



**RESIDENT FISH HATCHERIES
2005 ANNUAL REPORT**

**IDFG 05-49
January 2006**

TABLE OF CONTENTS

| | <u>Page</u> |
|------------------------------------|-------------|
| INTRODUCTION | 1 |
| AMERICAN FALLS FISH HATCHERY | 3 |
| ASHTON FISH HATCHERY | 11 |
| CABINET GORGE FISH HATCHERY | 21 |
| CLEARWATER FISH HATCHERY | 34 |
| GRACE FISH HATCHERY | 41 |
| HAGERMAN FISH HATCHERY | 52 |
| HAYSPUR FISH HATCHERY | 64 |
| HENRYS LAKE FISH HATCHERY | 77 |
| MACKAY FISH HATCHERY | 93 |
| McCALL FISH HATCHERY | 103 |
| MULLAN FISH HATCHERY | 111 |
| NAMPA FISH HATCHERY | 114 |
| SANDPOINT FISH HATCHERY | 128 |
| SAWTOOTH FISH HATCHERY | 134 |
| FISH HEALTH REPORT..... | 141 |

RESIDENT FISH HATCHERIES

2005 ANNUAL REPORT

Resident fish hatcheries reared and stocked nearly 24 million fish weighing over a million pounds. More than 2,500 stocking trips were made to plant fish in over 500 waters in the state. There were a total of 18 species and strains raised by the resident hatcheries during 2005.

Resident hatchery program costs were about \$2.3 million for an average cost of \$2.1 per pound or \$0.1 per fish.

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

The resident hatcheries cooperated with the states of Wyoming, Montana, Washington, Oregon and British Columbia as well as the US Fish and Wildlife Service to obtain various species to meet management efforts in Idaho. Kokanee eggs were obtained from British Columbia. Lake trout, Brown trout and Bear River Cutthroat were obtained from Wyoming. Westslope cutthroat were obtained from Montana and private sources. Lahontan cutthroat and Coho salmon were obtained from Washington. Fall Chinook were obtained from North Dakota.

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

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

The Engineering Bureau coordinated construction at the American Falls, Ashton, Hayspur, Hagerman, Grace, Nampa and Sandpoint hatcheries this fiscal year. A waterline at the Hayspur Hatchery was replaced; the domestic water supply at Hagerman was replaced, the domestic water pump was replaced at Nampa, heat pumps were installed in two residences and miscellaneous interior upgrades were done to the residences. The windows in all residences at the American Falls Hatchery were replaced and the spring collection area was reworked to remove vegetation that was plugging the system up. The settling pond outlet structure was replaced at the Ashton Hatchery. The residential furnaces at two of the residences at the Grace Hatchery were upgraded to efficient propane units and the windows and siding of residence #3 were replaced.

**Idaho Department of Fish and Game
Resident Hatcheries Fish Production
01/01/05 - 12/31/05**

| Production Hatchery | Put-and-Take Number | Pounds | Put-Grow-and-Take Number | Pounds | Average Fish/ pound | Feed Pounds | Feed Costs | Average Length | Total cost | Cost 1,000 fish | Cost/ Pound |
|---------------------|--|----------------|--------------------------|----------------|---------------------|------------------|------------------|----------------|----------------------|-----------------|---------------|
| American Falls | 342,804 | 87,936 | 11,854 | 123.5 | 4.0 | 72,661 | \$24,201 | 8.5 | \$213,735 | \$492.93 | \$2.85 |
| Ashton | 209,240 | 48,043 | 229,007 | 3,582 | 8.5 | 39,250 | \$14,918 | 6.4 | \$173,028 | \$394.82 | \$3.35 |
| Cabinet Gorge | | | 16,358,862 | 44,475 | 369.0 | 38,289 | \$23,155 | 2.19 | \$298,290 | \$18.19 | \$7.33 |
| Grace | 222,155 | 83,529 | 626,940 | 16,252 | 8.5 | 96,639 | \$34,056 | 6.4 | \$279,910 | \$329.65 | \$2.81 |
| Hagerman | 1,204,599 | 358,055 | 1,808,360 | 54,725 | 7.3 | 547,490 | \$182,371 | 6.8 | \$594,173 | \$124.51 | \$0.95 |
| Mackay | 96,218 | 59,975 | 2,852,541 | 33,259 | 31.6 | 90,330 | \$33,609 | 4.4 | \$269,628 | \$91.44 | \$3.27 |
| McCall | | | 120,500 | 72.87 | 1,654 | 51.6 | \$45 | 1.1 | \$5,365 ¹ | \$44.52 | \$74.5 |
| Nampa | 851,974 | 287,331 | 889,924 | 14,212 | 5.78 | 287,706 | \$96,150 | 6.72 | \$466,381 | \$267.88 | \$1.55 |
| Sandpoint | Sandpoint did not raise any fish during 2005 | | | | | | | | | | |
| Sawtooth | | | 14,955 | 7.0 | 2,250 | 10 ² | | 1 | \$1,785 ¹ | \$119.35 | \$255.00 |
| TOTAL | 2,926,990 | 924,869 | 22,912,943 | 166,708 | 137.44 | 1,172,417 | \$408,505 | 2.64 | \$2,302,295 | \$100.48 | \$2.11 |

¹ Flight costs only

Total cost for each hatchery is that hatchery's total budget minus capital outlay expenditures

Redistribution of catchables

| Hatchery | Put-and-Take Number | Pounds | Average Fish/ pound | Feed Pounds | Feed Costs | Average Length | Total cost | Cost 1,000 fish | Cost/ Pound |
|------------|---------------------|--------|---------------------|--------------------|------------|----------------|----------------------|-----------------|-------------|
| Clearwater | 74,275 | 25,809 | 3.1 | 3,000 ² | 0 | 9.4 | \$25,492 | \$324.79 | \$0.99 |
| McCall | 97,130 | 29,631 | 3.28 | 300 | \$150 | 9 | \$8,630 ³ | \$88.85 | \$0.29 |
| Mullan | 37,387 | 11,000 | 3.4 | 0 | 0 | 9 | \$38,908 | \$1,040.00 | \$3.54 |
| Sandpoint | 124,050 | 38,026 | 3.26 | 0 | 0 | 9.2 | \$54,208 | \$437.00 | \$1.43 |
| Sawtooth | 47,725 | 12,559 | 3.94 | 1,000 ⁴ | \$61.6 | 7.5 | \$26,369 | \$552.31 | \$2.10 |
| Hayspur | 58,106 | 13,106 | 4.4 | 0 | 0 | 8.9 | \$4,971 ³ | \$85.56 | \$0.38 |

² Feed left over from anadromous program donated to the resident program

³ Distribution mileage costs only

⁴ 800 lb feed left over from anadromous program donated to the resident program

IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL RESIDENT REPORT

AMERICAN FALLS FISH HATCHERY

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

INTRODUCTION

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

The primary mission of the AFFH is to rear approximately 200,000 catchable-sized (10-inch) Rainbow trout (*Oncorhynchus mykiss*). The AFFH also produced 16-inch catchable Rainbow trout for Springfield Lake. In addition, fingerling (from 3-inch to 6-inch) Rainbow and Westslope Cutthroat trout (*O. clarki lewisi*) are reared as requested. The number and pounds of fingerling produced varies significantly from year to year.

Two permanent employees and eleven months of temporary employee time staffed the AFFH during 2005. Volunteers are utilized for special projects as needed and when available.

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

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

Water for the AFFH comes from Rueger Springs, which is located on AFFH property. These springs flowed at an average of 18.98 cubic feet per second (cfs) at a water temperature of 54°F to 56°F during 2005.

During September 2002 the AFFH Fish Culturist position was transferred to the Ashton Fish Hatchery. A 3-month increase in temporary time was associated with this FTE transfer for Fiscal Year 2004 and forward.

FISH PRODUCTION

The AFFH raised triploid Hayspur strain Rainbow trout (T9), triploid Hayspur Kamloop trout (KT), triploid Troutlodge Kamloops (TT), and Westslope Cutthroat (C2) from the Westslope Trout Co. as well as Conner Lake Westslope Cutthroat trout from the Hayspur Hatchery for the 2005 production year.

The AFFH reared, and is holding over-winter, 78,666 Westslope Cutthroat trout fingerlings (1,431 lbs.) for northern Idaho waters. The AFFH stocked 269,844 catchable rainbow trout (81,236 lbs.). No fingerling rainbow trout were stocked from the AFFH this year. The AFFH received 176,555 triploid rainbow eggs from the Hayspur Fish Hatchery and 158,470 triploid eggs from Troutlodge. Total fish stocked was 354,658 fish weighing 88,059.5 lbs (Appendix 1). Net production for the year (lbs stocked + lbs on hand 12/31/2005 - lbs on hand 1/1/2005) was 74,990.5 lbs. Net number of fish produced, using the same basic formula, was 433,606 fish.

Costs in 2005 for various types and sizes of fish food were \$24,201.17 (Appendix 2). Feed costs for the year were \$0.32 per net pound of fish produced, or \$0.056 per net fish. Production costs overall were \$2.85 per net pound of fish produced. This cost includes all AFFH personnel and operating costs and the cost of transportation of AFFH fish to stocking waters using fish transports stationed at the Nampa and Hagerman Fish Hatchery during 2005. This figure does not include capital outlay or capital construction/repair costs.

Feed conversion for the year averaged 0.97 lbs of feed per net pound of fish produced.

The number of fish stocked this year was down from last year, mostly due to the fact that Blackfoot Reservoir was not stocked with one-pound fish as it was last year.

MAJOR HATCHERY IMPROVEMENTS

- Large cobble was hauled into Rueger Springs to put surface water underground.
- Windows were replaced in residences # 1, #2, and #3.
- Vinyl siding was installed on residence #3.

HATCHERY NEEDS

- The garage of residence #1 needs to be replaced.
- The automatic feeding system should be replaced.
- Additional raceways are needed to maximize efficiency and to more fully utilize the available water.

PUBLIC RELATIONS

The AFFH received an estimated 4,000 visitors during this period. Additionally, organized tours were given to schools, scouts, and families which consisted of 643 children and approximately 75 adults. The AFFH staff also gave presentations at camps, group meetings, zoo events, and school events which were attended by an estimated 500 children and adults. Other visitors include bird-watchers, drop-in visitors, hunters, and fishermen.

VOLUNTEER PROGRAM

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

ACKNOWLEDGEMENTS

During this year employees at AFFH were: Steve Wingert, Hatchery Manager I; David Billman, Assistant Fish Hatchery Manager; Jennifer Evans, Biological Aide, Brian Kopp, Biological Aide, Nathan Crosland, Biological Aide, Flint Raben, Biological Aide, and Cameron Fehringer, Biological Aide.

APPENDICES

Appendix 1. Swimming Inventory with fish transferred or stocked by month, American Falls Fish Hatchery, 2005.

| Month | Fish on hand | Pounds on hand | Fish stocked | Pounds stocked |
|-----------------|--------------|----------------|--------------|----------------|
| Dec. 2004 | 184,785 | 20,319 | 0 | 0 |
| | 80,630* | 1,615* | | |
| Jan. 2005 | 229,772 | 27,273 | 0 | 0 |
| | 80,500* | 2,208* | | |
| Feb. 2005 | 225,300 | 35,001 | 806 | 310 |
| | 80,387* | 3,257* | | |
| Mar. 2005 | 212,272 | 40,667 | 8,944 | 3,485 |
| | 96,600* | 5,436* | | |
| Apr. 2005 | 169,377 | 37,246 | 38,427 | 16,505 |
| | 102,167* | 6,750* | | |
| May 2005 | 144,240 | 33,195 | 78,652 | 8,600 |
| | 22,478* | 20* | 72,960* | 6,700* |
| Jun. 2005 | 102,214 | 25,836 | 67,358 | 16,120 |
| | 22,287* | 54* | | |
| Jul. 2005 | 122,839 | 25,510 | 6,081 | 2,486 |
| | 202,493* | 98* | | |
| Aug. 2005 | 187,538 | 26,606 | 8,241 | 3,690 |
| | 166,908* | 200* | 4,322* | 32.5* |
| Sep. 2005 | 202,909 | 26,288 | 6,658 | 3,190 |
| | 15,767* | 301* | 2,492* | 28* |
| Oct. 2005 | 176,045 | 13,737 | 29,827 | 15,260 |
| | 153,715* | 619* | 5,040* | 63* |
| Nov. 2005 | 147,982 | 4,215 | 24,850 | 11,590 |
| | 153,463* | 1,111* | | |
| Dec. 2005 | 265,697 | 7,434 | 0 | 0 |
| | 78,666* | 1,431* | | |
| Total Rainbow | | | 269,844 | 81,236 |
| Total Cutthroat | | | 84,814* | 6,823.5* |
| Grand Total | | | 354,658 | 88,059.5 |

* Denotes cutthroat trout, all others are rainbow trout.

Appendix 2. Fish feed fed during the 2005 production year, American Falls Fish Hatchery.

| Source | Size/Type | Pounds | Cost |
|---------------|------------------------|-----------------|--------------------|
| Rangen Dry | OO Swim-up/Starter | 32.25 | 15.61 |
| Rangen Dry | O Swim-up/Starter | 96.5 | 46.71 |
| Rangen Dry | #1 | 262.25 | 126.93 |
| Rangen Dry | #2 | 695.75 | 336.74 |
| Rangen Dry | #3 | 1,282.25 | 620.61 |
| Rangen Dry | 1/16" | 4,723.25 | 2012.10 |
| Rangen Dry | 1/8" Extruded Floating | 64,455 | 20,496.69 |
| Rangen Dry | 1/8 OTC | 888.75 | 545.78 |
| Skretting | 0 | 26 | Free trial |
| Skretting | #1 | 44.5 | Free trial |
| Skretting | #2 | 31 | Free trial |
| Skretting | 1.2mm | 124 | Free trial |
| TOTALS | | 72,661.5 | \$24,201.17 |

IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL RESIDENT REPORT

ASHTON FISH HATCHERY

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

INTRODUCTION

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

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

FISH PRODUCTION

General Overview

A total of 438,247 fish (51,625 lbs) were produced at AFH this year, consisting of 229,007 fingerlings (3,582.55 lbs), and 209,240 catchable sized fish, including holdovers (48,043 lbs). Total numbers and total lbs were up from the previous year (Appendix 1). Production costs (excluding capital outlay) were \$161,928.06 with \$14,918.10 spent on fish feed and the remaining \$147,009.96 spent on general hatchery operations and personnel costs. Fish transportation cost for 2005 was \$11,100.06. The average cost per lb of fish produced (less transportation cost) was \$2.92 (Appendix 1). All production costs are up from last year.

All of the fish reared at AFH were received as eyed eggs (Appendix 3).

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 was 1.02 and conversion for holdovers was 0.70 in 2005 (Appendix 2). Lights over the nursery tanks were adjusted to a moderate intensity, and growth rates were maintained by use of automatic fry feeders and covers when the fish were moved outside to the small raceways.

The average survival for all fish stocked from eyed egg to distribution was 66.7%. This is a decrease of 19.2% primarily due to very poor survival of the Grayling this year.

Rainbow Trout

Ashton Fish Hatchery produced and stocked 108,209 9-inch catchable rainbow (38,645 lbs) for distribution into area lakes and streams (Appendix 1). In December 2004, we received 135,000 Hayspur triploid rainbow trout (T9) eggs. From these eggs, 23,364 T9 fingerlings, averaging 2.1-inches, were planted in a number of Upper Snake Region waters. An additional 101,031 (9,398 lbs) of 6-inch T9 holdovers were produced for stocking in 2006.

Westslope Cutthroat Trout

Ashton Fish Hatchery did not rear any Westslope Cutthroat Trout during 2005.

Henrys Lake Cutthroat Trout

No Henrys Lake Cutthroat were reared at Ashton Hatchery during 2005.

Rainbow x Cutthroat Hybrid

We received 28,000 Rainbow x Cutthroat eyed hybrid eggs from Henrys Lake Hatchery in March 2005. From these eggs Ashton Hatchery produced 19,077 Rainbow x Cutthroat hybrids (228.75 lbs.) during 2005.

Arctic Grayling

In May 2005 we received 95,000 green Arctic Grayling eggs from Meadow Lake, Wyoming. We had extremely poor success with these eggs and produced only 1,704 fry weighing a total of 1.0 pound.

Brook Trout

We received approximately 255,000 triploid brook trout eggs from Kootenay Hatchery, British Columbia during 2004. The eggs arrived in extremely poor condition so were not enumerated. From these eggs 151,762 (3,072.75 lbs.) triploid brook trout were stocked into Henrys Lake. The fish were stocked at different times and sizes. In May we stocked 91,937 2.2-inch calcein marked brook trout. The remaining 59,825 5.0-inch unmarked brook trout were stocked in September.

In October 2005 we received 295,000 eyed triploid eggs from Kootenay Trout Hatchery, British Columbia for stocking as fingerling 2006. These eggs were in very good condition compared to those received during 2004. State fisheries policy allows for stocking approximately 100,000 brook trout into Henrys Lake; no other waters are to be stocked with brook trout. We therefore destroyed 152,000 eyed eggs during November and kept the remaining 143,000 eggs.

Brown Trout

In November 2004 we received 37,100 brown trout eggs from Auburn Hatchery, Wyoming. This resulted in 33,100 (193.25 lbs) fingerlings that were transferred to Hagerman Hatchery for stocking in Region 4. We received 40,000 brown trout eggs from Auburn Hatchery, Wyoming for stocking in Region 4 during 2006.

HATCHERY IMPROVEMENTS

This year the hatchery outlet structure was replaced which also slightly increased the area of the settling pond. We also finally replaced our 18 year old snow-blower with a new 4WD tractor with cab and front end loader.

Future needs include installing collection pipes and covering the recently purchased spring area. We also need to improve the existing spring collection area, which has become overgrown resulting in flooding and reducing the quality and quantity of water available for fish rearing.

FISH STOCKED AND TRANSFERRED

The stocking program at AFH remained similar to last year's program. The numbers of catchable rainbow trout on-station exceeded 2005 requests. Excess fish were stocked into the waters of the Upper Snake and South West regions.

ASHTON FISH SPAWNING

Personnel from AFH traveled to Henrys Lake Hatchery to sort and spawn cutthroat trout and rainbow x cutthroat hybrids. They also traveled to Pahsimeroi Hatchery to assist with Chinook spawning.

FISH FEED

A total of 39,250 lbs of fish feed were fed (Appendix 4) to produce 33,967 lbs of gain (Appendix 1), for an average conversion of 1.15. All fish were fed Rangen dry diets.

PUBLIC RELATIONS

Approximately 1,000 people visited AFH this past year. About 100 elementary students from as far away as Idaho Falls visited the hatchery during the spring, summer, and fall for tours. Because of construction we did not hold our Free Fishing Day event.

SPECIAL PROJECTS

No special projects were undertaken this year by the hatchery staff.

APPENDICES

Appendix 1. Fish production and cost, Ashton Fish Hatchery, 2005

| Species | Size (in.) | Number Fish | Lbs Planted or transf. | Weight Gained In 2005 | Cost/lb | Cost/fish | Total Cost |
|---|------------|----------------|------------------------|-----------------------|----------------|----------------|---------------------|
| Fingerlings Produced and Stocked | | | | | | | |
| Hayspur triploid Rainbow | 2.1 | 23,364 | 86.8 | 78.2 | \$47.78 | \$0.177 | \$4,147.77 |
| Rainbow x Cutthroat hybrid | 3.1 | 19,077 | 228.7 | 219.1 | \$15.82 | \$0.189 | \$3,619.87 |
| Brown Trout | 2.4 | 33,100 | 193.2 | 181.7 | \$30.92 | \$0.180 | \$5,972.79 |
| Brook Trout Triploids | 3.7 | 151,762 | 3,072.7 | 3,036.5 | \$9.96 | \$0.202 | \$30,603.00 |
| Grayling | 1.2 | 1,702 | 1.0 | 0.9 | \$301.66 | \$0.177 | \$301.66 |
| Totals/Ave | 3.3 | 229,007 | 3,582.6 | 3,516.4 | \$12.46 | \$0.195 | \$44,645.09 |
| Catchables Produced and Stocked | | | | | | | |
| Hayspur triploid Rainbow | 9.6 | 108,209 | 38,645 | 21,101 | \$1.94 | \$0.694 | \$75,067.09 |
| Totals/Ave | 9.6 | 108,209 | 38,645 | 21,101 | \$1.94 | \$0.694 | \$75,067.09 |
| Catchables Produced For 2006 | | | | | | | |
| Hayspur triploid Rainbow | 6.1 | 101,031 | (9,398) On hand | 9,349.9 | \$3.31 | \$0.308 | \$31,115.82 |
| Totals/Ave | 6.1 | 101,031 | 9,398 | 9,349.9 | \$3.31 | \$0.308 | \$31,115.82 |
| GRAND TOTAL * | | 438,247 | 51,625.6 | 33,967.3 | \$2.92 | \$0.344 | \$150,828.00 |

* Includes fish on hand

Appendix 2. Comparative growth rates, feed conversion, and percent survival for all species reared at Ashton Fish Hatchery, 2005.

| Species | Average Monthly Length Increase | Average Conversion | Percent Survival |
|------------------------------|--|---------------------------|-------------------------|
| Brown Trout | .432 | .730 | 89.2 |
| Brook Trout Triploid | .486 | 1.050 | 60.7 |
| Rainbow (catchables) Hayspur | .444 | 1.02 | 85.2 |
| Rainbow (fingerlings) | .501 | 0.70 | 95.6 |
| Rainbow x Cutthroat | .414 | 0.85 | 68.1 |
| Grayling | .470 | 2.77 | 1.7 |
| Holdover for 2006 stocking | | | |
| Rainbow | .501 | 0.70 | 95.6 |

Appendix 3. Origin of eggs and fish stocked or transferred, Ashton Fish Hatchery, 2005

| Species | Source | Eggs | Fish | Destination | Stocked | Transferred | Size (inches) |
|-------------------------------------|-----------------|----------------------|------|----------------------------|----------------|---------------|---------------|
| Brown Trout | Auburn, WY | ^a 37,100 | | MV Region | | 33,100 | 2.4 |
| Brown Trout | Auburn, WY | ^b 40,000 | | MV Region | | | eggs |
| Brook Trout Triploid | Kootenay, BC | ^a 255,000 | | Henrys Lake | 151,762 | | 2.2-5.0 |
| Brook Trout Triploid | Kootenay, BC | ^b 143,000 | | Henrys Lake | | | eggs |
| Rainbow x Cutthroat | Henrys Lake | 28,000 | | Upper Snake Region | 19,077 | | 3.1 |
| Grayling | Meadow Lake, WY | 95,000 | | Upper Snake/Salmon Regions | 1,704 | | 1.2 |
| Hayspur triploid rainbow | Hayspur | ^a 142,000 | -- | Upper Snake Region | 108,209 | -- | 9.6 |
| Hayspur Triploid rainbow | Hayspur | 135,000 | -- | Upper Snake Region | 23,364 | -- | 2.1 |
| Hayspur Triploid Rainbow | Hayspur | ^b 125,000 | | Upper Snake Region | | | eggs |
| | | | | | | | |
| Total stocked or transferred | | | | | 304,116 | 33,100 | |

^aReceived prior to 2005

^bFor stocking in 2006

Appendix 4. Feed use, Ashton Fish Hatchery, 2005

| Size | Source | Lbs | Cost/lb | Total Cost |
|---------------|---------------|---------------|-----------------|--------------------|
| Swimup | Rangens | 88 | \$0.4840 | \$42.59 |
| #1 Starter | Rangens | 250 | \$0.4840 | \$121.00 |
| #2 Starter | Rangens | 1,062 | \$0.4840 | \$514.01 |
| #3 Starter | Rangens | 2,500 | \$0.3840 | \$870.00 |
| 3/32 pellet | Rangens | 4,000 | \$0.3080 | \$1,232.00 |
| 1/8 pellet | Rangens | 31,500 | \$0.3080 | \$9,702.00 |
| shipping | | | | \$2,480.00 |
| | Credit return | -150 | | \$-43.50 |
| TOTALS | | 39,250 | \$0.3800 | \$14,918.10 |

IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL RESIDENT REPORT

CABINET GORGE FISH HATCHERY

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

INTRODUCTION

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

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

Water Supply

Cabinet Gorge Dam is located about one mile upstream from the hatchery. After its completion in 1952, artesian springs began appearing along the Clark Fork River at the present site of the hatchery. The CGFH water supply consists of approximately 5.4 cubic feet per second (CFS) from a spring and approximately 20-cfs from a well field. The temperatures of the lower spring and upper well field vary inversely with each other over a 12-month period. The cooler water from the lower springs (pump #7 and #8) was utilized for the entire Kokanee incubation and early rearing period. Incubation and early-rearing water temperatures were maintained around 50 degrees Fahrenheit (range 44.5 degrees F to 53 degrees F). Production water ranged from 37.5 degrees F to 46.0 degrees F.

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

Rearing Facilities

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

PRODUCTION

Cabinet Gorge Hatchery produced a total of 16,398,862 fish in 2005 weighing 44,475 lbs (Appendix 2). On January 1, 2006, an estimated total of 17,809,925 Lake Pend Oreille Kokanee eggs were on hand (Appendix 1). In addition 49,174 fall Chinook fry and 1,148,979 early-spawning Kokanee alevin were also on hand at the end of the year.

A total of 38,289 lbs of feed produced 40,681 lbs of weight gain for an overall (all species reared) feed conversion of 0.94. Total production cost (including Nampa's transportation costs) was \$298,290, resulting in a cost per pound of fish of \$7.33, cost per inch of fish of \$0.0083, and \$18.19 per thousand fish (Appendix 2).

Lake Pend Oreille Kokanee

General Rearing

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

Initial early rearing loading rates averaged 250,000 swim-up fry per raceway. Twelve raceways required thinning on their initial day of feeding. The excess unfed fry were stocked at Foster Bar side channel (Clark Fork River) during the first week of March. There were 1,112,150 unfed fry stocked at this time. With the new rearing protocols and lower rearing densities, Kokanee growth rates were equivalent to 29 monthly temperature units per inch of growth (MTUs), (2004, 29 MTUs). Fish health was excellent throughout rearing and no Bacterial Gill Disease was encountered in 2005.

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

A total of 15,301,906 late Kokanee fry were produced at an average length of 2.05 inches and an average weight of 383 fish per pound. These fish gained 37,231 lbs from 33,960 lbs of feed, resulting in a conversion rate of 0.91: 1.0. Fish production cost was \$7.11 per pound, \$0.0084 per inch, and \$17.29 per thousand (Appendix 2).

Survival of Lake Pend Oreille green eggs to feeding fry was estimated at 79.4% (2004, 80.3%). Survival from first feeding to release was estimated at 98.8% (2004, 97.6%), resulting in survival from green egg to release of 78.4% (2004, 78.3%).

A total of 973,415 early Kokanee fry were produced at an average length of 2.11 inches and an average weight of 359 fish per pound. These fish gained 2,544 lbs from 3,152 lbs of feed, resulting in a conversion rate of 1.24: 1.0. Fish production cost was \$9.65 per pound, \$0.0120 per inch and \$25.23 per thousand. Of these 966,079 (2,695 lbs) were stocked into Lake Pend Oreille (Appendix 2).

Survival of early Kokanee eyed eggs to feeding fry was estimated at 98.6%. Survival from first feeding to release was estimated at 99.6%, resulting in survival from eyed egg to release of 98.3%.

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 Cabinet Gorge Hatchery. All Kokanee fry received a thermally induced otolith pattern at the swim up stage of development. Differential temperature was about 9 degrees F. These fish will be distinguishable from their wild counterparts, as well as other hatchery year classes, by examining otolith growth rings for these distinctive bands, which are unique each year.

Analysis of pre-release fish specimens (Grimm, et. al., 2005) verified the presence of a recognizable otolith mark on all thermally treated fry.

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

All of the adults that returned to the Sullivan Springs Kokanee trap in the fall of 2004 were t-marked. With results from the Washington Department of Fish and Wildlife otolith lab in Olympia, Washington, Idaho fisheries biologists were able to determine the age of the fish and whether it was of hatchery or wild origin. Based on 60 fish sampled from the 2004 Kokanee spawning run 25% were hatchery four year olds (1999 brood year), 66.7% were hatchery three year olds (2000 brood year), and 8.3% were four year olds of wild origin. To date, no results have been received from the 2005 spawning adults.

Fish Liberation

From February 28 through March 7, 2005, 1,112,150 unfed late Kokanee fry were released into Foster Bar side channel (Clark Fork River). On May 18 and 19, 2005, 966,079 early Kokanee fry and 96,292 late Kokanee fry were released into Sullivan Springs. On the

same days, 990,819 late Kokanee fry were released into Spring Creek and 999,049 late Kokanee fry were released into Twin Creek. On May 23, 2005, 505,489 late Kokanee fry were released into Grouse Creek (a new stocking location). From June 14 through 16, 8,634,181 late Kokanee fry were released into Sullivan Springs.

In an effort to encourage pioneering of Kokanee into unused traditional lake-shore spawning gravels, late Kokanee fry were also released into new locations along the Northern and Western shores of Lake Pend Oreille. From May 31, 2005 through June 20, 2005, 1,091,943 late Kokanee fry were released from Trestle Creek to Ellisport Bay, 926,596 were released into Camp Bay, and 544,167 were released at Talache Landing. On June 20, 2005, the last of the hatchery Kokanee were released directly into the river. A volitional release of 351,634 and a flush of 49,586 were stocked into the Clark Fork River through the lower hatchery ladder.

Numbers at release were based upon Jensorter counter/sorter inventory numbers at eye-up minus mortality. All fish were off feed one day before inventory pound counts were taken. Pound counts were completed on all raceways one to three days prior to fish being loaded onto the transport vehicles. All raceways of fish were displaced onto the transport trucks for all of the releases to double check inventory numbers.

The early Kokanee fry release group was transported in one IDFG tanker (3,000-gallon capacity). There were two trips made to Sullivan Springs on May 18 and 19, 2005 (which included 250 lbs of late Kokanee- "to top off the load"). The IDFG tanker also planted late Kokanee fry into Spring Creek and Twin Creek on May 18, 2005. The next day, the 2-ton stocking truck from the Sandpoint Hatchery finished planting the fry in Spring Creek and Twin Creek.

The Sullivan Springs release group was transported in two IDFG tankers (3,000-gallon capacity) and the 2-ton stocking truck from Sandpoint Hatchery. Loading densities of small fish in all of the tankers was kept below 0.60 lbs per gallon. Fish were planted below the bridge on the access road to the IDFG patrol cabin. Two tankers and the 2-ton stocking truck made two releases each on June 14, 15, and 16, 2005. The two tankers made an additional release at the end of the day on May 16th to complete the Sullivan Springs release.

All of the other late Kokanee fry releases (excluding ladder releases) were accomplished utilizing the one and 2- ton stocking trucks from Sandpoint Hatchery.

Other Species

On December 31, 2005, a total of 49,174 Fall Chinook salmon sac-fry were on station. The Chinook stock came from Garrison Dam National Fish Hatchery in Riverdale, North Dakota. Fall Chinook salmon survival of eyed eggs to feeding fry was estimated at 65.6% (2004, 60.4%). These fish are scheduled for transfer to Nampa Hatchery on January 25, 2006. Production costs will be reported on the 2006 annual report.

During the months of April and May 2005, a total of 98,547 Westslope cutthroat were released into numerous Panhandle lowland lakes. These fish averaged 54 fish per pound and had attained an average length of 3.73 inches at release.

During the month of May 2005, a total of 7,336 early spawning Kokanee were released into three lowland lakes in Regions 1 and 2. These fish averaged 432 fish per pound and had attained a length of 1.97 inches at release.

On December 31st, 2005 the hatchery had 1,148,979 early spawning Kokanee sac-fry on hand. This stock came from the Clearwater Trout Hatchery in Canada. These fish will be used to start a run of early spawners in Sullivan Springs.

HATCHERY IMPROVEMENTS

Repairs and Improvements

- A new delay was installed on pump 6 and a new ARV was installed on pump 3.
- The private property surrounding the Granite Cr. trap was purchased by Avista Corp.
- Large rocks were removed from the west end of the hatchery building.
- New gravel was added to the lower section of the hatchery road from the settling pond to the fish ladder. This was a cooperative project with Avista Corp.
- Avista Corp. expanded the road around the fish ladder and trap.
- Electrical problems with the sewage lift station were repaired.
- Trees and shrubs were planted along the East property line of the hatchery.

HATCHERY RECOMMENDATIONS

An inadequate amount of available warm water (50 degrees F) during the production months remains the limiting factor for fish production. Although the upper well field 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 well field water. Unfortunately, only 5.4 cfs is available from the lower springs. Modification of existing water collection and pumping facilities or drilling additional wells at this location is warranted. The lower springs collects approximately 6 cfs of available water but the means to pump it is unavailable. Additional water at this location is also available for collection.

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

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

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

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

Residence's #1 and #2 at the old Clark Fork Hatchery are in need of new roofs and furnaces. They are both 30 plus years old.

FISH SPAWNING

Fish Trapping

The Clark Fork River fish trap was in operation from July 14, 2005 to November 22, 2005. The first adult Kokanee entered the trap on October 17, 2005, and trapping continued until November 22, 2005. At this time the trap was emptied and the ladder was shut down as additional Kokanee eggs were not necessary. There were 4,786 adult Kokanee trapped. Of these, 2,256 adults were transported to Spring Creek to spawn naturally and 500 were released back into the river after the ladder was closed. The remaining 2,030 fish were used for spawning one time early in the season when 166,200 eggs were taken. At this time 388 or 15.3% were gravid females. From July 14, 2005 to October 7, 2005 the trap was used by Avista Corp. personnel to collect and sample bull trout. A total of 5 adult bull trout were trapped, tagged, held for genetic results, and released. Avista also electro-shocked and hook and lined bull trout from the Clark Fork River that were staged on the spawning beds. Twenty-nine adults (4 from the hatchery ladder) were trucked around the Cabinet Gorge Dam and released into the mouth of Bull River and other Montana tributaries of the Clark Fork River. These fish were part of a USFW experiment to utilize traditional spawning habitat in Montana, which became inaccessible to the native bull trout stock when the Cabinet Gorge Dam was completed in 1952. After spawning, the out-migrating adults were recaptured and trucked back to the hatchery ladder and released.

The Sullivan Springs trap was in operation from October 18, 2005 to December 30, 2005. The Sullivan Springs trap collected 138,812 (165,187 in 2004) adult Kokanee salmon. Of these, 27,363 (11,555 in 2004) adults were passed above the trap to spawn naturally in Sullivan Springs Creek. In addition, 2,573 adults were released into Granite Creek above the weir and about 600 more escaped up Granite Creek during high water to spawn naturally. An estimated 40,000 adults backed out of Granite Creek during a "cold snap" in early December. Shortly thereafter an increase in local shoreline spawning activity was witnessed by numerous individuals from Whiskey Rock to Kilroy Bay. Spawntaking records showed that 37.7% (36.6% in 2004) of the run was female (40,809).

Spawntaking and Eggs Received

An estimated total of 17,809,925 green fertilized Kokanee eggs were collected during the 2005 spawning season. Of the 40,809 total females trapped, 35,839 female Kokanee were spawned at the Sullivan Springs and hatchery ladder traps (Appendix 1).

A total of 75,000 eyed fall Chinook eggs were received from Garrison Dam National Fish Hatchery on November 9, 2005.

A total of 1,200,000 eyed early spawning Kokanee eggs were received from Canada's Clearwater Trout Hatchery on October 21, 2005.

FISH FEED

The fish produced during 2005 were fed a total of 38,289 lbs of feed. Fish feed was acquired from Rangen's Inc. and Skretting USA, Inc. (formerly Moore-Clark USA, Inc.) The overall conversion was 0.94 lbs of feed to produce 1 pound of fish, not including the weight of mortality (Appendix 2).

PUBLIC RELATIONS

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

A total of 200 people signed our guest registration book this year. An estimated 600 visitors toured the hatchery during the 2005 season. In addition, 10 hatchery tours were given to local school groups.

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

The CGFH staff assisted with the local Free Fishing Day event in Clark Fork. There were approximately 70 children and adults that participated.

ACKNOWLEDGMENTS

The CGFH staff would like to thank the Cabinet Gorge Dam and Northern Lights personnel for their continued cooperation with hatchery operations. Thanks also to the Lake Pend Oreille Idaho Club, Bonner County Sportsmen's Association, numerous volunteers, and various regional and hatchery Department personnel for their cooperation during the spawning season. The staff would also like to thank Zach Olson- Fish Culturist, CGFH Maintenance Craftsman- John Suhfras, Mullan Hatchery Biological Aide- Mary Van Broeke and CGFH Biological Aides; Tyler Long, Beth Brown, Laura Censky, Rauno Raiha (Bonner County Sheriff's boat operator), Christina Suhfras, and Amarissa Fish for their dedication and hard work in making 2005 a successful year.

LITERATURE CITED

- Volk, E.C., Schroder S.L., and Fresh, K.L. 1990. Inducement of unique otolith banding patterns as a practical means to mass-mark juvenile Pacific salmon. *Am. Fish. Soc. Symp.* 7: 203-215
- Grimm, J.J., Nguyen, L.C., and Volk, E.C., 1997. Results of Idaho Department of Fish and Game 1997 Lake Pend Oreille Kokanee Otolith Thermal Mark Recovery, Brood Year 1996 Kokanee. Washington Department of Fish and Wildlife Otolith Laboratory.
- Grimm, J.J., Anderson, D.J., Nguyen, L.C., and Volk, E.C., 1999. Results of Idaho Department of Fish and Game 1998 Lake Pend Oreille Kokanee Otolith Thermal Mark Recovery, Brood Year 1996 and 1997 Kokanee. Washington Department of Fish and Wildlife Otolith Laboratory.

APPENDICES

Appendix 1. Lake Pend Oreille Kokanee spawntaking summary, 2005.

| Spawntaking Site | Total Fish | Females Spawned | Females Unspawned | Green Eggs | Fecundity | Percent Females * |
|------------------|------------|-----------------|-------------------|------------|-----------|-------------------|
| Sullivan Sps. | 108,276 | 35,453 | 5,356 | 17,643,725 | 498 | 37.7% |
| Cabinet Gorge | 4,786 | 386 | 2 | 166,200 ** | 431 | |
| Totals/Ave: | 113,062 | 35,839 | 5,358 | 17,809,925 | 497 | 37.7% |

* includes male/female prespawn mortality

(not recorded for hatchery ladder with only one male/gravid female sorting)

** Note: 2,256 adults were transported to Spring Creek on 11/22/05 to spawn naturally in available gravels.
Ladder was closed after 11/22/05

Appendix 2. Production Summary, all species, 2005

| Species | Number | Lbs | Length | Fish/lb | Feed Fed | Feed Cost (b) | Annual Cost (c) | Cost/lb of fish | Cost/1,000 fish | Cost/inch of fish | Conversion |
|----------------|------------|--------|--------|---------|----------|---------------|-----------------|-----------------|-----------------|-------------------|------------|
| PdO KL | 15,301,906 | 39,902 | 2.05 | 383 | 33,960 | \$20,455.13 | \$264,564.98 | \$7.11 | \$17.29 | \$0.0084 | 0.91 |
| Can. KE | 973,415 | 2,712 | 2.11 | 359 | 3,152 | \$1,898.54 | \$24,555.62 | \$9.65 | \$25.23 | \$0.0120 | 1.24 |
| N.D. FC | 24,994 | 34 | 1.65 | 735 | 11 | \$10.67 | \$85.70 | \$7.74 | \$3.43 | \$0.0021 | 0.99 |
| 04-WS Cutt. | 98,547 | 1,827 | 3.73 | 54 | 1,166 | \$790.82 | \$9,083.71 | \$10.15 | \$92.18 | \$0.0247 | 1.30 |
| Totals/Ave: | 16,398,862 | 44,475 | 2.19 | 369 | 38,289 | \$23,155.17 | \$298,290.00 | \$7.33 | \$18.19 | \$0.0083 | 0.94 |

(b) Includes freight, shipping & handling.

(c) Includes transportation costs for truck transportation from Nampa Hatchery - \$9,113.00.

IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL RESIDENT REPORT

CLEARWATER FISH HATCHERY

**Tim Klucken, Fish Culturist
Chad Hensen, Fisheries Technician**

INTRODUCTION

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

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

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

FISH PRODUCTION

Release Year 2005

Catchable Rainbow Trout

The CFH produced no catchables in 2005 because spring Chinook and steelhead occupied all available rearing space. The CFH was strictly a redistribution center for Nampa State Fish Hatchery (NSFH) reared rainbow trout catchables in 2005.

FISH FEED

Catchable Rainbow Trout

The CFH redistributed catchable rainbow trout into Region 2 waters during 2005. Because these fish were stocked in local waters as soon as they arrived, little supplemental feed was needed to maintain overall health and size of the fish.

A total of 3,000 lbs of Bio-Oregon soft moist and Bio-Dry 1000 feed was fed to the rainbows through the summer of 2005 as a maintenance diet (Appendix 2). This food was donated by Rapid River Fish Hatchery and surplus feed came from the CFH steelhead program.

FISH STOCKED AND TRANSFERRED

Catchable Rainbow Trout

The CFH redistributed 74,275 Troutlodge triploid (reared at Nampa State Fish Hatchery) and 4,212 Shasta strain (reared at Dworshak National Fish Hatchery) rainbow trout during 2005 (Appendix 1). They averaged 3.1 fish per pound (fpp) and weighed 25,809 lbs. A total of 79 fish plants were administered to 27 different plant sites. Included in this total were 4,212 Shasta strain rainbow trout that were reared at Dworshak and Kooskia National Fish hatcheries for their annual open house. These fish were stocked into Spring Valley Reservoir and Karolyn's Pond by CFH personnel.

PUBLIC RELATIONS

Clearwater Hatchery and its satellites were open to visitors during the year. Tours at the main hatchery were given to various groups. We had visitors from many states, as well as from other countries.

Three summer youth employees assisted Dworshak Hatchery during their annual open house on June 9, 2005.

On June 30, Mike Tetwiler planted 560 catchable rainbow trout (3.2 fpp) into Camp Grizzly Pond.

On July 13, Chad Henson planted 500 rainbows into Jaype Mill Pond for sixth-graders on a 4-H forestry tour.

On August 5, Lacey Alberts hauled 500 catchable rainbow trout (3.5 fpp) and 5 trophy-size trout to Orofino Creek near Pierce for their annual 1860 Days Celebration.

SPECIAL PROJECTS

A total of 111 adult size fish, ranging in weight from 3 lbs to 8 lbs, were recovered from the Clearwater Fish Hatchery's total flow pond. The planting crew supplemented 17 fish stocking trips to 9 different sites with these large fish.

FISH HEALTH

In general, the fish health at Clearwater Fish Hatchery was good this year. The catchable rainbow trout were transferred from NSFH to CFH and these fish were, in most cases, immediately stocked out into regional waters. These fish showed no signs of poor health. All fish at CFH are monitored daily by personnel to detect any early signs of fish health problems.

New Zealand Mud Snail Information

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

ACKNOWLEDGEMENTS

The CFH would like to thank the Nampa Fish Hatchery crew for raising the rainbows and Dick Bittick and Gary Ady for transporting the rainbows to CFH for distribution. Bio-Aides who assisted in rainbow distribution included Robert Schloss, Theresa Elliott, Bridgette Arata, Carrie Licht, Chris Stamper, Jenny Hole, Jami Bahadar, Alex Martin, Bob Miller, Mike Tetwiler, Max Bausch, Tim Lee, Nichole Madrid, JZ Savage, Steve Green, and Dan Green; Fishery Technicians Chad Hensen and Lacey Alberts; Maintenance Craftsman Fred Hough; and three youths involved in the Clearwater Youth Program.

Appendix 1. Clearwater Hatchery resident fish redistribution, January 1 – December 31, 2005.

2005 Catchable Rainbow Trout

| | | | Number of Fish | Weight (lbs) |
|-------------------------------------|------------------------|---------------|------------------------|------------------------|
| 2005 catchable RBT on hand 1/1/05 | | | 0 | 0 |
| 2005 catchable RBT on hand 12/31/05 | | | 0 | 0 |
| Date | Number released | Lbs | Fish per Pound | Type of Fish |
| 4/1-4/30 | 3,151 | 900 | 3.5 | Troutlodge TT |
| 5/1-5/31 | 21,197 | 5,888 | 3.6 | Troutlodge TT |
| 6/1-6/30 | 26,622 | 10,327 | 2.6 | Troutlodge TT /Shasta* |
| 7/1-7/31 | 10,475 | 2993 | 3.5 | Troutlodge TT |
| 8/1-8/31 | 2,900 | 829 | 3.5 | Troutlodge TT |
| 9/1-9/30 | 13,767 | 4,747 | 2.9 | Troutlodge TT |
| 10/1-10/31 | 375 | 125 | 3.0 | Troutlodge TT |
| Totals | 78,487 | 25,809 | Average fpp 3.1 | |

*Includes 4,212 Shasta strain rainbow trout at 1 fpp raised at Dworshak and Kooskia National Fish hatcheries.

Appendix 2.

Fish feed costs and amount fed for the CFH rainbow programs,
January 1 - December 31, 2005.

| DATE | BRAND | FEED TYPE | WEIGHT (lbs) | COST PER LB | TOTAL |
|----------|------------|---------------|--------------|-------------|------------|
| 5/1-9/31 | Bio-Oregon | Bio-Moist 2.5 | 1000 | \$.68 | \$680.00 |
| 5/1-9/31 | Bio-Oregon | Bio-Dry 1000 | 2000 | \$.50 | \$1,000.00 |
| | | | | | \$1,680.00 |

Total Summary of Catchable Rainbow Trout Redistributed.

| # of FISH | WEIGHT (lbs) | FEED FED | CONVERSION | COST PER LB FOR REDISTRIBUTION | COST/1000 FISH FOR REDISTRIBUTION |
|-----------|--------------|-----------|------------|--------------------------------|-----------------------------------|
| 78,487 | 25,809 | 3,000 lbs | 1.0 | \$.99* | \$324.79** |

Estimated costs include 50% of the FY04 & FY05 budgets and do not include permanent salaries or feed cost @ NSFH. Redistribution expenditure by CFH \$19,417.00.

* Cost/lb equals total budget divided by total lbs produced, 1/1/05-12/31/05.

** Cost/1,000 fish equals total budget (minus feed cost @ NSFH) divided by total number of fish produced times 1,000.

| | | |
|--------------------|--|--------------------|
| 1/1/05 to 12/31/05 | Cost for Rearing @ NSFH and Redistribution @ CFH | \$19,417.00 |
| | Transport cost to deliver fish from NSFH to CFH | <u>\$ 6,075.00</u> |
| | Total cost | \$25,492.00 |

IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL RESIDENT REPORT

GRACE FISH HATCHERY

Dwight Aplanalp, Fish Hatchery Manager I
Jeffrey D. Seggerman, Assistant Fish Hatchery Manager
Jeff Houck, Fish Culturist

INTRODUCTION

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

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

A Fish Hatchery Manager I, an Assistant Fish Hatchery Manager, and a Fish Culturist staff the GFH. One 8-month temporary employee is hired to assist with hatchery operations.

Water for GFH is supplied by gravity flow from Middle and West Whiskey Creek springs located on private property owned by Robert Harris. Flow for 2005 was an average of 13.41 cubic feet per second (cfs) which is 102% of the ten-year average. There is a natural fluctuation in water quantity basically opposite of run-off and GFH biomass. Flows are at a minimum during April and May and peak in October and November. The GFH biomass is at a maximum in April and at a minimum in October. Water temperature fluctuates from 52°F to 54°F.

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

FISH PRODUCTION

The GFH cultured sterile Hayspur strain rainbow (T9), sterile Kamloop rainbow (KT), Troutlodge triploid rainbow (TT) and sterile lake trout (LT) in 2005.

The GFH began the 2005 calendar year with 203,999 fish weighing 16,107 lbs. A total of 475,301 fish weighing 83,474 lbs were reared and planted by GFH in the year 2005. There were 577,793 fish weighing 32,414 lbs on hand December 31, 2005. This accounts for a total production of 849,095 fish weighing 99,781 lbs (Appendix 1).

The GFH received eyed-eggs from various state and private hatcheries in 2005. During the year a total of 955,982 eyed-eggs of various species were received (Appendix 2).

Production costs at GFH for 2005, excluding capital outlay, were \$263,202 (Appendix 3). Production costs were calculated for pondside and streamside amounts. Pondside cost is total budget minus capital outlay and minus transportation. Streamside cost includes transportation.

Rainbow trout (fingerlings and catchables combined) accounted for 98.9% of the total lbs produced and 98% of total cost. The average cost to produce a rainbow trout at GFH in 2005 was \$2.78 per lb or \$.33 per fish (\$328.60 per 1,000 fish). Triploid lake trout accounted for the remaining 1.1% of the lbs produced and 2.0% of total cost (Appendix 4).

Catchable Rainbow Trout

During 2005, the GFH planted tributaries of the Bear River and Snake River watersheds with sterile catchable rainbow trout. Sterile Hayspur rainbow (T9), Sterile Kamloop rainbow (KT), and Troutlodge triploid rainbow (TT) were the strains of rainbow catchables planted. Sterile rainbows were planted in the Bear River watershed to prevent hybridization with the native Bear River cutthroat trout. The GFH achieved 119% of the 2005 catchable request. Most of the surplus catchables were planted into Chesterfield and Blackfoot reservoirs.

The GFH freeze-branded fish destined for sections of the Bear River in 2005. The freeze-branded fish were marked with a "T" brand on the right side of the fish between the dorsal fin and the lateral line. Triploid catchable rainbows stocked in the Bear River at the Black Canyon access site had a "T1" brand, or an upright "T". Fish planted in the Bear River directly below Alexander Reservoir had a "T3" brand ("T" rotated 180 degrees). Fish planted in the Bear River below the Grace Dam had a "T4" brand ("T" rotated 270 degrees). The freeze-branded fish will be evaluated by fisheries management biologists to track upstream and downstream migrations of catchables after stocking.

The GFH started this calendar year with 147,285 triploid catchable trout. Over the course of the year, 161,840 (68,354 lbs) triploid catchable trout averaging 10.18 inches were planted. On December 31, 207,600 (31,214 lbs) fish remained on the station for future planting. Total produced for the year was 222,155 triploid catchable rainbows weighing 83,529 lbs. These fish converted 80,265 lbs of fish food at a feed conversion of 0.96. The average cost to plant a 10.18-inch catchable was \$1.38 per lb or \$.58 per fish (\$582.90 per 1,000 fish) (Appendices 1, 4).

Lake Trout

The Department has a cooperative agreement with the Utah Department of Wildlife Resources (UDWR) to stock 50,000 triploid LT into Bear Lake over a three-year period. Research biologists and hatchery personnel developed a successful recipe for making triploid lake trout using hydrostatic pressure. In 2005 the GFH moved from the experimental phase to the hatchery production phase in making and rearing triploid LT. The GFH and Story Fish Hatchery personnel with the Wyoming Game and Fish Department (WGFD) produced the triploid LT that were stocked into Bear Lake in 2005.

During 2005, a total of 14,201 (1,075 lbs) were planted into Bear Lake as 6.72 inch triploid LT. These fish were confirmed triploid and received an adipose and right ventral fin clip prior to stocking. The average cost of planting a 6.72 inch triploid LT was \$5.08 per lb, or \$.38 per fish (\$384.78 per 1,000). Triploid LT converted 1,809 lbs of food at a feed conversion of 1.68 (Appendices 1, 4).

Rainbow Trout Fingerlings

During 2005 a total of 299,260 triploid fingerlings weighing 14,045 lbs were planted in Idaho waters as follows:

- 79,980 (6,200 lbs) of Kamloop trout fingerlings were raised to 5.79 inches at a cost of \$4.28 per lb or \$.33 per fish (\$331.53 per 1,000 fish). These fish were planted in Hayden Lake and Cocololla Lake (Appendix 4).
- 164,541 (2,833 lbs) of Kamloop trout fingerlings were raised to 3.5 inches at a cost of \$11.64 per lb or \$.20 per fish (\$200.41 per 1,000 fish). These fish were planted in Hayden Lake, Cocololla Lake and transferred to Sandpoint hatchery for further redistribution (Appendix 4).
- 52,739 (4,972 lb of Hayspur T9 fingerlings were raised to 6.18 inches at a cost of \$3.75 per lb \$.35 per fish (\$353.86 per 1,000). These fish were planted in Chesterfield, Daniels, Treasureton, and Twentyfour Mile reservoirs (Appendix 4).
- 2,000 (40 lbs) of Troutlodge triploid fingerlings were raised to 3.68 inches at a cost of \$10.54 per lb or \$.21 per fish (\$210.71 per 1,000 fish). These fish were planted in Bloomington Lake (Appendix 4).

Triploid rainbow fingerlings converted 14,564 lbs of food at a feed conversion of 0.96 (Appendix 1).

FISH FEED

The fish produced during 2005 were fed a total of 96,639 lbs of feed from Rangen Inc (Appendix 5). The net weight gained during 2005 was 99,781 lbs, which resulted in an overall conversion of 0.97 lbs of feed to produce one lb of fish (Appendix 1).

REPAIRS AND IMPROVEMENTS

- Constructed brick retaining walls and concrete pad at residence #4.
- Planted trees and put down sod at residence #4.
- Installed sprinkler system at residence #4.
- Finished the basement at residence #4.
- Installed new garage doors on 2-stall garage.
- Remodeled bathroom and installed vinyl dining room flooring in residence #3.
- Installed vinyl siding and storm windows and doors in residence #3.
- Acquired a new 4X4 utility vehicle for the hatchery.

- Installed propane stoves for back-up heating at residences #1 and #4.
- Cut brush and removed debris on the East Spring of Whiskey Creek.
- Installed concrete walls to remove common section of large raceways 1-2 and 3-4.

NEEDED RENOVATIONS

- Install domestic water pressure tank in residences #1 and #3.
- Install an auxiliary water supply pipe from the main supply line to a head box with new line going to the small raceways.
- Dredge existing settling pond and build new concrete settling pond with a sump basin that will service the vats, small raceways, medium raceways and large raceways.
- Build a doublewide garage and storage area for 2-ton, snowplow, and feeding tractor.
- Rebuild hatchery driveway and place Geotech Fabric to maintain stability.
- Build a French drain at residence #1 entry door.
- Install new kitchen linoleum in residence #2
- Remodel the kitchen in residence #3

PUBLIC RELATIONS

The GFH staff gave four scheduled tours to local area schools totaling 200 kids and teachers. Staff also gave formal tours to Boy Scout troops and to an additional 100 members of the public who visited the hatchery. Self-guided tour signs and informative tri-fold packets are available to the public at our visitor kiosk. It is estimated about 1,000 people took self-guided tours around the hatchery in 2005. Staff also participated in the Governor's Idaho Corps of Discovery program by providing information and serving as a passport stamp point of service. The GFH staff conducted a Free Fishing Day clinic at the hatchery. An estimated 200 kids, 14 and under, fished the escapement pond on Free Fishing Day. GFH also answered many questions from personal contacts and phone calls.

ACKNOWLEDGEMENTS

During 2005 the Grace Fish Hatchery crew included: Dwight Aplanalp, Hatchery Manager I, Jeffrey D. Seggerman, Assistant Hatchery Manager, Thomas Kent, Fish Culturist, Jeff Houck, Fish Culturist, and Nick Muller, Biological Aide. The GFH would like to offer special thanks to Terri Bergmeier, Region 5 volunteer coordinator, for coordinating all volunteer efforts at GFH this year. Volunteers helped with fin clipping of the lake trout, fish stocking, and Free Fishing Day activities.

APPENDICES

Appendix 1. Number and lbs of fish produced, reared and stocked by Grace Fish Hatchery, 2005.

| Species/Strain | Number Lbs On Hand 01/01/05 | Number Lbs Reared & Planted | Number Lbs On Hand 12/31/05 | Number Lbs Produced | Feed Conversion |
|---------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---------------------------|--------------------|
| Triploid Rainbow Catchables | 147,285 fish | 161,840 fish | 207,600 fish | 222,155 fish | 0.96 |
| | 16,039 lbs | 68,354 lbs | 31,214 lbs | 83,529 lbs | |
| Triploid Rainbow Fingerlings | 56,714 fish | 299,260 fish | 370,193 fish | 612,739 fish | 0.96 |
| | 68 lbs | 14,045 lbs | 1,200 lbs | 15,177 lbs | |
| Lake Trout | 0 fish | 14,201 fish | 0 fish | 14,201 fish | 1.68 |
| | 0 fish | 1,075 lbs | 0 lbs | 1,075 lbs | |
| Total fish | 203,999 fish | 475,301 fish | 577,793 fish | 849,095 fish | 0.97 |
| Total lbs | 16,107 lbs | 83,474 lbs | 32,414 lbs | 99,781 lbs | |

Appendix 2. Eyed eggs received at Grace Fish Hatchery 2005.

| Species/Strain | Source | Number Received | Date Received |
|----------------------------------|---------------|------------------------|----------------------|
| Sterile Rainbow Trout (T9) | IDFG Hayspur | 13,406 | 01/26/05 |
| Sterile Kamloops Rainbow (KT) | IDFG Hayspur | 111,780 | 01/26/05 |
| Troutlodge Triploid Rainbow (TT) | Troutlodge | 75,000 | 03/09/05 |
| Troutlodge Triploid Rainbow (TT) | Troutlodge | 75,000 | 08/17/05 |
| Sterile Kamloops Rainbow (KT) | IDFG Hayspur | 301,154 | 11/30/05 |
| Sterile Rainbow Trout (T9) | IDFG Hayspur | 28,111 | 11/30/05 |
| Triploid Lake Trout (LT) | WGFD Story | 96,531 | 11/23/05 |
| Sterile Kamloops Rainbow (KT) | IDFG Hayspur | 110,000 | 12/06/05 |
| Sterile Rainbow Trout (T9) | IDFG Hayspur | 100,000 | 12/13/05 |
| Troutlodge Triploid Rainbow (TT) | Troutlodge | 45,000 | 12/22/05 |
| Total | | 955,982 | |

Appendix 3. Pondside and streamside production costs at Grace Fish Hatchery, 2005. Streamside cost includes \$16,708 of Nampa's transportation costs.

| Lbs Produced | Production Cost | Pondside Cost | Pondside Cost/lb | Streamside Cost | Streamside Cost/lb |
|--------------|-----------------|---------------|------------------|-----------------|--------------------|
| 99,781 | \$263,202 | \$255,519 | \$2.56 | \$279,910 | \$2.81 |

Appendix 4. Costs of fish produced at Grace Fish Hatchery, 2005. This reflect all costs budgeted except capital outlay, and includes \$16,708 of Nampa's transportation costs.

| Species/Strain | length/inches | Number Produced | Weight Lbs | Costs produce and plant | Cost/1000 | Cost/lb |
|---------------------------------|---------------|------------------|----------------|-------------------------|-----------------|---------------|
| Fish on Hand Jan 1, 2005 | | | | | | |
| Hayspur Rainbow (T9,KT) | 7.3 | 70,730 | 11,021 | | | |
| Troutlodge Triploids (TT) | 5.47 | 76,555 | 5,018 | | | |
| Hayspur Rainbow (T9,KT) | 1.44 | 56,714 | 68 | | | |
| TOTAL | 5.82 | 203,999 | 16,107 | | | |
| Fish Planted | | | | | | |
| Triploid Lake Trout (LT) | 6.72 | 14,201 | 1,075 | \$5,464.26 | \$384.78 | \$5.08 |
| SUBTOTAL | 6.72 | 14,201 | 1,075 | \$5,564.26 | \$384.78 | \$5.08 |
| Triploid Rainbow (KT,T9,TT) | 10.18 | 161,840 | 68,354 | \$94,335.84 | \$582.90 | \$1.38 |
| Hayspur Rainbow (T9) | 6.18 | 52,739 | 4,972 | \$18,662.23 | \$353.86 | \$3.75 |
| Hayspur Rainbow (KT) | 5.79 | 79,980 | 6,200 | \$26,515.70 | \$331.53 | \$4.28 |
| Troutlodge Triploids (TT) | 3.68 | 2,000 | 40 | \$421.43 | \$210.71 | \$10.54 |
| Hayspur Rainbow (KT) | 3.50 | 164,541 | 2,833 | \$32,975.04 | \$200.41 | \$11.64 |
| SUBTOTAL | 7.64 | 461,100 | 82,399 | \$172,910.23 | \$375.00 | \$2.10 |
| TOTAL | | 475,301 | 83,474 | \$178,374.49 | \$375.29 | \$2.14 |
| Fish on Hand Dec 31, '05 | | | | | | |
| Triploid Rainbow (T9,KT,TT) | 8.51 | 121,110 | 29,820 | \$59,013.67 | \$487.27 | \$1.98 |
| Troutlodge Triploids (TT) | 3.84 | 109,246 | 2,481 | \$24,020.38 | \$219.87 | \$9.68 |
| Hayspur Rainbow (KT,T9) | 0.93 | 347,437 | 113 | \$18,501.29 | \$53.25 | \$163.73 |
| TOTAL | 5.19 | 577,793 | 32,414 | \$101,535.35 | \$175.73 | \$3.13 |
| GRAND TOTAL | | | | | | |
| Planted in 2005 | | 475,301 | 83,474 | \$178,374.49 | \$375.29 | \$2.14 |
| (+)On Hand Dec. 31, 2005 | | 577,793 | 32,414 | \$101,535.35 | \$175.73 | \$3.13 |
| TOTAL | | 1,053,094 | 115,888 | \$279,909.84 | \$265.80 | \$2.42 |
| (-)On Hand Jan. 1, 2005 | | 203,999 | 16,107 | | | |
| TOTAL GAINED | | 849,095 | 99,781 | \$279,909.84 | \$329.66 | \$2.81 |

Appendix 5. Fish food fed and cost, Grace Hatchery, 2005.

| Source | Diet | Size | Cost/lb. | Lbs | Total Cost |
|---------------|----------------|----------------|-----------------|-----------------|--------------------|
| Rangens | Dry | 00 | \$0.486 | 71.0 | \$34.50 |
| Rangens | Dry | # 0 | \$0.486 | 208.0 | \$101.09 |
| Rangens | Dry | #1 | \$0.486 | 475.0 | \$230.85 |
| Rangens | Dry | #2 | \$0.486 | 850.0 | \$413.10 |
| Rangens | Dry | #3 | \$0.486 | 3,350.0 | \$1628.10 |
| Rangens | Dry | #4 | \$0.366 | 3,695.0 | \$1352.37 |
| Rangens | Extr. 450 | 3/32 sink | \$0.366 | 9,490.0 | \$3473.34 |
| Rangens | Extr. 450 | 1/8 sink | \$0.324 | 8,750.0 | \$2835.00 |
| Rangens | Soft Moist | 1/8 sink | \$0.832 | 1,250.0 | \$1040.00 |
| Rangens | Extr. 450XXvit | 1/8 bulk float | \$0.335 | 68,499.5 | \$22,947.33 |
| TOTAL | | | | 96,638.5 | \$34,055.68 |

IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL RESIDENT REPORT

HAGERMAN FISH HATCHERY

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

INTRODUCTION

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

Funding is provided primarily through Department license money. The HFH used approximately \$594,173 this year: \$319,417 from Hagerman's budget, \$229,564 from Dingell-Johnson (DJ) monies, and \$60,339 from the fish transportation budget, to rear and stock fish in the 2005 production year, not including capital outlay expenditures (Appendix 1).

The HFH is staffed with a Hatchery Manager II, Hatchery Manager I, two Fish Culturists, and a Fish Transport Operator. One of the fish culturists, Tim Klucken, transferred to Clearwater Hatchery, and was replaced by Darlene Snyder. Approximately 19 months of temporary labor is available from the DJ budget for use during the year.

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

HATCHERY PRODUCTION

During 2005, the HFH reared and stocked 3,012,959 fish weighing 412,780 lbs. Of these, 1,204,599 were stocked 6-inches or longer and 1,808,360 were stocked smaller than 6-inches (Appendix 1). About 35.1% of the total fish were stocked in Magic Valley Region waters (Appendix 2). The majority of the larger trout were Kamloops rainbows from Troutlodge Inc., with the balance from Hayspur Fish Hatchery. Approximately 79,000 steelhead and 280,650 Coho salmon were also stocked. The 3-inch to 6-inch fish consisted of rainbow trout and Kamloops trout from Hayspur and Troutlodge Inc., and Coho salmon (Appendix 1). Many of the original stocking request numbers were eliminated or modified to compensate for water shortages in area reservoirs due to drought.

The 412,780 lbs stocked included 358,055 lbs of put-and-take fish averaging 8.9 inches, and 54,725 lbs of fingerlings that averaged 4.1 inches. The cost of planting the average 7.3 fish per pound (fpp) (6.8 inches) fish was approximately \$0.95 per lb, or \$130.16 per 1,000 fish (Appendix 1).

In addition to the fish reared and planted, 1,759,061 fish (164,830 lbs) were on hand at the HFH on December 31, 2005. These consisted of 1,257,779 fish (163,306 lbs, average 7.7 fpp, or 6.7 inches) in the large raceways and 501,282 fingerlings (1,524 lbs, average 329 fpp, or

1.9 inches) in the west raceways. The cost of producing the larger fish was \$1.11 per lb or \$143.96 per 1,000, and \$13.74 per lb or \$41.77 per 1,000 for the fingerlings (Appendix 1).

On hand January 1, 2005 were 1,423,733 fish (107,460 lbs). The HFH also received 1,050,604 fish (5,752 lbs) of fish from other hatcheries. Consequently, these subtractions yielded a net production for 2005 of 2,297,683 fish (464,398 lbs), mortality excluded (Appendix 1). The cost of producing the net production of 464,398 lbs was \$1.28 per lb.

A total of 8,354,772 eggs and fry were acquired to yield the fish produced. Approximately 3,074,359 eggs were purchased and the balance was acquired from government sources at no cost (Appendix 4). Of the eggs and fry received, 5,145,175 were received for the fish planted and the balance was used for 2006 production. Some eggs were sent to Magic Valley Fish Hatchery (MVFH) to alleviate overcrowded conditions here. They were then transferred to Hagerman Fish Hatchery (HFH) when they were about 183 fpp (2.3-inches). Because of last year's success, eggs were again shipped to MVFH for early rearing and will be transferred here in February 2006.

The overall survival rate of fish stocked was 58%, up from 49% survival last year (Appendix 3). Most of this difference can be attributed to the use of hydrogen peroxide in the hatchery building which resulted in less Coldwater Disease there. Once again, mortality due to IHN *Infectious Hematopoietic Necrosis Virus* decreased. However, about 200,000 subcatchable rainbow trout were lost to Ichthyophthirius (ICH) from December through February.

Fish transport operator Ken Taylor logged 28,128 miles delivering fish to state waters, while the rest of the crew logged 11,179 miles. This amounted to a total of 39,307 miles and 305 stocking trips during 2005, and included 27 trips for the private sector and Department hatcheries.

In addition to the annual requests by regional fisheries managers, the HFH crew made 27 trips to haul and stock 301,306 fish weighing 115,726 lbs from other sources (Appendix 7). These included three trips for the American Falls Fish Hatchery (AFFH) to stock 86,185 trout weighing 25,740 lbs; three trips to stock 15,441 channel catfish weighing 2,718 lbs; six trips to stock 24,913 brown trout weighing 6,440 lbs and 200 rainbow trout weighing 740 lbs from the University of Idaho Fish Culture Station; two trips for Ashton Fish Hatchery (AFH) to stock 23,596 rainbow trout weighing 7,900 lbs; one trip for Magic Valley Hatchery to stock 40,500 steelhead weighing 1,013 lbs, and 12 trips for several commercial hatcheries to stock 110,671 rainbow trout weighing 71,915 lbs.

FISH FEED

The fish produced during 2005 were fed a total of 547,490 lbs of feed from Rangen Inc (Appendix 5). The net weight gained during 2005 was 464,398 lbs, which resulted in an overall conversion of 1.18 lbs of feed to produce one lb of fish, not including the weight of the mortalities.

HATCHERY IMPROVEMENTS

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

- Installed new belting on the traveling screen.
- Completed a visitor's kiosk at the showpond to protect signage and added handicap access.
- Constructed new fire hose boxes throughout the hatchery.
- Constructed a drain line for the water chiller building crawlspace.
- Repaired the roof and replaced the floor of the clipping trailer.
- Replaced the old sewer lines in residence #3 and added a storage area to the garage.
- Installed a bathroom in the basement and new kitchen flooring and cabinets in residence #3.
- Installed new cabinets in the kitchen and remodeled the bathroom in residence #2.
- Installed a woodstove in Residence #2 and installed a fence in the yard.
- Removed large roots from the Riley Creek pipeline and also the trees above the pipeline.
- Constructed a new fish pump storage building by the feed shed.
- Extended the sidewalk behind the office duplex.
- Planted 35 black walnut trees around the hatchery.
- Replaced some raceway dam boards.

PUBLIC RELATIONS

The HFH received a large number of visitors and sportsmen throughout the year. An estimated 30,000 visitors toured the facility and used the surrounding public grounds this year. The 37 acres of HFH property are surrounded by 880 acres of the Hagerman Wildlife Management Area (WMA). The WMA provides a large variety of outdoor experiences, including fishing and hunting, wildlife viewing, and family picnic areas.

Hatchery personnel were called upon to give 13 tours to 547 school kids during the spring and fall, 4 tours for area scouts, and 3 tours to other large groups of adults. The hatchery sponsored the first annual "Pickup for Fish" day in which local cub scouts from the Magic Valley area picked up litter and then learned how to fish. The hatchery also hosted a Free Fishing Day clinic here for about 300 participants. The Hagerman Boy Scouts, Hagerman National Hatchery personnel, and personnel from the Magic Valley Bassmasters and the Department assisted. Pepsi-Cola, Falls Brand Meats, and Trader Jack's Sporting Goods in Hagerman contributed to the event.

Again this year, a monthly article was contributed to the Hagerman newspaper, the "Fish Wrap", to keep local anglers informed about fishing hot spots, tips, and miscellaneous fishing and hunting adventures. Hatchery personnel also participated in regional activities, such as fawn-trapping, spawning fish, and working the county fair.

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

FISH TAGGING OPERATIONS

The HFH crew participated in two tagging operations during the year in which 189,787 trout weighing 6,781 lbs were marked (Appendix 6). These fish were stocked into Salmon Falls Creek Reservoir on June 30 and September 15. This study is to evaluate fingerling and catchable stocking survival in this reservoir.

ACKNOWLEDGMENTS

Thanks to the permanent HFH staff of Dave May, Brian Thompson, Darlene Snyder, and Tim Klucken; to transport operator Ken Taylor; and to temporaries Paul Gaulin, Deskin Waters, and Lionel Gonzales.

Regional personnel Doug Megargle, Rob Ryan, Richard Holman, Dean Grissom, and Gary Hompland also deserve our gratitude. Thanks also to personnel from Niagara Springs and Magic Valley hatcheries for their cooperation this year.

APPENDICES

Appendix 1. Costs of fish produced at Hagerman Fish Hatchery 2005. Costs reflect all costs budgeted, except capital outlay, and include \$60,339 of the fish transportation budget.

| Species/Strain | Length/ Inches | Number Produced | Weight/ Lbs | Cost to produce and plant | Cost/ 1,000 |
|---------------------------------------|-------------------|--------------------|------------------|------------------------------|---------------------|
| FISH ON HAND JANUARY 1, 2005 | | | | | |
| Rainbow trout, yellow (YT,SP,03) | 13.4 | 3,490 | 3,490 | | |
| Kamloops rainbow trout (KT) | 9.0 | 29,946 | 9,361 | | |
| Steelhead (SA) | 6.3 | 100,350 | 9,300 | | |
| Kamloops rainbow trout (TL,TT) | 5.8 | 1,009,414 | 83,632 | | |
| Kamloops rainbow trout (KT) | 2.5 | 230,299 | 1,556 | | |
| Hayspur rainbow trout (T9) | <u>1.8</u> | <u>50,234</u> | <u>121</u> | | |
| Totals | 5.6 | 1,423,733 | 107,460 | | |
| FISH PLANTED | | | | | |
| Rainbow trout, yellow (YT,SP,01) | 15.7 | 2,936 | 5,100 | \$1,017.93 | \$346.71 |
| Kamloops rainbow trout (KT) | 10.4 | 84,787 | 39,860 | \$19,457.05 | \$229.48 |
| Kamloops rainbow trout (TL,TT) | 9.5 | 694,720 | 246,045 | \$145,062.89 | \$208.81 |
| Rainbow trout (T9) | 8.5 | 62,490 | 16,200 | \$11,759.54 | \$188.18 |
| Steelhead (SA) | 8.2 | 79,016 | 17,650 | \$14,381.35 | \$182.01 |
| Coho salmon | 6.7 | <u>280,650</u> | <u>33,200</u> | <u>\$41,326.70</u> | <u>\$147.25</u> |
| Subtotals | 8.9 | 1,204,599 | 358,055 | \$233,005.46 | \$193.43 |
| Hayspur rainbow trout (T9) | 3.7 | 861,010 | 19,450 | \$70,199.80 | \$81.53 |
| Kamloops rainbow trout (KT) | 4.0 | 669,205 | 18,625 | \$58,491.86 | \$87.40 |
| Kamloops rainbow trout (TL,TT) | 5.9 | 124,120 | 11,600 | \$16,245.67 | \$130.89 |
| Coho salmon (CO) | 4.2 | <u>154,025</u> | <u>5,050</u> | <u>\$14,218.33</u> | <u>\$92.31</u> |
| Subtotals | Average | 4.1 | 1,808,360 | 54,725 | \$159,155.66 |
| Total Planted | Average | 6.8 | 3,012,999 | 412,780 | \$392,161.11 |
| FISH ON HAND DECEMBER 31, 2005 | | | | | |
| Rainbow trout, yellow (YT,CL,04) | 13.2 | 8,580 | 8,580 | \$2,512.42 | \$292.82 |
| Kamloops rainbow trout (KT) | 10.4 | 59,297 | 28,237 | \$13,559.17 | \$228.67 |
| Steelhead (SA) | 6.5 | 204,431 | 24,386 | \$29,467.95 | \$144.15 |
| Kamloops rainbow trout (TL,TT) | 6.2 | 985,471 | 102,103 | \$135,533.70 | \$137.53 |
| Kamloops rainbow trout (KT) | 1.9 | 491,368 | 1,482 | \$20,475.97 | \$41.67 |
| Rainbow trout, yellow (YT,CL,05) | <u>2.1</u> | <u>9,914</u> | <u>42</u> | <u>\$462.67</u> | <u>\$46.67</u> |
| Totals | 6.0 | 1,759,061 | 164,830 | \$202,011.89 | \$114.84 |
| TOTAL FISH PRODUCED | | | | | |
| Planted in 2005 | | 3,012,999 | 412,780 | | |
| On Hand December 31, 2005 | | <u>1,759,061</u> | <u>164,830</u> | | |
| Totals | | 4,772,020 | 577,610 | \$594,173.00 | \$124.51 |
| From other hatcheries | | 1,050,604 | 5,752 | | |
| On Hand January 1, 2005 | | <u>1,423,733</u> | <u>107,460</u> | | |
| TOTAL GAINED | | 2,297,683 | 464,398 | | |

Appendix 2. Fish distribution from Hagerman Fish Hatchery, 2005.

Percent of number planted by Region

| | Number | Lbs | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|------------------|----------------|------------|-------------|-------------|-------------|-------------|-------------|------------|
| Catchables \geq6 inches | | | | | | | | | |
| Rainbow trout, yellow | 2,936 | 5,100 | | | | 100.0 | | | |
| Kamloops rainbow trout (TT) | 694,720 | 248,045 | - | 19.6 | 22.6 | 44.7 | 8.5 | 4.6 | - |
| Rainbow trout, (T9) | 62,490 | 16,200 | | | | | 100.0 | | |
| Kamloops rainbow trout (KT) | 84,787 | 39,860 | | - | 18.4 | 62.6 | 9.1 | 9.9 | |
| Steelhead (SA) | 79,018 | 17,650 | - | - | 75.0 | 25.0 | - | - | - |
| Coho salmon | 280,650 | 33,200 | | | 100.0 | | | | |
| Subtotal | 1,204,599 | 358,055 | - | 11.2 | 42.5 | 37.3 | 5.5 | 3.4 | - |
| <i>Fingerlings <6 inches</i> | | | | | | | | | |
| Hayspur rainbow trout (T9) | 861,010 | 19,450 | - | - | 1.1 | 50.2 | 37.3 | 11.4 | - |
| Kamloops rainbow trout (KT) | 669,205 | 18,625 | - | - | - | 26.4 | 39.8 | 33.8 | - |
| Kamloops rainbow trout (TT) | 124,120 | 11,600 | - | - | - | - | 100.0 | - | - |
| Coho salmon | 154,026 | 5,050 | | | 100.0 | - | - | - | - |
| Subtotal | 1,808,360 | 54,725 | 0.0 | 0.0 | 9.1 | 33.6 | 39.4 | 17.9 | 0.0 |
| TOTAL | 3,012,959 | 412,780 | 0.0 | 4.5 | 22.5 | 35.1 | 25.8 | 12.1 | 0.0 |

Appendix 3. Fish survival from eyed-egg to stocking, 2005.

| Species/Strain | Number Stocked | Eggs and Fry Received | Percent Survival |
|-----------------------------|-----------------------|------------------------------|-------------------------|
| Rainbow trout, Yellow | 2,936 | 5,436 | 54.01 |
| Rainbow trout, Hayspur (T9) | 923,500 | 1,556,967 | 59.31 |
| Kamloops, Troutlodge (TT) | 818,840 | 1,502,630 | 54.50 |
| Kamloops, Hayspur (KT) | 753,992 | 1,192,574 | 63.22 |
| Steelhead (SA) | 79,016 | 187,568 | 42.13 |
| Coho salmon | 434,675 | 700,000 | 62.10 |
| TOTAL | 3,012,959 | 5,145,175 | 58.56 |

Appendix 4. Number of eyed-eggs and fry received, species, and source for fish produced in 2005.

| Species/Strain | Eggs/Fry received | | |
|---|-------------------|-------------------|------------------------|
| | For Fish | For fish on hand | Source |
| | Planted | December 31, 2005 | |
| Received as eggs | | | |
| Rainbow/Yellow (YR) | 5,436 | 42,400 | Clear Lakes (ITP) |
| Rainbow/Kamloops (KT) | 933,873 | 1,109,733 | IDFG Hayspur |
| Rainbow/Hayspur (T9) | 765,064 | 175,910 | IDFG Hayspur |
| Rainbow/sterile Troutlodge (TT) | 1,502,630 | 1,571,729 | Troutlodge, WA |
| Steelhead | 187,568 | 309,825 | IDFG Pahsimeroi, Oxbow |
| Coho Salmon (CO) | 700,000 | | |
| Subtotal eggs | 4,094,571 | 3,209,597 | |
| Received as fry | | | |
| Rainbow from Magic Valley (T9) | 791,903 | 0 | IDFG Hayspur |
| Kamloops (Hayspur) from Magic Valley (KT) | 258,701 | 0 | IDFG Hayspur |
| Subtotal fry | 1,050,694 | 0 | |
| TOTAL | 5,145,175 | 3,209,597 | |

Appendix 5. Fish feed used during 2005 at Hagerman Fish Hatchery.

| Size | Source | Lbs | Cost/pound | Cost |
|----------------------|--------|----------------|---------------|---------------------|
| Str | Rangen | 450 | \$0.44 | \$217.80 |
| S.M. Str | Rangen | 50 | \$0.86 | \$ 42.95 |
| #1 | Rangen | 5,500 | \$0.49 | \$2,662.00 |
| #2 | Rangen | 21,150 | \$0.49 | \$10,236.60 |
| #2 TM | Rangen | 150 | \$0.62 | \$92.31 |
| #3 | Rangen | 73,350 | \$0.35 | \$25,525.80 |
| #3 TM | Rangen | 3,100 | \$0.62 | \$1,907.74 |
| 1/32 S.M. | Rangen | 880 | \$0.86 | \$755.92 |
| 3/64 S.M. | Rangen | 220 | \$0.83 | \$182.97 |
| 3/32 in, EXT450Float | Rangen | 132,520 | \$0.33 | \$43,466.56 |
| 5/32 in, EXT450Float | Rangen | 302,370 | \$0.30 | \$90,106.26 |
| 5/32 in, TM | Rangen | 7,750 | \$0.53 | \$4,135.40 |
| Subtotal | | 547,490 | \$0.33 | \$179,332.31 |
| Freight charges | | | | \$2,737.00 |
| Fuel Surcharge | | | | \$301.12 |
| Total cost | | | | \$182,370.88 |

Appendix 6. Summary of fish marked at Hagerman Fish Hatchery in 2005.

| Date Stocked | Species | Water | Number | Lbs | Clip |
|---------------|---------|-------------------------|----------------|--------------|---------|
| 06/30 | SA | Salmon Falls Creek Res. | 13,187 | 3,381 | RV |
| 09/15 | KT | Salmon Falls Creek Res. | 176,600 | 3,400 | Ad-clip |
| TOTALS | | | 189,787 | 6,781 | |

Appendix 7. Fish stocked by Hagerman Fish Hatchery from other sources, 2005.

| Hatchery Stocking | Species | Number | Lbs | Source | Destination |
|--------------------------|----------------|----------------|----------------|--------------------------------------|---|
| Hagerman | KT,T9 | 86,185 | 25,740 | American Falls Hatchery (Department) | Am. Falls Res., Little Wood R.; Blackfoot Res.; Devil's Creek Res. |
| | | | | | |
| Hagerman | BN | 12,140 | 500 | Ashton Hatchery | Rock Creek |
| Hagerman | BN | 12,773 | 5,940 | U of ID | Billingsley Creek, Horsethief Res. |
| | | | | | |
| Hagerman | T9 | 23,596 | 7,900 | Ashton Hatchery (Department) | Chesterfield; Blackfoot Res. |
| | | | | | |
| Hagerman | CC | 15,441 | 2,718 | Fish Processors, Buhl, ID | Riley Creek, Dog Creek Res., Alexander Res. |
| | | | | | |
| Hagerman | R1 | 200 | 740 | U of ID | Riley Creek |
| Hagerman | SA | 40,500 | 1,013 | Magic Valley Hatchery (Department) | Salmon Falls Creek Res. |
| Hagerman | R1 | 82,540 | 68,450 | Crystal Springs Hatchery | C.J. Strike Res.; Lucky Peak Res.; Riley Creek, Frank Oster #1 & #3 |
| Hagerman | R1 | <u>27,931</u> | <u>2,725</u> | Clear Springs Foods | C.J. Strike Res. |
| SUBTOTAL: | | 301,306 | 115,726 | | |

IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL REPORT

HAYSPUR FISH HATCHERY

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

INTRODUCTION

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

The HSFH is located in Blaine County, approximately 30 miles south of Sun Valley on Loving Creek. The HSFH property is an odd shaped 105.12-acre parcel. Fish culture facilities include an incubation building with 23 vertical 8-tray Heath type incubator stacks for trout eggs, a hatchery building with 20 early rearing vats, 15 covered 24-foot circular ponds, 4 small raceways, and 6 large production raceways. Other buildings include a fish spawning equipment storage building, two generator buildings, three residences for permanent employees, an office building, shop, a three bay garage, a barn, and dormitory for temporary employees.

Water sources include the covered spring that supplies 5.5 cubic feet per second (CFS) at 52°F (11.6°C), and three pumped artesian wells producing 2.5 CFS at 48°F to 52°F (8.9° C to 11.6°C). The spring and well water are both considered specific pathogen free (SPF) water supplies.

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

RAINBOW AND KAMLOOPS EYED EGG PRODUCTION

The 2005 rainbow trout spawning season was a nine-month project, beginning in August and ending in May with an egg take of 11,060,844 green eggs from 4,241 females during the year (Appendix 1). Photoperiod manipulation, or light control, has expanded "normal" spawn timing to more closely match egg production with eyed egg requests. Only three-year-old and older Hayspur rainbows and Kamloops rainbows were manipulated. Hayspur rainbow trout triploid eyed egg production totaled 3,633,906 with 2,042 females spawned. Kamloop triploid-eyed egg production totaled 3,597,735 with 2,199 females spawned. All eggs produced, except for broodstock replacement eggs, were heat or pressure shocked for triploidy. American Falls, Ashton, Cabinet Gorge (Sandpoint), Eagle, Grace, Hagerman, Hagerman National, Magic Valley, McCall, Nampa, and Tuccannon National hatcheries were shipped eggs as per their requests. Value to the Department, at the current contract price of \$28.00/1,000 for sterile triploid rainbow trout eggs and \$38.00/1000 for Westslope trout eggs, equates to \$203,646.69 (Appendix 2).

In 2005, all rainbow trout eggs produced for shipping were heat or pressure shocked and made sterile. Replacement broodstock eggs were not heat shocked and were utilized exclusively at HSFH for replacement broodstock needs. This was the fifth year of full production using the heat or pressure shock method refined during the previous six years of research. Washington State University performed induction rate sampling on eleven randomly selected lots of eggs reared at the Eagle Fish Health lab. After the eggs had hatched and fish reached approximately

three inches in length, blood samples were sent to the lab. A total of 443 individuals were sampled (heat shocked). Sample results indicated that 426 out of 443 were verified as being triploid. The overall induction rate was 96.2%, down slightly from 96.3% the previous year. A total of 157 individuals were sampled (pressure shocked). Sample results indicated that 150 out of 157 were verified as being triploid. The overall induction rate was 95.5%. The final cumulative result for the season was 576 out of 600 or 96%.

WESTSLOPE CUTTHROAT TROUT EYED EGG PRODUCTION

The 2005 spawning season was a four-month project beginning in February and ending in May. The first spawn occurred on February 25, 2005. Spawning was completed on April 29, 2005. A total of 19 egg collections resulted in 348 females (BY00 and BY02) being spawned. A total of 235 females were spawned for production purposes and 113 females were spawned for replacement broodstock. Average fecundity was 504 eggs per female. The overall eye-up rate was 25.41% (down from 58.82% in 2004). A total of 175,615 green eggs were collected and eyed egg production equaled 44,632 (Appendix 1). Of the eyed eggs produced, 30,546 were shipped to American Falls Hatchery for rearing and 14,086 were retained as future broodstock replacements.

FISH LIBERATIONS

Fish requested for the Big Wood and Little Wood drainages were reared at Nampa Fish Hatchery (NFH) and transported to HSFH for redistribution by HSFH personnel. Semi-tank and trailer loads were hauled as needed to complete HSFH 2003 plant request. A total of 43 stocking trips into the Big Wood and Little Wood drainages were stocked with 45,300 catchable sized rainbow trout (Appendix 3). In addition, a total of 12,806 surplus diploid rainbow trout fingerlings were stocked into Salmon Falls Creek Reservoir during 3 stocking trips. Gaver's Lagoon received a total of 5,049 surplus broodstock. In all, 58,106 fish were distributed during the season.

FISH FEED

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

HATCHERY IMPROVEMENTS AND NEEDS

Improvements to the HSFH during 2005 included:

- Large willow trees were trimmed.
- The carpets in all of the residences and the dormitory were professionally cleaned in the spring and the fall.
- All of the garage doors in the office building were repaired and painted.
- Vegetation was removed from large raceways A through F.
- Russian Olive trees were pruned in the campground.
- Predator covers over the small raceways were repaired as needed during the season.
- Genplus, a division of Cummins Intermountain Generator Service, serviced both generators in November. In addition, Generator #2 had a bad thermostat replaced during April.
- The boiler was repaired.
- Additional adult Round Pond crowd racks were constructed. In addition, several crowd rack extensions were constructed for Round Pond segregation.
- A leak in the small raceway supply line was repaired.
- All of the chimneys were professionally cleaned.
- New auto glass was installed in the ½ TPU and the Kubota tractor.
- A total of eight picnic tables were sanded and painted for use on the Hayspur grounds. In addition, two small benches along the Loving Creek project were sanded and refinished.
- The park restrooms were pumped and serviced.
- New furniture was purchased for the hatchery temporary employee dormitory. A closet/dresser combination unit, end table, and two lamps were purchased.
- Pump #4 was repaired and pump #2 was removed, inspected, serviced, and reinstalled.

Needs of the HSFH are:

- Replace the small raceway supply line.
- Replace the roof on Residence #3.
- Repair the hatchery building walls.
- Remove several willows behind Residence #1.
- Repair and/or replace numerous concrete areas around the HSFH.
- Replace the sewage lift station electrical panel components.
- Replace and enlarge the Gavers Lagoon outlet pipe.
- Resurface the HSFH entrance road and reduce the asphalt in front of the office building.
- Repair the flapper valve associated with Pump #4.
- Repair the broken spring on the Pump #3 flapper valve.
- Replace the linoleum in the bathrooms of Residence #1 and #3, and replace the linoleum in the kitchen and dining room of Residence #3.

BROODSTOCK MANAGEMENT

The Hayspur rainbow trout (R9) replacement population is perpetuated by using year-class crosses. Using one-male with one-female, 198 pairs of fish were crossed. The adult fish used in the replacement program were adipose clipped. Marked fish are generally used for production egg lots, rarely are they used again for development of a replacement population.

Hayspur's Kamloops rainbow (K1) broodstock replacement population is perpetuated by using year-class crosses. Using one-male with one-female, 144 pairs of fish were crossed. The adult fish utilized were adipose clipped. Marked fish are generally used for production egg lots, rarely are they used again for development of a replacement population.

Isolation incubators were used to separate individual families. In 2005, six R9 and zero K1 families tested positive for Bacterial Kidney Disease (BKD) and were culled. Isolation trays, constructed of disinfectable metal and plastic, were tested and used as isolation incubators. Each stainless steel tray was capable of holding 10 families segregated from one another. Each plastic tray was capable of holding 1 family. Trays were placed in Heath stacks and eggs were added for isolation incubation. Similar results occurred regardless of the method used.

A total of 14,086 Westslope cutthroat trout eggs were obtained in 2005. Cutthroat eggs are available on even years from Conners Lake, British Columbia Canada. These fish, along with the BY 00, BY 02, and BY 04 fish on station will be used as an adfluvial broodstock to provide fry for the high mountain lake program.

PUBLIC RELATIONS

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

Tours were provided to area schools. Valley Elementary School, Sun Valley Community School, Idaho Falls Holy Rosery School, Big Wood School, Big Wood Preschool, and the Wood River Middle School were exposed to the history of the hatchery, the life cycle of trout, water sources and water treatment, followed up by a question and answer period (Appendix 5).

MISCELLANEOUS

Jarrett Page attended a Hatchery Manager's meeting in Jerome, Idaho on January 26th. The meeting addressed catchable and fingerling statewide requests.

On February 1st Tom Frew received 2,000-eyed eggs for TIC programs, the MK Nature Center received 300-eyed eggs, and Keith Johnson received 400-eyed eggs for the Eagle Fish Health Lab. Joe Chapman received 250-eyed eggs for TIC programs on February 15th.

Steve Seiler received eggs from 8 females and milt from 16 males for research experimentation at Idaho State University on February 16th.

The Hayspur staff collected milt for use at Henry's Lake Fish Hatchery on February 14th and on February 17th. The milt was used to generate cutthroat/rainbow hybrids via delayed fertilization.

Jamie Mitchell attended a Fish Genetics class in Boise on February 22nd.

Brad Dredge attended AFS from February 24th through the 26th.

Brad Dredge and many others received a National Award for work on heat induced triploid trout production on March 23rd.

Vicki Osborn (Communications bureau) recorded a video on spawning procedures, pressure shocking of rainbow trout eggs, and interviewed Brad Dredge on April 20th. In addition, Vicki shot videos of egg husbandry work on May 8th.

Brad Dredge, Jarrett Page, and Jamie Mitchell attended In-Service Training School in Boise the week of May 23rd.

Jamie Mitchell attended a Cold Water Fish Culture workshop in Bozeman, Montana from the 20th of June through the 1st of July.

The State of Idaho facility inspection was performed on the 7th of June and the boiler inspection was completed on the 13th of June.

Brad Dredge and Jarrett Page attended the Hatchery Manager's meeting in Orofino, Idaho on the 18th of July.

Darren Beckley received 2,000-eyed eggs on November 28th for the MK Nature Center.

Brad Dredge and Jamie Mitchell attended the 56th Northwest Fish Culture Conference held in Boise, Idaho from December 6th through the 8th. Brad Dredge gave a Power Point presentation titled "Heat Induced Triploid Trout Production".

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

ACKNOWLEDGMENTS

In 2005, Hayspur Hatchery benefited from the capable assistance of Fishery Technicians Kenyon Roark and Travis Sadecki and Biological Aides Deanna Byington, Brian Walker, and Timothy Berk. The HSFH would like to thank IDFG employees who helped out during the spawning season: Lisa Brittain, Brian Thompson, Dan Greene, Art Butts, Kevin Meyer, Steve Elle, and John Cassanelli. The HSFH would like to thank Hagerman National Fish Hatchery employees Nathan Wiese, Eric Willet, James Brandon, and Brian Clifford. Special thanks go to Gary Ady and Dick Bittick for transporting catchables to HSFH from Nampa FH during 2005. Hatchery personnel would also like to thank the IDFG engineering crew, which consisted of Keith Samson, Buck Peak, and Lee Vandebogart for assisting with small raceway supply line repairs.

APPENDICES

Appendix 1. Egg production summary of Hayspur Fish Hatchery, 2005.

| Species | ^aEggs Taken | ^bEggs Shipped |
|-------------------------|-------------------------------|---------------------------------|
| T9's & KT's (Triploids) | 11,060,844 | 7,231,641 |
| C2's | 175,615 | 30,546 |
| Totals | 11,060,844 | 7,231,641 |

^aTotal is displaced (gram weight) of both good and bad eggs taken in 2005.

^bTotal is displaced (gram weight) of eyed eggs available for shipping in 2005.

Appendix 2. Eyed egg shipment summary from Hayspur Fish Hatchery, 2005.

| Hatchery | ^a Species | Total eggs shipped | ^b Estimated value |
|--------------------|----------------------|--------------------|------------------------------|
| American Falls | T9 | 125,741 | \$3,520.75 |
| | **C2 | 30,546 | \$1,160.75 |
| Ashton | T9 | 125,000 | \$3,500.00 |
| Cabinet Gorge | T9 | - | \$0.00 |
| | KT | - | \$0.00 |
| Grace | T9 & KT | 664,451 | \$18,604.63 |
| | | - | \$0.00 |
| Hagerman | T9 & KT | 1,994,525 | \$55,846.70 |
| | | - | \$0.00 |
| Mackay | | - | \$0.00 |
| | | - | \$0.00 |
| Magic Valley | T9 & KT | 1,054,251 | \$29,519.03 |
| | | - | \$0.00 |
| McCall | T9 & KT | 73,195 | \$2,049.46 |
| | | - | \$0.00 |
| Nampa | T9 & KT | 1,600,844 | \$44,823.63 |
| | | - | \$0.00 |
| Sandpoint | T9 | 44,903 | \$1,257.28 |
| | | - | \$0.00 |
| ^c Other | T9 & KT | 1,378,240 | \$38,590.72 |
| | | - | \$0.00 |
| Hagerman NFH | T9 & KT | 170,491 | \$4,773.75 |
| Tucannon NFH | KT | - | \$0.00 |
| Totals | | 7,262,187 | \$203,646.70 |

^aT9=sterile R9, KT=sterile Kamloops

^bAt contract value of \$28.00/1,000 sterile rainbow trout eggs.

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

^cEggs used for trout in the classroom programs, exchanged for laboratory work, shipped or discarded, and research purposes.

Appendix 3. Hayspur Fish Hatchery stocking summary, 2005.

| Fish size | Number of fish | Pounds of fish | Fish per pound |
|------------------------------|-----------------------|-----------------------|-----------------------|
| 3N Catchables | 45,300 | 12,712 | 3.56 |
| 2N Rainbow fingerlings | 12,806 | 394 | 32.50 |
| 2N Broodfish Extras to Gaver | 5,049 | 7,257 | 0.70 |
| Total | 58,106 | 13,106 | |

Appendix 4. Hayspur Fish Hatchery Feed Summary, 2005.

| Date | Size | Rangens Amount /pounds | Cost |
|---------------|----------------------|---------------------------------------|---------------------|
| 2/11/2005 | 1/4 in. Brood pellet | 10,880 | \$ 4,065.92 |
| 5/4/2005 | 1/4 in. Brood pellet | 11,260 | \$ 4,202.34 |
| 7/7/2005 | 1/4 in. Brood pellet | 11,500 | \$ 4,289.50 |
| 9/12/2005 | 1/4 in. Brood pellet | 11,220 | \$ 4,226.43 |
| Totals | | 44,860 | \$ 16,784.19 |

| Date | Size | Rangens Amount /pounds | Cost |
|---------------|-------------------------|---------------------------------------|--------------------|
| 1/27/2005 | Trout/Salmon Starter #2 | 100 | \$ 48.40 |
| 2/23/2005 | TM Medicated Feed #2 | 50 | \$ 48.68 |
| 3/30/2005 | Trout/Salmon Starter #2 | 100 | \$ 48.40 |
| | Trout Grower #4 | 900 | \$ 313.20 |
| 7/7/2005 | Trout Grower #4 | 200 | \$ 69.60 |
| | Trout/Salmon Starter #1 | 50 | \$ 42.11 |
| 8/8/2005 | Extruded 450 1/8" | 550 | \$ 169.40 |
| 9/12/2005 | Extruded 450 3/32" | 250 | \$ 84.50 |
| | Extruded 450 1/8" | 800 | \$ 246.40 |
| 10/5/2005 | Extruded 450 5/32" | 500 | \$ 154.00 |
| | Trout Grower #4 | 100 | \$ 34.80 |
| 11/9/2005 | Extruded 450 5/32" | 900 | \$ 277.20 |
| 11/25/2005 | Extruded 450 5/32" | 400 | \$ 123.20 |
| | Trout/Salmon Starter #0 | 50 | \$ 24.20 |
| | Trout/Salmon Starter #1 | 50 | \$ 24.20 |
| 12/30/2005 | Extruded 450 5/32" | 500 | \$ 154.00 |
| | Trout/Salmon Starter #3 | 50 | \$ 24.20 |
| | Trout/Salmon Starter #2 | 100 | \$ 48.40 |
| Totals | | 6,050 | \$ 2,070.09 |

Appendix 5. Hayspur Fish Hatchery Tour Group Summary, 2005.

| Month | Name of Tour Group | Grade/Age | Number in Group |
|--------------|------------------------------------|------------------|------------------------|
| April | Wood River Middle School (WRMS) | 6th | 60 |
| | Sun Valley Community School | Kindergarden | 15 |
| May | Holy Rosary School - Idaho Falls | | 25 |
| June | Blaine County Recreation District | 6-13 yrs. | 60 |
| | Free Fishing Day Event | 5-15 yrs. | 50 |
| July | 4th of July | | 50 |
| October | Sun Valley Community School | 7th | 30 |
| | Valley Elementary | 4th | 46 |
| | Big Wood Preschool | 4- 5 yrs. | 12 |
| | Local Cub Scouts | 10-11 yrs. | 20 |
| December | Wyoming Game and Fish-Steve Sharon | | 9 |
| Jan - Dec | General Visitors/Campers | | 1,000 |

IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL RESIDENT REPORT

HENRYS LAKE FISH HATCHERY

Damon Keen, Assistant Hatchery Manager

ABSTRACT

The 2005 spawning operations at Henrys Lake produced 1,270,914-eyed Yellowstone cutthroat trout eggs and 331,452 eyed hybrid trout eggs. Yellowstone cutthroat trout in the Hatchery Creek run showed a mean length of 444 mm; the hybrid trout mean length was 559 mm. The percentages of adipose fin clipped Yellowstone cutthroat returning to the ladder were recorded daily throughout the 2005 spawning run and ranged from 11.4% to 47.5%.

Pathology reports for viral or bacterial presence detected positive results from 13 families of Yellowstone cutthroat eggs and two families of hybrid eggs (bacterial presence), and all positives were subsequently destroyed.

A creel survey was conducted on Henrys Lake from May 28 through October 31. 1,272 interviews were conducted representing over 2900 anglers. The catch rate was .48 fish per hour (fpp).

Riparian fencing, fish diversion structures, and screening were maintained on the tributaries of Henrys Lake. Tributaries maintained were Howard Creek, Targhee Creek, Duck Creek, and Timber Creek. Fencing was also maintained on the south side of the county boat dock. The lower Duck creek fence was dismantled and salvaged. Additionally, a new fence was installed along the Henrys Lake shoreline, north of the county boat dock.

Late winter dissolved oxygen concentrations were assessed at established sampling sites. Oxygen concentrations were monitored to establish oxygen depletion rates and predict possible hazardous oxygen levels for fish in the lake. Dissolved oxygen data was evaluated and were predicted to remain above the area of concern, therefore, aeration was not deployed.

Author:

Damon Keen
Assistant Hatchery Manager

INTRODUCTION

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

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

The current hatchery building was completed in 1949 and remodeled in 1989. The building consists of 10 double stacks of Heath tray incubators. Hatchery water is supplied via gravity flow from Hatchery springs at 1.5 cfs for domestic and egg incubation use. Unused water flows into Hatchery Creek, through the spawning/trapping facility, and then finally into Henry's Lake via a 150-foot long fish ladder. The spawning/trapping facility was rebuilt in its entirety in 2003.

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

METHODS

Spawning Operation

The Hatchery Creek fish ladder was initially opened for the spring run on February 12 for the hybrid take and remained in operation until May 10. Fish ascending the ladder were identified as Yellowstone cutthroat or hybrid trout and enumerated. Sub-samples of approximately 10% of each group were measured (Total Length - mm) on a random basis. Additionally, all of the Yellowstone cutthroat were examined to detect the presence or lack thereof, of adipose fins. Yellowstone cutthroat trout were produced using ripe females spawned into seven fish pools and fertilized with pooled milt from four to seven males. Hybrid trout were produced with Yellowstone cutthroat trout eggs from the Henrys Lake run and Kamloops rainbow trout milt obtained from Hayspur Hatchery. The hybrid contribution was sterilized by inducing a triploid condition by pressure shocking the eggs post fertilization. Hybrid eggs were placed in the pressure treatment machine 47 minutes and 45 seconds post-fertilization at 10,000 psi and held at this level of pressure for 5 minutes. Random samples of the hybrid eggs were sent to the Eagle Fish Health Lab to test induction rates of sterilization. Hybrid production eggs were shipped to Mackay for hatching, rearing, and subsequent release back into Henrys Lake and other local waters. Yellowstone cutthroat eggs were also shipped to Mackay for hatching, rearing, and release back into Henrys Lake.

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

Riparian Fencing and Fish Screening

Electric fencing has been in place at Henrys Lake since the early 1990s. Fencing was stretched and solar panels, batteries, and connections were installed during May 2005 at ten sites on the tributaries of Henrys Lake as established in routine maintenance guidelines. Fencing was checked routinely during the summer and fall months for proper voltage and function. Voltage was checked using a voltmeter at each of the ten sites.

Conservation agreements completed during the summer of 2004 allowed for continued dismantling of several fences on the west side of Henrys Lake. The fence on lower Duck creek was taken out of service and the dismantling process completed.

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

Fish diversion screens are located at nine sites on the tributaries of Henrys Lake. Screens were maintained, cleaned and checked for proper operation on a daily basis during the summer and fall months of 2005.

Adult spawner counts were initiated on the same tributaries that fry trapping occurred in 2004. The three tributaries were walked in entirety along the known spawning habitat and evaluated using physical observation and with the help of polarized sunglasses. Numbers and species were recorded.

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

Creel Survey

From May 28 through October 31, a creel survey was conducted on Henrys Lake. Anglers were counted and interviewed on computer creel program generated random dates and times. Anglers were counted at the designated time and date from a point overlooking the lake with the aid of binoculars and spotting scopes. A revolution of the lake was subsequently taken by boat to count any anglers not visible from the point. Counts were completed within one half hour. Anglers were then interviewed at random throughout the day by boat access and occasional point of access sites.

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

Water Quality

Winter (January, February, and March 2005) dissolved oxygen concentrations; snow depth, ice thickness, and water temperatures were taken at established sampling sites. Sites were located using GPS readings from historical sampling sites. Holes were drilled in the ice prior to sampling using a gas powered ice auger. Dissolved oxygen samples were taken using a YSI model 550A oxygen probe and by sampling at each site at ice bottom and subsequent one-meter intervals until the bottom of the lake were incurred. Total g/m² of oxygen was calculated for each site.

RESULTS AND DISCUSSION

Spawning Operation

A total of 2,297 Yellowstone cutthroat trout ascended the spawning ladder between February 12 and May 10, with 1,266 males (Graph 1) and 1,031 females (Graph 2) enumerated. Hybrid trout totaled 526 fish, of which 344 were males (Graph 3) and 182 were females (Graph 4). Yellowstone cutthroat trout male and female total lengths averaged 442 and 445 mm (Graph 5), respectively. Combined mean Yellowstone cutthroat trout length was 444 mm. Hybrid trout males and females averaged 537 mm and 582 mm (Graph 6), respectively. Combined mean hybrid trout length was 559 mm.

Yellowstone cutthroat green eggs totaled 1,750,695 from 740 females for a mean fecundity of 2,366 eggs per female (Table 1). Eyed Yellowstone cutthroat eggs totaled 1,270,914 for an overall eye-up rate of 72.6% (Table 1). Yellowstone cutthroat trout eye-up varied throughout the spawn season from a low of 32.0% in Lot 3 to a high of 100.1% in Lot 10 (Graph 7). Eye-up was significantly reduced in Lot 3 due to the positive disease sampling results from 13 trays and the subsequent destruction of those families of eggs. Additionally, eye-up was recorded at greater than 100% in Lot 10 which probably resulted from egg enumeration error during spawn. Egg sampling enumeration is normally done on only three families per spawn day due to YCT eggs being somewhat fragile and therefore, occasional egg enumeration error can occur. Overall eye-up was reduced due to positive disease samples from 13 families of YCT and poor eye-up and subsequent total loss of Lot 13. All of the production of eyed Yellowstone cutthroat eggs was shipped to the Mackay facility where they were hatched, reared, and subsequently released back into Henrys Lake in the fall of 2005. A total of eleven spawn days during this year's spring run were devoted to Yellowstone cutthroat spawning.

Hybrid trout green eggs totaled 628,800 from 262 females for a mean fecundity of 2,400 eggs per female (Table 2). Eyed hybrid trout eggs totaled 331,452 for an overall eye-up rate of 52.7% (Table 2). Overall eye-up was reduced due to positive disease samples from two families of hybrids. Hybrid eggs totaling 306,452 were shipped to Mackay (Table 3) for hatching, rearing, and subsequent release into Henrys Lake and 28,226 of the hybrid production eggs were shipped to Ashton (Table 3) for hatching, rearing, and subsequent release into local waters. A total of two spawn days were devoted to production of hybrid eggs during this year's spawn. Sterilization induction rates for the hybrid production indicated 100% success for the triploid condition and represents a significant achievement for Department research.

Sub-samples of the identified Yellowstone cutthroat trout were inspected for the presence or lack of an adipose fin. The purpose of this was to collect data on run timing relative to spawn timing. For the last several years, 10% of the Henrys Lake cutthroat fry have had an adipose fin removed to estimate hatchery contribution to the total lake population. This information is obtained during routine creel checks. However, the 10% total has been taken solely from the earliest spawned fry. Therefore, a correlation between spawn timing and run timing at adult stage might be established by examining clipped adults at the ladder. Results of the data (Graph 8) indicated a slight decrease in percentage of adipose clipped fish as the run progressed, but still indicated a higher than expected component throughout the run. Increased survival of the earlier spawned fish might be indicated by this data. Additional data will be

gathered in the future in attempts to further quantify this relationship. Further analysis can be found in the regional report.

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

Bacterial disease sampling taken during spawning from ovarian fluid was positive for Lot 1; trays 5 and 10 of the hybrid take. Additionally, Lot 3, trays 3, 6, 7-9, and 11-18 tested positive in the YCT take. All positive corresponding families were subsequently destroyed. Additional analysis and results are available in the resident fisheries pathology report.

Riparian Fencing and Fish Screening

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

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

It was determined that the fences deemed no longer necessary should be removed and salvageable parts saved to be used on other projects. At the request of the landowner, some wooden posts were to be left in place to provide structure for birdhouses along the newly reclaimed wetland. The Lower Duck Creek fence project was completed and the new fence along the shoreline, north of the county dock was completed.

The decommissioned fences on Kelly Springs, Lower Duck Creek, and the west shoreline will result in time and labor savings to the department. The new fence is located in close proximity to the county boat dock and should only add a minimal increase in the workload which will be more than offset by the decommissioned fences. The new north county boat dock fence was constructed entirely with the salvaged Kelly Springs fence at a significant cost savings. The north and south county boat dock fences completed in 2004 and 2005 should provide new vegetation growth to approximately 1/2 mile of the west shoreline of Henrys Lake.

Adult Spawner Counts

Adult spawner counts were taken on the aforementioned tributaries during the estimated time of ascension. Additional interpretation and results, analysis, and corresponding graphs and charts are included in the regional fisheries management report.

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

Creel Survey

From May 28 through October 31, a creel survey was conducted on Henrys Lake. A total of 1,272 interviews were conducted throughout the course of the fishing season, representing approximately 2,925 anglers. The overall catch rate for the year was estimated at .48 fish per hour (fpp). The catch rate throughout the seven yearly intervals ranged from .75 fpp to .35 fpp. The estimated effort was recorded at 94,783 hours for the entire year. An estimated 8,991 fish were harvested over the course of the fishing season and an estimated 36,053 fish were released. The harvest rate was estimated at .096 fpp and an estimated 80% of the fish caught were released.

The catch rate shows a significant improvement over the last creel year (2003). Length frequencies taken during the season indicate a larger component of early age class fish than have been seen in the past several years. Further analysis can be found in the regionally fisheries report.

Water Quality

Oxygen profiles for December 2004-March 2005 were recorded for the four sites (Pittsburgh Creek, Hatchery Creek, County boat dock, and Wild Rose Creek). Total oxygen diminished from 32.5g/m² to 22.65g/m² at the Pittsburgh site, 25.9 g/m² to 18.35 g/m² at the County dock, 28.975 g/m² to 19.9 g/m² at the Wild Rose site, and 21.9 g/m² to 14.075 g/m² at the hatchery site. Due to slushy ice conditions throughout most of the winter, the Outlet site was not monitored.

Historically, the level of concern has been established at 10g/m². However, that level of concern is somewhat arbitrary due to the lack of a full understanding of critical dissolved oxygen levels in this environment in relation to the Yellowstone cutthroat species. The oxygen levels of the 2004-2005 remained above the level of concern and therefore, aeration was not deployed. Additional water quality information, analysis, and corresponding graphs and charts are included in the regional fisheries management report.

ACKNOWLEDGEMENTS

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

Likewise, a special acknowledgement is extended to the Henrys Lake Foundation. For many years, the foundation has given unselfishly in the form of donated time and funds, to maintain this important fishery.

The Henrys Lake facility remains an important avenue for disseminating information to the public. Hundreds of fisherwomen and fishermen, as well as the general public, stop by the facility to ask questions or to help with the processes of collecting data and spawning fish. Additionally, many public tours are given during the spawning season. Last season, many guided tours were given during the spawning season, namely in March.

LITERATURE CITED

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

APPENDICES

Table 1. 2005 Henrys Lake Spring Yellowstone Cutthroat Spring Spawning Summary

| <u>Spawn Date</u> | <u>Lot Number</u> | <u>Females Spawned</u> | <u>Number of Green Eggs</u> | <u>Mean Fecundity</u> | <u>Number Eyed Eggs</u> | <u>Disease Status</u> | <u>Percentage Eye-up</u> |
|-------------------|-------------------|------------------------|-----------------------------|-----------------------|-------------------------|-----------------------|--------------------------|
| 2/28/2005 | 3 | 140 | 328580 | 2347 | 105,000 | Pos. | 32.0% |
| 3/1/2005 | 4 | 70 | 164290 | 2347 | 155,000 | Neg. | 94.3% |
| 3/7/2005 | 5 | 105 | 246435 | 2347 | 213,333 | Neg. | 86.6% |
| 3/10/2005 | 6 | 105 | 246435 | 2347 | 182258 | Neg. | 74.0% |
| 3/14/2005 | 7 | 55 | 143000 | 2600 | 137097 | Neg. | 95.9% |
| 3/21/2005 | 8 | 57 | 133779 | 2347 | 103,226 | Neg. | 77.2% |
| 3/28/2005 | 9 | 53 | 124391 | 2347 | 117,742 | Neg. | 94.7% |
| 4/4/2005 | 10 | 35 | 82145 | 2347 | 82,258 | Neg. | 100.1% |
| 4/11/2005 | 11 | 67 | 157249 | 2347 | 150,000 | Neg. | 95.4% |
| 4/17/2005 | 12 | 20 | 46940 | 2347 | 25000 | Neg. | 53.3% |
| 5/9/2005 | 13 | 33 | 77451 | 2347 | 0 | Neg. | 0.0% |
| TOTALS | | 740 | 1750695 | 2366 | 1270914 | | 72.6% |

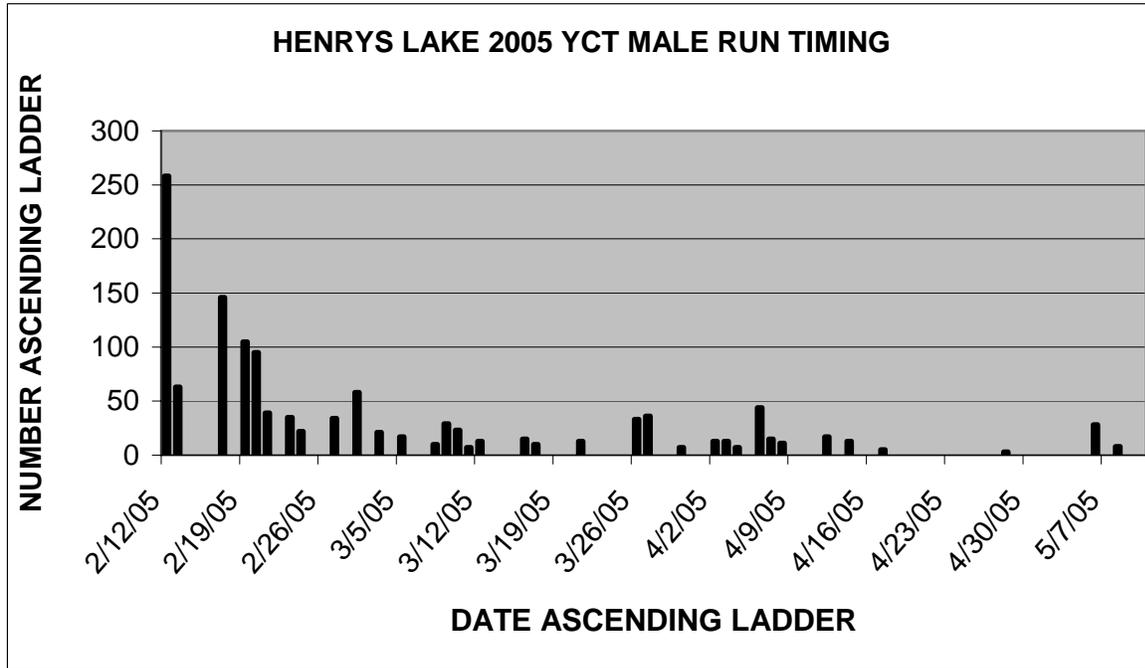
Table 2. 2005 Henrys Lake Hybrid Spring Spawning Summary

| <u>Spawn Date</u> | <u>Lot Number</u> | <u>Females Spawned</u> | <u>Number of Green Eggs</u> | <u>Mean Fecundity</u> | <u>Number Eyed Eggs</u> | <u>Disease Status</u> | <u>Percentage Eye-up</u> |
|-------------------|-------------------|------------------------|-----------------------------|-----------------------|-------------------------|-----------------------|--------------------------|
| 2/14/2005 | 1 | 147 | 352800 | 2400 | 167742 | 5 & 10 | 47.5% |
| 2/17/2005 | 2 | 115 | 276000 | 2400 | 163710 | Neg. | 59.3% |
| | | 0 | 0 | 0 | 0 | | |
| | | 0 | 0 | 0 | 0 | | |
| TOTALS | | 262 | 628800 | 2400 | 331452 | | 52.7% |

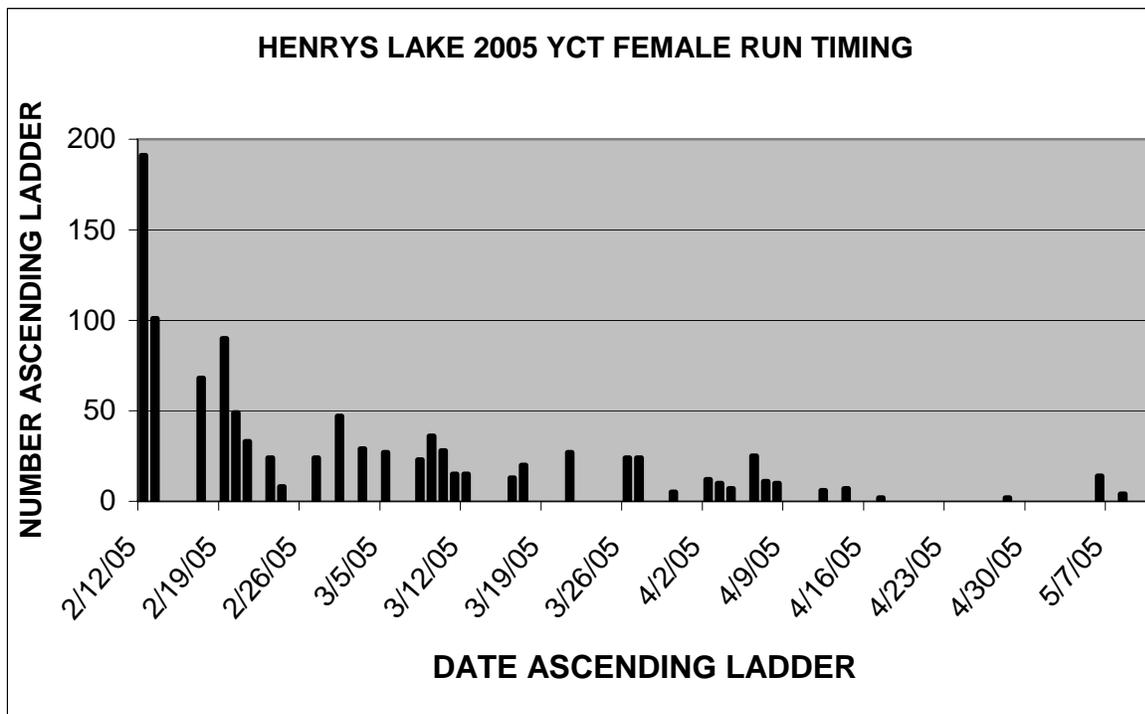
Table 3. 2005 Henrys Lake Egg Shipment Summary

| <u>DATE</u> | <u>LOT</u> | <u>STOCK</u> | <u>EGG SIZE</u> | <u>ML</u> | <u>EGGS</u> | <u>TU'S</u> | <u>DESTINATION</u> |
|-------------|------------|--------------|-----------------|-----------|------------------|-------------|---------------------|
| 18-Mar-05 | 1 | Hybrids | 3.1 | 10400 | 167,742 | 432 | MACKAY |
| 23-Mar-05 | 2 | Hybrids | 3.1 | 8400 | 135,484 | 459 | MACKAY |
| 23-Mar-05 | 2 | Hybrids | 3.1 | 1750 | 28,226 | 459 | ASHTON |
| 31-Mar-05 | 3 | YCT | 3.0 | 6300 | 105,000 | 419 | MACKAY |
| 7-Apr-05 | 4 | YCT | 3.0 | 9300 | 155,000 | 500 | MACKAY |
| 7-Apr-05 | 5 | YCT | 3.0 | 12800 | 213,333 | 419 | MACKAY |
| 15-Apr-05 | 6 | YCT | 3.1 | 11300 | 182,258 | 486 | MACKAY |
| 15-Apr-05 | 7 | YCT | 3.1 | 8500 | 137,097 | 432 | MACKAY |
| 27-Apr-05 | 8 | YCT | 3.1 | 6400 | 103,226 | 500 | MACKAY |
| 27-Apr-05 | 9 | YCT | 3.1 | 7300 | 117,742 | 405 | MACKAY |
| 11-May-05 | 10 | YCT | 3.1 | 5100 | 82,258 | 500 | MACKAY |
| 11-May-05 | 11 | YCT | 3.1 | 9300 | 150,000 | 405 | MACKAY |
| 20-May-05 | 12 | YCT | 3.1 | 1550 | 25,000 | 446 | MACKAY |
| | | | | | 331,452 | | TOTAL HYBRID |
| | | | | | 1,270,914 | | TOTAL YCT |

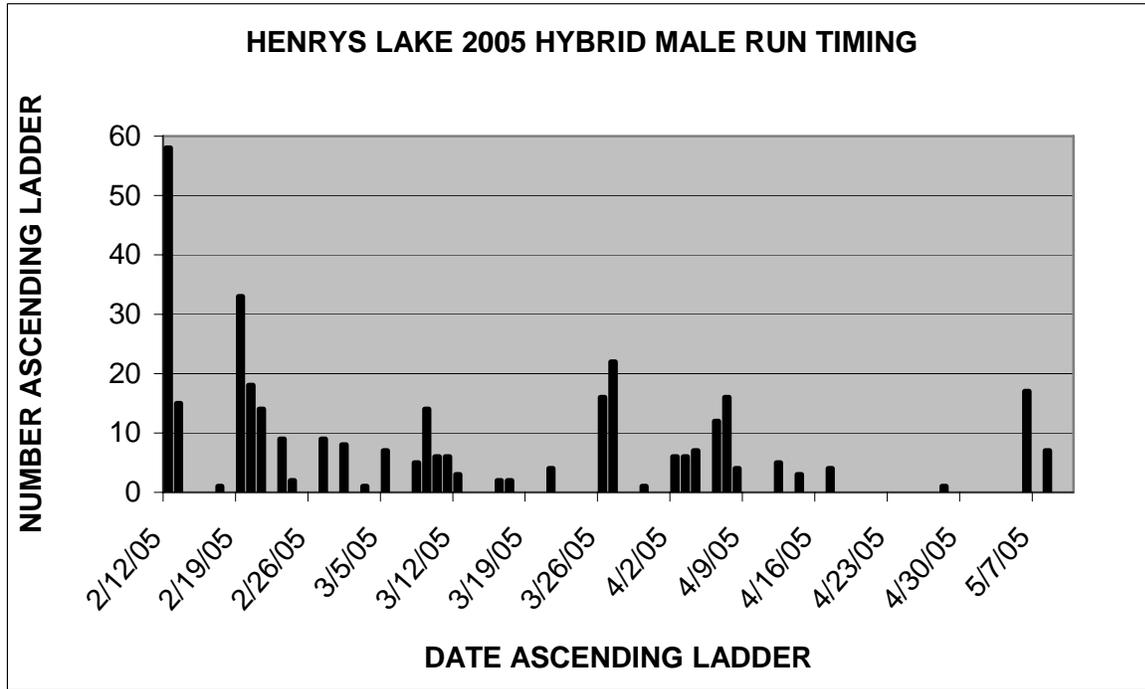
Graph 1. Henrys Lake 2005 Run Timing of Male Yellowstone Cutthroat Trout



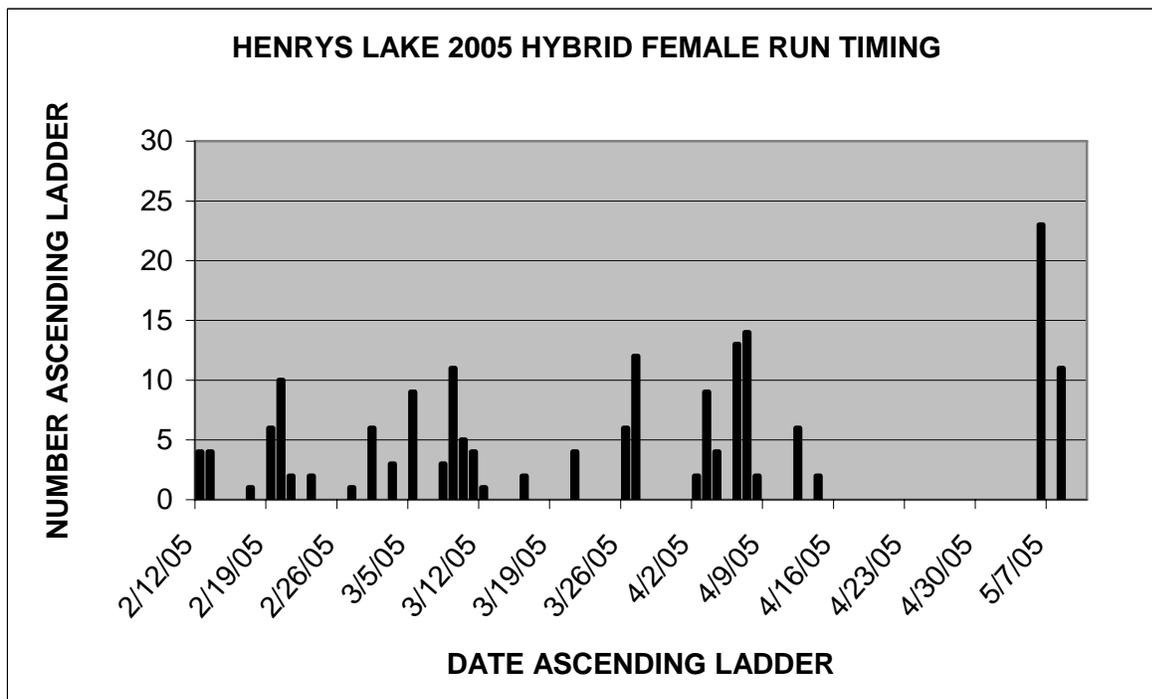
Graph 2. Henrys Lake 2005 Run Timing of Female Yellowstone Cutthroat Trout



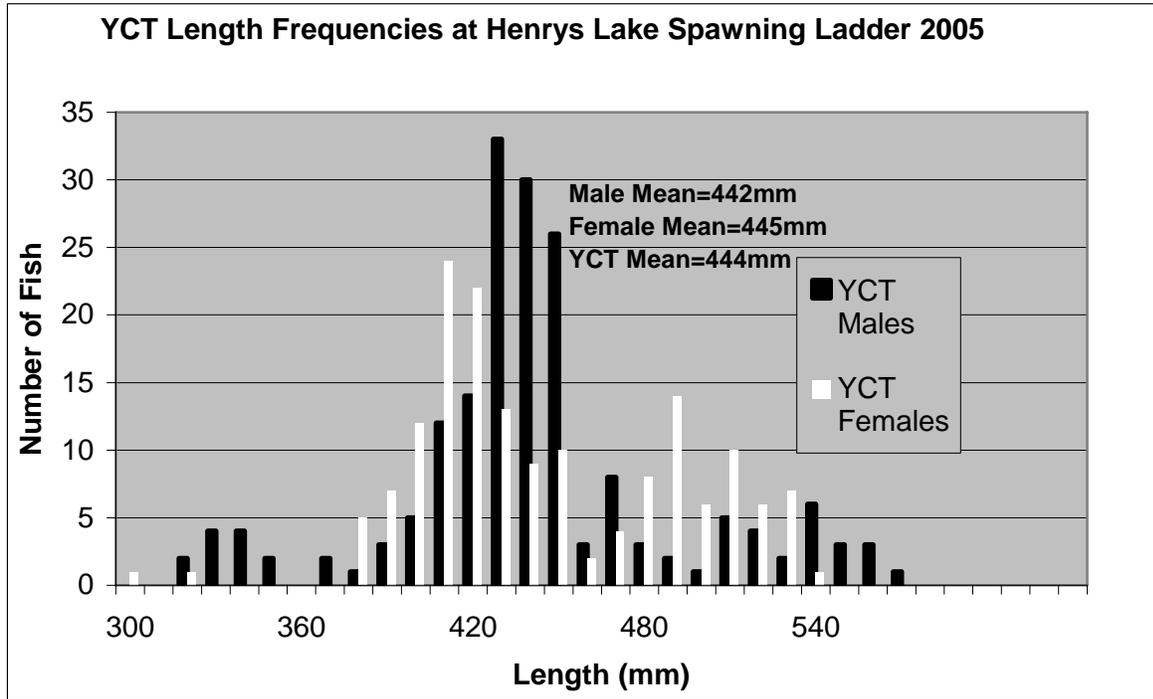
Graph 3. Henrys Lake 2005 Run Timing of Male Hybrid Trout



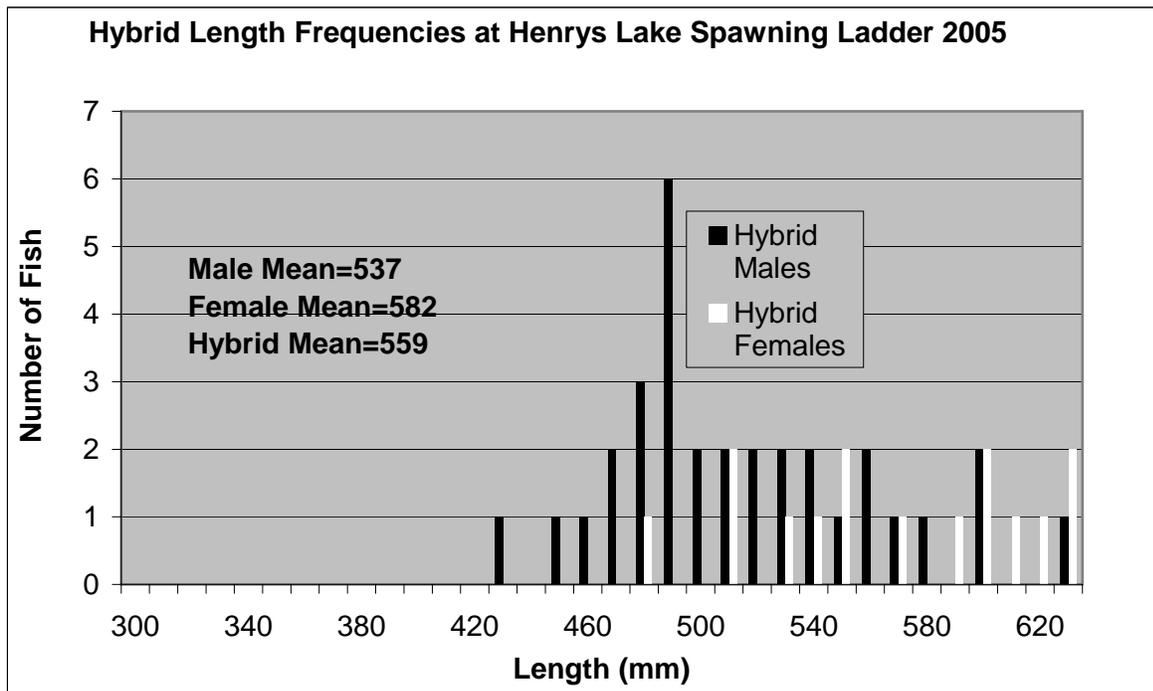
Graph 4. Henrys Lake 2005 Run Timing of Female Hybrid Trout



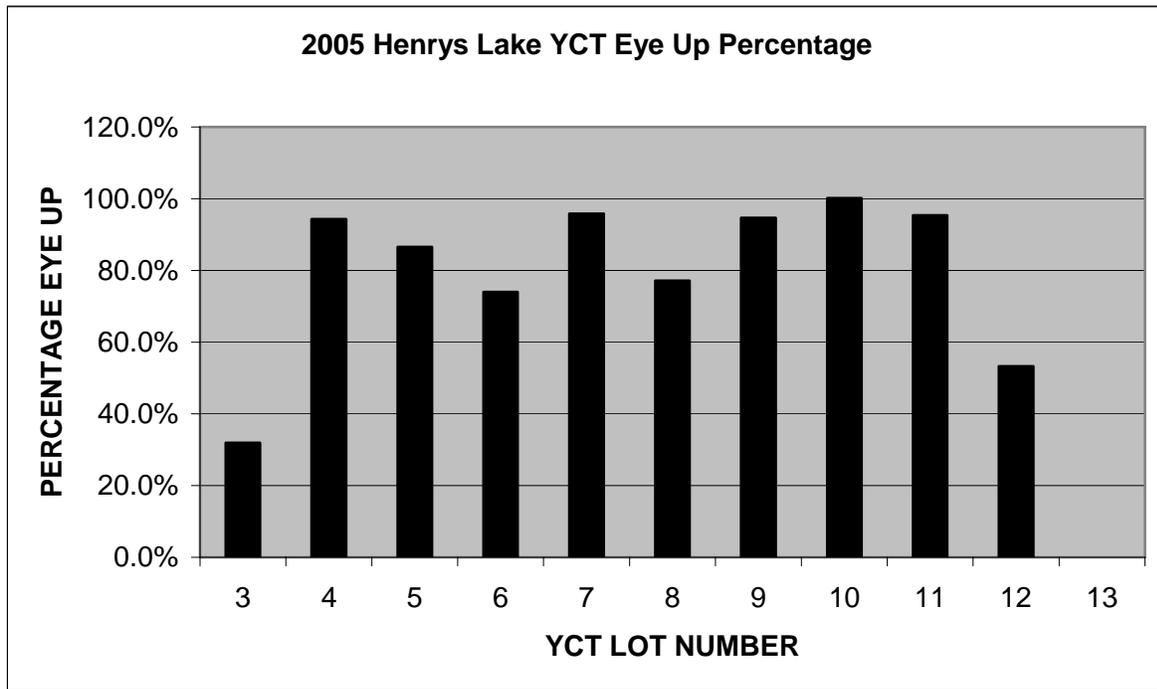
Graph 5. Henrys Lake 2005 Length Frequencies of YCT Spawning Run



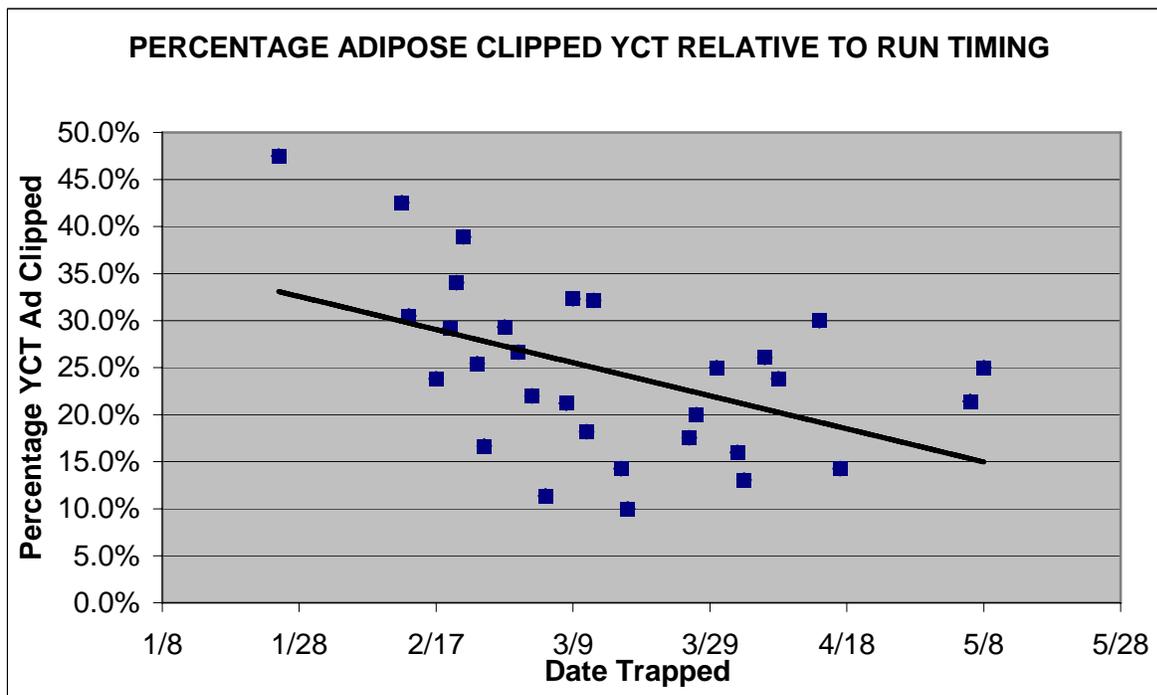
Graph 6. Henrys Lake 2005 Length Frequencies of Hybrid Trout Run



Graph 7. Henrys Lake YCT Eye-Up Percentages By Lot Number



Graph 8. Henrys Lake Adipose Clipped Yellowstone Cutthroat Run Timing



IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL RESIDENT REPORT

MACKAY FISH HATCHERY

**Robert M. Hoover, Assistant Fish Hatchery Manager
Phillip J. Coonts, Fish Hatchery Manager I
Bryan L. Grant, Fish Culturist**

INTRODUCTION

The Mackay Fish Hatchery (MFH) is a specialty fish production facility located approximately 15 miles north of Mackay, in Custer County. The hatchery produces various species and strains of fish, from 1 inch to 14 inches in length, for statewide distribution. The funding comes from state license monies for operational and personnel cost.

The hatchery is staffed with three full-time and two part-time Idaho Department of Fish and Game (Department) employees. The part-time employees share 16 months of temporary time. Wages, including benefits, cost \$180,308 for all personnel. The operating budget for the fiscal year was \$89,320.00. This year's fish production included three species and nine strains (Appendix 1).

Rainbow trout (*Oncorhynchus mykiss*)

Hayspur triploid (Bellevue, ID - Hayspur SFH)

Troutlodge triploid (Sumner, WA)

Kamloops triploid (Bellevue, ID - Hayspur SFH)

Yellowstone cutthroat trout (*O. clarkii*)

Henry's Lake (Island Park, ID - Henry's Lake SFH)

Snake River fine spot (Jackson, WY - Jackson NFH)

Rainbow x cutthroat triploid hybrids

Hayspur rainbow male x Henry's Lake cutthroat female

Kokanee salmon (*O. nerka*)

Early (Deadwood Reservoir, ID)

Early (Meadow Creek, Kootenay Lake, BC)

Triploid early (Deadwood Reservoir, ID)

October (Blue Mesa Reservoir, CO)

WATER SUPPLY

Water for the hatchery is provided by three collection springs in an artesian area on the hatchery grounds. The area has been dug out and filled with cobblestone to eliminate any standing water. The available volume of water for hatchery production has remained constant for many years. Flows range from 18 cfs during the early months of the year to 24 cfs during the summer months. The temperatures of the springs are as follows: 50°F, 51°F and 54°F. Egg incubation temperature is 51°F.

HATCHERY IMPROVEMENTS

- New furnace was installed in residence #3.
- Internet connection was upgraded to DSL.
- A new waste valve was installed on the hole raceways.
- Residence #3 interior was repainted.
- New light switches and electrical outlets were installed in residence #3.
- Residence #2 garage exterior vinyl siding was completed.
- A new clutch was installed on the 1952 Ford 8N tractor.
- Aluminum belt feeder lids were fabricated and installed.
- A permanent mounted ladder was constructed in the 4-bay garage.
- Crushed gravel was spread around the hatchery driveways.
- The dike in the first lower settling pond was repaired due to muskrat damage.
- Vinyl siding was installed on the new outdoor toilet facility.
- Holes and cracks in the hatch house troughs were repaired with gel coating.

FISH STOCKED

Fingerlings were planted in five regions across the state. These put-grow-and-take fish numbered 2,852,541 and weighed 33,259 lbs (Appendix 2).

Catchable rainbow trout were stocked in Regions 6 and 7. These put-and-take fish numbered 72,568 and weighed 44,275 lbs (Appendix 2).

Catchable Yellowstone cutthroat trout were stocked in Region 6. These put-and-take fish numbered 23,650 and weighed 15,700 lbs (Appendix 2).

TRANSPORT COSTS

The three fish transport trucks assigned to MFH made 112 separate stocking trips during the year. Fish from MFH were planted into 47 different bodies of water. Hatchery personnel traveled 28,300 miles doing this and averaged 253 miles traveled per trip. The fleet rental charges are \$296.19/month and 44.67 cents/mile for each of the 2-ton trucks. Fleet rental for the 1-ton truck is \$273.00/month and 32.85 cents/mile. All of these expenses totaled \$21,519.00.

The fish transport tanker trucks from Nampa Fish Hatchery (NFH) made eight trips to five different waters, traveling 3,174 miles for MFH during the year. For the use of the two tanker trucks, NFH expenses were \$7,594.00, bringing our total fish transportation cost to \$29,113.00.

FISH FEED

A total of 90,330 lbs of Rangen fish feed was used during the year costing \$33,591.00, including shipping charges (Appendix 3). Conversions ranged from a low of 0.83 for the 2005 Henrys Lake Yellowstone cutthroat trout to a high of 1.23 for the 2005 Snake River fine spot Yellowstone cutthroat trout. The average conversion for all lots of fish reared at MFH during the year was 1.07 (Appendix 3).

FISH MARKING

Adipose fin clips were given to 90,900 Henrys Lake Yellowstone cutthroat trout during the first week of August 2005. This represents 10% of the Yellowstone cutthroat planted into the lake. Natividad Wilson and her crew administered these clips.

A current study being performed by Department Fisheries Research comparing diploid Kokanee to triploid Kokanee required approximately 275,000 early spawner Kokanee from Deadwood Reservoir to be calcein marked. Joseph Kozfkay, Steve Elle and their technicians performed this calcein marking.

FISH HEALTH SUMMARY

The 2004 Hayspur triploid rainbow trout tested positive for coldwater disease (*F. psychrophilum*) and motile aeromonas septicemia (*A. sobria*). Mortality was never high, but was chronic throughout their time at MFH.

The 2005 Henrys Lake Yellowstone cutthroat trout suffered high mortality early in the fry stage. Coldwater disease (*F. psychrophilum*) was the causative pathogen. An oxytetracycline treatment of 10 g per 100 lbs of fish was fed for 14 days with no effect. Douglas Burton, Resident Hatchery Pathologist, stated the bacteria came in the egg due to disease-positive parents. Though MFH externally disinfects eggs it receives it cannot prevent this mode of infection.

PUBLIC RELATIONS

Approximately 500 people toured the hatchery during the year. Most of these visitors came to fish the diversion pond below the hatchery. Signs are posted designating the pond for youth fishing only and most people complied. Scheduled tours were given to area schools, an assisted living home and a youth conservation group. Hatchery employees also participate in the *Adopt a Highway* program by clearing the litter from 12 miles of Highway 93 biannually. MFH also continued to be an authorized stamp location for the *Idaho Corps of Discovery* program.

ACKNOWLEDGEMENTS

First, MFH would like to thank Steve England, Terrie Douglas and Shiloh Mangan, bio-aides at different times throughout the year, for their very important contribution to the hatchery's accomplishments. Their work enabled the hatchery to produce an excellent quality product for the angler. Thanks are also given to Theresa England, Dale Huffaker, Ed Wright and Keith Sampson who contributed to some of the year's hatchery improvements.

APPENDICES

Appendix 1. Fish cultured at Mackay Fish Hatchery, January 1 to December 31, 2005

| <u>Species/strain</u> | <u>Lot</u> | <u>Source</u> | <u>Received as</u> | <u>Number received in or carried into '05</u> | <u>Lbs received in or carried into '05</u> | <u>Destination</u> |
|--|-------------|-------------------|--------------------|---|--|-----------------------------------|
| Triploid rainbow - Hayspur | 03-ID-T9 | Hayspur SFH | eyed eggs | 2,450 | 1,361 | 2005 catchable |
| Triploid rainbow - Hayspur | 04-ID-T9 | Hayspur SFH | eyed eggs | 39,567 | 11,409 | 2005 catchable |
| Triploid Kamloops rainbow - Hayspur | 04-ID-KT | Hayspur SFH | eyed eggs | 39,500 | 11,175 | 2005 catchable |
| Triploid rainbow - Troutlodge | 05-WA-TT | Troutlodge | eyed eggs | 114,770 | N/A | 2005 fingerling 2006 catchable |
| Yellowstone cutthroat - Snake River fine spot | 03-WY-C4 | Jackson NFH | eyed eggs | 25,923 | 8,762 | 2005 catchable |
| Yellowstone cutthroat - Snake River fine spot | 04-WY-C4 | Jackson NFH | eyed eggs | 145,275 | 1,074 | 2005 fingerling 2006 catchable |
| Yellowstone cutthroat - Snake River fine spot | 05-WY-C4 | Jackson NFH | eyed eggs | 257,995 | N/A | 2006 fingerling 2007 catchable |
| Yellowstone cutthroat - Henrys Lake | 05-ID-C3 | Henrys Lake SFH | eyed eggs | 1,209,185 | N/A | 2005 fingerling |
| Rainbow x Cutthroat triploid hybrid | 05-ID-TH | Henrys Lake SFH | eyed eggs | 325,077 | N/A | 2005 fingerling |
| Early spawner Kokanee - Kootenay Lake, BC (Meadow Creek) | 04-CAN-KE | Kootenay Hatchery | eyed eggs | 1,400,000 | N/A | 2005 fingerling |
| Early spawner Kokanee - Deadwood Reservoir | 04-ID-KE | Nampa SFH | green eggs | 450,000 | N/A | 2005 fingerling |
| Early spawner Kokanee - Deadwood Reservoir (2N / 3N study) | 04-ID-KE-2N | Nampa SFH | green eggs | 120,000 | N/A | 2005 fingerling |
| Early spawner Kokanee - Deadwood Reservoir (2N / 3N study) | 04-ID-KE-3N | Nampa SFH | green eggs | 120,000 | N/A | 2005 fingerling |
| Early spawner Kokanee - Deadwood Reservoir | 05-ID-KE | Nampa SFH | green eggs | 2,899,040 | N/A | 2006 fingerling |
| October spawner Kokanee- Blue Mesa Reservoir, CO | 05-CO-KO | Roaring Judy SFH | eyed eggs | 347,009 | N/A | 2006 fingerling |

Appendix 2. Mackay Fish Hatchery stocking summary, 2005

| <u>Species/Strain</u> | <u>Lot</u> | <u>Number planted</u> | <u>Lbs planted</u> | <u>Size at release</u> |
|--|-------------|-----------------------|--------------------|------------------------|
| Yellowstone cutthroat-Snake River fine spot | 03-WY-C4 | 23,650 | 15,700 | catchable |
| Yellowstone cutthroat-Snake River fine spot | 04-WY-C4 | 127,465 | 5,485 | fingerling |
| Yellowstone cutthroat-Henrys Lake | 05-ID-C3 | 892,285 | 7,353 | fingerling |
| Rainbow x Cutthroat triploid hybrid | 05-ID-TH | 201,300 | 3,350 | fingerling |
| Triploid rainbow - Hayspur | 03-ID-T9 | 2,155 | 1,400 | catchable |
| Triploid rainbow - Hayspur | 04-ID-T9 | 31,150 | 19,210 | catchable |
| Triploid Kamloops rainbow - Hayspur | 04-ID-KT | 39,263 | 23,665 | catchable |
| Triploid rainbow - Troutlodge | 05-WA-TT | 750 | 2 | fingerling |
| Early spawner Kokanee-Kootenay Lake, BC | 04-CAN-KE | 987,080 | 7,620 | fingerling |
| Early spawner Kokanee-Deadwood Reservoir | 04-ID-KE | 430,195 | 6,752 | fingerling |
| Early spawner Kokanee-Deadwood Reservoir (2N / 3N study fish) | 04-ID-KE-2N | 110,946 | 1,382 | fingerling |
| Triploid early spawner Kokanee - Deadwood Res (2N / 3N study fish) | 04-ID-KE-3N | 102,520 | 1,315 | fingerling |

Total fish stocked, 2005

| | <u>Number of fish</u> | <u>Lbs of fish</u> |
|----------------------|-----------------------|--------------------|
| Fingerlings | 2,852,541 | 33,259 |
| Rainbow catchables | 72,568 | 44,275 |
| Cutthroat catchables | <u>23,650</u> | <u>15,700</u> |
| Total | 2,948,759 | 93,234 |

Appendix 3. Feed used and feed conversions at Mackay Fish Hatchery, 2005

| <u>Rangen Feeds</u> | <u>Cost / pound</u> | <u>Lbs used</u> | <u>Cost</u> |
|--------------------------------------|---------------------|-----------------|-------------|
| TSS # 0 | \$0.484 | 1,913 | \$926.00 |
| TSS # 1 | \$0.484 | 3,773 | \$1,826.00 |
| TSS #1 (Medicated) | \$0.615 | 328 | \$202.00 |
| TSS # 2 | \$0.484 | 10,860 | \$5,256.00 |
| Trout Grower # 3 | \$0.348 | 14,272 | \$4,967.00 |
| Extruded 450 3/32 sinking | \$0.308 | 4,612 | \$1,420.00 |
| Extruded 450 5/32 sinking | \$0.308 | 54,572 | \$16,808.00 |
| Shipping Charges | N/A | N/A | \$2,186.00 |
| Total lbs of feed used = | 90,330 | | |
| Total cost of feed used = | \$33,591 | | |

Feed conversions

| <u>Lot</u> | <u>Conversion</u> |
|----------------|-------------------|
| 05-ID-C3 | 0.83 |
| 03-WY-C4 | 1.2 |
| 04-WY-C4 | 0.87 |
| 05-WY-C4 | 1.23 |
| 04-CAN-KE | 1.15 |
| 04-ID-KE | 1.04 |
| 04-ID-KE-2N | 1.17 |
| 04-ID-KE-3N | 1.2 |
| 04-ID-T9 | 0.95 |
| 04-ID-KT | 1.1 |
| 05-WA-TT | 1.1 |
| 05-ID-TH | <u>1.03</u> |
| AVERAGE | 1.07 |

Appendix 4. Mackay Fish Hatchery production and costs summary, 2005

| | |
|---|---------------------|
| Lbs of fish stocked, 2005 = | 93,234 lbs. |
| Lbs of fish on station, 12/31/2005 = | <u>23,319 lbs.</u> |
| NET lbs of fish produced, 2005 = | 116,553 lbs. |
| Lbs of fish on hand, 12/31/2004 = | <u>34,181 lbs.</u> |
| TOTAL lbs of fish produced, 2005 = | 82,372 lbs. |

Production costs

6 months FY 2005 budget

| | |
|-------------|-----------------|
| personnel = | \$90,154 |
| operating = | <u>\$44,660</u> |
| | \$134,814 |

6 months FY 2006 budget

| | |
|-------------|-----------------|
| personnel = | \$90,154 |
| operating = | <u>\$44,660</u> |
| | \$134,814 |

| | |
|--|------------------|
| TOTAL 2005 costs = | \$269,628 |
| Cost per 1000 fish stocked = | \$91.44 |
| Cost per pound of fish stocked = | \$2.89 |
| Cost per pound of fish produced = | \$3.27 |

IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL RESIDENT REPORT

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

Steven T. Kammeyer, Assistant Hatchery Manager

INTRODUCTION

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

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

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

Major resident program objectives:

- Hatch and rear Westslope cutthroat trout *O. clarki lewisi*, domestic Kamloops rainbow trout *O. mykiss*, golden trout *O. aquabonita* and rear grayling *Thymallus arcticus* fry for stocking into mountain lakes in the Panhandle, Clearwater, Southwest, and Salmon Regions.
- Redistribute up to 101,000 catchable-size rainbow trout.
- Maintain the statewide high mountain lakes stocking request database.
- Provide assistance to the anadromous program as needed and available.

FISH PRODUCTION

Mountain Lake Stocking

A total of 129 mountain lakes were stocked with 120,500 fry in 2005 (Appendix 1). Of these, 114 lakes were stocked with 103,050 fry using fixed-winged aircraft at a cost of \$5,365.00 in flight time. Eight flights were flown from August 16 through September 12, 2005 and covered approximately 2,570 air miles. No arctic grayling or golden trout were available for stocking in 2005. The average cost to stock a mountain lake in 2005, based on flight time, was \$47.06 and ranged from \$35.68 to \$89.42 for individual regions. Volunteers stocked 12 lakes in the McCall area, saving the Department approximately \$552.84 in comparable flight time.

Incubation mortality was elevated for all species hatched out at MCFH in 2005. No definitive cause for this mortality was isolated. However large amounts of a gelatinous “egg-like” substance were observed coming in from the hatchery water source in Payette Lake. Sufficient quantities of this material may have clogged the bottoms of the egg trays, creating stagnate areas that would result in eggs/fry being suffocated. Mortality levels dropped to normal once fry were moved to indoor early rearing raceways. Overall, 62.1% of Westslope cutthroat trout requests were met.

Catchable Rainbow Trout Redistribution

A total of 97,130 sterile Troutlodge rainbow trout triploids were stocked into 38 water bodies in the McCall vicinity between May 17 and September 8, 2005. These fish were reared at Nampa Fish Hatchery (NFH) then transferred to MCFH. Transport costs to bring catchable-size trout from NFH totaled \$3,038.00 with 1,387 miles driven. Hatchery personnel drove approximately 4,683 miles on 102 stocking trips to complete requests at an approximate transportation cost of \$5,592.00. To maximize efficiency, multiple sites were stocked on 16 occasions eliminating the need to make additional separate stocking trips. Combined transport distribution cost was \$88.85 for each 1,000 fish stocked. To maintain the condition of fish received from NFH after mid-July, 300 lbs of 3.0 mm Bio-Dry trout feed was purchased to provide intermittent feeding at a cost of \$150.00.

Lake Cascade Perch Relocation

McCall Regional fisheries staff collected a total of 366,590 yellow perch in 2005 to aid in Lake Cascade perch recovery efforts: 183,890 – Phillips Reservoir, OR (March 20-April 11); 182,700 Lost Valley Reservoir, ID (May 3-25). Of these, MCFH personnel transported a total of 87,610 yellow perch collected at the two trapping sites on 12 stocking trips during the period of March 24 to May 6, 2005. In doing so, approximately 2,960 miles were driven by hatchery personnel using the resident 1-ton and 2-ton trucks at a projected transportation cost of \$5,838.00. Additional assistance was provided the McCall sub-Regional management staff in the forms of making available the resident 1-ton truck/ tank and a separate trailer/tank for transporting perch from Lost Valley Reservoir to Lake Cascade, sharing temporary personnel to help with perch capture at both sites, and providing personnel to help with the placement of an

electrical weir across the NF Payette River to stop upstream spawning migrations of undesirable species.

Payette Lake Net Pens

Anticipated placement of net pens on Payette Lake for continued rearing of catchable-size rainbow trout did not occur in 2005 due to opposition from adjacent landowners. McCall sub-Regional fishery staff completed negotiations with various agencies and landowners and will re-establish the net pens in the spring of 2006. Primary operation of the net pens will be directed out of the McCall sub-Regional Office with assistance provided by the hatchery staff.

Special Projects

Detailed directions to catchable rainbow trout stocking sites were compiled into a booklet to assist new personnel in locating these areas. During the past summer an effort was made to error-check the directions and to take photos of the stocking sites that will be incorporated into a revised stocking booklet.

Public Relations

Fish stocking opportunities were provided to several groups of volunteers from the Treasure Valley Back Country Horsemen and local backpackers who brought fry into 12 mountain lakes in the McCall area. Hatchery staff gave a fish stocking demonstration and talk to approximately 60 sixth graders attending an "outdoor school" at the Donnelly 4-H camp. Numerous hatchery tours were given to visitors and several school groups throughout the summer.

ACKNOWLEDGEMENTS

Resident program tasks in 2005 were completed thanks to the support and cooperation of the entire staff at McCall Summer Chinook Hatchery. I wish to thank Gene McPherson, MCFH Fish Manager II, for his advice and assistance on various resident projects as well as for generously allowing personnel hired primarily for anadromous activities to be utilized on resident endeavors. Individuals assisting on MCFH resident program activities in 2005 included: Joel Patterson (MCFH Fish Culturist) and seasonal employees Andrew Basabe, Morgan Bessaw, Ken Felty, Bud Forsythe, Jerry Harris, Joey Ishida Jr. and Nathan Parker.

APPENDICES

Appendix 1. Fry redistribution by Region, McCall Fish Hatchery, 2005.

| Species | Panhandle | Clearwater | Southwest (Nampa) | Southwest (McCall) | Salmon | Total |
|---|---------------|---------------|-------------------|-----------------------------|--------------|----------------|
| Rainbow Trout Triploid (Hayspur – T9) | - | - | 5,000 | 18,630 9,250 (excess) | 1,650 | 34,530 |
| Kamloops Rainbow Triploid (Trout Lodge – TT) | 14,600 | 1,000 | - | 5,170 | - | 20,770 |
| Westslope Cutthroat Trout (Westslope Cutthroat Trout Co.) | 11,500 | 15,000 | 26,450 | 12,250 | - | 65,200 |
| Cutthroat Trout Request Met | 58.4 % | 100.0 % | 92.0 % | 28.1 % | - | 62.1 % |
| Rainbow Trout Request Met | 100.0 % | 100.0 % | 100.0 % | 100.0 % | 100.0 % | 100.0 % |
| Region Subtotal | 26,100 | 16,000 | 31,450 | 45,300 | 1,650 | 120,500 |
| # Lakes Stocked by Plane | 12 | 25 | 41 | 29 | 7 | 114 |
| Lakes Stocked by Other Means | - | - | - | 15 | - | 15 |
| Approximate Flight Costs | \$ 1,073.00 | \$ 892.00 | \$ 1,711.00 | \$ 1,336.00 | \$ 353.00 | \$ 5,365.00 |
| Average Cost to Stock Each Lake by Plane | \$ 89.42 | \$ 35.68 | \$ 41.73 | \$ 46.07 | \$ 50.43 | \$ 47.06 |

Appendix 2. Resident feed usage and conversion data, McCall Fish Hatchery, 2005.

| | # Stocked/ Transferred | Feed Used (lb) | Lbs Gained | Conversion | Cost per Lb Gain | Cost per 1000 fish | Total Feed Cost |
|---|---------------------------|----------------|-------------|-------------|------------------|--------------------|-----------------|
| Rainbow Trout Triploid (Hayspur – T9) | 34,530 | 33.1 | 33.7 | 0.98 | \$ 0.85 | \$ 0.83 | \$ 28.63 |
| Kamloops Rainbow Triploid (Trout Lodge – TT) | 20,770 | 3.9 | 3.8 | 0.97 | \$ 0.89 | \$ 0.16 | \$ 3.37 |
| Westslope Cutthroat Trout (Westslope Cutthroat Trout Co.) | 65,200 | 14.6 | 10.1 | 1.45 | \$ 1.25 | \$ 0.19 | \$ 12.63 |
| Total | 120,500 | 51.6 | 47.6 | 1.08 | \$ 0.94 | \$ 0.37 | \$ 44.63 |

Appendix 3. Total production and distribution costs, McCall Fish Hatchery, 2005.

| Species | Eggs/ fish Received | Fish Stocked | Transportation Cost | Lbs Gained | Cost per lb Gained | Cost per 1000 Stocked |
|--|---------------------|----------------|--------------------------|-------------|--------------------|-----------------------|
| Fry Redistribution ^a | | | | | | |
| Kamloops Rainbow Triploid ^b (Hayspur – KT) | 14,750 | - 0 - | - | - | - | - |
| Kamloops Rainbow Triploid (Trout Lodge – TT) | 25,000 | 20,770 | \$ 900.00 | 3.8 | \$ 236.84 | \$ 43.33 |
| Rainbow Trout Triploid (Hayspur – T9) | 56,000 | 34,530 | \$ 1,290.00 | 33.7 | \$ 38.28 | \$ 37.36 |
| Westslope Cutthroat Trout (Westslope Cutthroat Trout Co.) | 185,000 | 65,200 | \$ 3,240.00 | 10.1 | \$ 320.79 | \$ 49.69 |
| Subtotal | 280,750 | 120,500 | \$ 5,430.00 | 47.6 | \$ 114.08 | \$ 45.06 |
| Note: ^a Breakdown includes flight (\$ 5,365.00) and vehicle (\$ 65.00) redistribution costs, fry stocked by volunteers (12 lakes) included at no cost. ^b 100% Mortality occurred during incubation. | | | | | | |
| Catchable Rainbow Trout Redistribution | | | | | | |
| Trout Lodge Rbt Triploid (Reared at Nampa FH) | 97,450 | 97,130 | \$ 8,630.00 ^c | N/a | | \$ 88.85 |
| Note: ^c Cost based on transportation costs of \$ 8,630 (MCFH \$ 5,592 and \$ 3,038 Nampa FH). | | | | | | |
| Grand Total | 378,200 | 217,630 | | 47.6 | \$1,394.43 | \$304.99 |
| Note: Grand total cost based on resident program expenditures (Nov 04to Nov 05 of \$ 66,375); no ital outlay is included. | | | | | | |

IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL RESIDENT REPORT

MULLAN FISH HATCHERY

Mary Van Broeke, Fisheries Technician

INTRODUCTION

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

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

The Mullan facility plays a vital role in supporting the put-and-take rainbow trout *Oncorhynchus mykiss* fishery. From this location, daily trips are made to the Coeur d'Alene and St. Joe River drainages to stock ponds and lakes 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.

Mullan Hatchery personnel, in 2005, were also involved with the Kokanee spawning operation at Granite Creek.

HATCHERY IMPROVEMENTS

Hatchery improvements during 2005 included:

- Fish and Game rented a man lift for scraping and painting the buildings.
- The stairs on the crew's apartment were removed, because of safety concerns.
- The freezer compressor and condenser were replaced with the compressor and condenser from the Clark Fork Hatchery.

FISH STOCKED OR TRANSFERRED

A total of 37,387 rainbow trout (nine-inches long) were released in waters of the Coeur d'Alene and St Joe river drainages from May to September to support a put-and-take fishery. All stocking sites received sterile rainbow trout. Trout Lodge Triploids (TT) Trout released from the MUFH came from Nampa Hatchery. Hatchery personnel loaded the fish into a 500-gallon pick-up truck mounted tank and delivered them to numerous lakes and ponds. The distribution schedule requires three to five hour trips, four to five days each week during the summer season.

Mullan Hatchery has an annual operating budget of \$16,179. If employee wages of \$18,172 and transportation costs of \$4,557 for Nampa Hatchery to deliver fish to MUFH are included, the streamside cost for MUFH to redistribute fish was \$1.04/fish.

PUBLIC RELATIONS

The MUFH is located adjacent to a popular Shoshone County "day use" park. As a direct result, the hatchery receives a much higher visitor level than would be expected in this remote location. The hatchery serves the highest number of visitors of any hatchery in the Panhandle Region, with over 10,000 people touring the grounds in 2005. The hatchery also hosted the Chrysler/Jeep Jamboree and the Silver Valley Good Samaritan RV rally. People from across the nation attended these functions. There were 11 hatchery tours given to local school groups.

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

IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL REPORT

NAMPA FISH HATCHERY

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

INTRODUCTION

Nampa Fish Hatchery (NFH) is a resident trout rearing facility located one mile south of Nampa. The NFH water is supplied by eight pump-assisted artesian wells. A maximum flow of 35 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

During the 2005 fish year, the NFH net fish production was 1,741,898 at a net weight of 301,543 lbs (Appendix 1). The net cost for rearing fish at the NFH from grow out through stocking was \$466,381.00 (Appendix 2). Fish transferred to other hatcheries are included in the total number and lbs produced. Kamloops and rainbow trout *Oncorhynchus mykiss* comprised 84.1% of the fish stocked or transferred from NFH. In addition, Lahontan cutthroat trout *O. clarki henshawi* and fall Chinook salmon *O. tshawytscha* were produced at NFH during 2005 (Appendix 3). Another 600 fish weighing 196 lbs were produced at NFH and given to schools for educational purposes and to department personnel for various research programs. These fish were not included in overall production numbers. A total of 3,225,164 eyed-eggs were received during the 2005 fish year (Appendix 4).

In January, raceway B2 was diagnosed to be positive for Ichthyophthirius (ICH). This was the first time ICH has ever been documented at NFH. With water transfer between raceways B1 & B2, it was decided to treat both raceways. The fish in those raceways were treated every other day with a formalin flow through drip treatment. Treatment was continued until early May when the fish were large enough for release. The average daily mortality at its highest was about 136 fish during the first month of treatment. In mid-April, NFH changed from formalin to potassium permanganate as a treatment method. In mid-May raceways C1, C2, C5 & C6 were diagnosed with (ICH) and treatment was started immediately.

In September, NFH received 30,221 Hayspur triploid fingerlings weighing 133 lbs from Sandpoint Hatchery. These fish were sent to Sandpoint Hatchery as eyed eggs to slow down their development. This allowed NFH to produce a catchable sized fish for release into Stanley basin lakes that meet the size restrictions as per ESA permit number 1188.

FISH STOCKED/TRANSFERRED

The NFH personnel stocked or transferred 2,487,345 fish, weighing 358,871.25 lbs, during the 2005 fish year. These fish included warm water transfers and fish reared in non-Department hatcheries to waters in Idaho. NFH made 211 stocking trips to 394 planting waters during 2005.

The NFH stocked or transferred a total of 333,688 fry (Appendix 5), 866,336 fingerlings (Appendix 6) and 910,909 catchables (Appendix 7), which are listed by species/strain in each table. A total of 434,405 catchables (129,834 lbs) (Appendix 8) were transferred to six other hatcheries throughout the state.

The NFH participated in the Cascade restoration project again this year by transporting perch from Phillips Reservoir in Oregon to Cascade Reservoir.

FISH TRANSPORTATION

Fish transport operators stationed at NFH stocked waters in all seven regions throughout the state. They transported fish to and from 16 different state and federal fish hatcheries. The transport operators made 133 trips totaling 58,188 miles during 2005.

The NFH transport operators stocked rainbow trout fingerlings from Lyons Ferry Fish Hatchery (204,909 fish, 5,674 lbs) into Clearwater Region waters. They also stocked spring Chinook salmon and B-run steelhead smolts from Clearwater Fish Hatchery and assisted with the transportation of summer Chinook salmon smolts from McCall Fish Hatchery. They stocked Channel catfish purchased from Fish Breeders of Idaho to lakes in the Panhandle, Clearwater and Southwest Regions. In April, Dick and Gary went to Oxbow Fish Hatchery, which is operated by the Oregon Department of Fish & Wildlife (ODFW) to transport ESA sockeye salmon back to Sawtooth Hatchery. In November the transport operators assisted in transporting and stocking 1000 surplus A-run adult steelhead from Oxbow Fish Hatchery into the Boise River.

During summer of 2005 NFH received the new Kenworth Transport truck to replace Gary Ady's old transport truck. Gary spent time this fall converting the tank from his old truck to the new truck in preparation for fish hauling in 2006. Dick started replacing the aerators and enlarging the tank opening on both the truck tank and the tank on the trailer.

LAHONTAN CUTTHROAT TROUT

During the 2005 fish year, NFH stocked 276,358 Lahontan cutthroat trout (685.25 lbs) into lakes and reservoirs located in the Southwest and Upper Snake regions. The Lahontan cutthroat eggs were received from Omak Fish Hatchery in Washington. Southwest Region and Upper Snake Region fish were stocked as fry (Appendix 5). Estimated survival from eyed-egg to stocking was 57.7%. Due to past shipping and handling problems, NFH personnel continue to meet the Omak personnel at Pendleton, OR to pick up the eyed cutthroat eggs.

FALL CHINOOK

In 2005, fall Chinook was again reared at NFH. The fry were transferred to NFH from Cabinet Gorge Hatchery in January and reared through June. A total of 26,310 fingerlings were stocked in Coeur d'Alene Lake, meeting the June fish request (Appendix 6).

FISH FEED

A total of 287,706 lbs of feed was fed during 2005 at a cost of \$96,159.47 (Appendix 9). The average cost per pound of feed was 33.42 cents. Rangen's Inc. made up 99.40% of the feed purchased by weight. An additional 750 lbs of feed was received from other hatcheries and fed throughout the year. The overall feed conversion was 0.95 lbs of feed fed to produce one pound of fish.

Skretting feed continued to outperform other starter feeds. However, due to problems in receiving Skretting feed in a timely fashion NFH in 2005 started using more Rangen's starter feeds for starting fry on feed. Rangen's continues to carry the feed contract and is used throughout the remainder of the rearing cycle. Skretting feed was used throughout the rearing cycle of the Lahontan cutthroat trout and fall Chinook salmon. The cutthroat were stocked as fry this year and were only on feed about three weeks before stocking.

FISH SPAWNING

Early Kokanee

The NFH continues to operate the early run Kokanee salmon *O. nerka kennerlyi* trapping and spawning project on Deadwood Reservoir. The total number of Kokanee in Deadwood Reservoir is still rebounding, with the fish trapped at the weir continuing to decrease in average size from 12.56 inches last year to 10.98 inches this year. The egg-take goal for 2005 of 2,000,000 green eggs for Mackay Hatchery production was attained for the first time since 1998.

Following the direction of Southwest Regional biologists, no fish were intentionally released above the weir for natural spawning. All fish that entered the trap and ripened were spawned. Approximately 3,500 kelts were taken upstream after spawning for natural stream fertilization. After the egg-take goal was reached, 923 male Kokanee were released above the weir for natural stream fertilization. The trap was installed on August 3 with the first Kokanee being trapped on August 7. The weir was installed Between Wild Buck Creek and Basin Creek this year. The trap was placed at this location because in the last couple years Basin Creek has blown out and caused containment of the weir to be lost. A second weir was then placed at the mouth of Basin Creek preventing fish from entering the creek. Early in the spawning run the water level in the river and reservoir dropped steadily due to the Bureau of Reclamation releasing water at the dam. By the end of the run the water level remained relatively constant.

The Kokanee run started about the same time as it has the past few years. There were a total of five spawn takes this year. The first spawn date was August 25 and the last was on September 5th. All fish were spawned at the trap site. A green egg yield of 2,899,040 eggs was taken from 7,668 females for fecundity of 434 eggs/female (Appendix 11). On the last spawn take Mackey Hatchery discarded 2 ½ coolers of excess eggs. Average total length of Kokanee females was 274 mm, with males averaging 284 mm (Appendix 12). Eggs were shipped to the Mackay Hatchery via fixed-wing aircraft. The shipping techniques were similar to those used in previous years. The Department contracted the flying service with McCall Air Taxi.

This year the weir across the Deadwood River was kept in place the entire spawn season and containment was never lost. There was however some escapement upstream by smaller fish that were able to fit between the pickets in the weir. This was corrected by placing hardware cloth in front of the pickets. On September 2, the weir on Basin creek became plugged with debris from kids playing in the creek and containment was lost for approximately two hours. It was estimated that approximately 2,000 escaped up the creek.

The trap was removed on September 21 by direction from Southwest Regional biologist and the few fish that remained in the trap were destroyed.

Deadwood Reservoir continues to be a popular fishing spot during the Kokanee run. With the low number of returning Kokanee, the department again issued an emergency fishing closure from August 3 running through September 15 in order to protect the fish that were in the Deadwood River. The closure area was from the weir in the river to the slack water of the Deadwood Reservoir. Information and "No Fishing" signs were installed on both sides of the river from the weir downriver every 100 yards to the mouth to inform the public about the fishing closure. The trap tenders also spoke with all visitors visiting the trap and explained the reason for the closure. Most of the people contacted seemed to respond favorably.

The weir across Trail Creek was installed and operated by the region. The crew this year assisted regional personnel in walking Trail Creek and the other tributaries throughout the spawning season conducting adult spawning surveys.

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

HATCHERY IMPROVEMENTS

Several important improvements were implemented at NFH during 2005:

- Replaced carpet in residences 2 & 3.
- Replace carpet in the bedrooms in Residence #1.
- Installed front screen entry door in Residence # 1
- Replaced kitchen countertops in all residences.
- Painted all hatchery residences.
- Replaced stoves in all residences.
- Refurbished bathroom in residence #3.
- Replaced domestic pump for residences 2 & 3.
- Installed new water softeners in residences 2 & 3.
- Finished installation of heat pumps in residences 2 & 3.
- Replaced old 1-ton pick-up with new 1-ton pick-up.
- Converted transport tank from old truck to new truck.
- Received new Kenworth transport truck to replace Gary's old Freightliner transport truck.
- Finished installation of new backup generator.
- Purchased new floating aerators for hatchery.
- Replaced old ATV mule with new one.
- Replaced kitchen sinks in residences 1 & 3.

- Installed Jib Crane.
- Installed new alarm system and connected it to new generator.
- Enlarged tank opening and replaced aerators on Dick's truck tank and trailer.

NFH improvements scheduled for 2006 include:

- Develop hatchery pamphlets for self guided tour.
- Budget for aluminum screens and dam boards for B & C raceways.
- Build new deck on residence #2.
- Install new back doors in residence #2
- Build new storage building for storing wood and metal.
- Repair broken key ways in the C ponds.
- Replace fence between residences 2 & 3.
- Build or repair handicap fishing platform.
- Replace shake shingles on hatchery office, dorm and residence #1

PUBLIC RELATIONS

As in past years, NFH was a focal point for many visitors, tours, and special groups. In 2005, an estimated 4,200 tourists visited the NFH. Most visitations came through the late spring and summer months although with year-round schooling, tours were scheduled spring, summer and fall. A total of 53 guided tours were given to area school, church, and Boy Scout groups. The NFH participated in two job shadows during 2005. The disabled veterans were allowed to fish the settling pond five times during the summer months. Ten other groups of the disabled from the Nampa area were allowed to fish the settling pond through the summer. The settling pond was also opened to fishing on Free Fishing Day. The NFH, with the help of regional personnel, reservists and local Boy Scouts, hosted the Free Fishing Day clinic, which saw 800 visitors/fishermen, with an estimated 800-1,000 fish caught. The largest fish caught was a seven-pound rainbow trout and several more over three pounds. Free Fishing Day at NFH was again a big success and will be continued in the future. We felt the "kids only" session from 8:00 a.m. to noon continued to be very popular and successful. The Gem State Fly Fishing Group continues to hold a 3-day fly fishing instructional class (no hooks allowed) at the hatchery. Hatchery personnel assisted with the Trout in the Classroom program again this year. Eggs, fry and fingerlings were provided for living streams and catchables were provided for dissection in several classes.

ACKNOWLEDGEMENTS

The NFH staff for 2005 included Rick Alsager, Fish Hatchery Manager II; Brian Malaise, Assistant Fish Hatchery Manager; Bob Turik, Fish Culturist; Gary Ady and Dick Bittick, Fish Transport Operators. Bio-aides for 2005 included; Ken Felty, Travis Balls, Justin Willis and Jake Erskine. Chuck Kiester and Howard Garwick assisted with the Kokanee spawning operation and fish marking. Four 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 450 hours of time.

APPENDICES

Appendix 1. Total net fish production at Nampa Fish Hatchery, 1994 through 2005

| Year | Put-and-Take | | Put-grow-and-take | | Total Number | Total Lbs | Feed | | Feed Conversion |
|------|--------------|---------|-------------------|--------|-----------------|--------------|---------|-----------|--------------------|
| | Number | Lbs | Number | Lbs | | | Lbs | Costs | |
| 1994 | 308,023 | 146,978 | 793,065 | 55,014 | 1,101,088 | 201,992 | 220,544 | \$72,340 | 1.09 |
| 1995 | 567,147 | 193,309 | 783,722 | 42,336 | 1,350,869 | 235,645 | 261,589 | \$76,793 | 1.11 |
| 1996 | 694,659 | 212,011 | 950,412 | 34,271 | 1,645,071 | 246,282 | 262,902 | \$91,893 | 1.07 |
| 1997 | 556,718 | 188,208 | 693,859 | 19,006 | 1,250,577 | 207,214 | 240,140 | \$94,502 | 1.12 |
| 1998 | 692,706 | 228,006 | 2,172,659 | 22,901 | 2,865,363 | 250,907 | 267,782 | \$96,338 | 1.07 |
| 1999 | 1,077,110 | 336,841 | 348,962 | 26,677 | 1,426,072 | 363,518 | 345,288 | \$112,003 | 0.95 |
| 2000 | 864,603 | 250,976 | 1,100,595 | 18,197 | 1,965,198 | 269,173 | 281,264 | \$81,862 | 1.04 |
| 2001 | 754,641 | 241,435 | 1,197,489 | 15,513 | 1,952,130 | 256,948 | 282,264 | \$75,737 | 1.10 |
| 2002 | 923,854 | 346,918 | 1,155,212 | 24,334 | 2,079,066 | 371,252 | 356,982 | \$100,727 | 0.96 |
| 2003 | 981,383 | 285,537 | 535,119 | 16,239 | 1,516,502 | 301,776 | 337,630 | \$91,742 | 1.12 |
| 2004 | 811,838 | 272,531 | 711,242 | 11,206 | 1,523,080 | 283,737 | 310,718 | \$93,818 | 1.10 |
| 2005 | 851,974 | 287,331 | 889,924 | 14,212 | 1,741,896 | 301,543 | 287,706 | \$96,150 | 0.95 |

Appendix 2. Total cost of net fish production at Nampa Fish Hatchery, 1994 through 2005

| Year | Total cost through grow - out | | | | Mean Length in inches | Total cost through stocking | | | |
|------|-------------------------------|-------------------|----------------|---------------|-----------------------------|-----------------------------|-------------------|----------------|---------------|
| | Total Cost | Cost/1000 Fish | Cost/ Pound | Cost/ Inch | | Total Cost | Cost/1000 Fish | Cost/ Pound | Cost/ Inch |
| 1994 | \$258,010 | \$234.32 | \$1.28 | \$0.029 | 8.06 | \$291,650 | \$264.87 | \$1.44 | \$0.028 |
| 1995 | \$271,156 | \$200.77 | \$1.15 | \$0.033 | 7.93 | \$304,695 | \$225.30 | \$1.29 | \$0.037 |
| 1996 | \$274,072 | \$166.60 | \$1.11 | \$0.027 | 7.50 | \$310,851 | \$188.96 | \$1.26 | \$0.031 |
| 1997 | \$308,979 | \$247.07 | \$1.49 | \$0.043 | 7.79 | \$342,063 | \$273.52 | \$1.65 | \$0.048 |
| 1998 | \$279,045 | \$97.39 | \$1.11 | \$0.023 | 7.30 | \$329,161 | \$114.88 | \$1.31 | \$0.027 |
| 1999 | \$363,623 | \$255.00 | \$1.00 | \$0.025 | 10.12 | \$428,624 | \$300.58 | \$1.18 | \$0.030 |
| 2000 | \$353,747 | \$180.02 | \$1.31 | \$0.032 | 5.59 | \$411,497 | \$209.41 | \$1.53 | \$0.037 |
| 2001 | \$338,998 | \$173.67 | \$1.32 | \$0.031 | 5.64 | \$390,917 | \$200.27 | \$1.52 | \$0.036 |
| 2002 | \$379,398 | \$182.49 | \$1.02 | \$0.027 | 7.75 | \$440,031 | \$211.66 | \$1.23 | \$0.032 |
| 2003 | \$408,764 | \$269.63 | \$1.35 | \$0.037 | 7.22 | \$441,840 | \$291.45 | \$1.46 | \$0.040 |
| 2004 | \$391,145 | \$256.83 | \$1.38 | \$0.036 | 7.07 | \$409,293 | \$268.74 | \$1.44 | \$0.037 |
| 2005 | \$428,208 | \$245.96 | \$1.42 | \$0.037 | 6.72 | \$466,381 | \$267.88 | \$1.55 | \$0.040 |

Appendix 3. Fish Requested and produced at Nampa Fish Hatchery, 2005

| Species/Strain | Size | Production | Actual | % of Goal |
|--|-------------|------------------|------------------|---------------|
| | | Goal | Production | Achieved |
| Lahontan cutthroat trout (C6) | 1-3 inches | 200,000 | 276,358 | 138.2% |
| Triploid rainbow trout (T1) | 3-5 inches | 600,000 | 533,684 | 88.9% |
| Triploid Kamloops trout (KT) | 3-5 inches | 50,000 | 51,813 | 103.6% |
| Fall Chinook (FC) | 6-8 inches | 40,000 | 26,310 | 65.8% |
| Triploid Kamloops x steelhead trout (TT) | 8-12 inches | 900,000 | 884,246 | 98.2% |
| Triploid rainbow trout (T9) | 8-12 inches | <u>18,000</u> | <u>26,663</u> | <u>101.3%</u> |
| Totals: | | 1,808,000 | 1,799,074 | 99.5% |

Appendix 4. Eyed- eggs received at Nampa Fish Hatchery, January 1 to December 31, 2005

| Date | Species/Strain | Source | Number | Destination | Cost/1000 |
|---------------|-------------------------------------|-------------|------------------|---|-----------|
| Received | | | | | fish |
| 1/5/05 | Triploid Kamloops trout | Hayspur | 108,512 | Southwest Region | N/C |
| 1/5/05 | Triploid rainbow trout | Hayspur | 236,045 | Southwest Region | N/C |
| 1/19/05 | Triploid rainbow trout | Hayspur | 85,119 | Southwest Region | N/C |
| 1/19/05 | Triploid Kamloops trout | Hayspur | 80,322 | Southwest Region | N/C |
| 2/1/05 | Triploid Kamloops trout | Hayspur | 52,845 | Southwest Region | N/C |
| 2/1/05 | Triploid rainbow trout | Hayspur | 77,714 | Southwest Region | N/C |
| 2/9/05 | Triploid Kamloops trout | Hayspur | 67,673 | Southwest Region | N/C |
| 2/9/05 | Triploid rainbow trout | Hayspur | 38,886 | Southwest Region | N/C |
| 2/16/05 | Triploid rainbow trout | Hayspur | 27,165 | Salmon Region | N/C |
| 2/16/05 | Triploid Kamloops trout | Hayspur | 60,850 | Magic Valley Region | N/C |
| 2/23/05 | Triploid Kamloops trout | Hayspur | 30,662 | Magic Valley Region | N/C |
| 2/23/05 | Triploid rainbow trout | Hayspur | 17,213 | Magic Valley Region | N/C |
| 3/2/05 | Triploid Kamloops trout | Hayspur | 20,903 | Southwest Region | N/C |
| 3/2/05 | Triploid rainbow trout | Hayspur | 6,378 | Southwest Region | N/C |
| 4/12/05 | Lahontan cutthroat trout | Omak | 514,560 | SW/Reg & US Reg | N/C |
| 5/17/05 | Triploid Kamloops trout | Hayspur | 53,436 | Clearwater Region | N/C |
| 5/31/05 | Triploid Kamloops trout | Hayspur | 26,931 | Clearwater Region | N/C |
| 6/1/05 | Triploid Kamloops x steelhead trout | Trout Lodge | 421,040 | SW Reg, MV Reg., P Reg., C Reg. & Salmon Reg. | \$25.00 |
| 6/23/04 | Triploid Kamloops x steelhead trout | Trout Lodge | 455,676 | SW Reg., MV Reg., P Reg., C Reg., & Salmon Reg. | \$25.00 |
| 9/28/05 | Triploid Kamloops x steelhead trout | Trout Lodge | 239,245 | SW Reg, MV Reg., P Reg & Salmon Reg. | \$25.00 |
| 12/21/05 | Triploid rainbow trout | Hayspur | 406,235 | Southwest Region | N/C |
| 12/21/05 | Triploid Kamloops trout | Hayspur | <u>197,754</u> | Southwest Region | N/C |
| Total: | | | 3,225,164 | | |

Appendix 4. Continued

Destination Key

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

Appendix 5. Fry production at Nampa Fish Hatchery, 2005

| <u>Species/Strain</u> | <u>Source and Date Received</u> | <u>Number Received</u> | <u>Number Produced</u> | <u>Lbs Produced</u> | <u>% Survival Egg to Plant</u> | <u>Destination</u> |
|------------------------------|--|-------------------------------|-------------------------------|----------------------------|---------------------------------------|---------------------------|
| Lahontan cutthroat trout | Omak 4/05 | 279,538 | 150,951 | 404 | 54.0% | Southwest Region |
| Lahontan cutthroat trout | Omak 4/05 | 235,022 | 125,407 | 281.25 | 53.4% | Southeast Region |
| Triploid kamloop Trout | Hayspur 2/05 | 88,015 | <u>57,330</u> | <u>210</u> | 65.1% | Southwest Region |
| Totals: | | | 333,688 | 895.25 | | |

Appendix 6. Fingerlings produced at Nampa Fish Hatchery, 2005

| <u>Species/Strain</u> | <u>Source</u> | <u>Date Received</u> | <u>Number Received</u> | <u>Number Produced</u> | <u>Lbs Produced</u> | <u>% Survival Egg to Plant</u> | <u>Designation</u> |
|------------------------------|----------------------|-----------------------------|-------------------------------|-------------------------------|----------------------------|---------------------------------------|---------------------------|
| Triploid Kamloops Trout | Hayspur | 5/05 | 80,367 | 51,813 | 2,885 | 64.5% | Clearwater Regions |
| Triploid Rainbow Trout | Hayspur | 1/05, 2/05, 3/05 & 5/05 | 822,272 | 533,684 | 8,935 | 64.9% | Southwest Region |
| Fall Chinook | Cabinet Gorge | 1/05 | <u>24,994</u> | <u>26,310</u> | <u>1,500</u> | 105.3% | Panhandle Region |
| Totals: | | | 1,315,670 | 866,336 | 12,631 | | |

Appendix 7. Catchables produced at Nampa Fish Hatchery, 2005

| <u>Species/Strain</u> | <u>Source</u> | <u>Date Received</u> | <u>Number Received</u> | <u>Number Produced</u> | <u>Lbs Produced</u> | <u>% Survival Egg to Plant</u> | <u>Designation</u> |
|-------------------------------------|--------------------|----------------------|------------------------|------------------------|---------------------|--------------------------------|---|
| Triploid rainbow trout | Hayspur | 10/04 | 35,101 | 26,663 | 7,055 | 76.0% | Salmon Region |
| Triploid Kamloops x Steelhead Trout | lodge 6/04 & 10/04 | | <u>1,129,574</u> | <u>884,246</u> | <u>277,020</u> | 78.3% | Panhandle, Clearwater, Southwest, Southeast Magic Valley & Salmon Regions |
| Totals: | | | 1,164,675 | 910,909 | 284,075 | | |

Appendix 8. Catchables transferred from NFH to other hatcheries throughout the state in 2005.

| <u>Hatchery</u> | <u>Species</u> | <u>Number</u> | <u>Lbs</u> | <u>Fish/pound</u> |
|--------------------------|----------------|----------------|----------------|-------------------|
| Clearwater Fish Hatchery | TT | 82,760 | 23,900 | 3.46 |
| Hayspur Fish Hatchery | TT | 44,120 | 13,200 | 3.34 |
| McCall Fish Hatchery | TT | 97,444 | 29,800 | 3.27 |
| Mullan Fish Hatchery | TT | 35,907 | 10,950 | 3.28 |
| Sandpoint Fish Hatchery | TT | 126,449 | 39,425 | 3.21 |
| Sawtooth Fish Hatchery | TT | <u>47,725</u> | <u>12,559</u> | 3.80 |
| Totals: | | 434,405 | 129,834 | |

Appendix 9. Nampa Fish Hatchery Feed cost, 2005

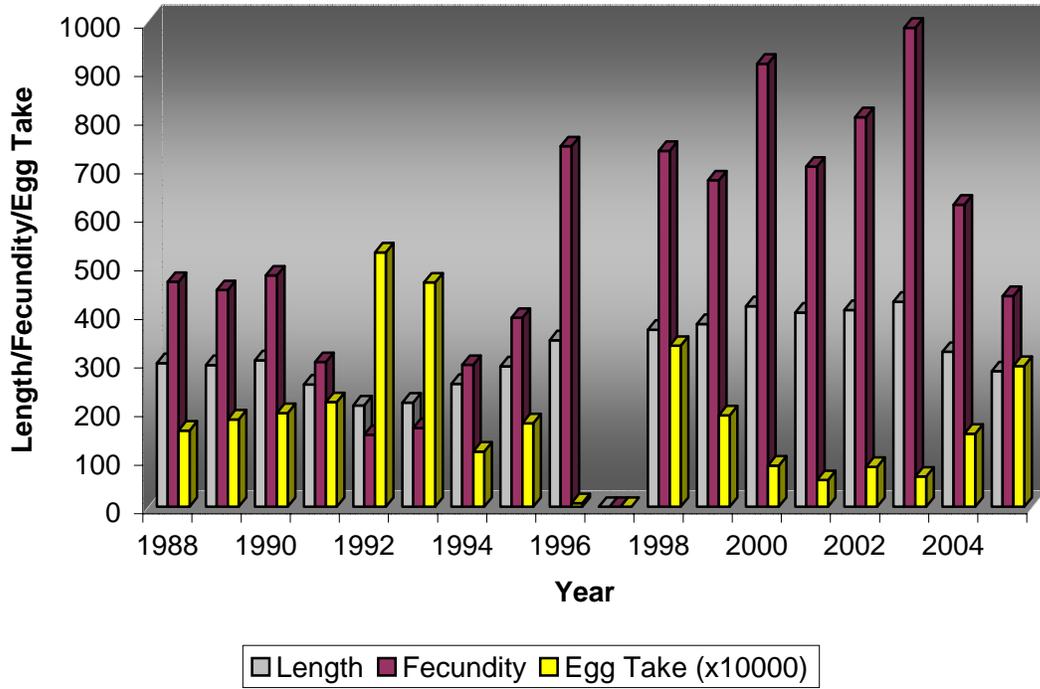
| Supplier/Source | Size/Type | # Boxes/Bags | Lbs | Price/lb. | Feed Charges |
|---------------------|-----------------|--------------|----------------|--------------|--------------------|
| Moore-Clark | | | | | |
| Nutra Plus | Starter #0 | 2 | 88 | 0.990 | \$87.12 |
| Nutra Plus | Starter #1 | 6 | 264 | 0.990 | \$261.36 |
| Nutra Plus | Starter #2 | 6 | 264 | 0.970 | \$256.08 |
| Nutra Fry | Grower 1.2 mm | 5 | 220 | 0.870 | \$191.40 |
| Nutra Fry | Grower 1.5 mm | <u>20</u> | <u>880</u> | <u>0.710</u> | <u>\$624.80</u> |
| Total: | | 39 | 1,716 | | \$1,420.76 |
| Freight: | | | | | \$0.00 |
| Grand Total: | | | | | \$1,420.76 |
| Rangen | | | | | |
| Dry Crumble | Starter #0 | 7 | 350 | 0.484 | \$169.40 |
| Dry Crumble | Starter #1 | 30 | 1,500 | 0.484 | \$726.00 |
| Dry Crumble | Starter #2 | 113 | 5,650 | 0.484 | \$2734.60 |
| Dry Crumble | Grower #3 | 397 | 19,850 | 0.348 | \$6,907.80 |
| 450 floating | 1/16 in. pellet | 131 | 6,550 | 0.426 | \$2,790.30 |
| 450 floating | 3/32 in. pellet | 149 | 7,450 | 0.338 | \$2,518.10 |
| 450 floating | 1/8 in. pellet | 132 | 6,600 | 0.308 | \$2,032.80 |
| 450 floating | 5/32 in. pellet | 5 | 250 | 0.308 | \$77.00 |
| 450 floating | 3/32 in. pellet | Bulk | 28,880 | 0.328 | \$9,472.64 |
| 450 floating | 1/8 in. pellet | Bulk | 207,160 | 0.298 | \$61,733.68 |
| Dry Crumble med. | Starter #1 | 3 | 150 | 0.615 | \$92.31 |
| Dry Crumble med. | Starter #2 | 14 | 700 | 0.615 | \$430.78 |
| Dry Crumble med. | Grower #3 | 128 | 6,400 | 0.615 | \$3,938.56 |
| Dry Crumble med. | Grower #4 | 40 | <u>2,000</u> | 0.534 | <u>\$1,067.20</u> |
| Total: | | | | | \$91,061.17 |
| Freight: | | | | | 5,098.30 |
| Grand Total: | | | 287,706 | | \$96,159.47 |

Appendix 10. Kokanee egg takes at Deadwood Reservoir by Nampa Fish Hatchery, 2005

| Lot Number | Spawn Date | Females Spawned | Green Eggs | Eyed Eggs | % Eye-up |
|----------------|------------|-----------------|------------------|------------------|--------------|
| 05-U-ID-KE-1 | 8/25/05 | 448 | 196,782 | 104,690 | 53.2% |
| 05-U-ID-KE-2 | 8/29/05 | 821 | 342,203 | 207,820 | 60.7% |
| 05-U-ID-KE-3 | 8/31/05 | 1,563 | 668,784 | 403,145 | 60.3% |
| 05-U-ID-KE-4 | 9/2/05 | 2,277 | 1,009,420 | 689,430 | 68.3% |
| 05-U-ID-KE-5 | 9/5/04 | <u>2,559</u> | <u>681,851</u> | <u>576,590</u> | <u>84.6%</u> |
| Totals: | | 7,668 | 2,899,040 | 1,981,675 | 68.4% |

Appendix 11. Kokanee spawning length, fecundity, egg take Nampa Fish Hatchery, (1988-2005)

**Deadwood Kokanee Spawning
Spawning Summary (1988-2005)**



IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL RESIDENT REPORT

SANDPOINT FISH HATCHERY

Zach Olson, Fish Culturist

INTRODUCTION

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

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

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

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

WATER SUPPLY

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

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

REARING FACILITIES

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

FISH STOCKING

Catchable size triploid rainbow trout (~9.0-10.0 inches) were stocked in the Kootenai, Pend Oreille, and Spokane River drainages to support a put and take fishery. All of the lakes and reservoirs stocked are located within the northern portion of Region 1. Fish supplied for redistribution in 2005 were Troutlodge triploid rainbows from Nampa Fish Hatchery (NFH). A total of 124,050 fish weighing 38,026 lbs (3.26 fpp) were stocked between the first week of April and the fourth week of September. Fish stocking scheduled for late March was cancelled due to road restrictions and were added to April's stocking request. Twenty-two different bodies of water received catchable rainbows in 2005. In addition to normal plants, the hatchery provided fish for a fishing clinic at Wal-Mart shopping center, and Free Fishing Day events at Rathdrum Boy Scout Park, Priest Lake golf course, and Clark Fork Pond. Streamside cost to redistribute fish was \$0.437 per fish (Appendix 1). The cost of stocking fish from SPFH included employee wages, transportation cost from NFH, and operating expenses that totaled \$54,208.

PRODUCTION

Sandpoint Hatchery received 44,900 T-9 eyed rainbow eggs from Hayspur Fish Hatchery (HFH) in May of 2005. Fish were kept on 46°F water and were fed a reduced diet between 1.25-1.5 percent body weight in order to minimize growth before being sent to NFH for final rearing. A total of 40,705 swim-up fry were ponded. After swim-up mortality, 30,450 juveniles were sent to NFH on August 25 (Appendix 2). Survival to shipping was 67.8%. A total of 51.3 lbs of Skretting Nutra Plus feed was fed which produced 65.22 lbs of growth for a conversion factor of 0.78:1 (Appendix 3).

HATCHERY IMPROVEMENTS

- New metal siding on main hatchery building.
- Remodel bathroom in main hatchery building.
- New windows in shop
- Epoxy seal floors in bathroom, shop, and entry way in hatchery building.
- Paint entry and hall way in hatchery building.
- Reset early rearing vats.

HATCHERY NEEDS

- Repair hatchery building interior ceiling panels and windows.
- Catwalk over headbox and tailbox of new raceways
- Relocate power pole by kiosk to accommodate tractor trailer loads of catchables from Nampa Fish Hatchery.
- Replace wooden dam boards with aluminum dam boards for outdoor raceways.
- Motion lights and reinforced doors for added security.

PUBLIC RELATIONS

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

Construction has continued on the Water Life Discovery Center, which will increase public educational opportunities in the future. The Center will include a pond with viewing windows, spawning channel, interpretive trail system, and educational building for visitors. Thus far the pond has been dug and fully landscaped with indigenous riparian plant life. The Amphitheater is nearly completed and the frames for the viewing windows are in place and ready to receive their windows.

ACKNOWLEDGEMENTS

The SPFH staff would like to thank the staff at CGFH; John Rankin (Fish Hatchery Manager 1), Bruce Thompson (Assistant Manager), and John Suhfras (Maintenance Craftsman) for their assistance when additional manpower was needed. Thanks to Gary Ady and Dick Bittick who transported catchable rainbows from Nampa Fish Hatchery throughout the stocking season. Appreciation is given to Regional Department staff, reservist, and volunteers who make high mountain lake stocking possible.

Appendix 1. Catchable Redistribution Cost.

| | |
|---|----------|
| Wages | \$17,500 |
| Transportation cost from Nampa Hatchery | \$16,708 |
| Operating | \$20,000 |
| Total | \$54,208 |

| | | |
|----------|----------------------|--------------------------|
| Cost | Number of Catchables | Streamside Cost Per Fish |
| \$54,208 | 124,050 | \$0.437 |

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

| | |
|----------------------------|--------|
| Lot Number | 1 |
| Date Received | 4-6-04 |
| # Eyed Eggs Received | 31,000 |
| Number Poned | 27,850 |
| % Survivability to Ponding | 89.8% |
| # Transferred to Nampa | 26,860 |
| Overall % Survive | 86.6 |

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

| | | |
|-------------------------|----------------------|---------------------|
| Raceway Number | 1 | 2 |
| Total Feed Fed | 10,578 gr = 23.3 lbs | 12,712 gr = 28 lbs |
| Begin Weight | 5.36 lbs @4,100 fpp | 6.54 lbs @3,500 fpp |
| End Weight | 33.1 lbs @ 452 fpp | 43.9 lbs @ 347 fpp |
| Growth | 27.82 lbs | 37.4 lbs |
| Feed Conversions | .83 | .74 |
| Daily Water Temperature | 46°F | 46°F |

IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL RESIDENT REPORT

SAWTOOTH FISH HATCHERY

Roger Elmore, Assistant Hatchery Manager

INTRODUCTION

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

FISH STOCKING

Sawtooth Fish Hatchery met its stocking request in 2005 with the exception of the following: 100 fish into Grouse Lake eliminated, Blue Mountain Meadow Pond reduced by 450, and Squaw Pond reduced by 100; all due to excessively warm water. Also, water to Squaw Pond was turned off on August 3rd due to a senior water right call by a local irrigator.

Nampa Fish Hatchery (NFH) supplied SFH with Troutlodge triploid rainbow for stocking. A total of 48,404 fish were received at SFH on four shipping days from May 17 until August 1. Based on 8 sample counts fish averaged 3.94 fish per pound (fpp) and 7.5 inches in total length (188 mm). SFH personnel drove approximately 2,776 miles on 63 stocking trips and stocked a total of 47,725 fish in lakes and streams in the area. The NFH stocked Stanley, Pettit, Perkins and Alturas lakes in 2005.

National Marine Fisheries Service (NMFS) permit #1188 which expired December 31, 2004, outlines resident rainbow trout releases in anadromous waters in the Salmon River drainage. Permit #1188 dictates hatchery-reared rainbow trout to be released in rivers, streams, and lakes with ESA-listed fish should have an average size no greater than 250 mm with no individual exceeding 300 mm in total length. The 250 mm size restriction would include fish planted in the Salmon River, Valley Creek, and Yankee Fork Dredge Ponds. Also, the permit dictates that fish in the upper Salmon River cannot be stocked until after June 15 and must be adipose fin-clipped. Only fish with the adipose fin clip may be kept thereby protecting wild rainbow trout. All rainbow trout received at SFH in 2005 were adipose clipped by personnel at NFH and then delivered to SFH 21 days later to allow for withdrawal of MS-222 to comply with label directions.

The catchable rainbow trout were fed a maintenance diet of Rangen's 450 extruded pellets in the 5/32 size throughout the summer. A total of 200 lbs were purchased at a cost of \$61.60. An additional 800 lbs of Bio-Oregon 3.0 mm left over from salmon rearing was fed to the rainbows. Transport costs to bring catchable-sized trout from Nampa to Sawtooth totaled \$1,519.00. An approximate total cost for 63 stocking trips was \$2,482.99.

Weekly notices informing the public of the whereabouts of the latest stocking locations are distributed to the local businesses and are posted at SFH. *Fishing the Sawtooth Valley* brochures are distributed to local businesses where they are readily available to summertime visitors. A repeating message containing stocking information and current news about SFH can be heard over the local radio transmitter. Stocking information can also be found on the Department's web site.

High Mountain Lake Stocking

Sawtooth personnel continued high mountain lake stocking of Westslope cutthroat trout by fixed-wing aircraft in the Salmon Region. Three flights flown by McCall Aviation using a Cessna 185 occurred on September 19 and 21. A total of 14,955 fish were stocked into 32 different lakes. A short flight took place on September 19 with three lakes stocked before the flight was aborted due to less than desirable flying conditions. Flying resumed on September 21 with two flights stocking 29 lakes. Twelve lakes included in rotation "A" were not stocked this year because of their location within the Temporary Flight Restriction (TFR) caused by the Valley Road fire (40,000+acres). The request for those lakes totaled 5,450 fish and could possibly be made up next year.

Approximately 30,000 Westslope cutthroat trout eggs were received on July 19. Unfortunately, due to a power outage, the eggs were exposed to river water three days later and were disposed of due to whirling disease pathogen exposure. A second uncounted group of eggs was received on July 23. After picking off dead eggs and fry, there were not enough fish to fulfill the entire request so each lake received 70% to 90% of the stocking request for that lake. The fish averaged between 2,000 and 2,500 fpp. Flight time was 5.3 hours at a cost of \$1,616.50. Estimated cost to stock fish was \$1,785.33.

Free Fishing Day

Sawtooth Fish Hatchery sponsored another Kid's Fishing Day at the Sawtooth Pond on Free Fishing Day, June 11, 2005. There were 51 kids and 52 adults that participated in fishing activities between the hours of 1000 am and 400 pm. Over 100 catchable-sized rainbow trout were stocked by hatchery staff prior to Free Fishing Day. The USFWS provided fish life history booklets and coloring books. Cold soda pop and a packet of information containing the fishing regulations, *Fishing Sawtooth Valley* brochure, and information on fish identification geared towards identifying bull trout were handed out to participants. Weather conditions were variable and partly cloudy with rain ending the event in late afternoon. Thanks to all who participated.

PLANS FOR 2006

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

In 2006, SFH plans to continue high mountain lake stocking of Westslope cutthroat trout *O. clarki lewisi* by airplane in the Salmon Region. Lake rotation "B" is scheduled to be stocked. Also, SFH personnel will review flight safety training as required.

The SFH plans to participate in Free Fishing Day program.

ACKNOWLEDGEMENTS

The SFH would like to thank Rick Alsager and the Nampa Hatchery crew for their assistance in making 2005 successful. Special thanks go to Gary Ady and Dick Bittick for transporting fish from Nampa and stocking the big lakes in the Stanley Basin. Bio Aides Desirae Downing and Amanda Downs did a good job of stocking fish, delivering stocking notices, and computer entry of the weekly stocking data for SFH.

New fishing poles were acquired and Vicky Runnoe purchased fishing pole holders for fishing poles used at the Sawtooth Kids Pond.

APPENDICES

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

| Site | Number |
|---------------------------|---------------|
| Sawtooth Kids Pond | 525 |
| Little Bayhorse Lake | 2,000 |
| Kelly Creek Pond | 1,100 |
| Salmon River | 34,650 |
| Yankee Fork Dredge Ponds | 4,000 |
| Valley Creek | 4,300 |
| Blue Mountain Meadow Pond | 450 |
| Squaw Creek Pond | 700 |
| | |
| Totals | 47,725 |

Appendix 2. Planting sites and numbers of cutthroat fry stocked in the high mountain lakes by Sawtooth Fish Hatchery in mid-September 2005.

High Mountain Lakes Stocking:

| Site | Number |
|---------------------------|---------------|
| Big Frog Lake #02 | 800 |
| Cache Creek Lake #01 | 125 |
| Castle Lake | 500 |
| Castle Lake #01 | 125 |
| Castle View Lake | 250 |
| Challis Creek Lake #02 | 600 |
| Challis Creek Lake #03 | 875 |
| Chamberlain Lake #07 | 450 |
| Cirque Lake | 1,000 |
| Cove Lake | 950 |
| Crater Lake | 750 |
| Drift Lake | 275 |
| East Basin Creek Lake #01 | 265 |
| Elk Lake | 500 |
| Goat Lake | 975 |
| Gunsight | 350 |
| Hindman Lake #01 | 250 |
| Honey Lake | 100 |
| Hoodoo | 200 |
| Little Redfish Lake | 125 |
| Martendale Lake #02 | 200 |
| Mystery Lake #03 | 75 |
| Ocalkens Lake #01 | 450 |
| Ocalkens Lake #02 | 650 |
| Sapphire Lake | 1,100 |
| Sheep Lake | 450 |
| Slide Lake | 200 |
| Snow Lake | 275 |
| W F Bear Creek Lake #01 | 100 |
| W F Camas Creek Lake #01 | 1,000 |
| W F Camas Creek Lake #03 | 600 |
| W F Camas Creek Lake #05 | 390 |
| | |
| Totals | 14,955 |

IDAHO DEPARTMENT OF FISH AND GAME

2005 ANNUAL RESIDENT REPORT

FISH HEALTH REPORT

Douglas R. Burton, Fishery Pathologist

INTRODUCTION

As the Resident Hatchery Pathologist, my primary duties are to provide fish health inspection and diagnostic services to the Idaho Department of Fish and Game's (Department) resident fish hatcheries and to assist hatchery personnel in maintaining good health in cultured resident fish. These same services are provided to Department fishery managers and biologists and occasionally to private individuals or companies when the information or relationship is of benefit to the State of Idaho. My counterpart, the Anadromous Hatchery Pathologist (A. Douglas Munson), and I work closely together, often assisting each other in our respective programs and coordinating efforts when those programs overlap. Both of us work at the Eagle Fish Health Laboratory (EFHL) and are supported by the personnel and facilities there. We are both certified by the American Fisheries Society Fish Health Section as Fish Health Inspectors.

With the assistance of EFHL personnel, I examined 76 cases for Department resident hatchery programs during 2005 (35 diagnostic cases, 25 routine hatchery inspections, and 16 inspections of feral brood fish). This was a slight reduction from 81 cases in 2004, (46 diagnostic cases, 19 routine inspections, and 16 inspections of feral brood fish), with a shift from diagnostic to inspection exams that has been seen for 2 consecutive years. I was also responsible for 1 inspection done on rainbow trout from Rangens Aquaculture (fish purchased by Idaho Power Company [IPC] for release in American Falls Reservoir), 4 wild fish inspections, 1 wild fish diagnostic, and 32 various research tests. Statewide, the most significant fish disease in the Department resident hatchery program continued to be bacterial coldwater disease (CWD), caused by *Flavobacterium psychrophilum*. The treatment of choice for CWD has been oxytetracycline (OTC) in medicated feed under an Investigational New Animal Drug (INAD) protocol. The total of 14 INAD protocols needed to use OTC at resident hatcheries in 2005 was greatly reduced from the numbers needed in 2003 or 2004 (23 each). Most of this reduction occurred at the Hagerman State Fish Hatchery.

I am the INAD Monitor for the Department resident hatcheries and biologists. The INAD process is the means by which the US Food and Drug Administration (USFDA) will allow the limited use of certain drugs and chemicals not currently labeled for a specific use in food fish, while accumulating data to support adding such use to the label. The Department joined the U.S. Fish and Wildlife Service Aquatic Animal Drug Approval Partnership Program (USFWS-AADAPP) in 1998. This group, located in Bozeman MT, administers INAD programs for Federal, State, Tribal, and private aquaculture across the United States. My duties include identifying the situations in which a drug or chemical may be used, assisting in preparing written requests and reports, and generally acting as intermediary between the users and the administrators. Chemicals used by IDFG resident programs in 2005 under the INAD program included Oxytetracycline (OTC), Chloramine-T (CHLOR-T), and Calcein. Oxytetracycline is used to treat fish with systemic bacterial infections, CHLOR-T is used to treat bacterial gill infections, and Calcein is a fluorescing dye used as a fish marking agent.

Another of my responsibilities was to issue import/transport permits when the fish or fish eggs involved were of resident species and the goal of the movement was the noncommercial release of fish into surface waters of the state. Such permits were issued to Department

personnel, other governmental agents, and private individuals. This duty involved collecting fish health inspection and certification information from various sources. The goal of the permitting process is to reduce jeopardy to Idaho's fishery resources by reducing the likelihood of importing unwanted pathogens or other exotic species. An addition, I coordinated procurement of the Federal Title 50 certificates for two importations of salmonid eggs into Idaho from British Columbia, Canada (Kokanee salmon *Oncorhynchus kisutch* and sterile brook trout *Salvelinus fontinalis*).

A summary of the work I did for each Department hatchery in 2005, as well as the results of all sampling done at those hatcheries, is as follows.

AMERICAN FALLS HATCHERY

Four of five diagnostic examinations documented CWD as the most significant infectious disease in rainbow trout *O. mykiss* at American Falls Hatchery in 2005 (Appendix A). Three of those episodes were treated using OTC-medicated feed under INAD protocols. The fifth case was diagnosed as motile aeromonad septicemia (MAS) involving both *Aeromonas caviae* and *A. hydrophila*, and was treated using the existing OTC label. The Connor Lake Westslope cutthroat trout were inspected prior to transfer to Cabinet Gorge Hatchery. No replicating viruses, *Renibacterium salmoninarum* (RS), cultured bacteria, or *Myxobolus* (MYXOB) spores were detected.

ASHTON HATCHERY

I visited the hatchery in April to sample the catchable rainbow trout and the sterile brook trout populations. No replicating viruses were detected from either group. (Due to small size, virology was the only test done on the brook trout). No MYXOB spores or cultured bacteria were detected from the rainbow trout. *Renibacterium salmoninarum* was detected in 3 of 60 kidney smears by direct fluorescent antibody tests (DFAT), but no signs of clinical bacterial kidney disease (BKD) were evident. (Appendix B). The hatchery manager reports that infestations of the external trematode *Gyrodactylus* (GYRO) continue to be the only significant disease problem on the station. Fish living in open portions of the spring and stream above the hatchery intake are the probably origin of these parasites. Ashton Hatchery continues to be at risk for contamination by *Myxobolus cerebralis* (MC), the causative agent of salmonid whirling disease (WHD), because the hatchery water source is not completely enclosed. The spring property between the original hatchery boundary line north to the county road was purchased, but plans to cover any more of the spring have not yet been implemented.

CABINET GORGE HATCHERY

Spawning Kokanee adults were examined at the Sullivan Springs trap in December (Appendix C), but no fish were available for sampling at the Clark Fork River trap. No replicating viruses, RS, or MYXOB spores were detected. Bacterial isolates included *F. psychrophilum* and *Pseudomonas putida*. The first is a significant fish pathogen, but the latter was likely an opportunist that started to grow as the fish's immune systems were depressed at

spawning. No signs of clinical CWD have ever been seen in these fish or their offspring. A light infection of encysted cestodes was evident in the pyloric caecae of about half of the fish. These are seen at about the same intensity and prevalence every year, and do not appear to have any adverse effect upon the fish hosts.

GRACE HATCHERY

General fish health on-station was very good this year, and no diagnostic calls were made. I was on-station several times in conjunction with placing WHD exposure trials and did visual checks of production rainbow trout. Signs consistent with chronic coldwater disease (mostly eroded caudal peduncles) were observed, but mortality rates were never elevated to levels of concern. Therefore, I sampled no production fish. Hatchery personnel collected heads from 68 fish caught out of the settling pond for MC screening (Appendix D). No MYXOB spores were detected by pepsin/trypsin digest (PTD).

I conducted a series of exposure trials looking for MC in the Bear River and tributaries in response to the finding of the parasite at a private hatchery located approximately 6 miles south of Grace Hatchery. Sentinel groups of juvenile rainbow trout were exposed from August 9th to 19th. Exposure sites included the Bear River at Black Canyon, the Grace Hatchery settling pond, Whiskey Creek at Highway 34, Wright's Spring (Thatcher), and Williams Creek. A heavy population of what appeared to be New Zealand mudsnails was found on the box from the Grace settling pond on August 19. Fish from these live-boxes were held at the EFHL wet laboratory for 100 days to allow MC spores to develop. During that period, one fish in the group from the Grace settling pond was observed spinning in a suspicious manner just prior to an outbreak of bacterial gill disease (BGD) in that tank. All mortalities from that tank, including the spinning fish, were tested by polymerase chain reaction (PCR) and were negative for MC genetic material. No MYXOB spores were detected by PTD in fish from any of the sites once the 100 days were complete.

While waiting for the initial test results, my supervisor and I decided to put out more sentinel groups around Grace Hatchery. Fish were in place from October 21st to November 1st at sites including the short open channel below Upper Whiskey Spring, Middle Whiskey Spring, the large raceway tailrace, and the lower end of the settling pond. The fish remain in the Eagle Wet Laboratory and will be sampled mid-February, 2006. No signs of whirling have been observed. Recommendations have been made to enclose the remaining portion of the upper spring to increase bio-security for Grace Hatchery.

HAGERMAN STATE HATCHERY

A total of 13 diagnostic cases were examined from Hagerman State Fish Hatchery in 2005 (Appendix E), down from 23 cases in 2004. The total numbers of fish lost to viral infectious hematopoietic necrosis (IHN) continues on a decline, although some unusual losses occurred in larger fish. As in previous years, significant bacterial pathogens at Hagerman State were *Flavobacterium psychrophilum* and *F. columnare*, the causative agent of columnaris disease (COL). In many cases, these bacteria are isolated concomitant with each other or with a motile *Aeromonas*. However, the number of INAD protocols to treat CWD or COL dropped from 15 in 2004 to 5 in 2005. One production stage where antibiotic use has been significantly

reduced was in the vat building. A 1/2-hour bath treatment of 100-mg/l hydrogen peroxide is now given daily to every egg lot, beginning when the eggs arrive and continuing until the fish are moved out of the vat building. To date, the hatchery manager reports that the improvement in survival far outweighs any cost in time or materials. It is possible that healthier fish from the vat building are better able to resist diseases after ponding. An added benefit is that hydrogen peroxide is probably the most environmentally benign chemical that can be used in fish culture, rapidly breaking down into oxygen gas and water.

The protozoan parasite *Ichthyophthirius multifiliis* (ICH) caused significant mortalities in several lots of fish during the winter of 2004-2005. Alternating treatments of formalin and potassium permanganate were initiated in December 2004 and continued through March 2005. This was the first time that ICH has caused documented mortality on the hatchery.

HAYSPUR HATCHERY

Clinical fish disease at Hayspur in 2005 included BGD in the Hayspur-strain rainbow trout (R9) and Connor Lake Westslope cutthroat trout *O. clarkii* populations and BKD in the Connor Lake cutthroat (Appendix F). All fish groups diagnosed with BGD were successfully treated using CHLOR-T under INAD protocols. *Renibacterium salmoninarum* was detected in the R9, Kamloops (K1), and Connor Lake cutthroat populations by enzyme-linked immunosorbant assay (ELISA) and in the R9 and cutthroat by fluorescent antibody testing on ovarian fluid cell pellets (OCP-FAT). Test levels and mortality patterns in the cutthroat were consistent with clinical BKD, but there was no evidence of clinical disease in the rainbow trout populations. This was the 13th consecutive year with no replicating viruses detected at Hayspur Hatchery.

The primary focus of my efforts at Hayspur Hatchery was sampling the R9 and K1 adult females whose eggs were used for broodstock replacements. With the assistance of hatchery personnel, I collected ovarian fluid from every such female to be tested for viruses and for RS using OCP-FAT. Lethal sampling of a portion of the R9 and K1 females provided kidney and spleen tissues for virology, kidney smears for DFAT, and kidney tissues for ELISA. The tissue sampling provided corroboration for a portion of the ovarian fluid tests, and was consistent with Federal Title 50 sampling protocols. Eggs from individual females were held in isolation until the test results were complete. Following established protocol, a female's eggs were culled from the program if she tested positive for any virus, for RS by either DFAT or OCP-FAT, or for RS antigen by ELISA at an optical density (OD) above 0.120 (or lower at the hatchery manager's discretion).

The R9 brood stock replacement spawning was done on five separate days between October 24 and December 13, 2005. A total of 198 BY-2002 females were tested. No viruses were detected from any ovarian fluid or tissue samples. The RS test results were as follows: 4 of 198 ovarian fluid samples positive by OCP-FAT, 10 of 60 positive by ELISA (3 with OD >0.500; all 3 also positive by OCP-FAT), and 0 of 60 kidney smears positive by DFAT. Eggs from 6 females were culled from the program.

Kamloops brood stock replacement spawning was done on four days, from October 24 to November 12. A total of 144 females were tested. No viruses were detected from any ovarian fluid or tissue samples. The RS test results were as follows: 0 of 144 ovarian fluid

samples positive by OCP-FAT, 1 of 57 positive by ELISA (OD=0.113), and 0 of 57 kidney smears positive by DFAT. No eggs were culled.

Sixty-fish inspection samples (lethal) were taken from both BY-2003 R9 and K1 populations. No replicating viruses, RS, cultured bacteria, or MYXOB spores were detected from either population.

This was the first year that eggs were taken from the Connor Lake Westslope cutthroat for broodstock replacement. Specifically, fish from the BY-2000 population were crossed with fish from the BY-2002 lot to avoid the possibility of sibling crosses, with ovarian fluids from the females in each set of crosses sampled for pathogen analysis. Because of a history of low milk production from males and poor fertilization, it was decided that pooled groups of eggs would be fertilized by several males rather than use one-to-one pairings. With a limited number of fish, no lethal sampling was done. Ovarian fluids from 21 BY-2000 and 100 BY-2002 individual females were tested in four- to six-fish pools, corresponding to the pools of eggs. No replicating viruses were detected in any samples. Two BY-2000 pools (each a four-fish pool) were RS-positive by OCP-FAT and were culled. No RS was detected in the BY-2002 ovarian fluids. Pre-spawning mortalities were frozen and subsequently tested by DFAT and ELISA. Six of 11 BY-2000 fish were positive for RS by ELISA at low OD levels (the highest being 0.184), while 1 of 9 BY-2002 fish was positive at a very high OD (2.208). None of the fish tested positive by DFAT.

The production of sterile rainbow trout from all Department hatcheries has become an important part of statewide fishery management. All rainbow or Kamloops eggs taken at Hayspur Hatchery for general hatchery production were treated to induce a state of triploidy (3N), in which the embryonic cells retain an extra set of chromosomes from the parent female. All resulting 3N trout are sterile. Because we know that induction techniques are not perfect, the Department has determined that a 95% 3N rate in the production populations will be the program goal. To determine if this goal was met, hatchery personnel randomly selected 15 lots of treated eggs throughout the spawning season and gave me eyed-egg subsamples from those lots for incubation and rearing at the EFHL wet laboratory. The first eleven egg lots were treated with high temperature to induce triploidy and the last four were treated with high pressure. When the resulting groups of fish were large enough, 40 individual blood samples per group were taken and sent to the University of Washington for analysis. A total of 600 individual fish were tested, of which 576 (96%) were triploid. Induction rate for heat-treated eggs averaged 96.2%, while the rate for pressure treatment was 95.5%. One of the four pressure treated lots was only 85%, which brought the overall average down. A misunderstanding at EFHL resulted in the first four heat-treated lots being combined in one large group. Representation of the four lots in the combined group was nearly, but not exactly equal. Induction rate in the combined group was only 89.6% (146 of 163) with no way to determine if this was due to one "bad" lot or if poor induction was universal in all of them. Review of data collected at spawning does show that the third lot had more than twice as many eggs in the incubator tray and mean treatment water temperature was slightly lower during treatment. Eggs in the center of that tray may not have reached the desired shocking temperature, possibly explaining a poor 3N induction rate.

HENRYS LAKE HATCHERY

Fish health inspection samples were taken from spawning Yellowstone cutthroat trout at Henrys Lake Hatchery from January 21 through April 27, 2004 (Appendix G). Ovarian fluids

were collected by hatchery personnel and shipped to EFHL where they were tested for viruses (141 females in 23 pools) and RS by OCP-FAT (1027 females in 162 pools). No viruses were detected in any of the ovarian fluid samples, including 5 pools (29 fish) that were blind-passed to check for North American viral hemorrhagic septicemia virus (NAVHS). Fifteen pools were positive for RS by OCP-FAT (13 of 20 in the third egg-take alone), and the eggs from those pools were discarded. I visited the hatchery on April 5 and took lethal samples from a group of 20 fish (both males and females) for kidney DFAT, tissue virology, bacteriology, and MYXOB tests. No viruses were detected. Kidney smears were all negative for RS by DFAT, but all 20 individual kidney tissue samples were positive by ELISA (19 at low OD levels and 1 high). The 100% prevalence was somewhat higher than expected, but the fact that individual levels of intensity were mostly low was consistent with previous year's findings.

Bacteriology samples detected carrier-level infections of *Aeromonas salmonicida*, the causative agent of furunculosis (FUR), in 8 of 12 fish. This was the second consecutive year for detecting this pathogen and may be an indication of poor environmental conditions in the lake. Hatchery personnel at Mackay Hatchery were warned to take special care when iodine disinfecting the eyed eggs they received from this source. *Flavobacterium psychrophilum* was also isolated from 10 of 12 fish. This was consistent with previous findings and did not cause concern at the time, as there had never been an indication there were problems with CWD either in the adults in the lake or in their offspring in the hatchery. However, significant losses occurred in the fry at Mackay Hatchery at first feeding due to CWD (see the Mackay Hatchery section of this report).

No MYXOB spores were detected from the 20 individuals by the PTD method, although MC has been previously confirmed in both cutthroat trout and brook trout from Henrys Lake.

MACKAY HATCHERY

The BY-2004 Henrys Lake and BY-2004 Jackson National Fish Hatchery stocks of Yellowstone cutthroat trout were sampled in June (Appendix H). No replicating viruses, bacteria, or MYXOB spores were detected from the Jackson NFH fish, but clinical CWD was diagnosed in the Henrys Lake swim-up fry. An attempt to treat the sick groups with OTC-medicated feed was made with no evidence of success. Medicated feed is not available in the small starter size needed for first-feeding fry so larger feed must be ground to a finer consistency. Since OTC is water soluble, most of the antibiotic may have been gone by the time the fish ate the feed. An INAD is in place to attempt an immersion bath of OTC if necessary in 2006.

Mackay Hatchery received green eggs from the early-spawning Kokanee in Deadwood Reservoir. A 60-fish inspection was done on the spawning population on September 9. No viruses were detected. No RS was detected by either DFAT or ELISA, although there is a history of positive ELISA results from Deadwood Kokanee. Large MYXOB spores were detected by PTD in 6 of 12 five-fish pools. One pool was tested specifically for MC by PCR and was negative. Since the presence of the unnamed neurotropic *Myxobolus* species (NEURO) has been previously confirmed in Deadwood Reservoir, and the appearance of the spores was consistent, I believe it was reasonable to assume that this was the same species.

MCCALL HATCHERY RESIDENT PROGRAM

The McCall Resident Program consists of hatching rainbow and cutthroat fry for high mountain lake stocking, and redistribution of catchable rainbow reared at the Nampa Hatchery. Significant losses of both rainbow and cutthroat sac fry occurred in the incubator trays. The fish were tested for viruses and were negative (Appendix I). Since the greatest losses were in the upper trays, it was suspected that there may have been some problems with the water. McCall Hatchery's water source is from a deep intake in Payette Reservoir. Tests for gas supersaturation indicated a normal level of dissolved gases. Water samples were taken by Doug Munson and submitted to the Idaho Department of Agriculture Chemical Laboratory. One common breakdown product of agricultural fertilizer was identified at higher than recommended levels, but could not be confirmed as the cause of fish death. Hatchery personnel also observed some gelatinous organic material (possible zooplankton eggs) that could have clogged the screens of the egg trays. Filters placed in the top trays during salmon egg incubation (August through November) removed this unidentified material, and there was no significant loss in the salmon eggs or fry.

NAMPA HATCHERY

Nine diagnostic cases were examined at Nampa Hatchery in 2005 (Appendix J). Six episodes of clinical CWD and/or MAS were diagnosed. Treatments of OTC-medicated feed were applied using either the existing label or an INAD protocol when appropriate and response to treatment was generally good. Nampa Hatchery also experienced two episodes of BGD that were treated under INAD protocol with CHLOR-T. Considering the very high production levels at Nampa, it is surprising that BGD is not a bigger problem on this station.

Ichthyophthirius multifiliis was diagnosed from large rainbow trout in January and again in May. Losses were significant in the first episode, while detection was prior to elevated loss in the second. Treatments of potassium permanganate were initiated in both cases and continued until the fish were released. This was the first time that ICH had ever been documented on the hatchery. The intestinal parasite *Hexamita* was detected in a group of small rainbow trout in August. Successful treatment consisted of top-dressing feed with Epsom salts (magnesium sulfate) at a rate of 14 grams/pound of feed (3%) for 3 days. This was also the first time that *Hexamita* had been documented at Nampa.

SPRINGFIELD HATCHERY

Crystal Springs Hatchery, a former commercial trout hatchery, was donated to the Department in 2005 and renamed the Springfield Hatchery. During the course of negotiations for the donation, the Department wanted to learn the fish pathogen status of the facility. I sampled adult feral rainbow trout from the lake on the property and the outlet of the hatchery with the assistance of Tom Frew and Dick Scully, the Resident Hatchery Supervisor and Regional Fishery Manager. I also put out live-boxes containing sentinel rainbow trout fry to test for viral or MC infectivity (Appendix K). No replicating viruses or MYXOB spores were detected from any sentinel group or the feral adults. One 5-fish pool of feral adult kidneys tested positive for RS antibodies by ELISA at a very low lever (OD = 0.103), but all were negative by DFAT.

Motile *Aeromonas sobria* was isolated from one adult, and one adult with a swollen kidney tested negative for *Tetracapsula bryosalmonae*, the causative agent of proliferative kidney disease (PKD). External copepod and internal nematode parasites were prevalent (50-80%), which is not uncommon in wild fish from this part of the state. I did not consider any of these findings significant, thus I had no health reasons to object to the Department accepting the donation. Significant reconstruction will be necessary to bring the facility up to Department standards, but the supply of pathogen-free well water could make this facility a jewel in the Department's hatchery system.

OTHER ACTIVITIES

Doug Munson, Sharon Landin, and I attended a week-long Histology and Histopathology course presented by the USFWS in Olympia, WA. I presented a paper on my 2003-2004 findings at Hayspur Hatchery and Silver Creek at the 11th Annual Whirling Disease Symposium in Denver. I also attended the Idaho Chapter American Fisheries Society meeting, and the 46th Western Fish Disease Workshop in Boise that was co-hosted by IDFG/EFHL, University of Idaho, and Clearsprings Foods.

I assisted personnel from USFWS-AADAPP to complete a pivotal study at the EFHL wet laboratory involving a new fish anesthetic (Aqui-S) and Chinook salmon. Another identical study failed at the Rapid River Hatchery because the field test to confirm drug concentration would not run properly with the hatchery water chemistry. The same problem was experienced with a similar trial at the McCall Hatchery in 2004.

ACKNOWLEDGMENTS

I wish to thank my anadromous counterpart, A. Douglas (Doug) Munson, for his assistance in the field, for sharing his considerable knowledge with me, and for being a congenial office-mate and valued friend. I also acknowledge my supervisor, Keith Johnson, for directing the course of my work. The efforts of Fishery Technologists Carla Hogge, Sharon Landin, and Roberta Scott are greatly appreciated. Their timely and accurate results from the laboratory are essential in managing the resident hatchery system's fish health challenges. Doug Marsters, Utility Craftsman, was great at keeping EFHL's physical plant operating and in keeping our vehicles on the road. Lani Clifford, the new EFHL Office Coordinator has kept us all organized and operating smoothly. Most importantly, I wish to acknowledge the Hatchery Managers and personnel with whom I work. Their cooperation is greatly appreciated, and I sincerely hope my efforts have benefited their programs.

Appendix A. Summary report of Eagle Fish Health Laboratory results for American Falls Hatchery, January 1 – December 31, 2005.

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|-------------|---------------------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|---|
| 2004 | Troutlodge | Rainbow trout--3N | 05-002 | 1/04/05 | - | - | | | - | - | + | - | | | DX: CWD; VIRO 0/5 <i>Flavobacterium psychrophilum</i> 4/4 |
| 2004 | Troutlodge | Rainbow trout--3N | 05-026 | 1/19/05 | | | | | - | - | + | - | | | DX: CWD; <i>F. psychrophilum</i> 8/8 |
| 2004 | Connor Lake | Westslope Cutthroat trout | 05-134 | 4/21/05 | - | - | | - | - | - | - | - | - | - | IX: NPD; VIRO 0/60, DFAT 0/60, ELISA 0/60, BACTE 0/12, PTD-MYXOB 0/60 |
| 2005 | Hayspur | Rainbow trout--3N | 05-147 | 5/02/05 | | | | | - | - | + | - | | | DX: CWD, <i>F. psychrophilum</i> 3/4 |
| 2005 | Troutlodge | Rainbow trout--3N | 05-438 | 11/01/05 | | | | | - | - | - | + | | | DX: MAS; <i>Aeromonas caviae</i> 7/8, <i>A. hydrophila</i> 5/8 |
| 2005 | Troutlodge | Rainbow trout--3N | 05-454 | 11/29/05 | - | - | | | - | - | + | - | | | DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 3/6 |

152

Appendix B. Summary report of Eagle Fish Health Laboratory results for Ashton Hatchery, January 1 – December 31, 2005.

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|----------------------------|-------------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|---|
| 2004 | Kootenay Hatchery (CANADA) | Brook trout | 05-102 | 4/03/05 | - | - | | | | | | | | | IX: NPD; VIRO 0/60 |
| 2004 | Hayspur | Rainbow trout--3N | 05-103 | 4/03/05 | - | - | | + | - | - | - | - | - | - | IX : BKD; VIRO 0/60, DFAT 3/60, BACTE 0/12, PTD-MYXOB 0/60 |

Appendix C. Summary report of Eagle Fish Health Laboratory results for Cabinet Gorge Hatchery, January 1 – December 31, 2005.

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|------------------|----------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|---|
| Brood | Sullivan Springs | Kokanee salmon | 05-480 | 12/05/05 | - | - | | - | - | - | + | + | - | - | IX: CWD, MAS; VIRO 0/60, DFAT 0/60, ELISA 0/60, <i>Flavobacterium psychrophilum</i> 15/16, <i>Pseudomonas putida</i> 9/16, PTD-MYXOB 0/60 |

153

Appendix D. Summary report of Eagle Fish Health Laboratory results for Grace Hatchery, January 1 – December 31, 2005.

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|---------------|---------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|-------------------------|
| Feral | Settling Pond | Rainbow trout | 05-439 | 10/29/05 | | | | | | | | | - | - | IX: NPD; PTD-MYXOB 0/68 |

Appendix E. Summary report of Eagle Fish Health Laboratory results for Hagerman State Hatchery, January 1 – December 31, 2005.

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|------------|--------------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|--|
| 2004 | Hayspur | Rainbow trout--3N | 05-003 | 1/04/05 | - | - | | | - | - | - | - | | | DX: BACTEREMIA; <i>Flavobacterium</i> spp. 1/4 |
| 2004 | Troutlodge | Rainbow trout--3N | 05-030 | 2/01/05 | + | - | | | - | - | + | - | | | DX: IHN, CWD; IHNV 1/2 (x4), IPNV 0/9, <i>Flavobacterium psychrophilum</i> 8/8 |
| 2005 | Hayspur | Rainbow trout--3N | 05-076 | 3/18/05 | | | | | - | - | + | + | | | DX: CWD, MAS; <i>F. psychrophilum</i> 4/4, <i>Aeromonas sobria</i> 4/4 |
| 2004 | Hayspur | Kamloops trout--3N | 05-077 | 3/18/05 | + | - | | | - | - | + | - | | | DX: IHN, CWD, COL, ICH, GYRO; IHNV 1/2 (x5), IPNV 0/10, <i>F. psychrophilum</i> 1/4, <i>F. columnare</i> 3/4, <i>Ichthyophthirius multifiliis</i> 1/1, <i>Gyrodactylus</i> spp. 1/1 |
| 2004 | Troutlodge | Rainbow trout--3N | 05-078 | 3/18/05 | + | - | | | - | - | + | - | | | DX: IHN, CWD; IHNV 1/1 (x5), IPNV 0/10, <i>F. psychrophilum</i> 2/4 |
| 2004 | Troutlodge | Rainbow trout--3N | 05-199 | 6/24/05 | | | | | - | - | - | + | | | DX: MAS; <i>A. hydrophila</i> 1/8 |
| 2005 | Troutlodge | Rainbow trout--3N | 05-298 | 8/23/05 | - | - | | | - | - | - | - | | | DX: NPD; VIRO 0/5, BACTE 0/5 |
| 2005 | Hayspur | Kamloops trout--3N | 05-299 | 8/23/05 | - | - | | | - | - | + | - | | | DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 3/4 |
| 2005 | Hayspur | Kamloops trout--3N | 05-300 | 8/23/05 | - | - | | | - | - | + | + | | | DX: CWD, MAS; VIRO 0/5, <i>F. psychrophilum</i> 4/4, <i>A. hydrophila</i> 1/4 |
| 2005 | Troutlodge | Rainbow trout--3N | 05-424 | 10/21/05 | - | - | | | - | - | - | + | | | DX: MAS; VIRO 0/5, <i>A. caviae</i> 2/4 |

Appendix E. Summary report of Eagle Fish Health Laboratory results for Hagerman State Hatchery, January 1 – December 31, 2005 (continued).

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|------------|-------------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|--|
| 2005 | Troutlodge | Rainbow trout--3N | 05-425 | 10/21/05 | + | - | - | | - | - | + | - | | | DX: IHN, CWD; IHNV 1/2 (x5), IPNV 0/10, NAVHS 0/5, <i>F. psychrophilum</i> 5/8 |
| 2005 | Troutlodge | Rainbow trout--3N | 05-426 | 10/21/05 | - | - | | | - | - | + | - | | | DX: CWD, BACTEREMIA; VIRO 0/4, <i>F. psychrophilum</i> 4/4, <i>Shewanella</i> spp. 1/4 |
| 2005 | Troutlodge | Rainbow trout--3N | 05-488 | 12/21/05 | + | - | | | - | - | - | + | | | DX: IHN, MAS; IHNV 1/1 (x5), IPNV 0/5, <i>A. sobria</i> 1/4 |

Appendix F. Summary report of Eagle Fish Health Laboratory results for Hayspur Hatchery, January 1 – December 31, 2005.

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|-------------|---------------------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|--|
| Brood | Connor Lake | Westslope cutthroat Trout | 05-075 | 3/18/05 | - | - | - | - | | | | | | | IX: NPD; VIRO 0/29, NAVHS 0/10, OCP-FAT 0/29 |
| 2000 | Connor Lake | Westslope cutthroat trout | 05-081 | 3/18/05 | | | | + | | | | | | | IX: RS; DFAT 0/11. ELISA 6/11 (all lows) |
| 2002 | Connor Lake | Westslope cutthroat trout | 05-082 | 3/18/05 | | | | + | | | | | | | IX: BKD; DFAT 0/9, ELISA 1/9 (high) |
| 2004 | Hayspur | Rainbow trout--3N | 05-090 | 3/14/05 | | | | | | | | | | | IX: RESEARCH: Triploid induction rate 146/163 (89.6%) |
| 2000 | Connor Lake | Westslope cutthroat trout | 05-096A | 4/01/05 | - | - | | + | | | | | | | IX: BKD; VIRO 0/9, OCP-FAT 2/2 (x4), PCR-RS 1/1 (X4) |
| 2002 | Connor Lake | Westslope cutthroat trout | 05-96B | 4/01/05 | - | - | | - | | | | | | | IX: NPD; VIRO 0/35, OCP-FAT 0/35 |
| 2000 | Connor Lake | Westslope cutthroat trout | 05-122 | 4/15/05 | - | - | - | - | | | | | | | IX: NPD; VIRO 0/7, NAVHS 0/2, OCP-FAT 0/7 |
| 2002 | Connor Lake | Westslope cutthroat trout | 05-123 | 4/15/05 | - | - | | - | | | | | | | IX: NPD; VIRO 0/26, OCP-FAT 0/26 |
| 2000 | Connor Lake | Westslope cutthroat trout | 05-145 | 4/29/05 | - | - | | - | | | | | | | IX: NPD; VIRO 0/2, OCP-FAT 0/2 |

Appendix F. Summary report of Eagle Fish Health Laboratory results for Hayspur Hatchery, January 1 – December 31, 2005 (continued).

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|-------------|---------------------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|---|
| 2002 | Connor Lake | Westslope cutthroat trout | 05-146 | 4/26/05 | - | - | | - | | | | | | | IX: NPD; VIRO 0/14, OCP-FAT 0/14 |
| 2004 | Hayspur | Rainbow trout--3N | 05-165A | 5/09/05 | | | | | | | | | | | IX: RESEARCH: Triploid induction rate 40/40 (100%) |
| 2004 | Hayspur | Rainbow trout--3N | 05-165B | 5/09/05 | | | | | | | | | | | IX: RESEARCH: Triploid induction rate 40/40 (100%) |
| 2004 | Hayspur | Rainbow trout--3N | 05-166A | 5/17/05 | | | | | | | | | | | IX: RESEARCH: Triploid induction rate 40/40 (100%) |
| 2004 | Hayspur | Kamloops trout--3N | 05-166B | 5/17/05 | | | | | | | | | | | IX: RESEARCH: Triploid induction rate 40/40 (100%) |
| 2004 | Hayspur | Rainbow trout--3N | 05-197A | 5/17/05 | | | | | | | | | | | IX: RESEARCH: Triploid induction rate 40/40 (100%) |
| 2004 | Hayspur | Rainbow trout--3N | 05-197B | 5/17/05 | | | | | | | | | | | IX: RESEARCH: Triploid induction rate 40/40 (100%) |
| 2003 | Hayspur | Rainbow trout--3N | 05-198 | 5/16/05 | | | | | | | | | | | DX: EGD/BGD; Environmental/ Bacterial Gill Disease 2/2 |
| 2004 | Hayspur | Rainbow trout--3N | 05-213 | 6/27/05 | | | | | | | | | | | IX: RESEARCH: Triploid induction rate 40/40 (100%) |
| 2005 | Hayspur | Kamloops trout--3N | 05-214 | 6/27/05 | | | | | | | | | | | IX: RESEARCH: Triploid induction rate 40/40 (100%) |
| 2005 | Hayspur | Rainbow trout--3N | 05-215 | 5/17/05 | | | | | | | | | | | IX: RESEARCH: Triploid induction rate 40/40 (100%) |
| 2003 | Hayspur | Kamloops trout | 05-258 | 7/27/05 | - | - | | - | - | - | - | - | - | - | IX; NPD; VIRO 0/60, DFAT 0/59, ELISA 0/60, BACTE 0/12, PTD-MYXOB 0/60 |

Appendix F. Summary report of Eagle Fish Health Laboratory results for Hayspur Hatchery, January 1 – December 31, 2005 (continued).

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|-------------|---------------------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|---|
| 2003 | Hayspur | Rainbow trout | 05-281 | 8/11/05 | - | - | | - | - | - | - | - | - | - | IX; NPD; VIRO 0/60, DFAT 0/60, ELISA 0/60, BACTE 0/12, PTD-MYXOB 0/60 |
| Brood | Hayspur | Kamloops trout | 05-408 | 10/05/05 | - | - | - | - | | | | | | | IX: NPD; VIRO 0/24, NAVHS 0/4, DFAT 0/15, OCP-FAT 0/24, ELISA 0/15 |
| Brood | Hayspur | Kamloops trout | 05-422 | 10/19/05 | - | - | - | - | | | | | | | IX: NPD; VIRO 0/48, NAVHS 0/5, DFAT 0/18, OCP-FAT 0/48, ELISA 0/18 |
| Brood | Hayspur | Rainbow trout | 05-430 | 10/24/05 | - | - | - | - | | | | | | | IX: NPD; VIRO 0/24, NAVHS 0/3, OCP-FAT 0/24 |
| Brood | Hayspur | Kamloops trout | 05-443 | 11/02/05 | - | - | - | - | | | | | | | IX: NPD; VIRO 0/48, NAVHS 0/5, DFAT 0/12, OCP-FAT 0/48, ELISA 0/12 |
| Brood | Hayspur | Rainbow trout | 05-447 | 11/09/05 | - | - | | + | | | | | | | IX: RS; VIRO 0/36, DFAT 0/18, OCP-FAT 0/36, ELISA 1/18 (low) |
| Brood | Hayspur | Kamloops trout | 05-450 | 11/12/05 | - | - | - | + | | | | | | | IX: RS; VIRO 0/24, NAVHS 0/4, DFAT 0/12, OCP-FAT 0/24, ELISA 1/12 (low) |
| Brood | Hayspur | Rainbow trout | 05-452 | 11/22/05 | - | - | - | + | | | | | | | IX: RS; VIRO 0/54, NAVHS 0/6, DFAT 0/18, OCP-FAT 4/54, ELISA 5/18 (2 low, 3 high) |
| 2004 | Connor Lake | Westslope Cutthroat trout | 05-455 | 11/29/05 | | | | - | | | | | | | DX: NPD; DFAT 0/2, ELISA 0/2 |
| Brood | Hayspur | Rainbow trout | 05-456 | 11/29/05 | - | - | | + | | | | | | | IX: RS; VIRO 0/48, NAVHS 0/5, DFAT 0/12, OCP-FAT 0/48, ELISA 2/12 (low) |

Appendix F. Summary report of Eagle Fish Health Laboratory results for Hayspur Hatchery, January 1 – December 31, 2005 (continued).

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|---------|--------------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|--|
| Brood | Hayspur | Rainbow trout | 05-481 | 12/13/05 | - | - | - | + | | | | | | | IX: RS; VIRO 0/36, NAVHS 0/4 DFAT 0/12, OCP-FAT 0/36, ELISA 2/12 (low) |
| 2005 | Hayspur | Kamloops trout--3N | 05-482 | 9/29/05 | | | | | | | | | | | IX: RESEARCH: Triploid induction rate 39/39 (100%) |
| 2005 | Hayspur | Rainbow trout--3N | 05-483 | 9/29/05 | | | | | | | | | | | IX: RESEARCH: Triploid induction rate 40/40 (100%) |
| 2005 | Hayspur | Rainbow trout--3N | 05-484 | 9/29/05 | | | | | | | | | | | IX: RESEARCH: Triploid induction rate 34/40 (85.0%) |
| 2005 | Hayspur | Kamloops trout--3N | 05-485 | 9/29/05 | | | | | | | | | | | IX: RESEARCH: Triploid induction rate 37/38 (97.4%) |

Appendix G. Summary report of Eagle Fish Health Laboratory results for Henrys Lake Hatchery, January 1 – December 31, 2005.

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|-------------|-----------------------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|--|
| Brood | Henrys Lake | Yellowstone Cutthroat trout | 05-046 | 2/14/05 | | | | + | | | | | | | IX: BKD; OCP-FAT 2/21 (x7) |
| Brood | Henrys Lake | Yellowstone Cutthroat trout | 05-047 | 2/17/05 | - | - | | - | | | | | | | IX: NPD; VIRO 0/14, OCP-FAT 0/133 |
| Brood | Henrys Lake | Yellowstone Cutthroat trout | 05-054 | 2/28/05 | - | - | - | + | | | | | | | IX: BKD; VIRO 0/21, NAVHS 0/7, OCP-FAT 13/20 |
| Brood | Henrys Lake | Yellowstone Cutthroat trout | 05-055 | 3/01/05 | - | - | | - | | | | | | | IX: NPD; VIRO 0/14, OCP-FAT 0/70 |
| Brood | Henrys Lake | Yellowstone Cutthroat trout | 05-063 | 3/07/05 | - | - | - | - | | | | | | | IX: NPD; VIRO 0/21, NAVHS 0/7, OCP-FAT 0/105 |
| Brood | Henrys Lake | Yellowstone Cutthroat trout | 05-069 | 3/10/05 | - | - | | - | | | | | | | IX: NPD; VIRO 0/14, OCP-FAT 0/105 |
| Brood | Henrys Lake | Yellowstone Cutthroat trout | 05-070 | 3/14/05 | - | - | | - | | | | | | | IX: NPD; VIRO 0/7, OCP-FAT 0/56 |
| Brood | Henrys Lake | Yellowstone Cutthroat trout | 05-083 | 3/22/05 | | | | - | | | | | | | IX: NPD; OCP-FAT 0/57 |
| Brood | Henrys Lake | Yellowstone Cutthroat trout | 05-091 | 3/28/05 | - | - | | - | | | | | | | IX: NPD; VIRO 0/15, OCP-FAT 0/53 |

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

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|-------------|-----------------------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|---|
| Brood | Henrys Lake | Yellowstone Cutthroat trout | 05-104 | 4/04/05 | - | - | - | - | | | | | | | IX: NPD; VIRO 0/15, NAVHS 0/15, OCP-FAT 0/36 |
| Brood | Henrys Lake | Yellowstone Cutthroat trout | 05-105 | 4/05/05 | - | - | | + | + | - | + | - | - | - | IX: BKD, FUR, CWD; VIRO 0/20, DFAT 0/20, ELISA 20/20 (19 low, 1 high), <i>Aeromonas salmonicida</i> 8/12, <i>Flavobacterium psychrophilum</i> 10/12, PTD-MYXOB 0/20 |
| Brood | Henrys Lake | Yellowstone Cutthroat trout | 05-115 | 4/11/05 | - | - | | - | | | | | | | IX: NPD; VIRO 0/10, OCP-FAT 0/70 |
| Brood | Henrys Lake | Yellowstone Cutthroat trout | 05-129 | 4/17/05 | - | - | | - | | | | | | | IX: NPD; VIRO 0/10, OCP-FAT 0/20 |
| Brood | Henrys Lake | Yellowstone Cutthroat trout | 05-161 | 5/09/05 | | | | - | | | | | | | IX: NPD; OCP-FAT 0/35 |
| Brood | Henrys Lake | Rainbow/Cutthroat hybrids | 05-236 | 7/18/05 | - | - | | | | | | | | | IX: NPD; VIRO 0/60, Triploid induction rate 129/129 (100%) |

Appendix H. Summary report of Eagle Fish Health Laboratory results for Mackay Hatchery, January 1 - December 31, 2005.

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|--------------------|-----------------------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|---|
| 2005 | Henrys Lake | Yellowstone Cutthroat trout | 05-190 | 6/13/05 | - | - | | | - | - | + | - | | | DX: CWD; VIRO 0/10. <i>Flavobacterium psychrophilum</i> 4/4 |
| 2004 | Jackson NFH | Yellowstone Cutthroat trout | 05-191 | 6/14/05 | - | - | | - | - | - | - | - | - | - | IX: NPD; VIRO 0/60, DFAT 0/60, BACTE 0/12, PTD-MYXOB 0/60 |
| Brood | Deadwood Reservoir | Kokanee salmon | 05-360 | 9/07/05 | - | - | | - | | | | | - | + | IX: NEURO; VIRO 0/60, DFAT 0/60, ELISA 0/60, PTD-MYXOB 6/12 (x5), PCR-WHD 0/5 |

162

Appendix I. Summary report of Eagle Fish Health Laboratory results for McCall Hatchery, January 1 - December 31, 2005.

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|---------------------|---------------------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|-------------------|
| 2005 | Troutlodge | Rainbow trout--3N | 05-253 | 7/26/05 | - | - | | | | | | | | | DX: NPD; VIRO 0/5 |
| 2005 | Westslope Trout Co. | Westslope Cutthroat trout | 05-254 | 7/26/05 | - | - | | | | | | | | | DX: NPD; VIRO 0/5 |
| 2005 | Westslope Trout Co. | Westslope Cutthroat trout | 05-255 | 7/26/05 | - | - | | | | | | | | | DX: NPD; VIRO 0/5 |

Appendix J. Summary report of Eagle Fish Health Laboratory results for Nampa Hatchery, January 1 - December 31, 2005.

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|------------|--------------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|--|
| 2004 | Hayspur | Kamloops trout--3N | 05-004 | 1/05/05 | | | | | - | - | - | + | | | DX: MAS; <i>Aeromonas sobria</i> 1/4, <i>Aeromonas hydrophila</i> 1/4 |
| 2004 | Hayspur | Kamloops trout--3N | 05-029 | 1/25/05 | | | | | | | | | | | DX: ICH; <i>Ichthyophthirius multifiliis</i> 1/1 |
| 2004 | Troutlodge | Rainbow trout--3N | 05-045 | 2/23/05 | | | | | - | - | + | - | | | DX: CWD, BACTEREMIA; <i>Flavobacterium psychrophilum</i> 5/6, <i>Pasteurella</i> spp. 1/6 |
| 2004 | Troutlodge | Rainbow trout--3N | 05-045 | 2/23/05 | | | | | - | - | + | + | | | DX: CWD, MAS; <i>F. psychrophilum</i> 8/8, <i>A. hydrophila</i> 1/8 |
| 2005 | Hayspur | Rainbow trout--3N | 05-210 | 7/05/05 | | | | | - | - | + | + | | | DX: CWD, MAS; <i>F. psychrophilum</i> 3/4, <i>A. sobria</i> 2/4 |
| 2005 | Troutlodge | Rainbow trout--3N | 05-235 | 7/15/05 | | | | | - | - | + | + | | | DX: CWD, MAS; <i>F. psychrophilum</i> 4/4, <i>A. hydrophila</i> 3/4, <i>Pseudomonas</i> 4/4 |
| 2004 | Troutlodge | Rainbow trout--3N | 05-263 | 5/17/05 | | | | | | | | | | | DX: ICH, GYRO, EGD; <i>Ichthyophthirius multifiliis</i> 1/3, <i>Gyrodactylus</i> spp. 2/3, Environmental Gill Disease (pine pollen) 3/3 |
| 2005 | Troutlodge | Rainbow trout--3N | 05-270 | 8/03/05 | | | | | | | | | | | DX: HEXAMITIASIS; <i>Hexamita salmonis</i> 4/4 |
| 2005 | Troutlodge | Rainbow trout--3N | 05-449 | 11/14/05 | - | - | | | - | - | + | + | | | DX: CWD, MAS; VIRO 0/5, <i>F. psychrophilum</i> 3/4, <i>A. sobria</i> 1/4 |

Appendix K. Summary report of Eagle Fish Health Laboratory results for Springfield Hatchery, January 1 – December 31, 2005.

| Brood year | Stock | Species | Accession | Sample Date | IHN | IPN | NAVHS | BKD | FUR | ERM | CWD | MAS | WHD | NEURO | Diagnoses |
|------------|------------|-------------------|-----------|-------------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-------|--|
| Feral | Troutlodge | Rainbow trout | 05-406 | 10/03/05 | - | - | | + | - | - | - | + | - | - | IX: MAS, RS, MULTIPLE PARASITISMS; VIRO 0/50 DFAT 0/50, ELISA 1/10 (x5, low), <i>Aeromonas sobria</i> 1/20, PKX 0/1, <i>Salmincola</i> spp. ~25/50, <i>Cystidicola</i> spp. ~16/50 |
| 2005 | Troutlodge | Rainbow trout--3N | 05-444 | 11/08/05 | - | - | | | | | | | | | IX: NPD: VIRO 0/50 (Upper Pond) |
| 2005 | Troutlodge | Rainbow trout--3N | 05-445 | 11/08/05 | - | - | | | | | | | | | IX: NPD: VIRO 0/50 (Lower Pond) |
| 2005 | Troutlodge | Rainbow trout--3N | 05-446 | 11/08/05 | - | - | | | | | | | | | IX: NPD: VIRO 0/45 (Hatchery Outlet) |
| | | | 06-006 | 1/12/06 | | | | | | | | | | | |
| 2005 | Troutlodge | Rainbow trout--3N | 06-004 | 1/12/06 | | | | | | | | | - | - | IX: NPD: PTD-MYXOB 0/45 (Upper Pond) |
| 2005 | Troutlodge | Rainbow trout--3N | 06-005 | 1/12/06 | | | | | | | | | - | - | IX: NPD: PTD-MYXOB 0/28 (Lower Pond) |
| 2005 | Troutlodge | Rainbow trout--3N | 06-006 | 1/12/06 | | | | | | | | | - | - | IX: NPD: PTD-MYXOB 0/32 (Hatchery Outlet) |

Appendix L. List of Acronyms used in the Resident Hatcheries Fish Health Report-2005.

| | |
|---------|--|
| 3N | Tetraploid; having 3 times the haploid (N) chromosome number. |
| AADAPP | Aquatic Animal Drug Approval Partnership Program |
| BACTE | Bacteriology test results. |
| BGD | Bacterial Gill Disease, caused by a number of bacterial species. |
| BKD | Bacterial Kidney Disease, caused by <i>Renibacterium salmoninarum</i> . |
| CHLOR-T | Chloramine-T; used under INAD protocol to treat bacterial gill disease. |
| COL | Columnaris disease, caused by <i>Flavobacterium columnare</i> . |
| CWD | Coldwater Disease, caused by <i>Flavobacterium psychrophilum</i> . |
| DFAT | Fluorescent antibody test |
| DX | Diagnostic examination |
| EFHL | Eagle Fish Health Laboratory |
| ELISA | Enzyme-linked immunosorbant assay |
| ERM | Enteric Redmouth Disease, caused by <i>Yersinai ruckeri</i> . |
| FUR | Furunculosis, caused by <i>Aeromonas salmonicida</i> . |
| GYRO | <i>Gyrodactylus</i> ; a monogenetic trematode. |
| IDFG | Idaho Department of Fish and Game |
| IHN | Infectious Hematopoietic Necrosis disease, caused by IHN virus. |
| IHNV | Infectious Hematopoietic Necrosis virus; acronym used in diagnoses to indicate presence of virus without signs of clinical disease. |
| INAD | Investigational New Animal Drug |
| ICH | <i>Ichthyophthirius multifiliis</i> ; a protozoan parasite of skin and gills. |
| IPN | Infectious Pancreatic Necrosis disease, caused by IPN virus. |
| IPNV | Infectious Pancreatic Necrosis virus; acronym used in diagnoses to indicate presence of virus without signs of clinical disease. |
| IX | Inspection examination |
| K1 | Kamloops trout of generic origin |
| MAS | Motile Aeromonad Septicemia, caused by many <i>Aeromonas</i> -like species. |
| MC | <i>Myxobolus cerebralis</i> ; causative agent of Whirling Disease of salmonids. |
| MYXOB | <i>Myxobolus</i> ; acronym used when a species is not identified. |
| NAVHS | North American Viral Hemorrhagic Septicemia; viral disease not yet detected in Idaho. |
| NEURO | Neurotropic <i>Myxobolus</i> species |
| NPD | No Pathogens Detected |
| OCP-FAT | Ovarian cell pellet fluorescent antibody test |
| OTC | Oxytetracycline antibiotic |
| OD | Optical density; a measure of light transmission in the ELISA test directly correlated with the quantity of RS antigen in the sample. |
| PCR | Polymerase chain reaction test; used to detect specific DNA fragments of a targeted organism |
| PKD | Proliferative kidney disease, caused by <i>Tetracapsula bryosalmonae</i> |
| PKX | <i>Tetracapsula bryosalmonae</i> ; causative agent of PKD |
| PTD | Pepsin/trypsin digest method for detecting Myxobolus spores |
| R9 | Hayspur-strain rainbow trout |
| RS | <i>Renibacterium salmoninarum</i> ; causative agent of BKD; acronym used in diagnoses to indicate presence of bacteria without signs of clinical disease |
| USFWS | United States Fish and Wildlife Service |
| VIRO | Virology test results |
| WHD | Whirling Disease of salmonids, caused by <i>Myxobolus cerebralis</i> |

Submitted by:

Approved by:

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

**Virgil K. Moore, Chief
Fisheries Bureau**

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

**Thomas S. Frew
Resident Fish Hatcheries Supervisor**

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

**Tim Klucken, Fish Culturist
Chad Hensen, Fisheries Technician**

**Dwight Aplanalp, Hatchery Manager I
Jeffrey D. Seggerman, Assistant Hatchery Manager
Jeff Houck, Fish Culturist**

**Joe Chapman, Hatchery Manager II
David May, Assistant Hatchery Manager I
Brian Thompson, Fish Culturist
Tim Klucken, Fish Culturist
Darlene Snyder, Fish Culturist
Jen Taylor, Transport Operator**

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

Damon Keen, Assistant Hatchery Manager

**Robert M. Hoover, Assistant Hatchery Manager
Phillip J. Coonts, Hatchery Manager I
Bryan L. Grant, Fish Culturist**

Steven T. Kammeyer, Assistant Hatchery Manager

Mary Van Broeke, Fisheries Technician

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

Zach Olson, Fish Culturist

Roger Elmore, Assistant Hatchery Manager

Douglas R. Burton, Fishery Pathologist