 1,000
<b>FISH ON HAND JANUARY 1, 1999</b>					
Hayspur rainbow trout	8.38	62,800	15,700		
Hayspur rainbow trout	1.63	190,974	371		
Kamloops (TL) rainbow trout	6.52	903,708	112,929		
Kamloops rainbow trout	11.10	16,830	9,900		
Kamloops rainbow trout	1.80	259,447	647		
Rainbow trout (T9, Hayspur)	1.00	<u>56,385</u>	<u>22</u>		
<b>Totals</b>		<b>1,490,144</b>	<b>139,569</b>		
<b>FISH PLANTED</b>					
Hayspur rainbow trout	9.80	35,810	14,133	\$6,811.17	\$190.20
Kamloops rainbow trout, (TL)	9.65	659,939	249,215	\$123,601.11	\$187.29
<b>Subtotals</b>	<b>9.65</b>	<b>695,749</b>	<b>263,348</b>	<b>\$130,412.28</b>	<b>\$187.44</b>
Hayspur rainbow trout	4.91	931,365	49,650	\$88,754.97	\$95.30
Kamloops rainbow trout	4.65	644,110	29,200	\$58,130.52	\$90.25
Rainbow trout (R1, Hayspur)	5.78	146,274	12,675	\$16,409.16	\$112.18
Steelhead rainbow trout	3.30	134,000	2,000	\$8,582.42	\$64.05
Coho Salmon (WA.)	4.65	385,754	13,540	\$34,814.06	\$90.25
Rainbow trout (T9, Hayspur)	4.90	<u>23,915</u>	<u>1,225</u>	<u>\$2,274.36</u>	<u>\$95.10</u>
<b>Subtotals</b>	<b>Average</b>	<b>4.73</b>	<b>2,265,418</b>	<b>\$208,965.49</b>	<b>\$92.24</b>
<b>Total Planted</b>	<b>Average</b>	<b>6.63</b>	<b>2,961,167</b>	<b>\$339,377.77</b>	<b>\$114.61</b>
<b>FISH ON HAND DECEMBER 31, 1999</b>					
Hayspur rainbow trout	1.40	165,198	197	\$4,488.73	\$27.17
Kamloops (TL) rainbow trout	5.92	751,764	78,064	\$86,376.29	\$114.90
Kamloops (TL) rainbow trout	10.56	24,150	12,075	\$4,949.63	\$204.95
Kamloops rainbow trout	1.42	457,600	574	\$12,611.47	\$27.56
Rainbow trout (T9, Troutlodge)	4.75	166,405	8,074	\$15,340.92	\$92.19
Rainbow trout (T9, Hayspur)	8.76	<u>16,170</u>	<u>4,620</u>	<u>\$2,749.19</u>	<u>\$170.02</u>
<b>Totals</b>	<b>5.26</b>	<b>1,581,287</b>	<b>103,604</b>	<b>\$126,516.23</b>	<b>\$80.01</b>
<b>TOTAL FISH PRODUCED</b>					
Planted in 1999		2,961,167	371,638		
On Hand December 31, 1999		1,581,287	103,604		
<b>Totals</b>		<b>4,542,454</b>	<b>475,242</b>	<b>\$465,894.00</b>	<b>\$102.56</b>
From other hatcheries		963,902	2,648		
On Hand January 1, 1999		1,490,144	139,569		
<b>Total gained</b>		<b>2,088,408</b>	<b>333,025</b>		

\*Catchables (8 inches and longer)

\*Fingerlings (less than 8 inches)

Appendix 2. Fish distribution from Hagerman Fish Hatchery, 1999.

<b>Percent of number planted by Region</b>									
	<b>Number</b>	<b>Pounds</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Catchables &gt;8 inches</b>									
Hayspur rainbow trout	35,810	14,133	-	-	94.4	5.6	-	-	-
Kamloops rainbow trout (TL)	659,939	249,215	-	-	25.0	49.7	21.8	3.5	-
<b>Subtotal</b>	<b>695,749</b>	<b>263,348</b>	<b>-</b>	<b>-</b>	<b>28.6</b>	<b>47.4</b>	<b>20.7</b>	<b>3.3</b>	<b>-</b>
<b>Fingerlings &lt;8 inches</b>									
Hayspur rainbow trout	931,365	49,650	-	-	7.5	68.0	13.4	11.1	-
Kamloops rainbow trout	644,110	29,200	-	-	7.8	71.2	-	21.0	-
Rainbow trout (R1)	146,274	12,675	-	-	-	100.0	-	-	-
Steelhead rainbow trout	134,000	2,000	-	-	-	100.0	-	-	-
Coho Salmon	385,754	13,540	-	-	99.9	0.1	-	-	-
Rainbow trout (T9, TL)	23,915	1,225	-	-	-	100.0	-	-	-
<b>Subtotal</b>	<b>2,265,418</b>	<b>108,290</b>	<b>0.0</b>	<b>0.0</b>	<b>22.3</b>	<b>61.7</b>	<b>5.5</b>	<b>10.5</b>	<b>0.0</b>
<b>Total</b>	<b>2,961,167</b>	<b>371,638</b>	<b>0.0</b>	<b>0.0</b>	<b>23.8</b>	<b>58.3</b>	<b>9.1</b>	<b>8.8</b>	<b>0.0</b>

Appendix 3. Fish survival from eyed-egg to stocking, 1999.

<b>Species/Strain</b>	<b>Number planted</b>	<b>Eggs and Fry Received</b>	<b>Percent survival</b>
Kamloops trout, Troutlodge	814,239	1,339,040	60.81
Kamloops trout, Hayspur	644,110	1,373,353	46.90
Hayspur rainbow trout	967,175	2,381,681	40.61
Rainbow trout (R1 Hayspur)	24,399	63,228	38.59
Steelhead rainbow trout	134,000	269,742	49.68
Coho Salmon (WA.)	385,754	840,544	45.89
Rainbow trout (T9 Hayspur)	<u>23,915</u>	<u>99,382</u>	<u>24.06</u>
<b>Total</b>	<b>2,993,592</b>	<b>6,366,970</b>	<b>47.02</b>

Appendix 4. Number of eyed-eggs and fry received, species, and source for fish produced in 1999.

<b>Species/Strain</b>	<b>Eggs/Fry received</b>		<b>Source</b>
	<b>For Fish Planted</b>	<b>For fish on hand December 31, 1998</b>	
<b>Received as eggs</b>			
rainbow/Kamloops	1,339,040	1,121,190	Troutlodge, Washington
rainbow/Kamloops	935,801	764,904	IDFG Hayspur
rainbow/Hayspur	1,017,726	238,110	IDFG Hayspur
rainbow/sterile	-	211,700	Troutlodge, Washington
rainbow/sterile	99,382	31,550	IDFG Hayspur
coho	840,544	-	Lewis River Hatchery Wash. Dept. of Wildlife
Subtotal eggs	<b>4,232,493</b>	<b>2,367,454</b>	
<b>Received as fry</b>			
rainbow/R9 from Cabinet Gorge	150,750	-	IDFG Hayspur
rainbow/R9 from Magic Valley	1,128,575	-	IDFG Hayspur
kamloops (Hayspur) from Cabinet Gorge	310,922	-	IDFG Hayspur
Kamloops (Hayspur) from Magic Valley	42,000	-	IDFG Hayspur
rainbow/R1 from Hayspur	63,228	-	IDFG Hayspur
rainbow/R1 from Cabinet Gorge	169,260	-	IDFG Hayspur
steelhead/Niagara Springs	269,742	-	IDFG Niagara Springs
Subtotal fry	<b>2,134,477</b>	-	
<b>Total</b>	<b>6,366,970</b>	<b>2,367,454</b>	

Appendix 5. Fish feed used during Fish Year 1999 at Hagerman Fish Hatchery.

<b>Size</b>	<b>Source</b>	<b>Pounds</b>	<b>Cost/pound</b>	<b>Cost</b>
Str	Rangen	900	\$0.44	\$397.17
#1	Rangen	4,400	\$0.44	\$1,957.56
#1 TM	Rangen	25	\$0.59	\$14.82
#2	Rangen	24,550	\$0.44	\$10,879.33
#2 TM	Rangen	550	\$0.59	\$326.10
#3	Rangen	51,050	\$0.30	\$15,470.70
#3 TM	Rangen	600	\$0.59	\$355.74
#4 TM	Rangen	1,300	\$0.59	\$770.77
Str. Soft moist	Rangen	132	\$1.02	\$135.10
1/32 soft moist	Rangen	2,552	\$0.96	\$2,443.54
3/64 soft moist	Rangen	2,464	\$0.92	\$2,277.97
1/16 floating	Rangen	308	\$0.93	\$287.06
3/32 in, EXT450Float	Rangen	98,290	\$0.30	\$29,745.50
3/32 IN, TM	Rangen	950	\$0.51	\$485.36
5/32 in, EXT450Float	Rangen	<u>190,710</u>	<u>\$0.29</u>	<u>\$55,363.11</u>
<b>Subtotal</b>		<b>378,781</b>	<b>\$0.32</b>	<b>\$120,909.83</b>
#0	Moore-Clark	396	\$1.06	\$419.76
#1	Moore-Clark	836	\$1.06	\$886.16
#2	Moore-Clark	396	\$0.94	\$372.24
#2 Beta-glucans	Moore-Clark	88	\$1.95	\$171.60
#3	Moore-Clark	704	\$0.90	\$633.60
1.5	Moore-Clark	2761	\$0.48	\$1,325.28
1.5 Beta-glucans	Moore-Clark	<u>693</u>	<u>\$0.68</u>	<u>\$471.24</u>
<b>Subtotal</b>		<b>5,874</b>	<b>\$0.73</b>	<b>\$4,279.88</b>
<b>TOTAL</b>		<b>384,655</b>	<b>\$0.33</b>	<b>\$125,189.71</b>

Appendix 6. Summary of fish marked in 1999 at Hagerman Fish Hatchery.

Date Stocked	Species	Water	Number	Pounds	Clip
13-May	K1	Brownlee Reservoir	50,000	3,750	Right ventral
6/7-6/8	K1	Blackfoot Reservoir	42,000	14,000	35,370 adipose
10-Jun	R9	Snake R.--Shelley	49,000	4,900	Grit-marked
9-Jun	R9	Snake R.--Blackfoot	21,600	1,800	Grit-marked
9-Jun	R9	Snake R.--Tilden	54,000	4,500	Grit-marked
9/7&8	K1	Blackfoot Reservoir	36,090	12,100	Adipose
9/28-9/29	CO	Cascade Reservoir	<u>94,270</u>	<u>7,500</u>	Grit-marked
<b>Totals</b>			<b>216,600</b>	<b>28,950</b>	

Date Stocked	Species	Water	Number	Pounds	Clip
17-May	K1	Lava Lake	400	116	jaw-tagged
18-May	K1	Dierkes Lake	400	122	jaw-tagged
19-May	K1	Mountain Home Res.	400	120	jaw-tagged
20-May	K1	Dog Creek Res.	400	120	jaw-tagged
21-May	K1	Park Center Pond	400	120	jaw-tagged
24-May	K1	Sublett Reservoir	400	128	jaw-tagged
25-May	K1	Blair Trail Reservoir	400	126	jaw-tagged
26-May	K1	Cove Arm Reservoir	400	124	jaw-tagged
27-May	K1	Deep Creek Reservoir	400	124	jaw-tagged
1-Jun	K1	Little Camas Reservoir	400	124	jaw-tagged
2-Jun	K1	Roseworth Reservoir	400	126	jaw-tagged
3-Jun	K1	Manns Creek Reservoir	400	122	jaw-tagged
7-Jun	K1	Magic Reservoir	400	132	jaw-tagged
8-Jun	K1	Hawkins Reservoir	400	145	jaw-tagged
14-Jun	K1	Featherville Pond	400	134	jaw-tagged
18-Jun	K1	Upper Payette Lake	<u>400</u>	<u>138</u>	jaw-tagged
			<b>6,400</b>	<b>2,021</b>	

## Appendix 7. Fish stocked by Hagerman Hatchery from other sources, 1999.

DATE	SPECIES	NUMBER	POUNDS	LENGTH	SOURCE	DESTINATION
6-Jan	SS	80	53	13.8	CSI	Snake R. Centennial Park
6-Jan	SS	22	15	13.8	CSI	Snake R. above Pillar Falls
6-Jan	SS	18	12	13.8	CSI	Snake R. above Pillar Falls
21-Jan	SS	100	200	20.0	CSI	Snake R. Bliss Bridge
21-Jan	SS	170	340	20.0	CSI	Snake R. Box Canyon
3-May	SA	23,400	6,000	8.7	Niagara Springs Hatchery	Roseworth Reservoir
4-May	SA	25,970	7,000	8.9	Niagara Springs Hatchery	Salmon Falls Reservoir
4-May	SA	46,860	12,000	8.7	Niagara Springs Hatchery	C.J. Strike Reservoir
5-May	SA	20,500	5,000	8.6	Niagara Springs Hatchery	Mountain Home Reservoir
6-May	SA	25,010	6,100	8.6	Niagara Springs Hatchery	Oakley Reservoir
21-Sep	CC	3,000	60	4.0	Oklahoma	Dog Creek Reservoir
21-Sep	CC	1,000	20	4.0	Oklahoma	Dierkes Lake
21-Sep	CC	2,000	40	4.0	Oklahoma	Wilson Lake
21-Sep	CC	1,000	20	4.0	Oklahoma	Connor Pond
21-Sep	CC	1,000	20	4.0	Oklahoma	Emerald Lake
21-Oct	SA	169,400	4,600	4.1	Niagara Springs Hatchery	Lake Walcott – Raft R.
22-Oct	SA	195,523	2,000	3.0	Niagara Springs Hatchery	Lake Walcott – Raft R.
25-Oct	SA	63,120	2,600	4.7	Magic Valley Hatchery	Roseworth Reservoir
25-Oct	SA	48,700	1,975	5.1	Magic Valley Hatchery	Salmon Falls Reservoir
<b>TOTALS</b>		<b>626,873</b>	<b>48,055</b>			

**IDAHO DEPARTMENT OF FISH AND GAME**

**1999 ANNUAL REPORT**

**HAYSPUR FISH HATCHERY**

**Bob Esselman, Fish Hatchery Manager II  
Roger Elmore, Assistant Fish Hatchery Manager  
Russ Wood, 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. Three captive rainbow trout *Oncorhynchus mykiss* broodstocks are maintained on-station. These are the Hayspur strain, a Kamloops strain, and a Colorado River strain of rainbow trout. The HSFH personnel maintain a free on-site public campground, a general season pond fishery, and a trophy stream fishery.

The HSFH is located in Blaine County, approximately 40 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, vertical incubator stacks, isolation incubators, and egg picking apparatus. The HSFH has 20 early-rearing tanks; 12 covered 24-ft circular ponds, 6 small raceways, and 6 large production raceways.

Water sources include the covered Hayspur spring that supplies 3.0 to 5.5 cubic feet per second (cfs) at 52°F (11.6°C), three pumped artesian wells producing 5.0 cfs at 48°F to 52°F (8.9°C to 11.6°C), and 7.4 cfs to 18 cfs of Loving Creek water at 33°F to 73°F (0.6°C to 22.7°C). The spring and wellwater are both considered specific-pathogen-free (SPF) water supplies.

Three permanent employees (Fish Hatchery Manager II, Assistant Fish Hatchery Manager, and Fish Culturist) and 10 months of temporary biological aide time are assigned to the HSFH. Usually, three biological aides are hired for the spawning season.

## RAINBOW AND KAMLOOPS EYED EGG PRODUCTION

The 1999 spawning season was a ten-month project, with an egg-take of 12,024,587 green eggs during the period covered. Spawning begins in September and ends in June. Eggs were taken from 3,551 females. A total of 7,340,531 eyed-eggs were produced (Appendix 1). Photoperiod manipulation, or light control, has expanded "normal" spawn timing to more closely match egg production with eyed-egg requests. Only three-year-old and older rainbows and kamloops were manipulated. We have found two-year-olds respond poorly to photoperiod manipulation. Egg production was extended by two months (May and June) this season. Hayspur rainbow trout eyed-egg production totaled 3,904,120. Kamloops eyed-egg production totaled 3,429,190 and Colorado eyed-egg production totaled 32,397 (Appendix 1). Hagerman, Nampa, American Falls, Grace, Ashton, Mackay, and Clearwater hatcheries were shipped eggs per their requests. Magic Valley Fish Hatchery (MVFH) was shipped trout eggs destined for Hagerman. Value to the Department, at the current contract price of \$15.00/1,000 for regular eggs and \$25.00/1,000 for sterile eggs, equates to \$109,422.11 and \$12,535.89, respectively (Appendix 2).

## RE-DISTRIBUTION OF CATCHABLES

Fish requested for the Big and Little Wood drainages were reared at Nampa Fish Hatchery, hauled to HSFH, and stocked by HSFH personnel. Semi-tank and trailer loads were

hauled as needed to complete our requests. Area waters were stocked with 51,519 catchable-sized rainbow trout. In addition, 30,981 Colorado River strain fry were stocked into Challis Creek. Steelhead (B-run) totaling 1,000 and averaging 4.5 fpp were stocked into the Hayden Lake Ponds, and 1,000 steelhead (B-run) were stocked into Mosquito Flat Reservoir. The Colorado River strain broodstock consisted of 67 adults that were stocked into Gaver Lagoon, ending production of Colorado River rainbow at HSFH (Appendix 3).

## **FISH FEED**

Rangen Inc provided the 1/4-in brood feed. This food was ordered with 150-g/ton canthaxathin red additive to enhance egg color and other possible health benefits. Rangen Inc was the source of early rearing feeds, the food for catchables, and for replacement broodstock feeds (Appendix 4).

## **HATCHERY IMPROVEMENTS AND NEEDS**

Improvements to the HSFH during 1999 included:

- A section of the effluent line between the hatchery building and the brood pond was replaced.
- Safety railing was installed on top of the headbox.
- The computer printer was replaced.
- A boardwalk was installed along Loving Creek to control angler traffic and protect the riparian area.
- Donation tubes were fabricated and installed at both accesses to the campground.

Needs of the HSFH, listed in order of priority, are:

- Repair the roof of the office/crew quarters/shop building.
- Replace the domestic water system.
- Install an alarm system to monitor water levels and pump function.
- Replace roof of residence #1.
- Replace bird and mammal enclosure on small raceways.

## **BROODSTOCK MANAGEMENT**

The Hayspur rainbow trout (R9) replacement population was developed by using year-class crosses. One-male and one-female pairings were performed with 200 pairs. These adult fish were either sacrificed for pathogen workup or adipose clipped. Marked fish are used for production egg lots, but not used again for development of a replacement population.

Hayspur's Kamloops (K1) replacement population was developed by using three-year-old adults of mixed Trout Lodge/Skanes stock and a mixed-year-class population of four- to six-year-old adults of Trout Lodge stock. Fish used for the replacement population were sacrificed or marked to identify them. Marked fish are used for production egg lots, but not used again for development of a replacement population.

The Colorado River rainbow trout were discontinued. Fry were stocked into Mosquito Flat reservoir and adults were stocked into Gaver Lagoon. Westslope cutthroat from Conner Lake, British Columbia are scheduled to become part of the broodstock program in 2000.

Pathogen status was addressed through penicillin G injections, vaccinations and culling. All females were injected to reduce the chance of vertical transmission of Coldwater Disease (CWD). All one-year-old broodstock replacements were injected with a killed Flexibacter vaccine. This vaccine was developed using flexibacter cultured from Hayspur fish. Eggs are culled upon positive results from virology or bacteriological techniques. The goal is to effect pathogen status while maintaining genetic material. The trend is very encouraging, in that numbers of culled families was low. Only five sub-families total from both strains were culled this year.

## **PUBLIC RELATIONS**

Tours were provided to area schools. Bellevue Elementary, Burley Elementary, Hailey Elementary, Hemingway School (Ketchum), Little Annie's Day Care, Minico High School, Wood River High School, and two home-school groups were shown the life cycle of trout and had questions answered. Organized groups that were given tours included Flyfishers of Idaho, Good Sam RV Clubs, Carey Cub Scouts, Camp Rainbow Gold, College of Southern Idaho Aquaculture Program, and 4-H Clubs.

Naples, Wood River High School, Kellogg, Fairfield, Shelley Jr. High, Shelley High, Hobbs Middle School, Goodsell Elementary, Jerome Middle School, Murtaugh High School, Kimberly High School, East Minico, and Pioneer Elementary Schools were shipped eyed-eggs. Some of the resultant fry were stocked into Adopt-a-Stream projects. Salmon region biologists used ripe adults for spawning demonstrations and anatomy lessons at Challis High School, Leadore and Brooklyn Elementary. Gebhards Creek, at the Morrison Knudsen Nature Center, was shipped eyed-eggs for public viewing of the developmental stages of rainbow trout.

Approximately 7,000 individuals visited, camped, and/or fished on HSFH property. Gaver Lagoon continues to gain popularity among a variety of anglers including the physically challenged and children.

The HSFH campground benefited from the efforts of volunteer Camp Hosts. Travis and Sherry Dilleha volunteered time to answer questions, give directions, clarify regulations, tidy outhouses, clean up litter, provide fishing tips, assist with stocking fish, and generally enhance the image of the Department. Bud Purdy, a local rancher, supplied a grader and operator to level the road in the campground.

## **SPECIAL PROJECTS**

### **1999 Triploid (3N) Projects**

This year marked the shipping of production rather than experimental lots of eyed triploid rainbow (T9) eggs. Experimentation developed a protocol of heat shocking to produce triploid of sterile fish. Twenty minutes after fertilization (MAF), eggs were placed in a 26°C water bath for twenty minutes. Progeny were sampled at Washington State University. Induction of triploidy rates of 98% to 100% were not uncommon (see Appendix 5). A total of 571,487 eggs were shipped. When the same methodology was applied to the kamloop strain (K1), triploidy rates were less than desirable (Appendix 5). Evidently, there is a strain difference and induction is impacted. It was thought ambient temperature was the same and the methodology should cross over. Experimentation will continue on this methodology in 2000.

### **Loving Creek**

The fishery in Loving Creek has improved since a rehabilitation project in 1991. Effort and use by campers and visitors has increased as well. Foot traffic along the angler trail has degraded the riparian area. Damaged areas had a boardwalk built over them. Boards measuring 3-in x 1in x 12-ft were nailed to 6-in x 8-in x 24-in timbers to form walkways over impacted areas. A total of 220 feet were protected.

### **Miscellaneous**

The HSFH personnel assisted Region 4 staff with artificial simulated animal (ASA) duty, depredation complaints, and sharptail grouse trapping. Personnel assisted Region 7 (Salmon Region) with sampling Middle Fork of the Salmon tributaries for genetic and pathogen parameters. The sperm from kamloop trout were pooled and placed into ziploc baggies, three males per bag, and used at Henrys Lake to generate hybrids via delayed fertilization. Hayspur personnel performed thermal shocks to fertilized hybrid eggs at Henrys Lake.

## **ACKNOWLEDGMENTS**

The efforts of Biological Aides need to be recognized. Tom Kent, Mary Rosen, Dustin Kindt, Pat Taylor and Nathan Limbaugh worked hard and produced a lot of product to make fishing better.

The HSFH would like to thank the people who helped out during the spawning season: Mark Olson, Damon Keene, Jeff Sagerman, Rob Morris, Clark Gebhardt, friends Skip and Dave, Roger Elmore, Kurt Gindling, Mel Hughes and Margaret Oveson.

Appendix 1. Egg production summary of Hayspur Fish Hatchery, 1999.

<b>Species</b>	<b>Total green eggs<sup>a</sup></b>	<b>Total eyed eggs</b>
Kamloops rainbow trout	5,378,890	3,429,190
Hayspur rainbow trout	5,430,870	3,904,120
Colorado River rainbow trout	49,833	32,397
T9's (R9's 3N)	514,394	229,860
KT's ( K1's 3N)	531,851	317,973
Broodstock replacement	118,749	84,311
<b>Totals</b>	<b>12,024,587</b>	<b>7,997,851</b>

<sup>a</sup>Total is displaced (volumetric) of both good and bad eggs taken in 1999.

Appendix 2. Eyed egg shipment summary from Hayspur Fish Hatchery, 1999.

<b>Hatchery</b>	<b><sup>a</sup>Species</b>	<b>Total eggs shipped</b>	<b><sup>b</sup>Estimated value</b>
American Falls	R9	1,131,748	\$16,976.22
	K1	94,016	\$1,410.24
Ashton	R9	201,190	\$3,017.85
Clearwater	R9	521,581	\$7,823.72
	T9	119,757	\$2,993.93
Grace	R9	48,783	\$731.75
	K1	299,032	\$4,485.48
	T9	63,980	\$1,599.50
Hagerman	R9	754,134	\$11,312.01
	K1	1,350,026	\$20,250.39
	T9	10,970	\$274.25
	KT	24,478	\$611.95
Mackay	K1	466,604	\$6,999.06
Magic Valley	R9	621,065	\$9,315.98
	K1	351,442	\$5,271.63
Nampa	R9	670,439	\$10,056.59
	K1	391,856	\$5,877.84
	T9	30,033	\$750.83
	KT	250,817	\$6,270.43
<sup>c</sup> Other	R9	5,766	\$86.49
	KT	1,400	\$35.00
	K1	356,147	\$5,342.21
	RR	30,981	\$464.72
<b>Totals</b>		<b>7,796,245</b>	<b>\$121,958.07</b>

<sup>a</sup>R9=Hayspur rainbow trout, K1=Kamloops rainbow trout, T9=sterile R9, KT=sterile Kamloops

<sup>b</sup>At contract value of \$15.00/1,000 eggs, and \$25.00/1,000 sterile eggs.

<sup>c</sup>Eggs used for educational programs, or Big Wood River stocking.

Appendix 3. Hayspur Fish Hatchery stocking summary, 1999.

<b>Fish size</b>	<b>Number of fish</b>	<b>Pounds of fish</b>
Catchables*	51,519	19,758
Steelhead (SB) smolts	9,000	2,000
Fry	30,981	579
<b>Totals</b>	<b>91,500</b>	<b>22,337</b>

\*Include adult brood fish stocked (68 fish at 325 pounds)

Appendix 4. Hayspur Fish Hatchery Feed Summary, 1999.

<b>Rangens</b>				
<b>Date</b>	<b>Size</b>	<b>Amount /pounds</b>	<b>Cost</b>	
3/15/99	1/4 in. Brood pellet	13,920	\$	4,245.60
5/28/99	1/4 in. Brood pellet	13,080	\$	3,989.40
8/3/99	1/4 in. Brood pellet	10,100	\$	2,979.50
10/12/99	1/4 in. Brood pellet	9,640	\$	2,843.80
12/13/99	1/4 in. Brood pellet	11,880	\$	3,623.40
<b>Total</b>		<b>58,620</b>	<b>\$</b>	<b>17,681.70</b>

<b>Rangens</b>				
<b>Date</b>	<b>Size</b>	<b>Amount /pounds</b>	<b>Cost</b>	
1/13/99	Extruded 450 floating 5/32	1,000	\$	305.00
2/5/99	Extruded 450 floating 5/32	750	\$	228.75
3/15/99	TM Medicated 5/32	250	\$	127.73
4/15/99	Trout grower #4 crumble	50	\$	15.43
	Trout/Salmon starter #2	50	\$	22.48
	Idaho #3 Grower	100	\$	30.85
	Extruded 450 floating 5/32	500	\$	152.50
5/24/99	Extruded 450 floating 5/32	1,000	\$	305.00
5/28/99	Trout grower #4 crumble	50	\$	15.43
	Trout grower coarse crumble	150	\$	46.28
6/14/99	Idaho #3 Grower	50	\$	15.43
	Trout grower #4 crumble	100	\$	30.85
7/6/99	Extruded 450 floating 3/32	100	\$	32.25
7/20/99	Extruded 450 floating 5/32	1,000	\$	305.00
7/27/99	Extruded 450 floating 3/32	200	\$	64.50
	Trout grower #4 crumble	100	\$	30.85
	Trout grower coarse crumble	200	\$	61.70
8/3/99	Extruded 450 floating 5/32	500	\$	143.75
9/16/99	Extruded 450 floating 3/32	200	\$	61.50
	Extruded 450 floating 1/8	500	\$	143.75
11/8/99	Extruded 450 floating 3/32	200	\$	61.50
11/29/99	Extruded 450 floating 3/32	250	\$	76.88
	Extruded 450 floating 1/8	250	\$	71.88
12/13/99	Trout/Salmon starter #1	50	\$	21.80
	Trout/Salmon starter #2	50	\$	21.80
12/21/99	TM Medicated 1/8	100	\$	48.43
<b>Totals</b>		<b>7,750</b>	<b>\$</b>	<b>2,441.32</b>

<b>Moore Clark</b>				
<b>Date</b>	<b>Size</b>	<b>Amount /pounds</b>	<b>Cost</b>	
8/6/99	Nutra Fry 2.0	110	\$	63.80
8/6/99	Nutra Fry 2.5	110	\$	61.60
<b>Totals</b>		<b>220</b>	<b>\$</b>	<b>125.40</b>

Appendix 5. Triploid Production at Hayspur Fish Hatchery, 1999.

<b>DATE</b>	<b>STRAIN</b>	<b>GOOD EGGS</b>	<b>BAD EGGS</b>	<b>TOTAL</b>	<b>% EYE-UP</b>	<b>% TRIPLOID</b>	<b>SHIPPED TO:</b>
1/7/99	R9	56,838	26,111	82,949	69	98	Grace
2/25/99	R9	7,142	8,023	15,165	47	100	Grace
2/25/99	K1	29,000	22,093	51,093	57	67	Grace
3/4/99	R9	35,448	35,854	71,302	50		Hagerman
3/24/99	R9/K1 Mix	280,850	223,189	504,039	56	92	Nampa
5/12/99	R9	3,050	24,186	27,236	11	100	Nampa
11/25/99	R9	115,542	27,750	143,292	81		Clearwater
12/23/99	R9	43,617	17,647	61,264	71	100	Nampa/Mackay
	Total	571,487					

**IDAHO DEPARTMENT OF FISH AND GAME**

**1999 ANNUAL REPORT**

**MACKAY FISH HATCHERY**

**Douglas Young, Fish Culturist  
Robert Hoover, Assistant Fish Hatchery Manager  
Phil Coonts, Fish Hatchery Manager 1**

## INTRODUCTION

The Mackay Fish Hatchery (MFH) is a specialty fish production facility located approximately 12 miles north of Mackay, in Custer County, Idaho. The hatchery produces salmonids of various species and strains, from 1- to 16-inches in length, for statewide distribution. Funding is obtained under contract from the Dingall-Johnson Act for wages, and from state license monies for fish feed and operational costs.

Three full-time and two part-time employees who share 18 months of temporary time man the hatchery. Wages, including benefits, cost \$121,700 for the permanent employees and \$29,200 for the temporary employees. The operating budget for the calendar year January through December 1999 was \$62,590. Included in the year's production were 17 lots of fish, comprised of 6 species and 11 different strains.

Rainbow trout *Oncorhynchus mykiss*

Arlee (Ennis NFH, MT) 3 year-classes  
Kamloops (Troutlodge, WA)  
Hayspur (Hayspur SFH)  
Hayspur steriles (Hayspur SFH)

Cutthroat trout *O. clarki*

Westslope (McCall SFH)  
Henrys Lake (Henrys Lk. SFH) 2 year-classes  
Yellowstone (Jackson NFH, WY)

Brown trout *Salmo trutta*

Crawford (Paint Bank SFH, VA)

Rainbow x cutthroat trout hybrids

Henrys Lake cutthroat females x Hayspur SFH rainbow males

Kokanee salmon *O. nerka kennerlyi*

Early (Deadwood Res.) 2 year-classes

Grayling *Thymallus arcticus* 3 year-classes

## **WATER SUPPLY**

Water for hatchery production is provided by three collection springs in an artesian area at the hatchery. The area is fenced off and has been dug out, then filled with cobblestone. The water volume available for hatchery production remained consistent with previous years. Flows ranged from 18 to 24 cubic feet per second (cfs). Lowest flows occurred during February, while highest flows occurred during July. Since the 1983 earthquake, temperatures have varied between the three different springs supplying the hatchery, one at 50°F, one at 51°F, and one at 54°F. Incubation temperature is 51°F.

## **HATCHERY IMPROVEMENTS**

- Driveways about the hatchery were covered with crushed gravel.
- The clean-and-waste ditch was cleaned out and deepened.
- New covers were constructed for the large raceways headrace.
- Covers were installed on any open water areas in the spring area.
- The stocking tank removal system was made safer for the 1-ton pickup truck.
- Reconstruction of the utility trailer was completed.
- The shop walls were repaired, washed, and painted.

## **FUTURE NEEDS**

- Residence #3 needs new siding and a new roof.
- Remodel the garage for residence #2, and build a garage for Residence #3.
- Residence #2 needs new siding installed.
- A fish-proof screen should be installed at the exit of the large raceway tailrace to keep feral fish out of the tailrace.

## **FISH STOCKED**

Fingerlings of various species and strains were stocked in six regions of the state (Appendix 1). These put-grow-and-take fish numbered 2,759,350 and weighed 35,900 lbs.

Catchable rainbow trout (10+ inches) were stocked in the Upper Snake and Salmon regions. These put-and-take fish numbered 79,830 and weighed 50,611 lbs. Catchable brown trout, numbering 7,267 and weighing 3,450 lbs, were planted in Region 6. Catchable cutthroat trout, numbering 4,870 and weighing 1,975 lbs, were stocked into Regions 6 and 7. Catchable browns, cutthroat, and grayling were donated to the Morrison-Knudsen Nature Center waters.

The hatchery also reared 14,000 cutthroat fry for planting into ten high mountain lakes in Regions 4 and 6. Four-wheelers, pack-stock, and foot travel were used to plant these fish.

The fish transport trucks assigned to MFH made 113 fish-stocking trips during the year, traveling 28,000 miles, and planting 33 different waters. Transport tankers assigned to Fish Transportation hauled nine loads of fish for the hatchery during the year.

### **FISH FEED**

A total of 98,030 lbs of fish feed was used during the year at a cost of \$35,164. Feed conversion averaged 1.0 lbs of feed for every lb of fish produced. Conversion ranged from a high of 1.18 for the 1997 browns to a low of 0.79 for the 1999 Arlee rainbows. The browns were intentionally overfed in an effort to decrease competition and maintain fin quality. Naturally occurring foods supplemented hatchery foods, enabling the low conversions to occur. Average feed cost per lb of fish produced was \$0.36.

State contract required that Rangen feeds be used exclusively. Semi-moist starters were used for some species, but most of the feed used was the dry diet. Fish health and performance showed no ill effects from the Rangen brand. All feeds used and amounts are shown in Appendix 3.

### **FISH MARKING**

Of the 1 million cutthroat planted into Henrys Lake, 101,200 were adipose-fin clipped prior to stocking. For the study occurring this season comparing sterile and regular catchable performance in Ririe Reservoir, left ventral fins from 8,660 sterile trout and right ventral fins from 8,900 regular trout were clipped. A crew of three did the clipping during the second week of August.

### **PUBLIC RELATIONS**

Approximately 800 people toured the hatchery during the year. The hatchery's remote location does not attract large crowds of people. Most visitors come to fish in the diversion pond below the hatchery. Scheduled tours were given to Mackay and Arco elementary classes, Boy Scout groups, and FFA groups. The hatchery is assisting Mackay High School in an aquaculture program. The hatchery crew and the local conservation officer participated in Idaho's "Adopt a Highway" litter control program. Six miles of Highway 93 along Mackay Reservoir are cleaned biannually. Assistance was also provided for the Hunter Education Program at Mackay School.

## **ACKNOWLEDGEMENTS**

During 1999, the Mackay Fish Hatchery crew included: Biological Aides Adam Broussard, and Bob Evans. Without their excellent assistance, we could not have accomplished all that we did during the year. Their care and concern enabled the hatchery to produce the quality of fish we do. Mel Hughes, Fish Culturist, Doug Young, Fish Culturist, Mick Hoover, Assistant Hatchery Manager, and Phil Coonts, Hatchery Manager, round out the hatchery's personnel.

## Appendix 1. Fish Production at Mackay Fish Hatchery, January 1, 1999 to December 31, 1999.

Species/strain	Lot	Source	Received As	Fish Number	Pounds	Yield Number	Yield Pounds	Destination
				Received or Carried Into 99*	Received or Carried Into 99*			
Arlee rainbow trout	8-EN-RA	Ennis NFH	eyed-eggs	80,000 *	36,360 *	80,370	50,611	99 catchables
Arlee rainbow trout	9-EN-RA	Ennis NFH	eyed-eggs	174,000 *	961 *	133,100	32,200	00 catchables
Arlee rainbow trout	0-EN-RA	Ennis NFH	eyed-eggs	167,000	eyed-eggs	105,400	400	01 catchables
Hayspur rainbow/sterile	9-R9-T9	Hayspur H	eyed-eggs	15,000	eyed-eggs	8,603	2,705	00 catchables
Kamloops rainbow	0-U-ID-K1	Hayspur H	eyed-eggs	457,000	eyed-eggs	320,000	220	00 Reg 1
Shasta rainbow	9-EN-R5	Ennis NFH	eyed-eggs	344,500	eyed-eggs	306,275	7,325	99 Island Pk
Henry's Lk cutthroat	8-U-ID-C3	Henry's Lk H	eyed-eggs	6,300 *	2,275 *	6,269	3,078	99 + 00 catchables
Henry's Lk cutthroat	9-U-ID-C3	Henry's Lk H	eyed-eggs	1,600,000	eyed-eggs	1,270,200	7,800	99 Reg 5,6,7
Yellowstone cutthroat	9-C4	Jackson NFH	eyed-eggs	15,000	eyed-eggs	10,895	135	experimental
rainbow/cuthroat hybrid sterile	9-U-ID-RC	Henry's Lk H Hayspur H.	eyed-eggs	320,000	eyed-eggs	203,550	3,600	99 Henry's Lk
westslope cutthroat	8-U-ID-C2	McCall H.	fingerlings	28,000*	71 *	23,760	1,555	99 Payette, Fish Lk
Deadwood kokanee	8-U-ID-KE	Deadwood Res	green eggs	1,000,000 *	1,000 *	914,962	14,430	99 Reg 3,5,6
Deadwood kokanee	9-U-ID-KE	Deadwood Res	green eggs	1,600,000	650	1,300,000	3,300	00 Reg 1,2,3,4,5,6
grayling	7-GR	Ashton H.	fry	27 *	25 *	23	23	99 Nature Center
grayling	8-GR	Ashton H.	fry	35 *	15 *	32	15	00 Nature Center
grayling	9-GR	Ashton H.	fry	45	10	40	5	01 Nature Center
Crawford brown trout	7-PB-BN	Paint Bank, VA	eyed-eggs	7,300 *	3,100 *	7,267	3,450	99 Reg 7

Appendix 2. Mackay Hatchery Stocking Summary, 1999.

<b>Lot Number</b>	<b>Number Planted</b>	<b>Lbs. Planted</b>	<b>Size Planted</b>
8-EN-RA	80,370	50,611	catchable
9-EN-R5	306,275	7,325	fingerling
9-EN-RA	41,600	750	fingerling
7-PB-BN	7,267	3,450	catchable
8-U-ID-C2	23,760	1,555	fingerling
8-U-ID-C3	6,269	3,078	catchable
9-U-ID-C3	1,270,000	7,800	fingerling
8-U-ID-KE	914,962	14,433	fingerling
9-U-ID-RC	203,550	3,600	fingerling
9-U-ID-C3	14,000	30	fry

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**Total Fish Planted**

	<b>Numbers</b>	<b>Pounds</b>
High Mtn. Fry -	14,000	30
Fingerlings -	2,759,346	35,901
Total Catchables -	93,366	57,139
rainbow -	79,830	50,611
cutthroat -	6,269	3,078
browns -	<u>7,267</u>	<u>3,450</u>
<b>Totals -</b>	<b>2,866,712</b>	<b>93,070</b>

Appendix 3. Mackay Fish Feed Used, January 1 1999 through December 31, 1999

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	<b>Pounds Used</b>	<b>Feed Cost</b>
<b>Rangen Fish Feeds</b>		
Semi-moist starters		
0 swim-up -	528	\$ 562
1/32 "cut" -	2,302	2,204
1/32 -	1,350	1,330
Trout and Salmon Starter		
0 swim-up -	500	239
#1	2,550	1,216
# 2 -	10,050	4,794
# 3 -	15,350	4,874
# 4 -	4,400	1,443
Extruded 450 Pellets		
Ext 3/32 -	10,100	3,232
Ext 5/32 -	50,900	15,270
	<u>100,580</u>	<u>\$ 36,380</u>
<b>Total Pounds</b>	<b>100,580</b>	<b>Total Cost \$ 36,380</b>

Appendix 4. Mackay Fish Hatchery Lot Histories, 1999 Totals, except as noted.

Lot	Fish Planted or On-Station	Pounds Gained	Pounds Feed	conv.	\$ Feed	Feed Cost Per lb fish	Feed Cost Per fish
8-EN	79,830	29,010	31,904	1.1	10,033	0.34	0.125
'98 totals		<u>21,600</u>	<u>23,381</u>		<u>9,308</u>		
		50,610	55,285	1.08	19,341		
9-EN	92,000	32,200	25,591	0.79	7,850	0.24	0.085
9-R5	306,275	7,325	8,060	1.1	4,000	0.54	0.013
9-R9/T9	8,603	2,700	2,824	1.04	693	0.25	0.08
9-RC	203,550	3,600	3,085	0.85	1,519	0.42	0.007
9-C3	1,255,199	7,800	7,494	0.96	3,750	0.48	0.002
8-C3	6,269	3,078	3,125	1.06	854	0.29	0.13
8-C2	23,760	1,129	1,235	1.09	406	0.35	0.017
'98 totals		<u>426</u>	<u>581</u>		<u>261</u>		
		1,555	1,816	1.16	667	0.44	0.028
8-KE	914,962	14,430	14,759	1.02	5,852	0.4	0.006
7-BN	7,267	989	1,185	1.2	396	0.4	0.05
'98 totals		<u>2,520</u>	<u>2,975</u>		<u>935</u>		
		3,509	4,160	1.18	1,331	0.39	0.18
9-C4	10,913	133	100	0.75	40	0.3	0.003
9-KE	1,300,000	2,200	2,050	0.93	1,707	0.77	0.001

**IDAHO DEPARTMENT OF FISH AND GAME**  
**1999 ANNUAL REPORT**

**McCALL SUMMER CHINOOK HATCHERY**  
**(Resident Program)**

**Steven T. Kammeyer, Assistant Hatchery Manager**

## INTRODUCTION

McCall Summer Chinook Fish Hatchery (MFH) is located within the city limits of McCall, approximately ¼-mile downstream of Payette Lake, adjacent to the North Fork of the Payette River. The U.S. Army Corps of Engineers (USACE) renovated this facility in 1979. The primary hatchery objective is to produce one million summer chinook salmon *Oncorhynchus tshawytscha* smolts annually. Anadromous funding is provided through the Lower Snake River Compensation Program (LSRCP). Facility secondary objectives pertain to resident programs. Funding for the resident fisheries program (April 1 to September 30) is provided through Idaho Department of Fish and Game (Department) license sales revenue.

Payette Lake provides all of the MFH water requirements. 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 8-tray Heath-style incubation stacks. Additional incubators may be plumbed into six of the early rearing vats if more incubation space is required. Rearing of resident fry is accomplished utilizing several of the 14 indoor vats. Each early rearing vat is 40-ft long x 4-ft 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) which 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 Kamloops rainbow trout *O. Mykiss*, rainbow x cutthroat hybrids, golden trout *O. Aguabonita* and rear grayling *Thymallus arcticus* fry for stocking into high mountain lakes in regions 1, 2, 3B, and 3M.
- Redistribute up to 80,000 catchable-size rainbow trout.
- Operate Fish Lake satellite trap for the collection of westslope cutthroat trout eggs.
- Maintain and provide technical assistance for Payette Lake net pens.
- Maintain the statewide high mountain lakes stocking request database.
- Provide assistance to McCall sub-regional personnel as needed and when available.

## FISH PRODUCTION

### Fish Lake Broodstock

Fish Lake was established in 1978 as a naturalized broodstock source for westslope cutthroat trout with the introduction of 2-year-old fish from Rochat Pond. Trapping and spawning operations began in 1980, but the first eggs were not collected until 1981. Numbers of spawning fish increased and peaked in 1986. Since that time, numbers of adults returning to the trap have steadily fallen off. This past year resulted in the fewest fish trapped to date. It appears that poor water quality may be the limiting factor for fish survival in this system.

Fish Lake is located approximately seven miles west of McCall. It is on Little Creek, a tributary to the Little Salmon River. The satellite facility is equipped with two 6-ft x 22-ft x 4-ft concrete holding ponds, a 4-ft x 12-ft x 4-ft fish trap, and a velocity barrier. Westslope cutthroat trout trapping and spawning operations typically extend from early April through May.

The Fish Lake trap operated from April 16 through June 1, 1999. A total of 72 westslope cutthroat trout were trapped. Of these, 30 were males (41.7%) and 42 were females (58.3%). Average total lengths for males and females were 299.6 mm and 324.3 mm, respectively (Figure 1).

Of the 72 adults that returned in 1999, 44 were marked with fin clips (61.1%). The most common mark observed was for 3-year-old adipose-clipped fish (34 fish or 77.3% of all marked fish). This group of fish (BY96) overwintered at MFH and then was released in the spring of 1997. Replacement broodstock released after BY96 have not received any identifying fin-clips. The percentage of marked fish returning to the trap has generated a significant, and continuing, trend indicating a loss of natural recruitment to the population.

Spawntaking operations took place from May 10 to May 27, 1999. A total of 41 females were spawned in 6 lots to produce a green egg take of 33,860 eggs (Appendix 1). Average fecundity was 825.9 eggs per female. The average eye-up for these eggs was 92.6%, resulting in 31,370 eyed-eggs. Of these, approximately 30,500 were initially ponded and available for hatchery programs. Due to the poor number of females returning to the trap, no green females were released above the trap to spawn naturally.

On May 18, 1999, Fish Lake was stocked with 5,760 westslope cutthroat trout from brood year 1998. These unmarked fish had overwintered at Mackay Fish Hatchery and averaged 14.4 fpp (147.3 mm TL) when stocked. Additional replacement broodstock fry from the 1999 spawntake were released back into Fish Lake on September 27, 1999. These unmarked westslope cutthroat trout numbered 10,500 and were scatter-planted around Fish Lake at a size of 370 fpp (50.1 mm TL).

Joel Patterson assisted Paul Janssen in electrofishing Fish Lake on October 12 in order to determine a population size for the lake, which could then be compared with results obtained in 1998. Only one sampling date was used, as the capture mark applied in the fall of 1998 was still visible and could be used to calculate population size. Of the 91 westslope cutthroat trout

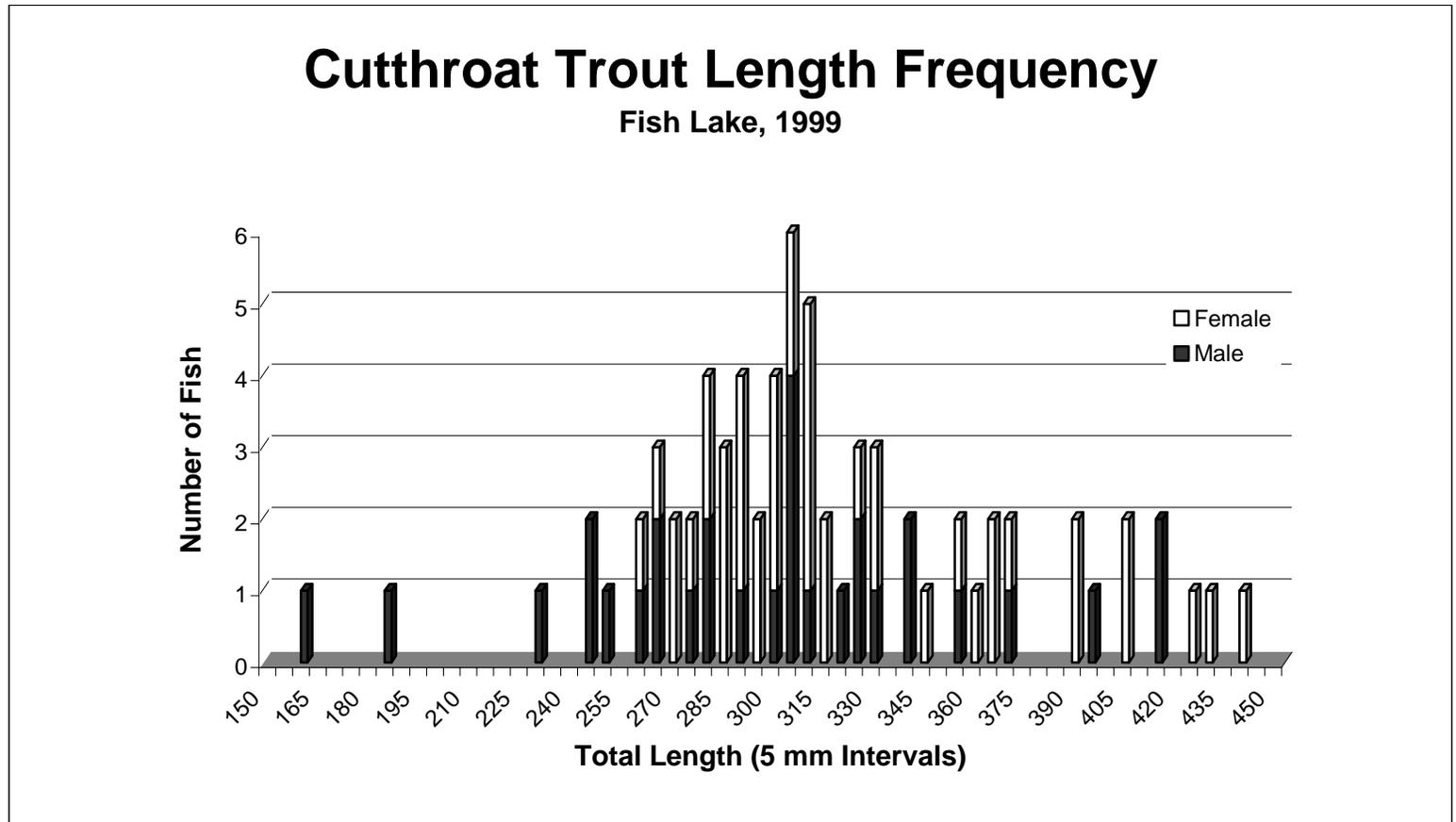


Figure 1. Cutthroat Trout Length Frequency, Fish Lake, 1999.

collected, 27 were marked from the 1998 sampling. This was used to determine a maximum population size for the lake of 711 +/- 75 fish (95% CI). The main assumption made for this calculation was that all fish marked in 1998 were still available for sampling in 1999. Should any of these fish have been lost then the population size calculated would be smaller. Sampling in 1998 indicated a population size of 877 +/- 93 fish (95% CI). Numerous 0+ fry, released two weeks earlier, were observed but not collected. However, few of the replacement broodstock that were released in the spring were observed.

Currently it is anticipated that Fish Lake operations will be phased out within the next two or three years due to poor westslope cutthroat trout performance.

## **High Mountain Lake Stocking**

Size is critical to the efficiency of the high mountain lake stocking program. A desirable stocking size is 600 to 1,200 fpp; however this may not be achieved due to logistical concerns of surrounding the various species stocked. Fish stocking is coordinated to ensure all species requested in a general area are stocked at the same time to reduce the total amount of flight time required to complete fish plants.

A total of 254 lakes were stocked with 273,525 fry in 1999 (Appendix 2). Of these, 243 lakes were stocked using fixed-wing aircraft at a cost of \$8,959.50 in flight time. The average cost to stock a lake in this manner was \$36.87. Volunteers stocked 11 lakes in the McCall area. This saved the Department approximately \$295 in comparable flight costs. Feed costs for all resident fry reared at McCall Hatchery totaled \$368.90.

Species available and used for high mountain lake stocking in 1999 included: westslope cutthroat, domestic Kamloops (both sterile and viable), golden trout and arctic grayling (Appendix 3). Means of stocking included volunteer backpacking, aerial plants, and truck plants. All primary mountain lake flights were conducted within the six-month resident funding period.

Additional fry stocked out in 1999 included: 9,450 adipose-clipped westslope cutthroat to Brundage Reservoir, 30,000 westslope cutthroat to Payette Lake, 34,200 domestic Kamloops to North Fork Payette River, Lake Fork Creek, and Davis Reservoir; and 5,200 grayling to Granite and Summit lakes (Appendix 5).

## **Catchable Redistribution**

From May 21 to September 2, 1999 a total of 69,395 catchable-size domestic Kamloops were stocked into 33 bodies of water in the McCall vicinity. Additional catchables transferred for Free Fishing Day clinics numbered 350 for Council and 1,000 for Rapid River Hatchery. All of these fish were reared at Nampa Fish Hatchery (NFH) and then transferred to MFH. Transportation costs to bring catchables from NFH to McCall Hatchery totaled \$3,065. Hatchery personnel drove 2,835 miles on 73 stocking trips to complete catchable stocking requests at an approximate cost of \$2,725.

In addition to routine catchable redistributions, MFH personnel also assisted McCall sub-regional personnel by transporting tiger muskie from Columbia Basin Fish Hatchery, WA and stocking them into Winchester Lake (100), Little Payette Lake (200), and Cascade Reservoir (280). Hatchery personnel also transported and stocked smallmouth bass collected by Trout Unlimited (TU) members in Hells Canyon into Little Payette Lake.

### **Payette Lake Net Pens**

This was the ninth year for net pen production of trout in Payette Lake. The McCall chapter of TU continues to provide the primary community support for this project and has committed their organization to this project through the year 2000. Members of TU organized a schedule for several local businesses that fed the fish in the net pens daily. This year, TU sponsored two fishing clinics for area children and families to fish off the net pen docks. In doing so, several large rainbows from 1998 net pen production were caught by enthusiastic beginning fisherman. Many northernpike minnows *Ptychocheilus oregonensis*, which congregate around the net pens, were also harvested.

Two net pens (20-ft x 20-ft x 28-ft) were used to rear 6,200 domestic Kamloops. These fish were placed into the nets on June 14, 1999. Average fish size at this time was 3.0 fish per lb (fpp) or 9.8 inches TL. Trout from the net pens were released on September 15, 1999. These fish had grown well and averaged 1.49 fpp or 12.4 inches TL. No significant mortality occurred during the rearing cycle. Total production from the net pens was 6,200 domestic Kamloops or 4,150 lbs (2,085 lbs gained). To accomplish this, a total of 2,850 lbs of feed was fed out resulting in a conversion of 1.37 (Appendix 4).

Total costs incurred as part of the net pen project were estimated at \$1,850. Community businesses and TU contributed approximately \$500 in donated labor to this project. The cost estimate for MFH was \$1,350, which included personnel costs for setup, removal, cleanup, and purchase of all feed used (Appendix 5).

### **Hatchery/ Program Improvements**

Discussions held with TU and the City of McCall Manager on September 22, 1999 demonstrated continued support for the Payette Lake net pen project. Trout Unlimited has offered to replace one net pen and purchase two new belt feeders for net pen operation in the year 2000. The McCall City Council changed its ordinance to allow fishing from the net pen docks when the net pens are not in place and operating. The City Parks and Recreation Department has indicated it will explore ways to improve the main dock leading to the net pens to improve public safety.

## **Public Relations**

Assistance was provided to TU and Department fishery personnel by transporting and stocking smallmouth bass collected in Hells Canyon into Little Payette Lake. One fish stocking presentation was made for approximately 60 outdoor school sixth-graders on Lake Cascade. Hatchery personnel participated in fishing clinics sponsored by TU on the Payette Lake net pen docks. Once again MFH personnel assisted with Free Fishing Day activities held at Rowland Pond, and conducted numerous tours through the hatchery facility for visitors.

## **ACKNOWLEDGEMENTS**

Accomplishments made through the resident program in 1999 could not have been done without the support of the entire staff at McCall Summer Chinook Hatchery. I wish to thank Gene McPherson, MFH Fish Manager II, for his advice and assistance on various resident projects as well as for generously allowing Anadromous-funded personnel to work on resident projects. Individuals assisting on resident endeavors at MFH in 1999 included: Joel Patterson, MFH Fish Culturist, and seasonal temporaries Bob Welch, Randy Martinez, Ryan Kinzer, Jeff Kay and Tyler Hollow

Appendix 1. Westslope cutthroat trout spawn take results, Fish Lake, McCall Fish Hatchery, 1999.

<b>Females Spawned</b>	<b>Green eggs Taken</b>	<b>Percent Eye-up</b>	<b>Eyed-eggs Available</b>	<b>Average Fecundity</b>
41	33,860	92.6	31,370	825.9

Appendix 2. Species stocked out, by region as part of the high mountain lake program, 1999.

	<b>Westslope Cutthroat</b>	<b>Domestic Kamloop</b>	<b>Domestic Kamloops (Sterile)</b>	<b>Arctic Grayling</b>	<b>Golden Trout</b>	<b>All Species Stocked</b>	<b>Total Lakes Stocked</b>
<b>Panhandle</b>	57,225	15,500		13,500	2,000	88,225	34
<b>Clearwater</b>	17,000	1,000				18,000	28
<b>Southwest (3B)</b>	36,500	5,750		10,000	2,500	54,750	84
<b>Southwest (3M) Salmon</b>	39,550	28,350 <sup>a</sup>	1,750	13,000	3,700	86,350	67
		750	18,800 <sup>b</sup>	5,750 <sup>c</sup>	900	26,200	41
<b>TOTALS</b>	150,275	51,350	20,550	42,250	9,100	273,525	254

<sup>a</sup> includes 500 fry (1 lake) stocked as make-up for mortality.

<sup>b</sup> includes 7,300 fry (2 lakes) stocked as excess and 500 fry (1 lake) stocked as make-up for mortality.

<sup>c</sup> includes 750 fry (1 lake) as make-up for mortality.

Appendix 3. Percent of mountain lake requests met by region and species, 1999.

	<b>Westslope Cutthroat</b>	<b>Domestic Kamloops</b>	<b>Domestic Kamloops (Sterile)</b>	<b>Arctic Grayling</b>	<b>Golden Trout</b>	<b>All Species</b>
<b>Panhandle</b>	100.9%	100.0%		117.4%	47.1%	100.3%
<b>Clearwater</b>	100.0%	100.0%				100.0%
<b>Southwest (3B)</b>	99.3%	109.5%		200.0%	45.5%	104.3%
<b>Southwest (3M) Salmon</b>	108.4%	100.0%	100.0%	173.3%	56.9%	107.9%
		100.0%	115.8%	200.0%	60.0%	123.9%
<b>TOTALS</b>	102.2%	101.0%	113.3%	156.6%	51.3%	104.8%

Note: only includes fry stocked as part of mountain lake program. Does not include additional lakes stocked with excess fry or mortality make-ups.

Appendix 4. Feed usage and conversion data, McCall Fish Hatchery, 1999.

Species	Stocked	Feed Used	Weight Gained	Conversion	Cost per lb Gain	Cost per 1000 fish	Total Feed Cost
<b>Fry Distribution</b>							
Westslope Cutthroat (Fish Lake)	23,200	56.8	52.5	1.08	\$1.23	\$2.78	\$ 64.58
Westslope Cutthroat (Commercial)	177,025	68.3	65.2	1.05	\$1.10	\$0.44	\$ 77.66
Domestic Kamloops	85,550	109.3	86.0	1.27	\$1.45	\$1.45	\$124.27
Domestic Kamloops (Sterile)	20,550	49.4	36.3	1.36	\$1.55	\$2.73	\$ 56.17
Arctic Grayling	47,450 <sup>a</sup>	36.8	31.2	1.18	\$1.34	\$0.88	\$ 41.84
Golden Trout	9,100	3.85	1.72	2.24	\$2.55	\$0.48	\$ 4.38
<b>TOTALS</b>	<b>362,875</b>	<b>324.45</b>	<b>272.92</b>				<b>\$368.90</b>
Note: Data includes all fry stocked.							
<b>Payette Lake Net Pens</b>							
Domestic Kamloops (BY98)	6,200	2,850	2,085	1.37	\$0.43	\$145.95	\$904.88

<sup>a</sup>Does not include mortality of 11,850 fry occurring during transport to McCall Fish Hatchery.

Appendix 5. Total production and distribution at McCall Fish Hatchery, 1999.

Species	Eggs/ fish Received	Fish Stocked out	Lbs Gained	Cost per lb gained	Cost/ 1000 fish Stock/ produced
<b>High Mountain Lake Program</b>					
Westslope Cutthroat	221,370	150,275	43.52		
Domestic Kamloops	110,300	71,900	69.23		
Arctic Grayling	49,650 <sup>a</sup>	42,250	24.13		
Golden Trout	15,265	9,100	1.72		
Subtotal	396,585	273,525	138.60	\$ 64.64	\$ 32.76
Note: Cost based on flight time expenses of \$8,959.50.					
<b>Payette Lake Net Pen Program</b>					
Domestic Kamloops (BY98)	Included in Catchable Trout	(6,200) <sup>b</sup>	2,085	\$ 0.89	\$ 298.39
Subtotal	Redistribution below	(6,200) <sup>b</sup>	2,085	\$ 0.89	\$ 298.39
Note: Cost based on program expenditures and contributions of \$1,850 (IDFG \$1,350; Trout Unlimited and Volunteers \$500).					
<b>Catchable Trout Redistribution (including free fishing day transfers and net pen loading)</b>					
Domestic Kamloops (BY98)		76,945			\$ 77.46
Subtotal		76,945	Catchables are not fed at MFH		\$ 77.46
Note: Cost based on IDFG transport expenses of \$5,960 (McCall Hatchery \$2,895; Nampa Hatchery \$3,065).					
<b>Additional Fry Redistribution (includes Fish Lake brood stock replacement)</b>					
Westslope Cutthroat	Included in Mountain Lake Program above	49,950	74.16	\$ 2.04	\$ 3.02
Domestic Kamloops		34,200	53.11	\$ 2.63	\$ 4.09
Arctic Grayling		5,200	7.10	\$ 11.99	\$ 16.38
Subtotal		89,350	134.37	\$ 2.80	\$ 4.21
Note: Cost based on partitioned feed expenses and stocking transportation costs (C2's = \$ 151.05, K1's = \$ 139.74, GR's = \$ 85.16).					
<b>TOTAL</b>	<b>474,497</b>	<b>439,820</b>	<b>2,357.97</b>	<b>\$ 17.83</b>	<b>\$ 95.62</b>
Note: Cost based on average McCall Fish Hatchery resident budget of \$ 42,054.					

<sup>a</sup> Does not include mortality of 11,850 fry occurring during transport to McCall Hatchery.

<sup>b</sup> Catchables loaded into net pens are included in catchable trout redistribution totals.

**IDAHO DEPARTMENT OF FISH AND GAME**

**1999 ANNUAL REPORT**

**MULLAN FISH HATCHERY**

**Mary Van Broeke, Bio-Aide**

## INTRODUCTION

The Mullan Fish Hatchery (MUFH) is a resident species redistribution station located four miles east of Mullan, Idaho. The Shoshone County Sportsmen's Association owns the MUFH buildings and grounds, and Shoshone County funds maintenance of the physical plant. The Idaho Department of Fish and Game (Department) funds personnel costs, production costs, and equipment with fishing and hunting license fee revenue. The facility operates as a satellite of the Clark Fork Fish Hatchery (CFFH) with one temporary employee on-station year-round.

The hatchery receives water from the South Fork of the Coeur d'Alene River and the Little North Fork of the Coeur d'Alene River. Two 6-ft x 65-ft concrete raceways, one 12-ft x 65-ft concrete raceway, 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 dirt pond has been developed as a show pond complete with a visitor's access deck, information board, and a feed dispenser.

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

## HATCHERY IMPROVEMENTS

There were no major hatchery improvements during 1999. The facility continues to operate with minimal funding for operations only.

The main hatchery building (a large two-story structure), the shop, and the garage were all prepped and painted by the temporary employee assigned to the hatchery.

## FISH STOCKED OR TRANSFERRED

A total of 52,361 (19,611 lbs) rainbow trout nine-inches long were released in the waters of the Coeur d'Alene, St. Joe, and St. Maries river drainages from May to September, to support a put-and-take fishery. All trout released from the MUFH were reared at the CFFH. Fish were reared to full release size and then transported from Clark Fork to Mullan for redistribution. The hatchery worker loaded the fish into a 500-gallon truck-mounted tank and delivered them to streams, lakes, and ponds. The distribution schedule required 8- to 10-hour trips, four to five days each week during the summer season. While lake stocking is usually accomplished with single large releases, river stocking is much more labor intensive. Even relatively small numbers of fish require multiple stops to distribute the fish effectively for sportsmen's access. A new plant site, Murray Pond was also added in 1999.

## **PUBLIC RELATIONS**

The MUFH is located adjacent to a popular Shoshone County "day-use" park. As a direct result, the hatchery receives a much higher visitor load than would be expected because of its remote location. The hatchery serves the highest number of visitors of any hatchery in the Panhandle Region, with over 9,000 people touring the grounds in 1999. The hatchery also hosted the Chrysler/Jeep Jamboree and the Silver Valley Good Samaritan RV rally. People from across the nation attended these functions.

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 and St. Joe River drainages.

On June 12, one of the dirt rearing ponds at the hatchery was stocked with rainbow trout to provide fishing for a Free Fishing Day clinic. Personnel from the Panhandle Region and the Shoshone County Sportsmen's Association provided training and advice to more than 143 participants that day, with every angler catching their 2-fish limit of rainbow trout. The location was particularly beneficial in providing access for persons having limited mobility. As usual, the Fishing Clinic received good reviews in the local newspaper and boosted the Department's image in the Silver Valley.

## **SPECIAL PROJECTS**

### **Water Quality Studies**

For the fourth year, MUFH assisted in a rearing and survival assessment for westslope cutthroat trout *O. clarki lewisi* and rainbow trout in South Fork Coeur d' Alene River water. This work is part of a major research project evaluating toxicity and water quality degradation following mining activity in the Silver Valley. Personnel from Environmental Services for Industry and Government (EVS) conducted the study. Fish for the study were obtained from wild, adult cutthroat that were caught by local sportsman from the Coeur d' Alene River. The fish were then spawned, the eggs were incubated, and the resulting fry were used in the study, which will be completed in the summer of 2000.

### **Hatchery Disease Evaluation**

Over 50 wild fish (brook trout and cutthroat trout) were captured from the south fork of the Coeur d' Alene River above and below MUFH and tested for Whirling Disease *Myxobolus cerebralis* in 1999. Pathology tests did not detect *M. cerebralis* in any of the fish sampled.

**IDAHO DEPARTMENT OF FISH AND GAME**

**1999 ANNUAL REPORT**

**NAMPA FISH HATCHERY**

**Rick Alsager, Fish Hatchery Manager II  
Dan Baker, Assistant Fish Hatchery Manager  
Bob Turik, Fish Culturist**

## INTRODUCTION

Nampa Fish Hatchery (NFH) is a resident trout rearing facility located one mile south of Nampa. The NFH water is supplied by eight pump-assisted artesian wells. A maximum flow of 40 cubic feet per second (cfs) of 59°F water is available for fish production. Built in 1975 and purchased by the Idaho Department of Fish and Game (Department) in 1982, fish rearing facilities consist of a hatchery building/dorm containing 4 early-rearing vats and a feed storage room. Outside rearing tanks including 16 fry raceways, 3 fingerling/broodstock raceways and 10 production raceways. Sixteen upwelling incubators are available for use in the fry raceways for eyed-egg incubation. A settling pond treats flows from the production units before discharge into Wilson Springs Ponds and Wilson Springs Drain.

## FISH PRODUCTION

The NFH produced 1,426,072 fish weighing 363,518 lbs during the 1999 fish year. Fish transferred to other hatcheries are included in the total number and lbs produced. Kamloops and rainbow trout *Oncorhynchus mykiss* comprised 97% of the fish stocked or transferred from NFH. In addition, brown trout *Salmo trutta* and Lahontan cutthroat trout *O. clarki hensawi* were produced at NFH during 1999 (Appendix 1). Another 3,000 fish weighing 350 lbs were produced at NFH and given to schools for dissection, and to department personnel for various research programs. These fish were not included in overall production numbers.

The total number of fry (Appendix 2), fingerlings (Appendix 3) and catchables (Appendix 4) stocked or transferred by NFH are listed by species/strain in each table. A total of 2,203,744 eyed-eggs were received during the 1999 fish year (Appendix 5).

## FISH STOCKED/TRANSFERRED

The NFH personnel stocked or transferred 1,943,835 fish, weighing 310,324 lbs during the 1999 fish year. A total of 388 stocking trips were made by NFH during 1999. The Southwest Region received 380,555 catchable trout weighing 138,847 lbs.

A total of 323,870 catchable trout (96,232 lbs) were transferred to other hatcheries throughout the state (Appendix 4). No broodstock fish were reared at NFH during the 1999 season.

## FISH TRANSPORTATION

Fish transport operators stationed at NFH stocked waters in all regions throughout the state of Idaho, and transferred fish to and from 25 different state and national fish hatcheries. They transferred endangered chinook salmon *Oncorhynchus tshawytscha* from Eagle Fish

Hatchery to the National Marine Fisheries Service's (NMFS) Manchester Fish Hatchery near Silverdale, WA. A trip was also made to Alva State Fish Hatchery in Oklahoma to pick up channel catfish *Ictalurus punctatus* fingerlings that were stocked in reservoirs throughout Idaho. Tiger muskie fingerlings were transported from Tionesta Fish Hatchery in Pennsylvania and stocked into Upper Snake and Magic Valley Regions. The transport operators stationed at NFH made 150 trips totaling 60,000 miles during 1999.

The NFH transport operators stocked rainbow trout fingerlings from Lyons Ferry Fish Hatchery (204,806 fish, 7,317 lbs) into the Clearwater Region waters. They also stocked chinook salmon and B-run steelhead smolts from Clearwater Fish Hatchery and assisted with the transportation of chinook salmon smolts from McCall Fish Hatchery. This fall, our drivers assisted in transporting and stocking surplus A-run adult steelhead from Oxbow Fish Hatchery; 300 steelhead were released into the Boise River and 300 steelhead were transported and released in the Little Salmon River.

The NFH transport operators also assisted the engineering department with personnel moves. They moved six personnel on four trips. Dick Bittick also assisted Howard Brown with preparing anadromous trucks for hauling smolts and picking up surplus equipment from Hanford, WA.

## **BROWN TROUT**

No brown trout eyed-eggs were received from Saratoga National Fish Hatchery during 1999. This program has been cut until further funding can be secured. A shipment of 56,290 eyed-eggs arrived in December of 1998. A total of 43,545 fry from this group were released in the Southwest region for an overall survival rate of 77.4% from eyed-egg to plant (Appendix 2).

## **LAHONTAN CUTTHROAT TROUT**

During the 1999 fish year, NFH stocked 11,400 Lahontan cutthroat trout into lakes and reservoirs located in the Southwest region. All Lahontan cutthroat eggs were received from Omak Fish Hatchery in Washington. The Southwest Region fish were stocked as fry (Appendix 2). Estimated survival from eyed-egg to fingerling was 21.51%. Low survival was due to handling problems during shipping. The first shipment of eyed-eggs was damaged during shipping by Federal Express, and was left in Oakland, CA. This group all died and the box was destroyed. The second shipment of 30,000 eyed-eggs also saw high egg mortality during shipment.

## **SPECIAL STUDIES**

The NFH assisted resident research biologists with a hatchery comparison study. Doug Megargle is heading this project and will repeat his study during the summer of 2000. The study

is set up to compare tag returns of catchable trout from three different hatcheries: Nampa, Hagerman, and American Falls hatcheries. Hagerman will also compare two separate water supplies. Doug Megargle will compare fish culture practices to determine what practices can be improved or changed to increase catchable trout return-to-creel. Results from this year and further information can be obtained from Doug Megargle at the Magic Valley Regional office.

The NFH also participated in a feed study. Representatives from Moore-Clark and EWOS feed companies offered to donate feed for the study. The NFH's normal feeding regime (Bio-Oregon starter/Rangen coarse crumbles) was compared with Moore-Clark and EWOS starter and grower feeds. Both feed companies performed very well with increased growth rates and more coloration in the fins. They also have natural additives in their feeds to boost immune systems. Even with better conversion and increased growth rates, it still is not feasible to use these feed companies. The cost per lb of fish produced was 41.9 cents for the control, 58.3 cents for EWOS and 54.6 cents for Moore-Clark. This study was stopped after the fingerlings reached 45 fish per lb. These companies are not capable of filling our bulk feed bins at this time. We repeated this trial finding similar results. For more detailed information contact Dan Baker at NFH.

## **FISH FEED**

A total of 345,200 lbs of feed was fed during 1999 at a cost of \$112,022 (Appendix 6). The average cost per lb of feed was 32.45 cents. Rangen Inc made up 98.3% of the feed purchased by weight, (Appendix 6). The overall feed conversion was .96 lbs of feed fed to produce one lb of fish.

## **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 remained strong this season. The fish size was slightly larger than last year. The fecundity dropped slightly but egg size was higher. Egg-take goals for 1999 were 1.75 million green eggs for Mackay Hatchery and 1.5 million for Dworshak Reservoir. These kokanee eggs were to be shipped to Cabinet Gorge Hatchery.

The kokanee population has rebounded in Deadwood Reservoir since the low run in 1996. The main weir across the Deadwood River was installed on August 17 after the water level had dropped to below the mouth of Wild Buck Creek. The kokanee weir structures were installed on Wild Buck, Trail and Basin creeks on August 18. Trapping and spawning ran smoothly throughout the run. The egg-take for Mackay Hatchery had been filled with six spawning days; 2,804 females were spawned achieving a total egg-take of 1,883,745 green eggs; average fecundity was 672 eggs per female.

With the large kokanee size (averaging 14.5 inches), and the high numbers of fish in the run, sportsmen have again found this to be a popular fishing destination. With the increased fishing pressure and the higher number of people using the area for recreation, we are having increasing problems with the general public tampering with the fish weirs. At one time or another during the kokanee run we had the public pulling pickets on all weirs allowing kokanee to pass upstream. The total duration and number of kokanee passing is unknown. The weirs along the Deadwood River were checked numerous times throughout the day. The weir across Trail Creek was checked every other day. Additional informational signs will be installed next season to help educate the public about our kokanee project.

Another problem arose with non-Department people camping in and around the Fish and Game camp. This made the campsite appear cluttered and unkempt. This also allowed access to the river through the Fish and Game camp. This created a security problem and also a problem with the sportsmen associating the general public as Fish and Game employees. The problem was greatest over the Labor Day weekend, when every available campsite was being used. We will contact the Forest Service next season to attempt to rectify this problem.

Conservation Officer Rob Braise was involved in a number of undercover operations, which allowed him to educate the sportsmen and women on the legal way to harvest kokanee.

Dale Allen received permission to remove the rock gabion across the Deadwood River. This gabion was installed to prevent kokanee salmon from migrating up the Deadwood River to spawn. The gabion is not needed to stop migration of kokanee, since the weir and trap site are set up downstream of the gabion and the numbers of kokanee allowed to pass upstream to spawn can be controlled by hatchery personnel. In October half of the gabion was removed allowing the river to go back to a natural flow. Removing the gabion will also eliminate part of the snagging problem of kokanee collecting behind the gabion.

The Morrison Knudsen Nature Center received 200 adult kokanee for viewing at the Nature Center ponds. The Salmon and Steelhead days received 100 pair of spawned out kokanee for educational purposes.

All fish were spawned at the trap site. A green egg yield of 1,883,745 eggs was taken from 2,804 females for a fecundity rate of 672 eggs/female (Appendix 8). Average total length of kokanee females was 376 mm, with males averaging 387 mm (Appendix 9).

Eggs were shipped to Mackay Hatchery via fixed-wing aircraft. Shipping techniques were similar to those used during previous years. The Department contracted the flying service with McCall Air Taxi.

## **HATCHERY IMPROVEMENTS**

Several important improvements were implemented at NFH during 1999:

- Landscaping around residences #2 and #3 was improved.

- The trim on the office and dorm/incubation buildings was painted.
- The upper shop and lawnmower storage buildings were painted.
- Storage shelving was added to the upper shop.
- The lower shop was restructured to allow for a safer more organized work area.
- Bird screen around the head ditch of the B-ponds was modified for better access of head ditch.
- Replaced wooden framed tailrace covers on the B-ponds with metal-framed screens.
- Repaired metal roof of upper shop building.

The following NFH improvements scheduled for 2000 include:

- Residences #2 and #3 need new siding.
- Continue work on visitor information center.
- Replace linoleum in Residence #1, #2 and #3.
- Paint ceilings in Residence #1.

## **PUBLIC RELATIONS**

As in past years, NFH was a focal point for many visitors, tours, and special groups. In 1999, an estimated 4,500 tourists visited NFH. Most visitors came through the late spring and summer months, although with year-round schooling, tours were scheduled every month except January. A total of 73 guided tours were given to area school, church, and Boy Scout groups. The NFH is becoming more involved in the job shadow program. During 1999, 10 students participated in one- or two-day job shadow programs. Three slide show presentations were given to area schools and churches. The disabled veterans were allowed to fish the settling pond five times during the summer months. Seven 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 two reservists, hosted the Free Fishing Day clinic, which saw 350 visitors/fishermen, with an estimated 900 fish caught. The largest fish caught was a five-pound rainbow trout and several more weighed over three pounds, including a three-pound brown trout. Free Fishing Day at NFH was again a big success and will be continued in the future. The "kids only" session from 8:00 a.m. to noon continued was very popular and successful. Assistance on fish culture programs was provided to many area schools. Fry and fingerlings were provided for living streams and catchables were provided for dissection in several classes.

## **ACKNOWLEDGEMENTS**

The NFH staff for 1999 included Rick Alsager, Fish Hatchery Manager II; Dan Baker, Assistant Fish Hatchery Manager; Bob Turik, Fish Culturist; Gary Ady and Dick Bittick, Fish Transport Operators. Bio-aides for 1999 included Steve Jones, Chad Knee, and Greg Kollman. Mike VanLeuven and Chuck Kiester assisted with the Kokanee spawning operation. Six area students assisted with fin clipping projects during 1999. Two high school students assisted hatchery personnel through a work-study program. Volunteers have also helped on a number of projects throughout the year, donating over 190 hours of time.

Appendix 1. Fish requested and produced at Nampa Fish Hatchery, 1999.

Species/Strain	Size	Production goal	Actual production	% of goal achieved
Lahontan cutthroat trout (C6)	1-3 inches	103,000	11,400	11.07% <sup>a</sup>
Brown trout (BN)	2-3 inches	0	43,545	NA
<sup>b</sup> Rainbow trout (R1)	3-5 inches	1,176,000	1,111,875	94.55%
Triploid rainbow trout (T9)	4-6 inches	7,000	11,365	162.36%
Kamloops trout (K1)	8-12 inches	755,500	779,285	103.15%
Rainbow trout (R9)	8-12 inches	17,000	40,610	238.88%
<b>Totals</b>		<b>2,058,500</b>	<b>1,998,080</b>	<b>97.06%</b>

<sup>a</sup> Eyed-eggs were damaged during shipping by Federal Express.

<sup>b</sup> Includes all rainbow trout fingerling production; Hayspur K1, Hayspur R9 and Trout Lodge K1.

Appendix 2. Fry production at Nampa Fish Hatchery, 1999.

Species/ Strain	Source and Source/Date	Number Received	Yield Number	Yield Pounds Egg	% Survival to plant	Destination
Brown trout	Saratoga 11/98	56,290	43,545	38.5	77.4%	Southwest Region
Lahontan cutthroat trout	Omak 5/99	30,000	11,400	14.24	38.0%	Southwest Region
<b>Totals</b>		<b>86,290</b>	<b>54,945</b>	<b>52.74</b>	<b>63.7%</b>	

Appendix 3. Fingerling production at Nampa Fish Hatchery, 1999.

Species/ strain	Source	Date	Number received	Yield number	Yield pounds	% Survival egg to plant	Destination
Rainbow trout/Kamloops trout	Haysur	11/98	719,440	460,011	14,530	63.94%	Southwest Region Magic Valley Region
Rainbow trout	Hayspur	12/98	150,565	128,064	1,650	85.06%	Magic Valley Region
Kamloops trout	Haysur	12/98	80,250	59,650	3,550	74.33%	Magic Valley Region Southwest Region
Triploid rainbow trout	Hayspur	1/99	25,798	10,275	544	39.83%	Southwest Region
Kamloops trout	Hayspur	3/99	65,740	49,000	3,500	74.54%	Clearwater Region
Rainbow trout/Kamloops trout	Haysur	5/99	320,500	359,685	9,945	112.23%	Upper Snake Region
Rainbow trout	Hayspur	6/99	2,070	1,220	44	58.94%	Magic Valley Region
Triploid rainbow trout	Hayspur	6/99	3,050	1,090	40	35.74%	Magic Valley Region
<b>Totals</b>			<b>1,367,413</b>	<b>1,068,995</b>	<b>33,803</b>	<b>78.18%</b>	

Appendix 4. Catchable production at Nampa Fish Hatchery, 1999.

Species/ strain	Source	Date	Number received	Yield number	Yield pounds	% Survival egg to plant	Destination
<sup>a</sup> Kamloops trout	Troutlodge	9/97	30,915	24,545	10,895	79.4%	Southwest Region
Kamloops trout	Troutlodge	6/97-9/97	1,000,000	729,740	249,260	73.0%	Southwest Region Transfer to McCall Transfer to Sawtooth Transfer to Clearwater Panhandle Region Transfer to Clark Fork Transfer to Hayspur
rainbow trout	Hayspur	10/98	85,996	64,610	16,157	75.1%	Southwest Region Transfer to Sawtooth Transfer to Hayspur
<b>Totals</b>			<b>1,116,911</b>	<b>818,895</b>	<b>276,312</b>	<b>73.3%</b>	

<sup>a</sup>Production fish carried over from 1998.

Appendix 5. Eyed-eggs received at Nampa Hatchery, January 1 to December 31, 1999.

Date received	Species/ strain	Source	Number	Destination	Expected yield	Cost/1,000 fish
1/19/99	triploid rainbow trout	Hayspur	25,798	SW Reg	20,000	N/C
3/29/99	Kamloops trout	Hayspur	77,440	C Reg	50,000	N/C
4/12/99	triploid rainbow trout	Hayspur	267,065	C Reg	150,000	N/C
5/3/99	rainbow trout / Kamloops trout	Hayspur	320,500	US Reg	250,000	N/C
5/17/99	rainbow trout / Kamloops trout	Hayspur	173,470	US Reg	140,000	N/C
5/19/99	Kamloops trout	Troutlodge	101,190	SW Reg, HSFH, MCFH	80,000	\$15.00
5/20/99	Lahontan cutthroat trout	Omak	30,000	SW Reg	20,000	N/C
6/2/99	rainbow trout	Hayspur	2,070	MV Reg	1,500	N/C
6/2/99	triploid rainbow trout	Hayspur	3,050	MV Reg	2,400	N/C
6/24/99	Kamloops trout	Troutlodge	538,416	SW Reg, HSFH, MCFH, SFH P Reg, CFH, CFFH	430,000	\$15.00
9/15/99	Kamloops trout	Troutlodge	173,635	SW Reg	140,000	\$15.00
10/26/99	rainbow trout	Hayspur	47,420	SW Reg, US Reg	35,000	N/C
12/6/99	rainbow trout	Hayspur	319,430	SW Reg	250,000	N/C
12/6/99	rainbow trout	Hayspur	124,260	SW Reg	100,000	N/C

Destination Key	
C Reg	Clearwater Region
CFFH	Clark Fork Fish Hatchery
CFH	Clearwater Fish Hatchery
HSFH	Hayspur Fish Hatchery
MV Reg	Magic Valley Region
MCFH	McCall Fish Hatchery
P Reg	Panhandle Region
SFH	Sawtooth Fish Hatchery
SW Reg	Southwest Region
US Reg	Upper Snake Region

Appendix 6. Nampa Hatchery feed costs, 1999.

Supplier/Source	Size/Type	# Boxes/Bags	Pounds	Price/lb	Feed Charge
<b>Biodiet</b>					
soft-moist	starter #1	7 boxes	308	1.05	\$324.10
soft-moist	starter #2	12 boxes	528	1.05	\$555.60
		<b>Totals</b>	<b>836</b>		<b>\$879.70</b>
<b>Rangen</b>					
Starter	Swimup	3 sacks	150	0.45	\$67.27
Dry crumble	Starter #1	35 sacks	1,750	0.46	\$808.50
Dry crumble	Starter #2	102 sacks	5,100	0.46	\$2,337.98
Dry crumble	Starter #3	129 sacks	11,450	0.32	\$3,647.62
Dry crumble	Starter #4	340 sacks	17,000	0.32	\$5,430.75
450 floating	1/16-in pellet	245 sacks	12,250	0.38	\$4,686.75
450 floating	3/32-in pellet	116 sacks	5,800	0.32	\$1,882.25
450 floating	1/8-in. pellet	350 sacks	17,500	0.31	\$5,489.88
450 floating	3/32-in pellet	bulk	41,370	0.31	\$12,927.00
450 floating	1/8-in pellet	bulk	210,310	0.30	\$63,970.17
450 floating	5/32-in.pellet	bulk	7,000	0.32	\$2,240.00
Dry crumble med	Starter #3	39 sacks	1,950	0.60	\$1,171.17
Dry crumble med	Starter #4	12 sacks	600	0.61	\$363.24
450 floating med	3/32-in pellet	45 sacks	2,250	0.51	\$1,157.70
450 floating med	1/8-in pellet	100 sacks	5,000	0.5	\$2,484.00
		<b>Totals</b>	<b>339,480</b>		<b>\$108,664.28</b>
<b>EWOS</b>					
Vextra crumbles	starter #0	2 sacks	110	0.48	\$52.80
Vextra crumbles	starter #1	5 sacks	275	0.38	\$105.60
Vextra crumbles	starter #2	6 sacks	330	0.32	\$105.60
Vextra crumbles	micro 1.2mm	13 sacks	715	0.37	\$264.00
Vextra crumbles	mini 1.5mm	23 sacks	1,265	0.25	\$316.80
		<b>Totals</b>	<b>2,695</b>		<b>\$844.80</b>
<b>Moore Clark</b>					
Nutra Plus	#0	4 sacks	176	\$ 1.00	\$176.00
Nutra Plus	#1	4 sacks	176	\$ 0.99	\$174.24
Nutra Plus	#2	8 sacks	352	\$ 0.94	\$330.88
Nutra Plus	#3	11 sacks	528	\$ 0.90	\$475.20
Clark's Fry	1.5mm	7 sacks	385	\$ 0.60	\$231.00
Clark's Fry w/proactive	1.5mm	12 sacks	660	\$ 0.68	\$448.80
		<b>Totals</b>	<b>2,277</b>	Freight	\$310.00
				<b>Credit</b>	<b>\$2,146.12</b>
					<b>&lt;\$538.56&gt;</b>
					<b>\$1,607.56</b>
		<b>Grand Totals</b>	<b>345,288</b>		<b>\$111,996.53</b>

Appendix 7. Total net fish production at Nampa Fish Hatchery, 1994 through 1999.

Year	Put-and-Take		Put-grow-and-take		Total Number	Total Pounds	Feed		Feed Conversion
	Number	Pounds	Number	Pounds			Pounds	Costs	
1994	308,023	146,978	793,065	55,014	1,101,088	201,992	220,544	\$72,340	1.09
1995	567,147	193,309	783,722	42,336	1,350,869	235,645	261,589	\$76,793	1.11
1996	694,659	212,011	950,412	34,271	1,645,071	246,282	262,902	\$91,893	1.07
1997	556,718	188,208	693,859	19,006	1,250,577	207,214	240,140	\$94,502	1.12
1998	692,706	228,006	2,172,659	22,901	2,865,363	250,907	267,782	\$96,338	1.07
1999	1,077,110	336,841	348,962	26,677	1,426,072	363,518	348,020	\$112,023	0.96

Appendix 8. Total cost of net fish production at Nampa Fish Hatchery, 1994 through 1999.

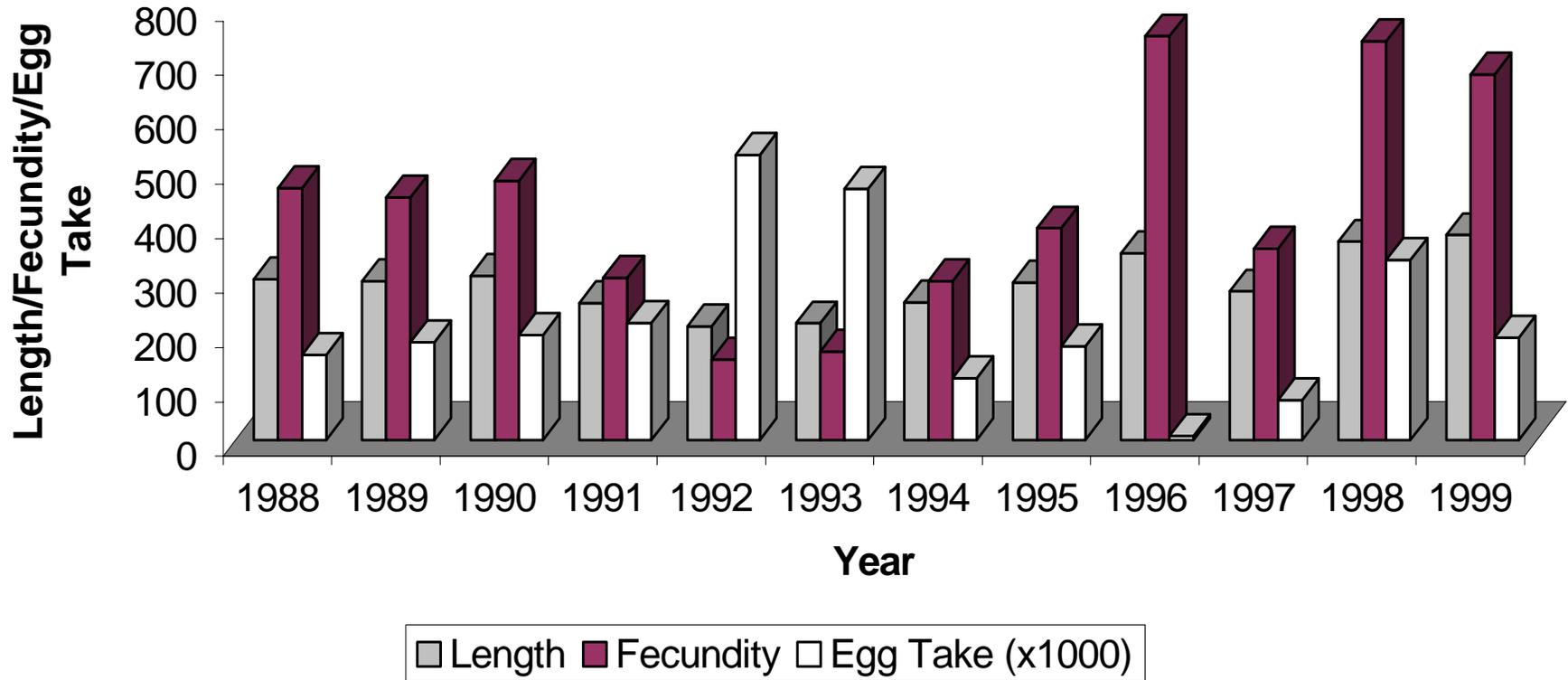
Year	Total cost through grow - out				Mean Length in inches	Total cost through stocking			
	Total Cost	Cost/1000 Fish	Cost/ Pound	Cost/ Inch		Total Cost	Cost/1000 Fish	Cost/ Pound	Cost/ Inch
1994	\$258,010	\$234.32	\$1.28	\$0.029	8.06	\$291,650	\$264.87	\$1.44	\$0.028
1995	\$271,156	\$200.77	\$1.15	\$0.033	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

Appendix 9. Kokanee egg-take at Deadwood Reservoir, Nampa Fish Hatchery, 1999.

Lot Number	Spawn date	Female spawned	Green eggs	Eyed Eggs	% eye-up
<b>Mackay</b>					
1	8/27/99	699	436,590	297,199	68.07%
2	8/31/99	561	355,943	281,405	79.06%
3	9/3/99	404	303,563	190,619	62.79%
4	9/7/99	532	347,234	269,990	77.75%
5	9/10/99	378	276,590	219,527	79.37%
6	9/15/99	230	163,825	149,994	91.56%
	<b>Total:</b>	<b>2,804</b>	<b>1,883,745</b>	<b>1,408,734</b>	<b>74.78%</b>

Appendix 10. Kokanee spawning length, fecundity, and egg-take (x1000), Nampa Fish Hatchery, 1988 – 1999.

### Kokanee Spawning Spawning Summary (1988-1999)



**IDAHO DEPARTMENT OF FISH AND GAME**

**1999 ANNUAL REPORT**

**SAWTOOTH FISH HATCHERY**

**Roger Elmore, Fish Culturist  
Margaret Oveson, Biological Aide**

## INTRODUCTION

Sawtooth Fish Hatchery (STFH) 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 the STFH is to trap, spawn, raise, and release spring chinook salmon *Oncorhynchus tshawytscha*. Also, adult steelhead are trapped and spawned, with the eyed-eggs and fry being sent to other hatcheries for hatching and growout. In 1990, a program to stock rainbow trout *Oncorhynchus mykiss* into the surrounding area waters for improved angling opportunities began. In 1999, STFH personnel stocked high mountain lakes with westslope cutthroat trout *Oncorhynchus clarki lewisi*. All high mountain lakes were stocked with fry.

## FISH STOCKING

Nampa Fish Hatchery (NFH) supplied STFH with rainbow trout (K1 and R9 strain) for stocking. The total of 85,049 fish were received at STFH and 72,463 fish were stocked. Based on 40 sample counts done on fish destined for lakes and ponds, fish stocked averaged 2.70 fish per pound (fpp) and 9.78 inches (248 mm) in length. Based on 44 sample counts done on fish destined for the Salmon River, Valley Creek, and the Yankee Fork Ponds, fish stocked averaged 2.68 fpp and 9.79 inches in length. The majority of the fish, totaling 36,000, were stocked into the main Salmon River (Appendix 1). National Marine Fisheries Service (NMFS) permit #908, which allows the river to be stocked, does not allow fish greater than 10 inches (250 mm) in length to be stocked into the Salmon River, Valley Creek, and the Yankee Fork Ponds. Adipose fin clipping has marked all fish stocked at these sites. Fish regulations allow only marked fish to be kept, thereby protecting wild rainbow trout.

All fish were adipose clipped by personnel at the Nampa Hatchery. Fish were clipped and then delivered to STFH 21 days later to allow for withdrawal of MS-222 so the fish would be safe for human consumption.

Fish feed was purchased from Rangen Inc. A total of 6,000 pounds of 1/8"-size pellets was fed throughout the course of the summer. Total cost of fish feed was \$1,888.66. Tourists purchased \$1,000.00 of feed through the coin feeders which helped to offset the feed cost.

Pettit Lake was stocked with 3,000 Hayspur strain (R9) adipose clipped rainbow trout. This was done to determine how many fish survive overwinter and what impacts, primarily predation, they may have on young sockeye salmon. The research is being conducted by the Sho-Ban Tribes.

This year the STFH had a Resident Fish Intern, Steve Kish. Steve worked in cooperation with the Department and the Sho-Ban Tribes on collection of trout stomachs from the Yankee Fork Ponds. The Yankee Fork Ponds received 4,000 rainbow trout over the course of four different trips. Each group of 1,000 fish was uniquely marked for

evaluation during the roving creel survey. Steve also conducted a roving creel survey at Yankee Fork Ponds, Squaw Creek Pond and Kelly Creek Pond.

New for 1999 was the stocking of Blue Mountain Meadow Pond, which is located on the Challis Golf Course located in Challis, Idaho. The pond was built as a cooperative effort between the Department and the City of Challis for use as a children's fishing pond.

Weekly notices informing the public of the whereabouts of the latest stocked locations are distributed to the local businesses and are posted at the STFH. Also, a repeating message containing stocking information and current news about STFH can be heard over the local radio transmitter. Stocking information is available by dialing the 1-800-ASK-FISH phone number.

The *Fishing Sawtooth Valley* brochure got its third revision in as many years and continues to improve each year. A total of 5,000 copies were printed and about 4,000 were distributed in 1999. This brochure provides valuable information about where to catch fish in the area, as well as color pictures to educate the public about protected species, such as bull trout. A short narrative describing the plight of anadromous fish is included. The back of the brochure has a map indicating where STFH stocks fish. This helpful brochure serves the approximately one million visitors who visit the Sawtooth National Recreation Area each year.

Once again, STFH sponsored a Kid's Fishing Day at the Sawtooth Display Pond on Free Fishing and Camping Day on Saturday, June 12, 1999. The perfect weather encouraged approximately 60 kids to participate in the fun. Most of the kids caught their limit of six fish using fishing poles, bait and lures provided by the Department's I&E Bureau and the Salmon Region. The Free Fishing Day account was used to provide snacks and drinks for the kids while they watched their fish being cleaned. Kurt Schilling, STFH Assistant Manager, put together this successful program. Several other Department employees helped out including: Mel Hughes-Fish Culturist, Gary Gadwa-Stanley C.O., Rusty Anderson-Stanley C.O., Ken Hartz-Department Reservist, and Bio-Aides Summer Macy, Lisa Ashby, John Graves, and Kurt Gindling. Other helpers on Saturday included Cpl. Huff- Idaho State Police, and Chris Cullen-Custer County Deputy Sheriff.

### **MOUNTAIN LAKE STOCKING**

The STFH personnel stocked high mountain lakes in the Salmon Region with fixed-wing aircraft, or by hiking. A total of 79 lakes were stocked with 47,150 westslope cutthroat trout. Cost of stocking was \$1,313.00 or \$21.17 per lake. Volunteers stocked seventeen lakes by hiking to them, donating time to the Department. The remainder of the project was funded by resident state money with cooperation from the USFWS. The Westslope Trout Co. of Ronan, MT supplied the cutthroat trout eggs. This is a very popular program and allows anglers to take ownership in some of the local lakes.

## PLANS FOR 2000

Permit #908 expired on December 31, 1999; an application for renewal for a five-year period has been submitted. Numbers of fish stocked and stocking strategy for 2000 will be similar to 1999. A request for a permit to stock Redfish Lake in 2000 has been submitted for consideration.

The STFH Internet web page is complete and can be accessed through the Department's web site ([WWW.State.ID.US/Fishgame/Sawtooth.HTM](http://WWW.State.ID.US/Fishgame/Sawtooth.HTM)). Current stocking information and answers to frequently asked questions will be upgraded each week starting next year on the Sawtooth's Home Page.

Stocking of mountain lakes for the past three years has consisted of double-stocking to catch up on a lack of available fish prior to this time. Now that stocking has caught up, 2000 should consist of a single rotation with 35,000 cutthroat, 2,500 grayling, and 1,500 golden trout (if available) to be stocked primarily in lakes of the White Cloud area.

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

## **ACKNOWLEDGEMENTS**

The STFH would like to thank Rick Alsager and the Nampa Hatchery crew for their cooperation in making 1999 a successful year. Special thanks go to Dick Bittick and Gary Ady for transporting fish from Nampa.

Paul Kline, Tom Curet, and his crew provided valuable assistance clipping adipose fins. Margaret Oveson kept anglers busy by stocking the fish. Jeff Anderson, of the Sho-Ban Tribes, coordinated with us on the Yankee Fork Pond evaluation.

Gary Gadwa contributed to the success of mountain lake stocking.

Appendix 1. Planting sites and numbers of catchable rainbow trout stocked in the Salmon Region by Sawtooth Fish Hatchery from May through September 1999.

**Salmon River Stocking:**

<b>Site</b>	<b>Number</b>
Salmon River	36,500
Stanley Lake	14,000
Alturas Lake	8,600
Valley Creek	4,000
Yankee Fork Ponds	4,000
Pettit Lake	3,000
Perkins Lake	2,000
Little Bayhorse Lake	2,000
Kelly Creek Pond	1,200
Blue Mountain Meadow Pond	1,009
Grouse Lake	100
<b>TOTALS</b>	<b>76,409</b>

Appendix 2. Planting sites and numbers of cutthroat fry stocked in the high mountain lakes by Sawtooth Fish Hatchery from late August through early September 1999.

**High Mountain Lakes Stocking:**

Fourth of July L.	1,000
Phyllis L.	500
Elk L.	500
Washington L. #02	500
Challis Creek L. #02	250
Challis Creek L. #03	250
W F Bear Creek L. #01	250
Castle L. #02	250
Castle L. #01	250
Martindale L. #02	500
Woodstick Creek L. #01	500
W F Camas Creek L. #01	500
W F Camas Creek L. #03	750
W F Camas Creek L. #05	500
Cache Creek L. #03	250
Cache Creek L. #01	250
Pole L.	500
Liberty L. #02 (South)	500
Rock L. #01	500
Rock L. #02	500
Falconberry L.	500
Nelson L. #01	250
Nelson L. #02	500
China L. #03	750
Garland L. #03	500
Garland L. #02	500
Garland L. #01	500
Swimm L.	1,000
Hoodoo L.	250
Gunsight L.	500
Tin Cup L.	500
Ocalkens L. #01	500
Ocalkens L. #02	750
Slide L.	500
Sheep L.	500
Cirque L.	500
Sapphire L.	750
Cove L.	750

Appendix 2. continued	
Gentian L.	250
Snow L.	250
Island L.	500
Dioxide L.	250
Goat L.	250
Little Redfish L.	250
Big Frog L. #02	1,000
Castle L.	500
Drift L. (Shallow)	500
Headwall L.	250
Lonesome L.	250
Born L. #02	500
Born L. #03	500
Glacier L.	500
Honey L.	750
Heart L.	750
Chamberlain L. #07	500
Castle View L.	250
Martha L.	250
Six L. #01	1,500
Six L. #03	750
Thunder L.	500
Lightning L.	500
Pipe L. (Blackrock L.)	500
Deer L.	500
MacRae L. (Upper Deer L.)	500
Yellow Belly L.	5,000
Rocky	500
Langer	500
Crater L.	1,000
Nyborg (P 38)	750
Martha L.	500
Lola L. #02	150
Kelly L.	250
F 82	500
Elk L.	500
Vanity L. #13	500
Lower Valley Cr. L.	500
Upper Valley Cr.	4,000
Hidden L.	500
<b>TOTALS</b>	<b>47,150</b>

**IDAHO DEPARTMENT OF FISH AND GAME**

**1999 RESIDENT HATCHERIES**

**FISH HEALTH REPORT**

**Douglas R. Burton, Fishery Pathologist**

## INTRODUCTION

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

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 will allow the limited use of certain drugs and chemicals that are not currently labeled for a specific use in food fish. The Department joined the US Fish and Wildlife Service's INAD program in June 1998. The only drug used by resident hatcheries under this program during 1999 was Oxytetracycline (OTC) as a feed additive.

The RHP and EFHL personnel examined 91 cases for resident hatchery programs during 1999 (51 routine inspections, including 22 inspections of feral brood stock, and 40 diagnostic cases). The most significant diseases, causing fish losses to hatchery fish statewide, were bacterial coldwater disease (CWD) and motile aeromonad septicemia (MAS). The only viral pathogen detected at any resident hatchery was infectious hematopoietic necrosis virus (IHNV), at Hagerman State Hatchery. A summary of the work at each IDFG hatchery, as well as the results of all sampling done at those hatcheries, is as follows.

## AMERICAN FALLS

No significant clinical disease or fish losses occurred at American Falls Hatchery in 1999. Catchable-size Kamloops trout were inspected for pathogens and were evaluated using an organosomatic index (Appendix A). This was done to provide baseline data for Douglas Megargle's research study comparing the return-to-creel of fish from three Department hatcheries (see Hagerman State Hatchery and Nampa Hatchery). A carrier state of *Flavobacterium psychrophilum*, the causative agent of CWD, was detected.

This was the third full production year in which clinical CWD was controlled at American Falls by good hatchery management instead of chemical therapy. This is truly amazing considering the history of CWD and drug use at this hatchery. As demonstrated by the inspection results, *F. psychrophilum* is still present. It is still possible for the bacteria to become a disease problem if conditions are again allowed to favor an epizootic.

## ASHTON HATCHERY

No significant clinical disease or fish losses occurred at Ashton Hatchery in 1999. A pathologist visited the facility once, but no samples were taken for laboratory analysis. Significant reductions in production in response to cuts in personnel and budget resulted in lower fish densities and healthier fish. Hatchery personnel reported that *Gyrodactylus*, a monogenetic trematode, was again present during the year, but no treatments were applied. Historically, the heaviest infestations of this parasite occur from December to February, when it is nearly impossible to keep a drip treatment from freezing due to very low air temperatures. The design of the open springs and water intake at the hatchery will probably always allow a reservoir of this parasite to exist. Another concern with the open water intake is *Myxobolus cerebralis* (MC), the causative agent of whirling disease. Numerous waters in the vicinity now contain the parasite, so there is a significant risk that the hatchery water source may become contaminated. While this may occur naturally, (birds, etc.), it is important that hatchery personnel remain vigilant to prevent it from happening due to a human vector, such as a muddy truck, dirty waders, or other equipment.

## CABINET GORGE HATCHERY

No significant clinical disease or fish losses occurred at Cabinet Gorge Hatchery in 1999. Two visits were made by the pathologist, one in early summer to inspect production kokanee and fall chinook, and one in December to inspect kokanee broodstocks (Appendix B). No viruses, bacteria (including RS), or *Myxobolus* spores were detected in the production groups. The condition of spawning kokanee at Sullivan Springs and at the Clark Fork River ladder appeared very good, with an observed occurrence of internal parasites, (encysted cestodes or nematodes in the swim bladder), similar to past years. No replicating viruses or *Myxobolus* spores were detected. *Renibacterium salmoninarum* (RS) antigen was detected in 2 of 12 pooled kidney samples (x5) from Sullivan Springs, and in 0 of 12 similar Clark Fork River samples, using the Enzyme-Linked Immunosorbent Assay (ELISA). Optical densities of the positive samples were very low, indicating very low levels of antigen (which infers equally low levels of the bacteria). Bacterial kidney disease (BKD) caused by RS has never been observed in these feral populations.

In addition, a Panhandle Region volunteer collected whirling disease samples from early-spawning kokanee adults out of Meadow Creek, a tributary of Kootenay Lake, British Columbia. Eagle Laboratory processed these samples and no MC spores were detected. Eggs from that population were eventually shipped to Cabinet Gorge Hatchery, following receipt of a Title 50 Importation Permit from the U.S. Fish and Wildlife Service.

## CLARK FORK HATCHERY

Fish at Clark Fork Fish Hatchery (CFFH) were sampled in May and December 1999 (Appendix C). The spawning westslope cutthroat adults were inspected and clinical BKD was observed. Confirmation of RS was done using the fluorescent antibody test (FAT) on kidney tissue. No replicating viruses were detected in ovarian fluids from 115 females. The Hayspur-strain triploid rainbow trout fry were checked at the same time and diagnosed with bacterial gill disease (BGD). Feed size and type were changed and the problem was resolved without chemical therapy. Two year-classes of juvenile westslope cutthroat and the Hayspur rainbow fingerling were inspected in December. No replicating viruses or RS were detected. The only significant bacterial pathogen detected was *F. psychrophilum* in the BY98 cutthroat at a low, carrier level.

Spring Creek, the main water supply at CFFH, contains a population of brook trout that has historically tested positive for infectious pancreatic necrosis virus (IPNV) and RS. While IPNV has not been detected on the hatchery since 1996, there is no reason to assume that the pathogen is no longer present. Fish may not have been sampled at the appropriate time to confirm the virus. Incubation and early rearing are done for as long as possible in the limited clean wellwater, but the fish must eventually be exposed to water from the open creek. Very little can be done to eliminate the threat of these pathogens unless significant changes can be made in the water source for the hatchery.

## CLEARWATER HATCHERY

Four different diagnostic cases were conducted on the Hayspur-strain diploid and triploid rainbow trout at Clearwater Hatchery (Appendix D). No replicating viruses were detected. Every case involved MAS, and two cases were complicated by concomitant CWD. Oxytetracycline was applied in medicated feed at standard dosage using the existing label. Mortality rates were reduced by the treatment to acceptable, but not outstanding, levels. Aeromonads are ubiquitous bacteria, often borne in the soil, water, and even in fish feeds. This particular syndrome has occurred in nearly every lot of rainbow reared at Clearwater Hatchery since the facility was constructed.

## GRACE HATCHERY

No significant clinical disease or fish losses occurred at Grace Hatchery in 1999. A single pathologist visit generated 2 inspection cases (Appendix E). No viruses, bacteria, or *Myxobolus* spores were detected from these samples. Production at Grace Hatchery was reduced this year, which resulted in lower rearing densities and healthier fish. A significant turnover of personnel may have also contributed to better management practices. Bacterial CWD and BGD are historically the most serious problems expected at Grace Hatchery, and both are often directly related to stress from

overloading or poor fish culture. Improved hatchery practice in these areas does not guarantee that epizootics cannot occur, but it seems to have worked this year.

### HAGERMAN STATE HATCHERY

A total of 21 diagnostic and 2 inspection cases were examined from Hagerman State Fish Hatchery in 1999 (Appendix F). Catchable-size Kamloops trout on both the Riley Creek and Tucker Springs water sources were inspected for pathogens and evaluated using an organosomatic index to provide baseline data for Douglas Megargle's research study comparing the return-to-creel of fish from three Department hatcheries (see American Falls Hatchery and Nampa Hatchery). A carrier state of IHNV was detected in these fish.

The peculiar losses in the hatchery vats were less serious this year, but continued to occur in a totally random fashion within egg lots and between different vats. An etiologic agent continues to elude identification. Fish on feed for 7-10 days suddenly go off feed and move to the bottom of the vat. Fecal casts sometimes appear, and mortality shortly follows.

Losses from rainbow/Kamloops lots in the outside raceways frequently involved a combination of pathogens. Infectious Hematopoietic Necrosis Virus (IHNV) was detected 9 times, often in combination with one or more bacterial pathogens (*F. psychrophilum*, *F. columnare*, *A. hydrophila*, or *A. sobria*). The hatchery personnel observed several additional IHNV episodes without calling on the EFHL for diagnostic confirmation. Several bacterial infections, primarily CWD and MAS, were diagnosed without the complication of virus. These were successfully treated with OTC-medicated feed, using the existing label or an INAD protocol, whichever was appropriate for the situation. *Aeromonas salmonicida*, the causative bacteria of furunculosis, was detected at Hagerman in 1998 but not in 1999.

One bright side to Hagerman Hatchery's disease situation is that the overall percentage of loss to IHNV in 1999 was again down when compared with most previous years. Some lots of fish went through the entire rearing cycle without any clinical signs of the virus. This is probably due to the completion of bird netting over the large raceways, improvement of the gate system for the bird netting, reconstruction of the Tucker Springs portion of the large raceway headrace, reduced production levels, and management efforts to grow the fish larger in the small raceways.

### HAYSPUR HATCHERY

The Resident Hatchery Pathologist's work at Hayspur Hatchery involved considerable effort to inspect broodstock and broodstock replacement lots, and to inject the adult broodstock with Penicillin-G (Appendix G). Two diagnostic cases detected CWD and MAS in both the BY97 and BY98 juvenile rainbow (R9). Both groups were treated with OTC-medicated feed at standard dosage. The BY97 group responded well, but chronic-level mortalities persisted in the BY98 group to the end of the year.

The BY97 replacement R9 lot was inspected in June. No viruses or significant bacteria were detected. The fish tested positive for RS antigen at low levels by ELISA in 9 of 30 two-fish pools, although FAT results for the same individuals were all negative. *Myxobolus cerebralis* spores were found in 1 of 6 pooled samples (x5), and was confirmed by the polymerase chain reaction test (PCR). These fish were reared on spring/well water in the small raceways, which are in very close proximity to an open pond. Evidence suggests that river otters, moving freely from an earthen-bottom pond to prey on these fish, were the likely vectors of the parasite. Construction of a solid predator enclosure around these raceways would greatly benefit the program, if replacement populations continue to be kept on site. The BY97 Kamloops (K1) replacement lot was also inspected. No viruses or *Myxobolus* spores were detected. No bacteria were detected from randomly sampled fish, but one obviously moribund individual was sampled and diagnosed with clinical CWD. *Renibacterium* antigen was detected by ELISA in 8 of 30 two-fish pools at low levels, but FAT results were again negative.

All BY98 replacement fish from both the R9 and K1 populations were given intraperitoneal injections of an autogenous *F. psychrophilum* bacterin (vaccine), prior to being moved from the inside vats to the small outside raceways. This was an experimental treatment, developed by Aqua Health Ltd., Charlottetown, P.E.I., Canada, from an isolate of the bacteria taken at Hayspur in 1998. The R9 lot subsequently experienced an episode of CWD and MAS, but no clinical disease has yet been observed in the K1 lot. Thus, the benefit of the treatment is equivocal.

All adult spawning fish, except for males in the light control ponds, were injected with Penicillin-G (Pen-G) at a dose level of 3000 IU/lb. The light control males were not injected because they were ready to spawn and we were uncertain what effect the sterile saline used to dilute the Pen-G would have on sperm viability. The purpose of the injections was to inhibit transmission of *F. psychrophilum*, either horizontally within the ponds, or via the eggs. This was the second year that Pen-G was used exclusively for this purpose. Penicillin-G was chosen in an attempt to use an injectable drug therapy that is less likely to cause future antibacterial resistance. The brood fish at Hayspur Hatchery are a contained population and no injected fish will ever be used for human consumption.

Intensive sampling and culling of the replacement broodstock pairings continued to be the health priority at Hayspur Hatchery. Ovarian fluids were collected from every female used in the pairings for virology and for RS analysis using the ovarian cell pellet fluorescent antibody test (OCPFAT). A portion of the females from each set of pairings was sacrificed for ELISA. Eggs from individual females were held in isolation until the test results were available. If the parent female tested positive for any virus or for RS by OCPFAT, the resulting group of eggs was culled. Fish tested by ELISA are considered to be RS-positive when the optical density (OD) is  $\geq 0.100$ , however, it is unlikely that vertical transmission occurs at this very level. Thus, the egg culling criterion for ELISA results was set at  $OD \geq 0.110$ , with the hatchery manager given the option of culling eggs from any fish at his discretion. Results from these samplings are as follows:

## Hayspur Rainbow

The R9 broodstock replacement spawning began on October 15 and ended December 29. Ovarian fluids from 200 females were tested for viruses and RS, and 60 of those same females were sacrificed for ELISA. No viruses were detected, nor were any RS organisms detected in ovarian fluid pellets. Five fish (8.3%) tested positive for RS by ELISA. Eggs from 3 ELISA-positive fish were culled. Detection of RS by ELISA was up from 1.7% in 1998, but was still below the 13.3% detected in 1997.

## **Hayspur Kamloops**

Kamloops broodstock replacement spawning ran from October 27 to December 22. Ovarian fluids from 147 females were tested for viruses and RS, with 50 sacrificed for ELISA. No viruses were detected, while two females tested positive for RS by OCPFAT and 3 by ELISA. Only one of those individuals was positive by both tests. Eggs from both OCPFAT-positive females were discarded, while those from the other two ELISA-positive females were kept (ODs <0.110). The total detection rate of RS in the population of 2.7% was slightly greater than in 1998 (2.4%), but was below that of 1997 (7.0%).

## **HENRYS LAKE HATCHERY**

Fish health inspection samples were taken from spawning cutthroat trout at Henrys Lake Hatchery from March 9 through April 29, 1999 (Appendix H). Ovarian fluids were collected by hatchery personnel and shipped to EFHL, where they were tested for viruses (203 females in 29 seven-fish pools) and RS by OCPFAT (1442 females in 206 seven-fish pools). A group of 60 fish (males and females) were sacrificed for kidney FAT, ELISA, virology, bacteriology (12 fish) and *Myxobolus* tests. No viruses were detected in any of the tissue or ovarian fluid samples. No RS was detected by OCPFAT or in the kidney FAT samples, but antigen was detected by ELISA in all 12 pooled (x5) kidney samples. No eggs were discarded in 1999. Bacteriology samples showed carrier-level infections of *F. psychrophilum* from 7 of 12 fish. No other bacterial pathogens were detected. *Myxobolus cerebralis* spores were detected in 7 of 12 five-fish pools, with PCR confirmation from 8 of 10 individuals. This is alarming in that the prevalence of the parasite in the population seems to be increasing. Clinical signs, primarily dished and shortened craniums, were observed.

## **MACKAY HATCHERY**

No significant clinical disease or fish losses occurred at Mackay Hatchery in 1999. The pathologist did not physically visit the hatchery during the year, an oversight that will be remedied early in 2000. Communications with the hatchery personnel indicated that the fish on the hatchery performed well as usual. Mackay Hatchery

receives green eggs from the early-spawning kokanee salmon in Deadwood Reservoir. The inspection results for these adult fish are reported in Appendix I. No viruses or *Myxobolus* spores were detected, but RS antigen was detected by ELISA in 8 of 12 pooled (x5) samples. Fluorescent antibody tests for RS were negative. These results are comparable to previous years data, although a single moderate ELISA value was higher than usual.

## **NAMPA HATCHERY**

Bacterial CWD and MAS, primarily *A. hydrophila* or *A. sobria*, continue to be the most common diseases diagnosed in Kamloops/rainbow trout at Nampa Hatchery (Appendix J). Outbreaks of MAS in Hayspur rainbow reared in the small "A" raceways were frequent in the spring and early summer. The hatchery was at full production, and heavy loading may have been a contributing factor to these episodes. Treatments with OTC-medicated feed on the existing label were moderately successful, at best. Two episodes of CWD were treated under INAD protocols with better success. Signs of a presumptive bluegreen algae/cyanobacteria toxicosis were observed, including detection of long chains of an unidentified, single-celled organism in the hind-gut of affected fish. This is the first occurrence of this syndrome since 1995. Samples were sent to specialists at Wright State University, but attempts to identify the organism were inconclusive.

Catchable-size Kamloops trout were inspected for pathogens and were evaluated using an organosomatic index. This was done to provide baseline data for Douglas Megargle's research study comparing the return-to-creel of fish from three Department hatcheries (see American Falls Hatchery and Hagerman State Hatchery).

## **SANDPOINT HATCHERY**

No significant clinical disease or fish losses occurred at Sandpoint Hatchery in 1999. The hatchery's main pipeline was repaired in 1998, and westslope cutthroat trout eggs were obtained from a certified disease-free source in Montana. Fish from those eggs were inspected as fingerlings in May 1999 (Appendix K). No viruses, bacteria (including RS), or *Myxobolus* spores were detected. The fish were stocked shortly after inspection and the hatchery was shut down for the remainder of the year.

## **ACKNOWLEDGMENTS**

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 test results from the laboratory are essential in diagnosing and treating fish health problems in the field. Doug Marsters, Utility Craftsman, was a great help in keeping EFHL's physical plant operating and in keeping my old black Ford running. Lab secretary Elaine Cavanaugh, contributed her computer skills and kept the mounds of paperwork moving. Finally, I wish to acknowledge the Hatchery Managers and personnel with whom I worked. Their cooperation is greatly appreciated, and I sincerely hope my efforts have been a benefit to their programs.

## Appendix A. Summary report of Eagle Fish Health Laboratory results for American Falls Hatchery, January 1 – December 31, 1999.

Brood Year	Stock	Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses
1998	Trout Lodge	Kamloops trout	99-129	-	-			-	-	+						IX: CWD (carrier); VIRO 0/15, <i>Flavobacterium psychrophilum</i> 2/16

## Appendix B. Summary report of Eagle Fish Health Laboratory results for Cabinet Gorge Hatchery, January 1 – December 31, 1999.

Brood Year	Stock	Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses
1998	Big Creek	Fall Chinook	99-166	-	-		-	-	-	-		-				IX: NPD; VIRO 0/60, FAT 0/60, BACTE 0/4, WHD 0/60
1998	Meadow Creek (CAN)	Kokanee salmon	99-167	-	-		-	-	-	-						IX: NPD; VIRO 0/60, FAT 0/60, BACTE 0/4
Brood	Meadow Creek (CAN)	Kokanee salmon	99-365									-				IX: NPD; WHD 0/61
Brood	Clark Fork River	Kokanee salmon	99-445	-	-		-					-				IX: RS; VIRO 0/60, FAT 0/60, ELISA 3/12(x5), WHD 0/60
Brood	Sullivan Springs	Kokanee salmon	99-446	-	-		+					-				IX: RS; VIRO 0/60, FAT 0/60, ELISA 2/12(x5), WHD 0/60

Appendix C. Summary report of Eagle Fish Health Laboratory results for Clark Fork Hatchery, January 1 – December 31, 1999.

Brood Year	Stock	Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses
1998	Hayspur	Rainbow trout (triploids)	99-163	-	-			-	-	-						DX: BGD, BACTEREMIA; VIRO 0/10, BGD 3/3, <i>Pseudomonas spp.</i> ¼
Brood	Clark Fork	Cutthroat trout	99-164	-	-		+					-				IX: BKD; VIRO 0/115, FAT 1/15, WHD 0/15
1998	Clark Fork	Cutthroat trout	99-447	-	-		-	-	-	+		-				IX: CWD; VIRO 0/20, FAT 0/12, <i>Flavobacterium psychrophilum</i> 1 /4, WHD 0/20
1999	Clark Fork	Cutthroat trout	99-448	-	-		-	-	-	-						IX: NPD; VIRO 0/20, FAT 0/12, BACTE 0/4
1998	Hayspur	Rainbow trout	99-449	-	-		-	-	-	-		-				IX: NPD; VIRO 0/20, FAT 0/12, BACTE 0/4, WHD 0/20

Appendix D. Summary report of Eagle Fish Health Laboratory results for Clearwater Fish Hatchery Resident Program, January 1 – December 31, 1999

Brood Year	Stock	Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses
1998	Hayspur	Rainbow trout	99-223	-	-			-	-	+						DX: MAS, CWD; VIRO 0/4, <i>Aeromonas hydrophila</i> 2/4, <i>Flavobacterium psychrophilum</i> 1 /4
1999	Hayspur	Rainbow trout (triploids)	99-297					-	-	-						DX: MAS; <i>A. hydrophila</i> 8/8
1999	Hayspur	Rainbow trout	99-298					-	-	+						DX: MAS, CWD; <i>A. sobria</i> 4/6, <i>F. psychrophilum</i> 3/6
1999	Hayspur	Rainbow trout	99-368	-	-		-	-	-	+						DX: MAS, CWD; VIRO 0/6, <i>Aeromonas hydrophila</i> 6/6, <i>F. psychrophilum</i> 3/6

Appendix E. Summary report of Eagle Fish Health Laboratory results for Grace Fish Hatchery, January 1 – December 31, 1999.

Brood Year	Stock	Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses
1999	Hayspur	Rainbow trout (triploids)	99-229	-	-		-	-	-	-						IX: NPD; VIRO 0/20, BACTE 0/5, WHD 0/20
1999	Trout Lodge	Kamloops trout	99-230	-	-											IX: NPD; VIRO 0/10

## Appendix F. Summary report of Eagle Fish Health Laboratory results for Hagerman State Hatchery, January 1 - December 31, 1999.

Brood Year	Stock	Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses
1999	Merwin (WA)	Coho Salmon	99-023	-	-											DX: COAGULATED YOLK; VIRO 0/5, COAGULATED YOLKS 5/5, <i>Aeromonas hydrophila</i> 1/4 (from yolk sac)
1999	Hayspur	Rainbow trout	99-024	-	-			-	-	+						DX: CWD; VIRO 0/5, <i>Flavobacterium psychrophilum</i> 2/4
1998	Hayspur	Rainbow trout (triploids)	99-025	-	-			-	-	-						DX: BACTEREMIA; VIRO 0/5, <i>A. hydrophila</i> 1/4, <i>Pasteurella haemolytica</i> 1/4
1998	Hayspur	Rainbow trout	99-026	-	-			-	-	+						DX: CWD, MAS; VIRO 0/10, <i>F. psychrophilum</i> 4/4, <i>A. hydrophila</i> 1/4
1998	Trout Lodge	Kamloops trout	99-027	+	-			-	-	+						DX: IHN, CWD, BACTEREMIA; IHNV 2/2 (x5), IPNV 0/10, <i>F. psychrophilum</i> 2/4, <i>Enterobacter spp.</i> 2/4
1998	Trout Lodge	Kamloops trout	99-028	-	-			-	-	+						DX: CWD; VIRO 0/5, <i>F. ychrophilum</i> 3 /4
1998	Trout Lodge	Kamloops trout (triploids)	99-029	+	-			-	-	+						DX: IHNV, CWD, MAS; IHNV 1/1 (x4), IPNV 0/4, <i>F. psychrophilum</i> 2/4, <i>A. sobria</i> 2/4
1999	Hayspur	Kamloops trout	99-067	-	-			-	-	+						DX: CWD; VIRO 0/4, <i>F. psychrophilum</i> 4/4
1999	Hayspur	Rainbow trout	99-070	+	-			-	-	+						DX: IHN, CWD; IHNV 1/1 (x4), IPNV 0/4, <i>F. psychrophilum</i> 4/4

## Appendix F. continued.

Brood Year	Stock	Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses
1999	Hayspur	Rainbow trout	99-071	-	-			-	-	+						DX: CWD; VIRO 0/4, <i>F. psychrophilum</i> 4/4
1999	Hayspur	Rainbow trout	99-092	+	-			-	-	+						DX: IHN ,CWD; IHNV 1/1 (x5), IPNV 0/5, <i>F. psychrophilum</i> 4/4
1999	Hayspur	Kamloops trout	99-093	-	-			-	-	+						DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 3/4
1999	Hayspur	Rainbow trout	99-094	-	-			-	-	+						DX: CWD; VIRO 0/4, <i>F. psychrophilum</i> 4/4
1999	Hayspur	Rainbow trout	99-095	-	-			-	-	+						DX: CWD; VIRO 0/4, <i>F. psychrophilum</i> 2/4
1998	Trout Lodge	Kamloops trout	99-096	-	-			-	-	+						DX: CWD; VIRO 0/4, <i>F. psychrophilum</i> 1/4
1998	Hayspur	Rainbow trout	99-097	+	-			-	-	+						DX: IHN, CWD, MAS; IHNV 1/1 (x3), IPNV 0/3, <i>F. psychrophilum</i> 3/3, <i>A. hydrophila</i> 1/3
1998	Trout Lodge	Kamloops trout	99-134	+	-			-	-	-						IX: IHN; IHNV 1/20 (x5), IPNV 0/100, BACTE 0/20, PKX 0/2
1999	Hayspur	Kamloops trout	99-181	-	-			-	-	+						DX: CWD; VIRO 0/10, <i>F. psychrophilum</i> 8/8
1998	Hayspur	Rainbow trout	99-182					-	-	+						DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 2/4
1998	Hayspur	Rainbow trout	99-183	+	-			-	-	+						DX: IHNV, COLUMNARIS, CWD, MAS; IHNV 2/2 (x5), IPNV 0/10, <i>F. columnare</i> 6/8, <i>F. psychrophilum</i> 2/8, <i>Aeromonas</i> spp. 1/8

## Appendix F. continued.

Brood Year	Stock	Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses
1999	Hayspur	Kamloops trout	99-191	+	-			-	-	+						DX: IHN, CWD; IHNV 3/3 (x5), IPNV 0/15, <i>F. psychrophilum</i> 7/8
1998	Hayspur	Rainbow trout	99-196	-	-			-	-	+						IX: CWD(carrier); VIRO 0/60, <i>F. psychrophilum</i> 1/15
1999	Hayspur	Kamloops trout	99-197	+	-			-	-	+						DX: IHN, CWD; IHNV 4/4 (x5), IPNV 0/20, <i>F. psychrophilum</i> 1/10

Appendix G. Summary report of Eagle Fish Health Laboratory results for Hayspur Hatchery, January 1-December 31, 1999.

99HatcheryReport

Brood Year	Stock	Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses
Brood	Hayspur	Rainbow trout	99-003	-	-		-									IX: NPD; VIRO 0/5, FAT 0/5
1997	Hayspur	Rainbow trout	99-039	-	-			-	-	+						DX: CWD. MAS; VIRO 0/10, <i>Flavobacterium psychrophilum</i> 4/8, <i>Aeromonas hydrophila</i> 1/8
1997	Hayspur	Rainbow trout	99-202	-	-		+	-	-	-	+					IX: RS, WHD; VIRO 0/60, FAT 0/60, ELISA 9/30 (x2), BACTE 0/20, <i>Myxobolus cerebralis</i> Digest 1/6(x5), WHD-PCR 2/5
1997	Hayspur	Kamloops trout	99-203	-	-		+	-	-	-	+	-				IX: RS, CWD; VIRO 0/60, FAT 0/60, ELISA 8/30 (x2), WHD 0/30, <i>F. psychrophilum</i> 1/21
1999	Hayspur	Rainbow trout	99-226													RES: VACCINE SAFETY TEST; NO ADVERSE RESPONSE
Brood	Hayspur	Rainbow trout	99-374	-	-		+									IX: RS; VIRO 0/20, ELISA 2/10, OCP-FAT 0/20
Brood	Hayspur	Kamloops trout	99-385	-	-		-									IX: NPD; VIRO 0/20, ELISA 0/10, OCP-FAT 0/20
Brood	Hayspur	Rainbow trout	99-394	-	-		-									IX: NPD; VIRO 0/30, ELISA 0/10, OCP-FAT 0/30
Brood	Hayspur	Kamloops trout	99-405	-	-		+									IX: RS; VIRO 30/0, ELISA 2/10, OCP-FAT 1/30
Brood	Hayspur	Rainbow trout	99-406	-	-		-									IX: NPD; VIRO 0/50, ELISA 0/10, OCP-FAT 0/50
Brood	Hayspur	Kamloops trout	99-425	-	-		-									IX: NPD; VIRO 0/50, ELISA 0/10, OCP-FAT 0/50

135

Appendix G. continued..

Brood Year	Stock	Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses
Brood	Hayspur	Rainbow trout	99-428	-	-		+									IX: RS; VIRO 0/50, ELISA 1/10, OCP-FAT 0/50
Brood	Hayspur	Kamloops trout	98-432	-	-		+									IX: RS; VIRO 0/23, ELISA 1/10, OCP-FAT 1/23
Brood	Hayspur	Rainbow trout	99-442	-	-		-									IX: RS; VIRO 0/30, ELISA 1/10, OCP-FAT 0/30
1999	Hayspur	Rainbow trout	99-443	-	-			-	-	+						DX: CWD, MAS; VIRO 0/8, <i>F. psychrophilum</i> 8/8, <i>A. caviae</i> 8/8
Brood	Hayspur	Kamloops trout	99-451	-	-		-									IX: NPD; VIRO 0/24, ELISA 0/10, OCP-FAT 0/24
Brood	Hayspur	Rainbow trout	99-456	-	-		+									IX: RS; VIRO 0/20, ELISA 1/10, OCP-FAT 0/20

Appendix H. Summary report of Eagle Fish Health Laboratory results for Henrys Lake Hatchery, January 1 – December 31, 1999.

Brood Year	Stock	Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses
Brood	Henrys Lake	Cutthroat trout	99-056A				-									IX: NPD; OCP-FAT 0/77
Brood	Henrys Lake	Cutthroat trout	99-056B				-									IX: NPD; OCP-FAT 0/42
Brood	Henrys Lake	Cutthroat trout	99-056C				-									IX: NPD; OCP-FAT 0/91
Brood	Henrys Lake	Cutthroat trout	99-062A				-									IX: NPD; OCP-FAT 0/70
Brood	Henrys Lake	Cutthroat trout	99-062B	-	-		-									IX: NPD; VIRO 0/70, OCP-FAT 0/98
Brood	Henrys Lake	Cutthroat trout	99-072A				-									IX: NPD; OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	99-072B				-									IX: NPD; OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	99-081A				-									IX: NPD; OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	99-081B	-	-		-									IX: NPD; VIRO 0/70, OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	99-098A				-									IX: NPD; OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	99-098B				-									IX: NPD; OCP-FAT 0/77

## Appendix H. continued.

Brood Year	Stock	Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses
Brood	Henrys Lake	Cutthroat trout	99-112	-	-		+	-	-	+		+				IX: RS, CWD, WHD; VIRO 0/60, FAT 0/60, ELISA 12/12 (x5), <i>Flavobacterium psychrophilum</i> 7/12, <i>Myxobolus cerebralis</i> Digest 7/12(x5), WHD-PCR 8/10
Brood	Henrys Lake	Cutthroat trout	99-113				-									IX: NPD; OCP-FAT 0/77
Brood	Henrys Lake	Cutthroat trout	99-114	-	-		-									IX: NPD; VIRO 0/63, OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	99-125A				-									IX: NPD; OCP-FAT 0/70
Brood	Henrys Lake	Cutthroat trout	99-125B				-									IX: NPD; OCP-FAT 0/70
Brood	Henrys Lake	Cutthroat trout	99-155				-									IX: NPD; OCP-FAT 0/70
Brood	Henrys Lake	Cutthroat trout	99-156				-									IX: NPD; OCP-FAT 0/70

## Appendix I. Summary report of Eagle Fish Health Laboratory results for Mackay Hatchery, January 1 – December 31, 1999.

Brood Year	Stock	Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses
Brood	Deadwood Reservoir	Kokanee salmon	99-322	-	-		+					-				IX:RS; VIRO 0/60, ELISA 8/12 (X5), WHD 0/60

## Appendix J. Summary report of Eagle Fish Health Laboratory results for Nampa Hatchery, January 1 – December 31, 1999.

Brood Year	Stock	Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses
1998	Hayspur	Rainbow trout	99-014	-	-			-	-	-						DX:MAS (carrier); VIRO 0/5, <i>Aeromonas caviae</i> 1/4 (single colony), BLUEGREEN ALGAE 0/4
1998	Trout Lodge	Kamloops trout	99-015	-	-			-	-	+						DX: CWD; VIRO 0/5, <i>Flavobacterium psychrophilum</i> 7/8
1999	Hayspur	Rainbow trout	99-044	-	-			-	-	-						DX: MAS; VIRO 0/10, <i>Aeromonas sobria</i> 1/10
1997	Hayspur	Rainbow trout	99-050					-	-	-						DX: MAS; <i>Aeromonas hydrophila</i> 6/6
1998	Hayspur	Kamloops trout	99-060					-	-	-						DX: MAS; <i>Aeromonas hydrophila</i> 8/8
1997	Hayspur	Kamloops trout	99-085					-	-	-						DX: NPD; BACTE 0/4
1998	Trout Lodge	Kamloops trout	99-123	-	-			-	-	-						IX: VIRO 0/100, BACTE 0/16
1999	Hayspur	Rainbow trout (triploid)	99-207	-	-			-	-	-						DX: MAS, PSEUDOMONAD SEPTICEMIA; VIRO 0/5, <i>A. hydrophila</i> 5/5, <i>Shewanella putrefaciens</i> 1/5
1999	Hayspur	Kamloops trout	99-208	-	-			-	-	-						DX: MAS, PSEUDOMONAD SEPTICEMIA; VIRO 0/5, <i>A. sobria</i> 5/5, <i>Shewanella putrefaciens</i> 5/5
1999	Hayspur	Rainbow trout	99-270	-	-			-	-	-						DX: MAS; VIRO 0/10, <i>A. hydrophila</i> 5/5

## Appendix J. continued.

Brood		Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses	
Year	Stock																
1998	Trout Lodge	Kamloops trout	99-271	-	-			-	-	-							DX: PSEUDOMONAS, BLUEGREEN ALGAE TOXICOSIS; VIRO 0/4, <i>Plesiomonas shigelloides</i> 2/4, <i>Pseudomonas spp.</i> 1/4, Bluegreen algae (gut) 2/4
1999	Trout Lodge	Kamloops trout	99-340					-	-	+							DX: MAS, CWD; <i>A. sobria</i> 6/8, <i>F. psychrophilum</i> 2/8
1999	Hayspur	Rainbow trout	99-389					-	-	+							DX: CWD; <i>F. psychrophilum</i> 6/8

## Appendix K. Summary report of Eagle Fish Health Laboratory results for Sandpoint Hatchery, January 1 – December 31, 1999.

Brood		Species	Accession	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	PKD	WHD	CSH	ICH	GBD	Diagnoses	
Year	Stock																
1998	Westslope	Cutthroat trout	99-165	-	-			-	-	-		-					IX: NPD; VIRO 0/25, FAT 0/24, BACTE 0/8, WHD 0/25

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