



RESIDENT FISH HATCHERIES

2008 ANNUAL REPORT

Resident fish hatcheries reared and stocked about 16.5 million fish weighing a million pounds. More than 2,000 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 2008.

Resident hatchery program costs were about \$2.3 million for an average cost of \$2.16 per pound or \$141.90 per 1000 fish.

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

The resident hatcheries cooperated with the states of Colorado, Wyoming, Montana, Washington, Oregon and British Columbia as well as the US Fish and Wildlife Service to obtain various species of fish to meet management efforts in Idaho. Kokanee eggs were obtained from Colorado and Washington. 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. Sterile Brook trout were obtained from the Fresh Water Fisheries Society of British Columbia. The US Fish and Wildlife Service provided Snake River cutthroat eggs.

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. Yellowstone Cutthroat trout eggs were taken at the trap at Henrys Lake.

The Engineering Bureau coordinated construction at the American Falls, Cabinet Gorge, and Nampa this fiscal year. A lot of work was done to the spring water collection system at

American Falls, Ashton, and Mackay hatcheries. Permitting and construction of raceways to house Westslope Cutthroat broodstock at Cabinet Gorge was finished as well as a new residence at Cabinet Gorge. The hatchery staff and regional staff accomplished a lot of work on the Sandpoint Nature Center. This center is being developed with volunteer labor and materials and will become an important part of the Sandpoint community. The settling pond at Nampa was dredged as well as the settling pond at Grace.

**Idaho Department of Fish and Game
Resident Hatcheries Fish Production
01/01/08 - 12/31/08**

Production Hatchery	Put-and-Take Number	Pounds	Put-Grow-and-Take Number	Pounds	Average Fish per pound	Feed Pounds	Feed Costs	Average Length	Total cost	Cost 1,000 fish	Cost/ Pound
American Falls	271,810	74,236	11,785	2,577	3.69	70,424	\$35,378	8.43	\$230,031	\$700.00	\$3.15
Ashton	171,573	28,285	245,095	8,979	11.18	33,921	\$21,607	5.83	\$189,198	\$454.00	\$5.08
Cabinet Gorge	0	0	7,359,498	30,774	239.15	28,671	\$27,479	2.1	\$294,159	\$39.97	\$10.70
Grace	79,303	32,164	1,582,325	19,311	31.2	61,514	\$32,856	4.1	\$224,609	\$122.00	\$3.19
Hagerman	1,105,162	447,090	1,528,276	44,108	5.36	672,374	\$348,850	7.45	\$649,800	\$134.87	\$1.32
Mackay	89,313	42,877	2,630,134	41,573	32.2	71,126	\$41,077	4.0	\$284,612	\$107.89	\$3.67
McCall ¹	0	0	192,980	940	205.3	29	\$43	2.3	\$14,940	\$77.42	\$329.22
Nampa	739,450	227,052	394,636	9,064	4.8	223,537	\$111,223	7.78	\$437,862	\$386.12	\$1.85
Sandpoint	0	0	119,009	88	1,352	22	\$0	1.0	\$10,367	\$140.00	\$117.81
Sawtooth	0	0	75,875	18.7	4,000	0	0	1.0	\$5,624	\$N/A	\$N/A
TOTAL	2,465,611	851,704	14,139,613	157,432		1,161,618	\$618,513		\$2,341,202	\$141.90	\$2.16

¹ Flight costs only

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

Redistribution of catchables

Hatchery	Put-and-Take Number	Pounds	Put-Grow-and-Take Number	Pounds	Average Fish per pound	Feed Pounds	Feed Costs	Average Length	Total cost	Cost 1,000 fish	Cost/ Pound
Clearwater	92,060	29,696	0	0	3.7	3,000	\$3,030	9.0	\$25,591	\$277.98	\$0.86
McCall ²	104,316	28,977	0	0	3.6	1,852	\$2,025	9.0	\$9,451	\$N/A	\$N/A
Mullan	35,004	10,001	0	0	3.5	0	0	9.0	\$38,723	\$1,106.24	\$3.87
Sandpoint	112,513	33,145	0	0	3.4	850	0	9.0	\$52,174	\$460.00	\$1.57
Sawtooth	46,129	13,647	0	0	3.4	308	126	9.0	\$13,275	\$278.21	\$0.76
Hayspur ³	35,757	12,929	0	0	2.77	0	0	9.5	\$9,948	\$278.21	\$0.76

² Distribution mileage costs only

³ Distribution costs were not broken out of the overall hatchery budget.

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AMERICAN FALLS FISH HATCHERY

Tim Klucken, Assistant Fish Hatchery Manager
Jeff Seggerman, 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, Idaho. It is owned and operated by the Idaho Department of Fish and Game (Department).

The primary mission of the AFFH is to rear approximately 280,000 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 brown trout, *Salmo trutta*, 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 2008. The permanent employee stationed at Springfield Hatchery (SH) spent an average of three days a week working at AFFH in 2008. Volunteers were utilized for special projects as needed and when available.

Funding for the AFFH operation came 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, five of which are split into ten single pass 50-ft x 3.5ft x 3.5ft concrete raceways, ten reuse 100-ft x 8-ft x 4-ft concrete raceways, and a hatchery building containing fourteen 21-ft x 4-ft x 3-ft concrete rearing vats.

Water for the AFFH comes from Rueger Springs, which is located on AFFH property. These springs flowed an average of 18.90 cubic feet per second (cfs) at a water temperature of 54°F to 56°F during 2008.

TRIPLOID EGG USAGE

During the 2008 calendar year the AFFH received 34,766 triploid rainbow trout eggs from the departments Hayspur Fish Hatchery, 360,000 triploid rainbow trout eggs from the Troutlodge facility in Washington, and 30,528 brown trout eggs from Wyoming's Daniels Hatchery.

FISH PRODUCTION

The AFFH raised triploid Hayspur strain rainbow trout (KT & T9), triploid Troutlodge Kamloops (TT), and Soda Lake brown trout (BN) from Wyoming's Daniels Fish Hatchery for the 2008 production year.

The AFFH stocked 11,785 brown trout (2,577 lbs) in Idaho waters. The AFFH stocked and transferred 271,810 catchable rainbow trout (74,236 lbs) statewide. Minus fish transferred to Grace Fish Hatchery, the average rainbow trout stocked by AFFH was 9.38-inches. Total fish stocked and transferred were 283,595 fish weighing 76,813 pounds (Appendix 1). Net production for the year (lbs stocked + lbs on hand 12/31/2008 - lbs on hand 1/1/2008) was 72,921 pounds. Net number of fish produced, using the same basic formula, was 330,975 fish.

Costs in 2008 for various types and sizes of fish feed were \$35,378, a 21% increase from last year (Appendix 2). Feed costs for the year were \$0.49 per net pound of fish produced, or \$0.11 per net fish produced. Production costs overall were \$230,031, equating to \$3.15 per net pound of fish produced, or \$0.70 per net fish produced. This cost includes all AFFH personnel and operating costs, three fifths of the SH personnel cost, and the cost of transportation of AFFH fish to stocking waters using fish transports stationed at the Nampa and Hagerman Fish Hatchery during 2008. This figure does not include capital outlay or capital construction/repair costs. Overall it costs \$0.92 to raise and stock a 9-inch catchable Rainbow trout from AFFH in 2008.

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

MAJOR HATCHERY IMPROVEMENTS

- A new non-submersible fish pump was purchased.
- The upper 100 feet of each raceway was divided into two raceways each half the original width of the raceway. This to provide smaller rearing units to manage fish production.
- A steam cleaner was purchased for chemical free disinfection of hatchery vats and equipment.
- Catwalks were installed on new raceway dividing walls.
- New carpet, kitchen cabinets, and vinyl flooring were installed in residence #3.
- New shelving units for chemical storage room were purchased and installed.

HATCHERY NEEDS

- Residence #1 and residence #1 garage need to be replaced.
- Additional raceways are needed to maximize efficiency and to more fully utilize the available water.

- Aluminum dam boards and screens for raceways need to be fabricated.
- Need to purchase and install steel siding for hatchery building.
- An ADA approved deck for public fish viewing and fish feeding area needs to be built.

PUBLIC RELATIONS

The AFFH received an estimated 2,000 drop-in visitors during this period. Additionally, organized scheduled tours were given to schools, scouts, and families which consisted of 628 children and approximately 114 adults. AFFH staff also gave presentations at camps, group meetings, and school events which were attended by an estimated 300 children and adults. The nature trail kiosk and voluntary sign in sheet indicated 287 visitor trips were placed, consisting of 96 youths and 191 adults. One hundred fifty four listed bird watching as their primary pursuit while here, 9 noted fishing, 1 listed hunting, and 123 checked other/hiking/walking/exploring as the reason why they had come to the hatchery and utilized the nature trail area. The AFFH staff participated in free fishing day activities and provided instruction, eggs, and fry to area schools for trout in the classroom programs.

VOLUNTEER PROGRAM

Multiple volunteers were used throughout the year to assist in scatter planting catchable fish and hand loading fish onto transport trucks and assisting with various projects as outlined in the Springfield Hatchery report. Volunteer contributions have been documented by the region 5 volunteer coordinator.

ACKNOWLEDGMENTS

During this year employees at AFFH were: Steve Wingert and Jeff Seggerman, Hatchery Managers I; Tim Klucken, Assistant Fish Hatchery Manager; Bryan Grant and Lars Alsager, Assistant Fish Hatchery Managers at SH; Janelle Porath and MARRISA SIEMEN, Biological Aides. Cory Roper, from Region 5, also assisted in operations at AFFH this year.

APPENDICES

Appendix 1. Swimming Inventory with fish transferred or stocked by month, American Falls Fish Hatchery, 2008.

Month	Fish on hand	Pounds on hand	Fish stocked	Pounds stocked
Dec. 2007	223,255 17,775*	12,233 13*		
Jan. 2008	203,913 16,575*	22,488 44*	9,390	1,950
Feb. 2008	228,668 16,335*	11,581 118*	66,664	15,065
Mar. 2008	195,252 16,235*	18,413 251*	24,949	1,391
Apr. 2008	182,252 16,145*	18,567 481*	3,853	1,645
May 2008	169,648 11,954*	17,246 565*	15,188	5,673
Jun. 2008	156,122 11,804*	17,179 922*	12,784	4,653
Jul. 2008	210,820 9,996*	18,256 1,282*	6,007	2,200
Aug. 2008	272,991 9,966*	23,039 1,917*	14,599	4,753
Sep. 2008	265,604 3,506*	34,887 674*	1,512 6,420*	630 1,127*
Oct. 2008	181,666	3,894	112,226 5,365*	34,387 1,450*
Nov. 2008	170,037 30,528*	4,988 2*	3,500	1,424
Dec. 2008	265,882 22,528*	8,343 11*	1,138	465
Total Rainbow			271,810	74,236
Total Brown			11,785*	2,577*
Grand Total			283,595	76,813

* Denotes brown trout, all others are rainbow trout.

Appendix 2. Fish feed fed during the 2008 production year, American Falls Fish Hatchery.

Source	Size/Type	Pounds	Cost
Rangen Dry	0	60	\$45.51
Rangen Dry	1	300	\$223.12
Rangen Dry	2	900	\$688.10
Rangen Dry	3	2,100	\$1,090.55
Rangen Dry	3TM	450	\$361.55
Rangen Dry	1/16	1,450	\$849.78
Rangen Dry	3/32	2,550	\$1,338.75
Rangen Dry	3/32TM	300	\$210.00
Rangen Dry	1/8	60,600	\$29,182.20
Rangen Dry	1/8TM	1,450	\$1,096.55
Rangen Soft Moist	1/32	44	\$50.60
Rangen Soft Moist	3/64	88	\$97.68
Rangen Soft Moist	1/16	132	\$143.88
Totals		70,424	\$35,378.27

ASHTON FISH HATCHERY

Doug Engemann, Fish Hatchery Manager I
Paul Martin, Fish Culturist

INTRODUCTION

Ashton Fish Hatchery (AFH) is located in Fremont County, Idaho, approximately two miles southwest of the community of Ashton. Ashton Fish Hatchery is owned and operated by the Idaho Department of Fish and Game (IDFG), and is funded by IDFG license dollars and Rocky Mountain Power Company mitigation funds.

Ashton Fish Hatchery's water source is Black Springs, which is a constant 50° F temperature and has a maximum flow of 5.5 cfs. Ashton Hatchery currently serves as a "specialty station," rearing four species/strains of trout, char, and grayling, including rainbow trout *Oncorhynchus mykiss*, Arctic grayling *Thymallus arcticus*, brook trout *Salvelinus fontinalis*, and rainbow x cutthroat hybrid. Species raised at AFH in past production years include cutthroat trout *O. clarkii*, brown trout *Salmo trutta*, and golden trout *Oncorhynchus aquabonita*.

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 (8-12 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 416,668 (37,264 pounds) fish were produced at AFH this year, consisting of 245,095 fry and fingerlings (8,979 pounds), and 171,573 catchable sized fish (28,285 pounds), including holdovers. Production costs (excluding capital outlay) were \$189,198.44 with \$21,607.44 spent on fish feed and the remaining \$167,591.00 spent on general hatchery operations and personnel costs. Fish transportation cost for 2008 was \$6,903.40. The average cost per pound of fish produced was \$5.08. A summary of production costs per species and life stage is provided in Appendix 1.

All fry in indoor nursery vats were fed by hand on an hourly basis. Fingerlings reared in indoor nursery vats were fed by hand at an average frequency of 4-5 feedings per day. Catchables and holdovers reared in outdoor raceways were fed by hand at an average frequency of 2 times per day. Shade covers were provided when the fish were transferred from vats to outdoor raceways. During 2008, feed conversion for catchables was 0.943 and conversion for holdovers was 0.90. A breakdown of feed cost by size and origin is provided in Appendix 4.

The average survival for all fish stocked from egg to distribution was 58.6 percent. Arctic grayling survival was poor at 2.34 percent. Consequently, if Arctic grayling survival is excluded from the calculations, the average survival for all fish stocked from egg to distribution was 71.7

percent. Appendix 2 provides a summary of comparative growth rates, feed conversion, and survival percentages for AFH in 2008.

All of the fish reared at AFH during 2008 were received as eyed eggs with the exception of Arctic grayling, which were received as green eggs. The origin of all incoming eggs and fish stocked during 2008 can be found in Appendix 3.

Rainbow Trout

Ashton Fish Hatchery produced and stocked 73,786 catchable rainbow trout averaging 9.2 inches in length (22,794 pounds) for distribution into area lakes and streams. All rainbow trout production at AFH consists of sterile Hayspur strain T-9 triploid fish.

A total of 9,511 fingerlings, averaging 3.2 inches in length (125.2 pounds) were stocked into Upper Snake Region waters. An additional 97,787 (12,347 pounds) of 6.83 inch T-9 holdovers were produced for stocking in 2009.

On December 17, 2007 AFH received 150,857 Hayspur strain (T-9) triploid rainbow trout eggs for 2009 fish stocking.

Rainbow x Cutthroat Hybrid

On April 2, 2008, AFH received 52,419 eyed hybrid eggs from Henrys Lake Hatchery. AFH produced 34,844 hybrid fingerlings at an average length of 2.8 inches (308 pounds) for stocking during 2008.

The 2008 rainbow-cutthroat (RC) hybrid fingerling request was reduced from 24,000 to 1,500 for the Upper Snake River Region. Mackay Hatchery is scheduled to cover this small RC fingerling request for 2009. A total of 1,500 RC fingerlings were stocked into Harriman Pond. This resulted in a surplus of 33,335 RC fingerlings remaining on hand, which were stocked into Salmon Falls Reservoir.

Arctic Grayling

Ashton Hatchery received 100,000 green Arctic grayling eggs from Meadow Lake, Wyoming on May 30, 2008. Poor survival resulted in 2,340 Arctic grayling fry averaging 1 inch in length, for a total weight of 1 pound. All fry were stocked into Horseshoe Lake. Hatchery personnel are investigating methods to improve survival of Arctic Grayling fry.

Brook Trout

On November 8, 2007, AFH received 250,000 eyed brook trout eggs from Kootenay Hatchery, in British Columbia, Canada. The 2008 brook trout fingerling request for Ashton Hatchery was 100,000 for Henrys Lake. A combination of extra eggs and good egg to fingerling survival resulted in surplus fingerling available for stocking. A total of 100,400 Brook Trout fingerling averaging 3.41 inches in length (1,606 pounds) were stocked into Henrys Lake in June 2008. An additional 98,000 fingerlings averaging 5.6 inches in length (7,000 pounds) were stocked into Henrys Lake in September 2008.

On November 4, 2008 AFH received 250,000 eyed brook trout eggs from Kootenay Hatchery in British Columbia, Canada. As was the case in the previous year, all brook trout fingerling are destined for Henrys Lake.

HATCHERY IMPROVEMENTS

The electric supply line to the raceway cleaning blower was replaced and relocated. New outdoor raceway head box covers were constructed and installed. The hatchery residence furnace ductwork was cleaned out, and the culturist residence propane furnace motor was replaced. The feed storage room and all metal hatchery building doors were repainted. The outdoor storage area was cleaned and organized, with all non-salvageable items taken to the county landfill.

FISH STOCKED AND TRANSFERRED

The 2008 stocking program varied slightly from the 2007 program. Due to warm summer surface temperature and visibly poor water quality, Rexburg City Pond was not stocked after June. This resulted in a reduction of 2,400 catchables from the original request.

Rainbow trout stocking requests for the Sand Creek WMA ponds shifted from fingerlings to catchables. AFH personnel were able to meet the request due to the reduction at Rexburg City Pond as detailed above.

With the exception of Arctic grayling, the numbers of fish produced were adequate to meet the 2008 stocking requests. Surplus brook trout fingerlings were stocked into Henrys Lake. No production fish transfers occurred during 2008.

ASHTON FISH SPAWN TAKING

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

FISH FEED

A total of 33,921.7 pounds of fish feed were fed (Appendix 4) to produce 37,264 lbs of fish weight gain (Appendix 1), for an average conversion of .910.

PUBLIC RELATIONS

Approximately 1,000 people visited AFH this past year, with 100 elementary and secondary level students receiving formal tours of the facility. Paul Martin and Doug Engemann gave a cutthroat trout presentation at Ashton Elementary School. Paul Martin and regional volunteers staffed free fishing day on June 7, 2008. Children were allowed to fish the hatchery settling basin on that day, and hatchery staff and volunteers taught the children the basics of trout angling as well as proper cleaning and care of the catch. Over 150 children participated in the event. Hatchery staff drove the AFH tanker in the annual Ashton July 4 parade. Doug Engemann attended the Henrys Lake Foundation picnic.

SPECIAL PROJECTS

Brook Trout Triploid Induction Study

Hatchery personnel traveled to Wyoming's Story Fish Hatchery to pressure shock brook trout eggs, using three different recipes. The eggs were transferred to the Eagle Hatchery at eye-up, and the resulting progeny will be sampled for induction rates. It is hoped that once a suitable recipe is obtained, Wyoming brook trout eggs will be a local source of sterile brook trout for Henrys Lake requests or future production efforts.

Brook Trout Estradiol Feminization Study

Through a combination of estrogen treatments and genetic screening, it is believed that a population of daughterless females (producing only YY progeny) can be produced. This could be a valuable tool for future use in controlling populations of non-native species. AFH is assisting with baseline data collection efforts with an Estradiol feminization study commencing December 2008.

AFH personnel received eyed eggs from four separate 1:1 Brook Trout pairings conducted at Story Hatchery. The resulting progeny from each of the four families were split into two groups resulting in eight lots of fish that will be kept separate for a minimum of two years. Eight totes were modified to contain the fish during the first segment of the study. Half the fish from each family will be fed feed containing Estradiol (Estrogen) for the first 60 days of feeding. Efficacy of feminization will be investigated upon sexual maturity, as well as comparative survival, growth, and age at maturation between treated and non-treated groups.

ACKNOWLEDGEMENTS

The Ashton Fish Hatchery staff sincerely thanks Tom Frew, Damon Keen, Jeff Heindel, Joe and Jerry Chapman, Brad Dredge, Phil Coonts, Doug Burton, Doug Munson, Mick Hoover, and Pat Moore for their help, advice, and support this year.

APPENDICES

Appendix 1. Fish production and cost, Ashton Fish Hatchery, 2008

Species	Size	Number Fish	Pounds Planted or transf.	Weight Gained In 2008	Cost/lb	Cost/fish	Total Cost
Fry and Fingerlings Produced and Stocked							
Hayspur triploid Rainbow	3.2	9,511	125	123	\$8.61	\$.110	\$1,059.33
Rainbow x Cutthroat hybrid	2.8	34,844	308	299	\$29.10	\$.249	\$8,703.13
Brook Trout Triploids	3.4	100,400	1,606	1,581	\$16.76	\$.264	\$26,487.78
Brook Trout Triploids	5.6	98,000	7,000	6,975	\$5.69	\$.405	\$39,731.67
Grayling	1.0	2,340	1.0	.87	\$529.76	\$6.23	\$529.76
Totals/Ave		245,095	9,040	8,979	\$8.52	.312	\$76,511.67
Catchables Produced and Stocked							
Hayspur triploid Rainbow	9.2	73,786	22,794	15,962	\$4.39	\$.950	\$71,525.64
Totals/Ave	9.2	73,786	22,794	15,962	\$4.48	\$.969	\$71,525.64
Catchables Produced For 2009 Stocking-Holdovers							
Hayspur triploid Rainbow	6.83	97,787 (On Hand)	12,347 (On Hand)	12,323	\$3.34	\$.421	\$41,161.13
Totals/Ave	6.83	97,787	12,347	12,323	\$3.34	\$.421	\$41,161.13
GRAND TOTAL		416,668	31,834	37,264	\$5.08	454	\$189,198.44

Appendix 2. Comparative growth rates, feed conversion, and percent survival for all species reared at Ashton Fish Hatchery, 2008.

Species	Average Monthly Length Increase	Average Conversion	Percent Survival
Brook Trout Triploid	.512	.86	79.4*
Rainbow catchables Hayspur	.474	.943	93.2+
Rainbow fingerlings Hayspur	.509	.67	82.2*
Rainbow Holdovers Hayspur	.510	.90	71.1+
Rainbow x Cutthroat	.561	0.85	66.5*
Grayling	.25	1.18	2.34*

*From egg to stocking
+2008 survival percentage

Appendix 3. Origin of eggs and fish stocked, Ashton Fish Hatchery, 2008

Species	Source	Eggs	Destination	Stocked	Size (inches)
		250,000	Henrys Lake	100,400	3.4
				98,000	5.6
Brook Trout Triploid	Kootenay, BC	250,000	Henrys Lake	Fry on hand	1.0
Brook Trout Triploid	Kootenay, BC				
Hayspur triploid Rainbow	Hayspur Hatchery	^a 125,733	Upper Snake Region	73,786	9.2
				9,511	3.2
Hayspur triploid Rainbow	Hayspur Hatchery	^b 150,857	Upper Snake Region	++97,787	7.0
Rainbow x Cutthroat	Henrys Lake	52,419	Upper Snake Region	34,844	2.8
Arctic Grayling	Meadow Lake, WY	100,000	Statewide	2,340	1.0
Total stocked or transferred				318,881	

^a Received in 2007-for stocking fingerling '07 and catchable '08

^b Received in 2008-stocking fingerling '08 and catchable '09

++ Holdovers remaining on station for stocking in 2009

Appendix 4. Feed use, Ashton Fish Hatchery, 2008

Size	Source	Pounds	Cost/lb	Total Cost
Swim up	Rangens	152	0.6984	\$106.16
#1 Starter	Rangens	400	0.6984	\$279.35
#2 Starter	Rangens	2,650	0.7317	\$1,939.05
#3 Starter	Rangens	1,500	.5280	\$792.00
3/32 Pellet	Rangens	739	0.4340	\$320.73
1/8 Pellet	Rangens	32,480	0.4639	\$15,070.05
1/8 pellet Aquaflor	Rangens	500	\$1.1241	\$562.05
1/8 Pellet 2x Vitamin	Rangens	500	.499	\$249.50
Cyclop-Eeze	Argent	1.027	\$104.17	\$107.02
Shipping				\$2,181.53
Total		33,921.70		\$21,607.44

CABINET GORGE FISH HATCHERY

John Rankin, Fish Hatchery Manager II
Bruce Thompson, Assistant Fish Hatchery Manager

INTRODUCTION

Cabinet Gorge Fish Hatchery (CGFH) is located on the south bank of the Clark Fork River in Bonner County, Idaho approximately eight miles southeast of the community of Clark Fork. The hatchery was constructed in 1985 and was co-funded by Avista (formerly Washington Water Power), Bonneville Power Administration (BPA), and Idaho Department of Fish and Game (IDFG). 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 three residences for the permanent staff and crew quarters for one temporary employee.

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 49 degrees Fahrenheit (range 44.5 degrees F to 51.5 degrees F). Production water ranged from 38.0 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).

In 2008, an additional four concrete raceways and 10 half stacks of vertical-flow incubators (in a separate enclosure) were added to the hatchery rearing facilities to operate a westslope cutthroat broodstock program. The broodstock holding area consists of four concrete brood ponds, two (5 ft. by 18 ft.) and two (7 ft. by 18 ft.). These four ponds have actual rearing space of 1,600 cubic feet.

PRODUCTION

Cabinet Gorge Hatchery produced a total of 7,359,498 fish in 2008 weighing 30,774 pounds (Appendix 2). On January 1, 2009, an estimated total of 647,610 Lake Pend Oreille kokanee eggs were on hand (Appendix 1). In addition 5,000 rainbow catchables, 19,500 westslope cutthroat broodstock, 143,200 westslope cutthroat fingerling, and 1,800,000 early-spawning kokanee fry were also on hand at the end of the year.

A total of 28,671 pounds of feed produced 27,479 pounds of weight gain for an overall (all species reared) feed conversion of 1.04. Total production cost (including Nampa's transportation costs) was \$294,159, resulting in a cost per pound of fish of \$10.70, cost per inch of fish of \$0.0185, and \$39.97 per thousand fish (Appendix 2).

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, and sorted with the Jensorter JHC-114 model sorter. The counter mechanism was not operational. Fry were allowed to volitionally swim out of the incubators into the raceways at 1,450 temperature units. All kokanee fry destined for Lake Pend Oreille 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 225,000 swim-up fry per raceway. With the new rearing protocols and lower rearing densities, kokanee growth rates were equivalent to 29 monthly temperature units per inch of growth (MTU's), (2007, 29 MTU's). Fish health was excellent throughout rearing and no Bacterial Gill Disease was encountered in 2008.

Kokanee were feed trained at approximately 49 to 52 degrees F using Bio-Oregon BioVita #0 and Rangen Trout and Salmon starter diets for 28 days. At that time, 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 in 2002 with very favorable results.

A total of 445,359 late kokanee fry were produced at an average length of 2.12 inches and an average weight of 351 fish per pound. These fish gained 1,191 pounds from 1,255 pounds of feed, resulting in a conversion rate of 1.05: 1.0. Fish production cost was \$10.48 per pound, \$0.0132 per inch, and \$28.03 per thousand (Appendix 2).

Survival of Lake Pend Oreille kokanee green eggs to feeding fry was estimated at 84.0% (2007, 77.6%). Survival from first feeding to release was estimated at 98.7% (2007, 98.3%), resulting in survival from green egg to release of 82.9% (2007, 76.2%).

By January 24, 2008, the Cabinet Gorge Hatchery had received 2,393,900 eyed (October spawning) kokanee eggs from the state of Colorado. Of these, 1,748,400 were Williams Fork Reservoir stock, 462,800 were Lake Granby stock, and 182,700 were Blue Mesa Reservoir stock. A total of 2,171,377 kokanee fry were produced at an average length of 2.24 inches and an average weight of 297 fish per pound. These fish gained 6,922 pounds from 7,170 pounds of feed, resulting in a conversion rate of 1.04: 1.0. Fish production cost was \$10.30 per pound, \$0.0147 per inch, and \$32.84 per thousand (Appendix 2).

Survival of Colorado kokanee eyed eggs to feeding fry was estimated at 92.6%. Survival from first feeding to release was estimated at 98.0%, resulting in survival from eyed egg to release of 90.6%.

On February 14 and 28, 2008, the Cabinet Gorge hatchery received 2,538,200 eyed late spawning kokanee eggs from Lake Whatcom hatchery in the state of Washington. A total of 2,465,369 late kokanee fry were produced at an average length of 1.8 inches and an average weight of 569 fish per pound. These fish gained 3,904 pounds from 3,851 pounds of feed, resulting in a conversion rate of 0.99: 1.0. Fish production cost was \$9.81 per pound, \$0.0086 per inch, and \$15.53 per thousand (Appendix 2). Of these, 25,000 (4.3 pounds) were released as unfed fry into Lake Pend Oreille at Bayview after on site gravel rehabilitation.

Survival of Lake Whatcom kokanee eyed eggs to feeding fry was estimated at 97.8%. Survival from first feeding to release was estimated at 99.3%, resulting in survival from eyed egg to release of 97.1%.

A total of 1,796,704 early kokanee fry were produced at an average length of 2.24 inches and an average weight of 297 fish per pound. These fish gained 5,714 pounds from 6,938 pounds of feed, resulting in a conversion rate of 1.21: 1.0. Fish production cost was \$12.08 per pound, \$0.0171 per inch and \$38.41 per thousand (Appendix 2).

Survival of early kokanee green eggs to feeding fry was estimated at 81.6% (2007, 76.8%). Survival from first feeding to release was estimated at 94.3% (2007, 97.9%), resulting in survival from green egg to release of 77.0% (2007, 74.3%).

In September 2008, Cabinet Gorge Hatchery received 2,619,945 green fertilized eggs from the kokanee trap on Deadwood Reservoir. On December 31st, 2008 the hatchery had 1,800,000 early spawning kokanee sac-fry on hand.

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 destined for Lake Pend Oreille received a thermally induced otolith pattern at the eye-up to 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. 2008) 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 2007 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 42 fish sampled from the 2007 kokanee spawning run, 38.1% were hatchery four year olds (2002 brood year), 35.7% were hatchery three year olds (2003 brood year), and 26.2% were four year olds of wild origin. To date, no results have been received from the 2008 spawning adults.

Fish Liberation

On March 27, 2008, 25,000 unfed Lake Whatcom late kokanee fry were released at Bayview next to the U.S. Naval yard. On June 17-19, 2008, 841,311 early kokanee fry, 1,646,376 Colorado (October spawning) kokanee fry, and 2,855,728 late kokanee fry were released into Sullivan Springs. On June 19, 2008, 525,001 Colorado kokanee fry and 30,000 late kokanee fry were released into Spring Creek.

Colorado kokanee fry releases at Sullivan Springs were comprised of 1,220,124 Williams Fork Res. stock and 426,252 Lake Granby stock. The Spring Creek release was comprised of 379,810 Williams Fork Res. stock and 145,191 Blue Mesa Res. stock.

During the months of May and June 2008, a total of 955,158 early spawning (Deadwood stock) kokanee were released into seven lowland lakes in Regions 1, 2 and 3. The fish released in May averaged 443 fish per pound and had attained a length of 1.96 inches at release. Spirit Lake received the last stocking of early kokanee on June 9 and 10, 2008. The fish averaged 268 fish per pound, and had attained a length of 2.32 inches at release.

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

All kokanee fry release groups destined for Sullivan Springs were transported in two IDFG tankers (3,000-gallon capacity) and the two 2-ton stocking trucks from Cabinet Gorge and Sandpoint Hatcheries. Loading densities of small fish in all of the tankers was kept below 0.60 pounds per gallon. Most of the fish were planted below the bridge on the access road to the IDFG patrol cabin. Two tankers made three releases each on June 17 and 18, 2008. Four additional releases each were made with the two 2-ton stocking trucks. All of the other kokanee fry releases were accomplished utilizing the one and 2-ton stocking trucks from Sandpoint, Mullan, and Cabinet Gorge Hatcheries.

Rainbow

General Rearing

On January 24, 2008, the Cabinet Gorge Hatchery received 343,800 eyed triploid rainbow eggs from Trout Lodge, Inc. All incoming eyed eggs were disinfected in 100 ppm iodine for 10 minutes. After enumeration, the eyed eggs were placed into upwelling incubators. Fry were allowed to volitionally swim out into the raceways at 700 to 800 temperature units. Feed training began at 1,000 temperature units. Initial early rearing loading rates average 80,000 swim-up fry per raceway. Growth rates were equivalent to 21 monthly temperature units per inch of growth (MTU's). At initial feeding, it was apparent that rainbow trout fed poorly on Bio-Oregon starter feeds. They were switched to Rangen trout and salmon starter and fed Rangen feed throughout their rearing.

The triploid rainbow fingerling gained 5,000 pounds from 4,830 pounds of feed, resulting in a conversion rate of 0.97: 1.0. Fish production cost was \$7.90 per pound, \$1.54 per inch, and \$137.75 per thousand (Appendix 2.)

Survival of eyed eggs to feeding fry was estimated at 92.3%. Survival from first feeding to release was estimated at 91.8%, resulting in survival from eyed egg to release of 84.7%.

Five thousand rainbow were held back for experimental rearing to catchable-size. They are scheduled to be released in the spring of 2009. On December 31, 2008, 4,911 triploid rainbow were on hand weighing 1,054 pounds. These fish gained 954 pounds from 1,172 pounds of feed, resulting in a conversion rate of 1.23: 1.0. Fish production cost was \$10.03 per pound, \$9.52 per inch, and \$1,949.16 per thousand (Appendix 2).

Fish Liberation

During the month of June 2008, 286,468 rainbow fingerlings were released into three lowland lakes in Regions 1 and 2. These fish averaged 56 fish per pound and had attained an average length of 3.56 inches at release.

Westslope Cutthroat

General Rearing

On May 28, 2008, the Cabinet Gorge Hatchery received approximately 12,000 green fertilized westslope cutthroat eggs for future broodstock from King's Lake in Washington. The eggs were disinfected in 100 ppm iodine for 10 minutes and then placed into isolation incubators for twenty-eight days pending genetic and disease sampling results. Four individual pairings were culled. Three parent fish were identified with rainbow trout alleles and two were diagnosed with high BKD levels. Fry were ponded at 500 to 600 temperature units. Initial early rearing took place in a 10 foot fiberglass trough. Feed training began at 800 to 900 temperature units. Growth rates were equivalent to 33 monthly temperature units per inch of growth (MTU's). These fish were feed trained using Bio-Oregon starter feeds.

In late September, BY2008 westslope cutthroat broodstock were inspected for pathogens and diagnosed with *Pseudomonas* and *Sphigmonas* bacteria in the gut. Hatchery personnel suspected problems with feed size and/or diet. Feed size was reduced and feed charts were adjusted. Overall fish health improved.

These fish gained 111 pounds from 102 pounds of feed, resulting in a conversion rate of 0.92: 1.0. Fish production cost was \$14.40 per pound, \$0.59 per inch, and \$204.80 per thousand (Appendix 2.) On December 31, 2008, the hatchery had on hand 7,765 BY2008 westslope cutthroat (King's Lake strain) weighing 113 pounds (Appendix 2).

On September 12, 2008, the BY2007 westslope cutthroat (King's Lake strain) were inventoried and transferred to the newly completed brood ponds. A back-calculation revealed that 12,191 fish weighing 198 pounds were on hand on January 1, 2008. Later in the month, BY2007 westslope cutthroat broodstock were diagnosed with a low incidence of *Flavobacterium psychrophilum*. Hatchery personnel suspected problems with feed size and diet. Feed size was reduced, feed charts were adjusted, and feed was switched to a Bio-Oregon semi-moist diet. Overall fish health improved.

These fish gained 2,523 pounds from 2,273 pounds of feed, resulting in a conversion rate of 0.90: 1.0. Fish production cost was \$14.08 per pound, \$0.3459 per inch, and \$3,016.07 per thousand. On December 31, 2008, the hatchery had on hand 11,782 BY2007 westslope cutthroat (King's Lake strain) weighing 2,721 pounds (Appendix 2).

On August 4, 2008, 185,500 eyed westslope cutthroat eggs were received from Westslope Trout Company in Ronan, Montana. All incoming eyed eggs were disinfected in 100 ppm iodine for 10 minutes. After enumeration, the eyed eggs were placed into vertical flow (Heath) incubators. These eggs were extremely small in size (25 eggs per ml.). Frequent picking of dead eggs was required throughout their incubation. Eggs/alevin remained in these incubators until they reached the button-up stage of development. Fry were moved into the raceways, and feed training began at 1,000 temperature units. Size at initial feeding was about 8,000 fish per pound and 0.71 inches in length. Initial early rearing loading rates average 45,000 swim-up fry per raceway. Growth rates were equivalent to 33 monthly temperature units per inch of growth (MTU's). These fish were feed trained using Bio-Oregon starter feeds.

The Montana westslope cutthroat gained 1,126 pounds from 1,046 pounds of feed, resulting in a conversion rate of 0.93: 1.0. Fish production cost was \$14.52 per pound, \$0.0403 per inch, and \$114.11 per thousand. On December 31, 2008, the hatchery had on hand a total of 143,241 Montana westslope cutthroat fry weighing 1,145 pounds and averaging 2.83 inches in length (Appendix 2).

Fish Liberation

No westslope cutthroat were stocked in 2008 due to lack of egg availability in 2007.

Fall Chinook

General Rearing

On October 30, 2008, 30,000 eyed fall Chinook eggs were received from Big Creek Hatchery in Astoria, Oregon. All incoming eyed eggs were disinfected in 100 ppm iodine for 10 minutes. After enumeration, the eyed eggs were placed into five 6 inch diameter upwelling incubators. Fry were allowed to volitionally swim out into the raceways at 800 to 900 temperature units. Feed training began at 1,600 temperature units. Initial early rearing took place in one hatchery raceway. Growth rates were equivalent to 25 monthly temperature units per inch of growth (MTU's). These fish were feed trained using Bio-Oregon starter feeds

The fall chinook gained 38 pounds from 36 pounds of feed, resulting in a conversion rate of 0.94: 1.0. Fish production cost was \$7.90 per pound, \$1.54 per inch, and \$137.75 per thousand (Appendix 2.) On December 31, 2008, 26,552 fall chinook salmon fry were on station.

Survival of eyed eggs to feeding fry was estimated at 98.3%. Survival from first feeding to transfer was estimated at 89.9%, resulting in survival from eyed egg to transfer of 88.4%.

Fish Liberation

A total of 26,522 fish were shipped to Nampa Hatchery on January 14, 2009. They averaged 420.99 fish per pound and had attained a length of 1.99 inches at transfer.

HATCHERY IMPROVEMENTS

Repairs and Improvements

- The contractor finished the new residence (#3) and the Fish Culturist moved in on January 22.
- The hatchery septic system was pumped out.
- The piping for the new broodstock ponds was completed by the Fish and Game Engineering crew.
- The westslope cutthroat broodstock building, ponds and incubation room were completed.
- The driveway, sidewalk and final grade work for residence #3 was completed by the Fish and Game Engineering crew.
- The landscaping and deck for residence #3 was completed by the hatchery crew.
- New linoleum was installed in the kitchens of residences #1 and #2.
- The sink hole in front of pumps 7 and 8 was filled in and the broken electrical conduit was replaced.
- The trees removed from the site of residence #3 were shipped to the mill.
- The phone line was dug in for residence #3.
- The propane tank for residence #3 was installed.
- A wood stove was installed in residence #3.
- A large hole in the hatchery settling pond was repaired.
- Half of the screens for the new brood stock ponds were built.
- The hatchery dorm was painted.

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 collect approximately 6 cfs of available water but the means to pump it is unavailable. Additional water at this location is also available for collection.

All 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 upper and lower weir at the Granite Cr. trap are made of wood and need replaced. Metal framework and concrete anchors are needed.

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. They are both 30 plus years old.

The main back-up generator and transfer switch as well as the alarm system for the hatchery is over 20 yrs old and needs replaced.

FISH SPAWNING

Fish Trapping

The Clark Fork River fish trap was in operation from July 22, 2008 to December 5, 2008. Seventy-eight adult kokanee entered the trap the entire season. All of these fish were transported to the raceway spawning channel at Clark Fork Hatchery. On December 5, 2008, the ladder was shut down. No eggs were taken.

From July 24, 2007 to October 19, 2007 the trap was used by Avista Corp. personnel to collect and sample bull trout. A total of 10 adult bull trout were trapped in the hatchery ladder, tagged, and held for genetic results. Avista also installed and operated a thrust block waterfall trap, electro-shocked, and hook and lined bull trout from the Clark Fork River. A total of 29 adults (3 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 21, 2008 to December 17, 2008. The Sullivan Springs trap collected 5,149 (5,914 in 2007) adult kokanee salmon. Of these, 512 (1,134 in 2007) adults were passed above the trap to spawn naturally in Sullivan Springs Creek. Spawn taking records showed that 56.5% (29.4% in 2007) of the run was female (2,615).

Spawn taking

An estimated total of 647,610 green fertilized kokanee eggs were collected during the 2008 spawning season. Of the 2,615 total females trapped, 2,112 female kokanee were spawned at the Sullivan Springs trap. The number of adults returning in 2008 was even lower than the previous year's kokanee trapping operation, which at that time was the lowest return on record. (Appendix 1).

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 150 people signed our guest registration book this year. An estimated 350 visitors toured the hatchery during the 2008 season. In addition, 7 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 five local schools received eyed eggs (kokanee and rainbow) 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 40 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 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 Jamie Mitchell- Fish Culturist, CGFH Maintenance Craftsman- Todd Braunschweig, Mullan Hatchery Fisheries Technician- Mary Van Broeke and CGFH Biological Aides; Tyson Pieper, Rauno Raiha (Bonner County Sheriff's boat operator), and Brett Hubbard for their dedication and hard work in making 2008 a successful year.

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APPENDICES

Appendix 1. Lake Pend Oreille kokanee trapping/spawn taking summary, 2008.

Spawn taking Site	Total Fish	Females Spawned	Females Unspawned	Green Eggs	Fecundity	Percent Females *
-	-	-	-	-	-	-
Sullivan Sps.	5,149	2,112	503	647,610	307	56.5%
Cabinet Gorge	78	0	n/a	n/a	**	n/a
-	-	-	-	-	-	-
Totals/Ave:	5,227	2,112	503	647,610	307	56.5%

* Includes male/female prespawn mortality.

** Note: All 78 adults were transported to Clark Fork Hatchery and put into LR #4, which was rehabilitated into a spawning channel by LPOIC members in the summer of 2008. Ladder was closed on 12/05/2008.

Appendix 2. Production Summary, all species, 2008.

Species	Number	Pounds	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	445,359	1,269	2.12	351	1,255	\$1,221.88	\$12,485.17	\$10.48	\$28.03	\$0.0132	1.05
Colorado KO	2,171,377	7,304	2.24	297	7,170	\$6,978.34	\$71,305.00	\$10.30	\$32.84	\$0.0147	1.04
Whatcom KL	2,465,369	4,332	1.80	569	3,851	\$3,747.70	\$38,294.21	\$9.81	\$15.53	\$0.0086	0.99
Dwd. KE	1,796,704	6,042	2.24	297	6,938	\$6,753.02	\$69,002.67	\$12.08	\$38.41	\$0.0171	1.21
Oregon FC	26,522	63	1.99	421	36	\$55.46	\$566.72	\$14.76	\$21.37	\$234.26	0.94
08 Trout Lodge RB	286,468	5,124	3.56	56	4,830	\$3,861.98	\$39,461.89	\$7.90	\$137.75	\$1.54	0.97
08 Trout Lodge RB ^a	4,911	1,054	8.13	5	1,172	\$936.81	\$9,572.34	\$10.03	\$1,949.16	\$9.52	1.23
08-WS Cutt. (Mont.) ^a	143,241	1,145	2.83	125	1,046	\$1,599.66	\$16,345.34	\$14.52	\$114.11	\$0.0403	0.93
08-WS Cutt.BS (K.L.) ^a	7,765	113	3.47	69	102	\$155.63	\$1,590.26	\$14.40	\$204.80	\$0.0590	0.92
07-WS Cutt.BS (K.L.) ^a	11,782	2,721	8.72	4	2,273	\$3,477.71	\$35,535.39	\$14.08	\$3,016.07	\$0.3459	0.90
Totals/Ave:	7,359,498	29,167	2.16	252	1	\$28,788.20	\$294,159.00	\$10.70	\$39.97	\$0.0185	1.04

^a Currently on station.

^b Includes freight, shipping, and handling.

^c Includes transportation costs for truck transportation from Nampa Hatchery.

CLEARWATER FISH HATCHERY

Jordan Rider, Fish Culturist

INTRODUCTION

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

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

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

FISH PRODUCTION RELEASE YEAR 2008

Catchable Rainbow Trout

CFH did not produce catchables in 2008 because spring chinook and steelhead occupied all available rearing space. CFH was strictly a redistribution center for Nampa State Fish Hatchery (NSFH) reared rainbow trout catchables in 2008.

FISH STOCKED AND TRANSFERRED

Catchable Rainbow Trout

CFH redistributed 89,260 Troutlodge triploid (reared at Nampa State Fish Hatchery), 2,800 Shasta (reared at Dworshak and Kooskia National Fish Hatchery) and 18,038 Spokane (reared at Lyon's Ferry Hatchery) strain rainbow trout during 2008 (Appendix 1). They averaged 3.7 fish per pound and weighed 34,122 lbs. A total of 78 fish plants were administered to 28 different plant sites. Included in this total were 2,800 Shasta strain rainbow trout that were reared at Dworshak and Kooskia National Fish Hatcheries for their annual open house. These fish were stocked by CFH personnel into Campbell's pond and Karolyn's Pond. Also included in this total were 18,038 Spokane strain rainbow trout reared at Lyon's Ferry Hatchery. These fish were stocked by CFH personnel into Soldier Meadows Reservoir.

FISH FEED

Catchable Rainbow Trout

CFH redistributed catchable rainbow trout into Region 2 waters during 2008. Because these fish were stocked in local waters as fast as they arrived, little supplemental feed was needed to maintain overall health and size of the fish.

A total of 3,000 lbs of Bio-Oregon feed was fed to the rainbows through the summer of 2008 as a maintenance diet (Appendix 2). This food was surplus feed from the CFH Chinook and steelhead programs.

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 other countries.

Two summer youth employees assisted Dworshak Hatchery during their annual open house on June 9, 2008.

On June 17, Jerod Morris planted 500 catchable rainbow trout (3.1 fpp) into Camp Grizzly Pond.

On July 9, Chad Henson planted 250 catchable rainbows (3.2 fpp) and 5 trophies into Jaype Mill Pond for sixth graders on a 4H forestry tour.

On July 31, Jerod Morris hauled 250 catchable rainbow trout (2.9 fpp) to Orofino Creek near Pierce, Idaho for their annual 1860 Days Celebration.

SPECIAL PROJECTS

A total of 96 (trophies) adult size fish, ranging in weight from 3 lbs. to 8 lbs., were recovered from Clearwater Fish Hatcheries total flow pond. The planting crew supplemented 17 fish stocking trips to nine 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 and 200-foot sections of C Bank at NSFH where no New Zealand mud snails (NZMS) were found. Some fish from the Clearwater Fish Hatcheries 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 also Dick Bittick and Gary Ady for transporting the rainbows to Clearwater Fish Hatchery for distribution. Bio Aides that aided in rainbow distribution included Jerod Morris, Steve Duty, Danielle Rogers, Heath Hopkins, Holly Stanton Smith, Jenny Hole, Kevin Miller, Chip Roth, Steve Lee, Jeff Jenni and Rebekah Waltmann. Sarah Nemeth and Jesse Faler our two summer youth participants also participated in the raising and distribution of the catchable rainbows.

APPENDICES

Appendix 1. Clearwater Hatchery resident fish redistribution, Jan 1 - Dec 31, 2008.

2008 Catchable Rainbow Trout

	Number of Fish	Weight (lbs.)
2008 catchable RBT on hand 1/1/08	0	0
2008 catchable RBT on hand 12/31/08	0	0

Date	Number released	Pounds	Fish per Pound	Type of Fish
4/1-4/30	9,900	3936	3.5	Troutlodge TT
5/1-5/31	71,738	18,233	5.6	Troutlodge TT/ Spokane*
6/1-6/30	23,025	9,227	2.9	Troutlodge TT/ Shasta**
7/1-7/31	14,375	4,650	3.0	Troutlodge TT
8/1-8/31	1,000	372	2.7	Troutlodge TT
9/1-9/30	2,900	1,608	1.8	Troutlodge TT
10/1-10/31	6,710	3,726	1.8	Troutlodge TT
Totals	110,098	64,518	Average fpp 3.7	

* Includes 18,038 Spokane strain rainbow trout at 58 fish per pound raised at Lyon's Ferry Hatchery.

** Includes 2,800 Shasta strain rainbow trout at 1 fish per pound raised at Dworshak and Kooskia National Fish Hatcheries.

Appendix 2. Fish feed costs and amount fed for the CFH rainbow programs, Jan 1 - Dec 31, 2008.

Date	Brand	Feed Type	Weight (Lbs)	Cost Per Lb	Total
4/1-10/31	Bio-Oregon	Bio-Grower 2.5	3000*	\$1.01	\$3,030.00

Total Summary of Catchable Rainbow Trout Redistributed.

# Of Fish	Weight (Lbs)	Feed Fed	Conversion	Cost Per Lb For Redistribution	Cost/1000 Fish For Redistribution
92,060	29,696	3000 lbs	NA	\$.86**	\$277.98***

Estimated costs include 50% of the FY08 & FY09 budgets and do not include permanent salaries or feed cost @ NSFH. Redistribution expenditure by CFH \$15,976.00.

*This feed was made available as surplus from BY06 Chinook and was fed out prior to the end of it's shelf life at no cost to the rainbow project.

** Cost/lb equals total budget divided by total lbs produced, 1/1/08-12/31/08.

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

1/1/08 to 12/31/08 Cost for Rearing @ NSFH and Redistribution @ CFH \$15,976.00
 Transport cost to deliver fish from NSFH to CFH \$9,615.00
 Total cost \$25,591.00

GRACE FISH HATCHERY

Grey Pino, Bio-Aide
Beau Gunter, Fish Culturist
Bryan Grant, Assistant Manager
Phil Coonts, Hatchery Manager

INTRODUCTION

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

The primary mission of GFH is to produce catchable and fingerling rainbow trout *Oncorhynchus mykiss* for stocking waters in the Southeast Region. Catchable size trout (from 8 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* for Bear Lake.

One 8-month temporary employee, a Fish Culturist, an Assistant Fish Hatchery Manager and a Fish Hatchery Manager I staff GFH.

Water for GFH is supplied by gravity flow from West Whiskey Creek spring and by Middle Whiskey Creek spring. Both springs are located on private property. Flow for 2008 averaged 13.2 cfs, just shy of the last 13-year average of 13.5 cfs. The springs' flows peak during the fall months. The highest flow this year was 17.9 cfs during October. The lowest flows occur during the spring months. This year's lowest flow was 6.6 cfs during June. The springs' flows are at opposition to the hatchery's needs. Our greatest demand for water is during the spring when we have all of next year's catchables and spring fingerling on station. Our least demand for water occurs in the fall when we have a few catchables yet to be planted and no fingerling on station. Water temperatures fluctuate from 52°F to 54°F.

Fish rearing space consists of sixteen (3 ft x 1.5 ft x 13 ft) single pass indoor 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 a mixture of first and second use water from the vats, the small and medium raceways. All effluent water flows through a settling pond before being discharged into Whiskey Creek.

FISH PRODUCTION

GFH began the 2008 calendar year with no catchable fish due to the chlorine spill in December 2007. American Falls and Mackay Hatcheries transferred 80,000 fingerling, (11,774 lbs), to GFH to supplement the chlorine loss. After rearing these fish to catchable size, GFH planted 79,303 catchables (32,164 lbs). There were 170,664 fish (30,697 lbs) on hand at the end of the year. These fish will be next years' catchable trout.

GFH began the 2008 calendar year with 30,303 rainbow fingerling (460 lbs). The hatchery planted 1,534,200 rainbow fingerling (19,106 lbs.) during the year.

GFH planted 8,125 (650 lbs) fingerling lake trout into Bear Lake. There were ~40,000 fry on hand at the end of the year.

Production cost at GFH for 2008, including capital outlay, was \$224,609. Rainbow trout (fingerlings and catchables combined) accounted for 99.99% of the total pounds produced and 99.99% of total cost. The average cost (personnel, operating and capital outlay) to produce a fish at GFH in 2008 was \$3.19/lb or 12.2 cents/fish (\$122/1,000 fish). Triploid lake trout accounted for the remaining 0.01% of the pounds produced and 0.01% of total cost.

Rainbow Trout Catchables

During 2008, 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.

GFH started out this calendar year with no catchable trout because of the chlorine kill the previous December. American Falls Hatchery transferred 70,000 and Mackay Hatchery transferred 10,000 fingerling to help make up for the loss. Over the course of the year 79,303 (32,164 lbs) triploid catchable trout averaging 10 inches were planted. On December 31, 2008; 170,664 triploid rainbow (30,697 lbs) remained on station for the 2009 planting season.

2008 catchables and 2009 catchables converted 44,100 pounds of fish food at a rate of 0.86 pounds of feed for a pound of fish (Appendix 1). The rental and mileage costs for the 1 and 3 ton planting trucks cost about \$16,000.

Rainbow Trout Fingerling

During 2008, GFH raised triploid and diploid fingerling. A total of 1,534,200 rainbow fingerling, weighing 19,106 pounds at an average length of 3.0 inches were planted into Idaho waters.

The rainbow fingerling converted 16,565 pounds of food at a feed conversion of 0.87 (Appendix 1). Transporting these fish by tanker to Island Park and American Falls Reservoirs cost about \$4,000.

Lake Trout

GFH has a cooperative agreement with the Utah Department of Wildlife Resources (UDWR) to stock 50,000 triploid lake trout over a three-year period into Bear Lake. The eggs for these fish are spawned at Storey Hatchery, Wyoming Game and Fish Dept. In 2008 8,125 fish, weighing 650 lbs., were planted into Bear Lake. These fish were confirmed 98.3% triploidy by Paul Wheeler at the WSU School of Biology. Triploid lake trout converted 849 lbs of food at a feed conversion rate of 1.3 (Appendix 1). There are approximately 40,000 fry on hand at the end of the year.

FISH FEED

The fish produced during 2008 were fed a total of 61,514 lbs of feed from Rangen Inc. The net fish weight gained during 2008 was 70,398 pounds, which resulted in an overall conversion of 0.87 pounds of feed to produce one pound of fish (Appendix 1, 3).

REPAIRS AND IMPROVEMENTS COMPLETED BY HATCHERY PERSONNEL

- Cleaned and organized the egg room.
- Cut a trough in the egg room floor to direct Heath stack water to the main drainage trough.
- Fabricate a table to assist in enumerating and putting away eggs.
- Make and install grating to cover the egg room drain trough.
- Replaced the roof of the spring collection box.
- Fabricated a cover for the outflow box below the spring collection box.
- Cover made for the agricultural diversion box.
- Covers made for the head- and tail-races on the medium raceways.
- Replaced the hatch-house main water supply line butterfly valves.
- Hatch-house cleaning water supply line replaced.
- Hatch-house screen room walls repaired, cleaned and organized.
- Screen disinfection tank fabricated.
- A fold-down step for the 1-T stocking truck was fabricated.
- Cleaned and organized the garden shed.
- Trimmed live trees and removed dead trees in the park.
- Constructed and installed a new bridge across the settling pond creek.
- Cracks in the tops of the large raceway walls were sealed.
- The fence on the north and east sides of the property was removed.
- The chicken and rabbit houses were removed.
- The sewer gas odor in residence 4 was resolved.

REPAIRS AND IMPROVEMENTS COMPLETED BY CONTRACTORS

- Hatch-house wiring was brought up to code.
- Improved lighting was installed in the hatch-house.
- Residence 1 wiring was brought up to code.
- Interior of residence 4 was repainted.
- The settling pond was dredged.
- New fencing was installed on the north and east sides of the grounds.

NEEDED RENOVATIONS

- A new concrete settling pond with a sump basin.
- A new building housing an office, public bathroom, and covered parking for the vehicles.
- A French drain at residence 1 entry door.
- New kitchen linoleum in residence 2.
- Remodel the kitchens in residences 2 and 3.
- Siding installed on the hatch house and garden shed.
- The middle spring and spillage from the west spring need to be enclosed.
- Wiring in residences 1, 2, and 3 needs to be upgraded.
- Central septic system for residences 1, 2, 3, office and hatch house.
- Refurbish the hatch house vats by sandblasting and installing elastomeric coating.
- Install vent system in the hatch-house to eliminate the dripping ceiling.
- Isolated incubation for Bear Lake cutthroat rearing program.
- Secure raceways to hold Bear Lake cutthroat brood fish.

PUBLIC RELATIONS

GFH staff gave scheduled tours to local area schools totaling 150 students and teachers. GFH staff also gave tours to an additional 50 private people. It is estimated about 200 people took self-guided tours around the hatchery. Staff also participated in the Governor's Idaho Corps of Discovery program by providing information and serving as a passport stamp point of service. GFH staff conducted a Free Fishing Day clinic at the hatchery. An estimated 150 kids, 14 and under, fished the settling pond during the day.

ACKNOWLEDGEMENTS

During 2008, the Grace Fish Hatchery crew included Grey Pino, Biological Aide; Beau Gunter, Fish Culturist; Travis Brown, Assistant Manager; Bryan Grant, Assistant Manager; and Phil Coonts, Hatchery Manager I. Travis lateraled to Eagle Hatchery in early March and Bryan lateraled to Grace in late March. Beau lateraled to Grace in November after the Springfield FTE position was eliminated. Volunteers helped with catchable trout freeze-branding, free fishing day, and the destruction of the chicken and rabbit house complex.

Appendix 1. Number and pounds of fish produced and stocked by Grace Fish Hatchery, 2008.

Species/strain	Number (pounds) on hand 01/01/08	Number planted 2008 (pounds)	Fish Transferred To GFH 2008	Number (pounds) on hand 12/31/08	Total Production 2008	Conversion
Rainbow catchables	0 0	79,303 (32,164)	80,000 (11,774)	170,664 (30,697)	249,967 (51,087)	0.86
Rainbow fingerlings	33,303 (460)	1,534,200 (19,106)	0 0	0 0	1,534,200 (18,646)	0.87
Lake Trout	10,000 (5)	8,125 (650)	0 0	40,000 (20)	48,125 (665)	1.3
Total	43,303 (465)	1,621,628 (51,920)	80,000 (11,774)	210,664 (30,717)	1,832,292 (70,398)	0.86

Appendix 2. Eggs Received During 2008.

Species/strain	Source	Number Received	Date Received	Cost
Troutlodge Triploid	Troutlodge, WA	194,000	5/7/08	\$ 5,500
Troutlodge Diploid	Troutlodge, WA	912,000	3/19/08	\$ 15,269
Hayspur Triploid	Hayspur SH, IDFG	761,959	1/3-1/29/08	\$ 0
Lake Trout	Story SH, WGFD	52,883	11/24/08	\$ 0
Total		1,920,842		\$ 20,769

Appendix 3. Fish Food Used and Cost, 2008.

Source	Diet	Size	Cost/lb. (cents)	Pounds	Total Cost
Rangens	Dry	# 0	69 to 75.7	1,000	\$726.00
Rangens	Dry	#1	69 to 75.7	1,900	\$1,143.00
Rangens	Dry	#2	69 to 75.7	6,112	\$4,475.00
Rangens	Dry	#3	69 to 75.7	8,866	\$6,016.00
Rangens	Dry	#4	0	974	0.00
Rangens	Extr. 450XXvit	1/8 bulk float	48.9	41,563	\$20,325.00
Rangens	TM 450	1/8	67.6	250	\$169.00
Rangens	Soft-moist	0	\$1.25	20	\$25.00
Rangens	Soft-moist	1	\$1.25	44	\$55.00
Rangens	Soft-moist	2	\$1.25	44	\$55.00
Rangens	Soft-moist	3	\$1.25	44	\$55.00
Rangens	Soft-moist	1/16	\$1.25	250	\$312.00
Rangens	Soft-moist	1/8	\$1.22	447	\$545.00
TOTAL				61,514 lbs	\$ 33,901

Appendix 4. Fish Marking

Freeze Brand	Stocking Site	Number
Upright T (T)	Black Canyon	1000
Reversed T (⌊)	Alexander Canyon	1000
270° T (⌋)	Grace Dam	1000

All lake trout planted received an adipose and a right ventral fin clip.

A SUMMARY TABLE FOR QUICK REFERENCES

Production Hatchery	Grace
Put and Take Number	79,303
Put and Take Pounds	32,164
Put, Grow and Take Number	1,542,325
Put, Grow and Take Pounds	19,756
Avg. Fish/lb	31.2
Feed Used (lbs)	61,514
Feed Cost	\$32,856
Avg. Length	3.36 in.
Total Cost (operating, personnel, c. o.)	\$224,609
Cost/1000 fish	\$122
Cost/lb fish	\$3.19

HAGERMAN FISH HATCHERY

Joe Chapman, Hatchery Manager II
David May, Assistant Hatchery Manager I
Beau Gunter, Fish Culturist
Ken Felty, Fish Culturist
Travis Parrill, Fish Culturist
Sam Van Liew, Fish Culturist
Ken Taylor, Transport Operator

INTRODUCTION

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

Funding is provided primarily through Department license money. The HFH used approximately \$649,800 this year: \$198,423 from Hagerman's budget, \$388,274 from Dingell-Johnson (DJ) monies, and \$63,103 from the fish transportation budget, to rear and stock fish in the 2008 production year, not including capital outlay expenditures (Appendix 1).

The HFH is staffed with a Hatchery Manager II, Assistant Hatchery Manager, two Fish Culturists, and a Fish Transport Operator. Both fish culturists here last year transferred to other hatcheries, and were replaced by Sam Van Liew and Travis Parrill. 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 2008, the HFH reared and stocked 3,369,800 fish weighing 495,465 lbs. Of these, 1,349,759 were stocked 6-inches or longer and 2,020,041 were stocked smaller than 6-inches (Appendix 1). About 35.3% 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 147,140 steelhead and 123,210 coho salmon were also stocked. About 20,650 yellow rainbows were stocked locally throughout the stocking season. The 3-inch to 6-inch fish consisted of rainbow trout and Kamloops trout from Hayspur (Appendix 1).

The 495,465 lbs stocked included 446,615 lbs of put-and-take fish averaging 9.2 inches, and 48,850 lbs of fingerlings that averaged 3.8 inches. The cost of planting the average 6.8 fish per pound (fpp) (7.0 inches) fish was approximately \$0.95 per lb, or \$139.77 per 1,000 fish (Appendix 1).

In addition to the fish reared and planted, 1,448,117 fish (163,785 lbs) were on hand at the HFH on December 31, 2008. These consisted of 1,038,297 fish (162,834 lbs), average 6.4 fpp, or 7.2 inches) in the large raceways and 409,820 fingerlings (951 lbs, average 431 fpp, or 1.7 inches) in the west raceways. The cost of producing these fish was \$1.09 per lb or \$123.47 per 1,000 (Appendix 1).

On hand January 1, 2008 were 2,184,479 fish (168,072 lbs). The HFH also received 817,940 fish (7,920 lbs) from other hatcheries. Consequently, these subtractions yielded a net production for 2008 of 1,815,498 fish (483,258 lbs), mortality excluded (Appendix 1). The cost of producing the net production of 483,258 lbs was \$0.99 per lb.

A total of 9,218,721 eggs and fry were acquired to yield the fish produced. Approximately 2,758,174 eggs were purchased and the balance was acquired from government sources at no cost (Appendix 4). Of the eggs and fry received, 5,967,025 were received for the fish planted and the balance was used for 2008 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 103 fpp (2.8-inches). Because of continued success, eggs were again shipped to MVFH for early rearing and will be transferred here in February 2009.

The overall survival rate of fish stocked was 56.5%, almost identical to last year. (Appendix 3). Again, the improved survival over previous years can be attributed to good survival in the hatchery building. Mortality due to IHNV *Infectious Hematopoietic Necrosis Virus* decreased overall, but still impacted larger fish that hadn't obtained the disease earlier in life, similar to last year. Losses to *Ichthyophthirius* (ICH) in 2008 did not occur due to an aggressive treatment program when the pathogen was initially detected, although losses to Furunculosis among the larger fish increased. Trout destined to be catchables in '09 were vaccinated for Furunculosis in an attempt to minimize this disease. The steelhead were kept on water from Tucker Springs to minimize their exposure to *Nucleospora salmonis*, thus improving their survival from 9% in 2007 to 74% in 2008.

Fish transport operator Ken Taylor logged 28,311 miles delivering fish to state waters, while the rest of the crew logged 9,616 miles. This amounted to a total of 37,927 miles and 305 stocking trips during 2008, and included 11 trips for the private sector and IDFG hatcheries.

In addition to the annual requests by regional fisheries managers, the HFH crew made 11 trips to haul and stock 1,840,869 fish weighing 58,458 lbs from other sources (Appendix 7). These included two trips for the American Falls Fish Hatchery (AFFH) to stock 94,556 trout weighing 25,800 lbs; three trips to stock 21,410 channel catfish weighing 6,112 lbs; two trips for Grace Fish Hatchery (GFH) to stock 1,277,000 rainbow trout weighing 13,800 lbs; one trip for Magic Valley Hatchery to stock 52,503 steelhead weighing 931 lbs; one trip for Niagara Springs Hatchery to stock 254,065 steelhead weighing 3,050 lbs; one trip to Ashton Fish Hatchery to stock 131,335 three-inch brook trout and rainbow x cutthroat hybrids weighing 7,295 lbs; and one trip from Mackay Hatchery to Grace Hatchery to transfer 10,000 rainbow trout weighing 1,470 lbs.

FISH FEED

The fish produced during 2008 were fed a total of 672,374 lbs of feed from Rangen Inc. and Silvercup (Appendix 5). The net weight gained during 2008 was 483,258 lbs, which resulted in an overall conversion of 1.39 lbs of feed to produce one lb of fish, not including the weight of the mortalities. Cost per pound of feed increased about 17% from 2007.

HATCHERY IMPROVEMENTS

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

- Repaired the dike between the settling pond and Riley Creek and removed some Russian olive trees.
- Added tabs to the raceway catwalks to improve safety and prevent accidents.
- Constructed new aluminum screens to replace the wooden ones in some of the large raceways.
- Replaced the fresh-flo's on the 2.5 ton.
- Removed the stairway to the loft above the incubation room as suggested by the safety inspector.
- Installed a second computer to improve efficiency in the office.
- Installed new damboards in some of the raceways.
- Repaired the 4-inch and 8-inch submersible fish pumps.
- Replaced the drain line from the kitchen sink to the sewer line in Residence # 3.
- Replaced the large, east-side, polyester-netting entrance gate with a permanent gate.
- Moved the tank on the 2.5 ton forward to comply with vehicle weight restrictions.
- Installed a new sink in the shop.
- Installed an eighty-gallon hot-water tank in the shop for use in treating ICH.

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 27 tours to 1,040 school kids during the spring and fall, 3 tours for area scouts, and 5 tours to other large groups of adults. The hatchery also hosted a "Pickup for Fish" day for local cub scouts where scouts picked up litter for a few hours, then learned how to fish. Finally, the hatchery hosted a Free Fishing Day clinic here for about 600 participants. The Hagerman Boy Scouts and personnel from Hagerman National Hatchery, Magic Valley Bassmasters and the Department assisted. Pepsi-Cola, Falls Brand Meats, the University of Idaho Fish Culture Station, Sportsman's Warehouse, 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, Castleford, and Bliss elementary schools, and Magic Valley Alternative High School. Three sessions were given which included delivery of eggs, discussion of habitat needs, spawning, fish anatomy, and stewardship. At the end of the school year, the students were given a hatchery tour and learned how to fish at the Hagerman WMA.

FISH TAGGING OPERATIONS

The HFH crew participated in several tagging operations during the year in which a total of 200,406 fish weighing 84,237 lbs were marked. Of these, 169,806 trout weighing 70,400 lbs were ad-clipped and coded wire tagged to determine survival difference between triploid and diploid catchables in lakes. Another 800 catchables were floy-tagged and stocked into Cascade and Anderson Ranch reservoirs. Ad-clipped catchables were also stocked into Lake Walcott to determine harvest, and into Manns Creek Reservoir to differentiate from wild rainbow stocks.

ACKNOWLEDGMENTS

Thanks to the permanent HFH staff of Dave May, Beau Gunter, Ken Felty, Sam Van Liew, and Travis Parrill; to transport operator Ken Taylor; and to temporaries Paul Gaulin, Drew McGuire, 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, Hayspur, and Magic Valley hatcheries for their cooperation this year.

APPENDICES

Appendix 1. Costs of fish produced at Hagerman Fish Hatchery 2008. Costs reflect all costs budgeted, except capital outlay, and include \$63,103 of the fish transportation budget.

Species/Strain	Length/ Inches	Number Produced	Weight/ Pounds	Cost to produce and plant	Cost/ 1,000
FISH ON HAND JANUARY 1, 2008					
Rainbow trout, yellow (YT,CL,04)	13.3	20,561	20,561		
Kamloops rainbow trout (KT)	9.9	47,662	19,859		
Steelhead (SA)	6.1	153,914	13,797		
Kamloops rainbow trout (TL,TT)	6.2	1,060,757	108,162		
Kamloops rainbow trout (KT)	5.9	35,940	3,099		
Kamloops rainbow trout (KT)	1.9	731,456	2,247		
Hayspur rainbow trout (T9)	1.8	<u>134,189</u>	<u>347</u>		
Totals	5.6	2,184,479	168,072		
FISH PLANTED					
Rainbow trout, yellow (YT,CL,06)	15.4	20,650	31,800	7,854.87	380.38
Kamloops rainbow trout (TL,TT)	9.7	557,998	213,640	133,464.51	239.18
Kamloops rainbow trout (TL,KS)	9.94	153,061	63,050	72,141.94	210.48
Kamloops rainbow trout (KT)	8.5	342,750	89,425	1,095.18	221.25
Hayspur rainbow trout (T9)	9.0	4,950	1,500	31,370.97	213.20
Steelhead (SA)	8.6	147,140	36,100	37,513.53	245.09
Coho salmon	6.2	123,210	11,100	<u>18,810.92</u>	<u>152.67</u>
Subtotals	9.2	1,349,759	446,615	283,440.99	209.99
Hayspur rainbow trout (T9)	3.4	515,746	9,400	43,691.33	84.71
Kamloops rainbow trout (KT)	3.9	1,504,295	39,450	<u>143,868.74</u>	<u>95.64</u>
Subtotals Average	3.8	2,020,041	48,850	187,560.07	92.85
Total Planted Average	7.0	3,369,800	495,465	471,001.06	139.77
FISH ON HAND DECEMBER 31, 2008					
Rainbow trout, yellow (YT,CL,07)	12.3	18,711	14,969	5,676.83	303.40
Hayspur rainbow trout (T9)	11.9	29,462	21,045	727.06	24.68
Kamloops rainbow trout (KT)	7.9	80,168	16,701	15,654.43	195.27
Steelhead (SA)	6.3	147,620	13,931	22,889.13	155.05
Kamloops rainbow trout (TL,TT)	6.2	762,336	96,188	116,385.86	152.67
Hayspur mix (KT/T9)	1.7	409,820	951	17,465.63	42.62
Totals	6.4	1,448,117	163,785	178,798.94	123.47
TOTAL FISH PRODUCED					
Planted in 2008		3,369,800	495,465		
On Hand December 31, 2008		<u>1,448,117</u>	<u>163,785</u>		
Totals		4,817,917	659,250	649,800.00	134.87
From other hatcheries		817,940	7,920		
On Hand January 1, 2007		2,184,479	168,072		
TOTAL GAINED		1,815,498	483,258		

Appendix 2. Fish distribution from Hagerman Fish Hatchery, 2008.

	Percent of number planted by Region								
	Number	Pounds	1	2	3	4	5	6	7
Catchables ≥6 inches									
Rainbow trout, yellow	20,650	31,800	-	-	-	97.6	-	2.4	-
Kamloops rainbow trout (TT)	557,998	213,640	-	13.1	16.7	34.1	29.6	6.6	-
Kamloops rainbow trout (KS)	153,061	63,050	-	8.7	31.7	45.2	3.5	-	-
Hayspur Kamloops rbt (KT)	342,750	89,425	-	12.4	20.4	57.6	9.6	-	-
Steelhead (SA)	147,140	36,100	-	-	100.0	-	-	-	-
Hayspur rainbow trout (T9)	4,950	1,500	-	-	100.0	-	-	-	-
Coho salmon	123,210	11,100	-	-	100.0	-	-	-	-
Subtotal	1,349,759	446,615	-	9.5	36.1	35.3	15.1	4.0	-
Fingerlings <6 inches									
Hayspur rainbow trout (T9)	515,746	9400	-	7.3	54.1	38.6	-	-	-
Kamloops rainbow trout (KT)	1,504,295	39450	-	-	1.7	55.9	39.0	3.4	-
Subtotal	2,020,041	48,850	-	1.9	15.1	51.5	29.0	2.5	-
TOTAL	3,369,800	495,465	-	4.9	23.5	45.0	23.5	3.1	-

Appendix 3. Fish survival from eyed-egg to stocking, 2008.

Species/Strain	Number Stocked	Eggs and Fry Received	Percent Survival
Rainbow trout, Yellow	20,650	30,005	68.82
Rainbow trout, Hayspur (T9)	520,696	1,089,185	47.80
Kamloops, Troutlodge (TT)	557,998	1,255,988	44.43
Kamloops, Troutlodge (KS)	153,061	167,900	91.16
Kamloops, Hayspur (KT)	1,847,045	2,923,947	63.17
Steelhead (SA)	147,140	200,000	73.57
Coho salmon	123,210	300,000	41.07
TOTAL	3,369,800	5,967,025	56.47

Appendix 4. Number of eyed-eggs and fry received, species, and source for fish produced in 2008.

Species/Strain	Eggs/Fry received		Source
	For Fish Planted	For fish on hand December 31, 2008	
Received as eggs			
Rainbow/Yellow (YR)	30,005	30,442	Clear Lakes (ITP)
Rainbow/Kamloops (KT)	2,428,367	*1,665,268	IDFG Hayspur
Rainbow/Hayspur (T9)	766,825	0	IDFG Hayspur
Rainbow/sterile Troutlodge (TT)	1,255,988	1,334,286	Troutlodge, WA
Rainbow/non-sterile Troutlodge (KS)	167,900	0	Troutlodge, WA
Steelhead	200,000	221,700	IDFG Pahsimeroi, Oxbow
Coho Salmon (CO)	300,000	0	Eagle Creek Nat'l Hatchery
Subtotal eggs	5,149,085	3,251,696	
Received as fry			
Rainbow from Magic Valley (T9)	322,360	0	IDFG Hayspur
Kamloops (Hayspur) from Magic Valley (KT)	495,580	0	IDFG Hayspur
Subtotal fry	817,940	0	
TOTAL	5,967,025	3,251,696	

* KT & T9 were mixed in '09.

Appendix 5. Fish feed used during 2008 at Hagerman Fish Hatchery.

Size	Source	Pounds	Cost/pound	Cost
Str	Rangen	850	0.7655	\$650.68
SM str		88	1.3400	\$117.92
#1	Rangen	5,450	0.7655	\$4,171.98
#2	Rangen	21,250	0.7655	\$16,266.88
#2 TM	Rangen	900	0.8750	\$787.50
#3	Rangen	50,550	0.5280	\$26,690.40
#3 TM	Rangen	4,550	0.8750	\$3,981.25
#3 Aquaflor	Rangen	1,200	1.3155	\$1,578.60
1/32 in, SM	Rangen	396	1.3100	\$518.76
3/32 in, EXT450Float	Rangen	131,460	0.5150	\$67,701.90
3/32 in, TM	Rangen	1,600	0.7000	\$1,120.00
1/8 in, Romet TC	Silvercup	6,450	1.0800	\$6,966.00
5/32 in, EXT450Float	Rangen	441,180	0.4690	\$206,913.42
5/32 in, Romet TC	Silvercup	6,450	1.1500	\$7,417.50
Subtotal		672,374	0.5129	\$344,882.78
Freight charges				\$3,361.87
Fuel Surcharge				\$605.14
Total cost				\$348,849.78

Appendix 6. Summary of fish marked at Hagerman Fish Hatchery in 2008.

Date Stocked	Species	Water	Number	Pounds	Clip
10/16 & 17	TT	Lake Walcott	19,970	10,300	Ad-clip
05/28	TT	Manns Crk Res.	6,680	1,900	Ad-clip
09/23	TT	Manns Crk Res.	3,150	1,400	Ad-clip
07/01	TT	Anderson Ranch Res	400	133	Floy-tag
06/05	SA	Cascade Res.	400	104	Floy-tag
Subtotal			30,600	13,837	
04/01	KS	Paddock Valley Res.	4,988	1,750	Ad-clip & CWT
04/01	TT	Paddock Valley Res.	4,930	1,700	Ad-clip & CWT
04/07	KS	Oakley Res.	4,995	1,850	Ad-clip & CWT
04/07	TT	Oakley Res.	4,950	1,800	Ad-clip & CWT
04/08	KS	Roseworth Res.	4,995	1,850	Ad-clip & CWT
04/08	TT	Roseworth Res.	4,950	1,800	Ad-clip & CWT
04/28	KS	Stone Res.	5,040	2,100	Ad-clip & CWT
04/28	TT	Stone Res.	5,040	1,800	Ad-clip & CWT
04/29	KS	Devil's Crk Res.	5,405	2,350	Ad-clip & CWT
04/29	TT	Devil's Crk Res.	5,355	2,550	Ad-clip & CWT
04/30	KS	Little Camas Res.	3,776	1,600	Ad-clip & CWT
04/30	TT	Little Camas Res.	3,885	1,750	Ad-clip & CWT
05/01	KS	Manns Lake	5,064	2,050	Ad-clip & CWT
05/01	TT	Manns Lake	5,040	2,100	Ad-clip & CWT
05/14,19;06/04	KS	Horsethief Res.	15,125	6,600	Ad-clip & CWT
05/14,19;06/04	TT	Horsethief Res.	15,593	7,050	Ad-clip & CWT
05/16	KS	Thorn Crk Res.	2,520	1,050	Ad-clip & CWT
05/16	TT	Thorn Crk Res.	2,573	1,050	Ad-clip & CWT
05/20	KS	Soldier's Meadow	4,700	2,000	Ad-clip & CWT
05/20	TT	Soldier's Meadow	4,540	2,000	Ad-clip & CWT
05/20	KS	Waha Lake	3,525	1,500	Ad-clip & CWT
05/20	TT	Waha Lake	3,405	1,500	Ad-clip & CWT
05/29	KS	Lost Valley Res.	7,590	3,300	Ad-clip & CWT
05/29	TT	Lost Valley Res.	7,557	3,300	Ad-clip & CWT
06/02,03	KS	Island Park Res.	16,800	7,000	Ad-clip & CWT
06/02,03	TT	Island Park Res.	17,465	7,000	Ad-clip & CWT
Subtotal			169,806	70,400	
TOTALS			200,406	84,237	

Appendix 7. Fish stocked by Hagerman Fish Hatchery from other sources, 2008.

Hatchery Stocking	Species	Number	Pounds	Source	Destination
Hagerman	TT,T9	94,556	25,800	American Falls Hatchery (IDFG)	Am. Falls Res., Blackfoot Res.
Hagerman	TT,KS	1,277,000	13,800	Grace Fish Hatchery (IDFG)	Island Park Res., Am. Falls Res.
Hagerman	TT	10,000	1,470	Mackay Hatchery	Grace Fish Hatchery
Hagerman	BK,RC	131,335	7,295	Ashton Fish Hatchery (IDFG)	Henry's Lake, Salmon Falls Creek Res.
Hagerman	SA, SB	52,503	931	Magic Valley Hatchery (IDFG)	Salmon Falls Creek Res.
Hagerman	SA	254,065	3,050	Niagara Springs Hatchery	Salmon Falls Creek Res.
Hagerman	CC	21,410	6,112	Fish Processors, Buhl, ID	Dog Creek Res., Alexander Res., Southwest Region lakes
TOTAL:		1,840,869	58,458		

HAYSPUR FISH HATCHERY

Bradford W. Dredge, Fish Hatchery Manager II
Brian L. Thompson, Fish Hatchery Assistant Manager
Richard E. Park, 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 are maintained on station. These are the Hayspur strain rainbow trout and the Kamloops strain rainbow trout. 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 2008 rainbow trout spawning season was a nine-month project, beginning in August and ending in May with an egg take of 12,013,046 green eggs from 4,029 females during the year. A total of 9,413,046 eggs were retained from 3,287 adults spawned, a total of 6,661,172 eyed eggs produced, and a total of 5,747,067 eyed eggs were shipped (Appendix 1). Photoperiod manipulation, or light control, has expanded "normal" spawn timing to more closely match egg production with eyed egg requests. Two 2-year old round ponds, two 3-year old round ponds, and two 4-year old round ponds of Hayspur rainbows and Kamloops rainbows were manipulated. Hayspur rainbow trout triploid-eyed egg production totaled 2,822,392. Kamloop triploid-eyed egg production totaled 2,924,675. All eggs produced, except for broodstock replacement eggs, were pressure shocked for triploidy. American Falls, Cabinet Gorge (Sandpoint), Dworshak National, Grace, Hagerman, Hagerman National, Magic Valley, Nampa, and Tuccannon National hatcheries were shipped eggs as per their requests. Value to the Department, at the current contract price of \$27.50/1,000 for sterile triploid rainbow trout eggs equates to \$182,480.98 (Appendix 2).

In 2008, all rainbow trout eggs produced for shipping were pressure shocked and made sterile. Replacement broodstock eggs were not pressure shocked and were utilized exclusively at HSFH for replacement broodstock needs. This was the eighth year of full production using the heat or pressure shock method. Washington State University performed induction rate sampling on four randomly selected groups. A total of 506 individuals were sampled. Sample results indicated that 505 out of 506 were verified as being triploid. The overall induction rate was 99.8%, up from 98.56% the previous year.

FISH LIBERATIONS

Fish requested for the Big Wood and Little Wood drainages were reared at Mackay (4,200), Nampa Hatchery (5,850), or HSFH (25,707). Semi-tank and trailer loads were hauled as needed to complete HSFH 2008 plant requests. A total of 29 stocking trips into the Big Wood and Little Wood drainages were stocked with 27,307 catchable sized rainbow trout (Appendix 3). In all, 35,757 fish or 12,929 pounds of fish were distributed during the season.

TRANSPORT COSTS

The two transport trucks assigned to HSFH made 46 separate stocking trips during the year. Fish from HSFH were planted by truck into 14 different bodies of water. Hayspur personnel traveled 3,009 miles for an average of 65 miles per trip. The fleet rental charge was \$421.96/month and 85 cents/mile for the 2-ton truck. Fleet rental for the 1-ton truck was \$222.75/month and 54 cents/mile. HSFH fish transport cost totaled \$9,948.52 for 2008.

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).

HATCHERY IMPROVEMENTS AND NEEDS

- Improvements to the HSFH during 2008 included:
- Large willow trees were trimmed and five large trees were removed.
- Residence #3 had two ceiling heater fan thermostats replaced while Residence #1 had one ceiling heater fan thermostat replaced and all baseboard heater thermostats replaced.
- Each residence had the doors keyed alike so each house can use one key for entry into any of its doors.
- Residence #1 had new linoleum installed in the kitchen, laundry room, and hall bathroom.
- The dryer vent in Residence #3 was replaced with solid line.

- All of the residences and the dormitory had the carpets cleaned once during the year.
- All of the hatchery fire extinguishers were serviced.
- The domestic water pump was repaired and replaced, as was the irrigation pump in the old domestic water room in the hatchery building.
- The chimney flues were cleaned in all the residences during the fall.
- A new CXT outhouse was installed by Gavers Lagoon.
- Well #4 was completely overhauled.
- All 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 back-up generators.
- The sewage lift station was rebuilt and equipped with new parts.
- Five of the six water heaters on station were replaced.
- The park restrooms in the campground were pumped and serviced.
- New chain link fence was installed around the back yard of Residence #3.
- New photo manipulation timers were purchased for Round Ponds 1-10.
- Power problems in Round Ponds 13-15 were repaired.
- The dormitory refrigerator water line was rerouted to comply with Idaho Industrial Safety Inspection codes.
- Several picnic tables received maintenance during the summer.
- The intermediate spring box cover was replaced.

Needs of the HSFH are:

- Replace the roof on Residence #3.
- Remove several willows between Residence #1 and Residence #3.
- Repair and/or replace numerous concrete areas around the HSFH.

- Replace windows and doors in Residences #1 and #3.
- Replace siding on Residence #3.
- Replace insulation in crawl space of Residence #3.
- Replace and enlarge the Gavers Lagoon outlet pipe.
- Replace the linoleum in the kitchen, dining room, and laundry 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, 192 pairs of fish were crossed. The adult fish used in the replacement program were adipose clipped. Marked fish are generally used for production egg lots, rarely are they used again for development of a replacement population.

Isolation incubators were used to separate individual families. In 2008, zero R9 families tested positive for Bacterial Kidney Disease (BKD). Isolation trays, constructed of disinfected metal and plastic, were used as isolation incubators. Each tray was capable of holding 10 families segregated from one another. Trays were placed in Heath stacks and eggs were added for isolation incubation.

PUBLIC RELATIONS

Many people utilized the Hayspur campground and the popular fishing pond, Gavers Lagoon, during the spring, summer, and fall period. The HSFH campground benefited from the efforts of volunteer Camp Hosts. Kenneth and Mary Robbins 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 and local groups. The Blaine County Sheriff's Office (PAL Program), Blaine County Recreation District, Valley Elementary School, Sun Valley Adaptive Sports Group, and the Woodside 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

On January 24, Tom Frew received 3,000-eyed eggs for Trout in Classroom (TIC) programs. Tom also received 300 TIC eggs on the 14th of October. The Hagerman State Fish Hatchery received 500-eyed eggs on February 4 for TIC events. Kelton Hatch and Jeff Seggerman received 1,000 and 2,000 TIC eggs on the 10 and 16 of December.

Brian attended a Fish Request meeting In Jerome on February 12.

Richard Park attended New Employee Orientation Training the week of March 18, March 31, and April 14.

Carl Ostberg, Washington State University, received eggs and milt on April 9 for research purposes.

The Hayspur staff collected milt for use at Henrys Lake Fish Hatchery on February 25 and on February 28. The milt was used to generate cutthroat/rainbow hybrids via delayed fertilization.

The State of Idaho facility inspection was performed on the 16th of September and the boiler inspection was completed on the 14th of July.

Brad attended the Hatchery Manager's meeting in Riggins on June 17 and 18 and also attended the Northwest Fish Culture Conference during the week of December 1.

Brad attended "Retirement's a Beach" on September 25.

Richard helped with Bitterbrush planting on the 19th of April.

ACKNOWLEDGMENTS

In 2008, HSFH benefited from the capable assistance of Biological Aides Beau Gunter, John Curtner, Victor Smith, Brandon Torske, David Grundy, and Louis Nottingham. The HSFH would like to thank IDFG employees who helped out during the spawning season: Sam Van Liew and Travis Parrill from Hagerman State Fish Hatchery, Tom Tighe and Wade Symons from Magic Valley Steelhead Hatchery, and Danielle Dorsch, Chris Jeszke, Phil Stone, Liz Crawford, Pete Starr, and Tomi Quigley-Baker from Sawtooth Fish Hatchery.

APPENDICES

Appendix 1. Egg production summary of Hayspur Fish Hatchery, 2008.

Species	Eggs Taken^a	Eggs Shipped^b
T9's	4,807,238	2,822,392
KT's	4,605,808	2,924,675
Totals	9,413,046	5,747,067

^a Total is displaced (gram weight) of both good and bad eggs taken in 2008.

^b Total is displaced (gram weight) of eyed eggs available for shipping in 2008.

Appendix 2. Eyed egg shipment summary from Hayspur Fish Hatchery, 2008.

Hatchery	Species^a	Total eggs shipped	Estimated value^b
American Falls	KT	34,766	\$956.07
Hagerman	T9	955,307	\$26,270.94
	KT	1,479,686	\$40,691.37
Grace	T9	660,459	\$18,162.62
	KT	148,334	\$4,079.19
Magic Valley	T9	449,663	\$12,365.73
	KT	569,374	\$15,657.79
Sandpoint	T9	61,110	\$1,680.53
Nampa	T9	565,407	\$15,548.69
	KT	594,372	\$16,345.23
Hagerman NFH	T9	124,946	\$3,436.02
	KT	25,054	\$688.99
Tucannon NFH	KT	67,589	\$1,858.70
Dworshak NFH	T9	5,500	\$151.25
	KT	5,500	\$151.25
Shipped		5,747,067	\$157,893.09
^c Other	Thrown out	894,105	\$24,587.89
	Research	20,000	\$550.00
	TIC	10,450	\$287.38
	catchables	76,379	\$2,100.42
Total		6,661,172	\$182,480.98

^a T9=sterile R9, KT=sterile Kamloops

^b At contract value of \$27.50/1,000 sterile rainbow trout eggs.

^c Eggs used for trout in the classroom programs, exchanged for laboratory work, and discarded.

Appendix 3. Hayspur Fish Hatchery stocking summary, 2008.

Fish size	Number of fish	Pounds of fish	Fish per pound
3N Catchables	35,757	12,929	2.77

Appendix 4. Hayspur Fish Hatchery Feed Summary, 2008.

Rangens			
Date	Size	Amount /pounds	Cost
1/23/08	1/4 in. Brood pellet	10,820	\$ 5,134.48
4/15/08	1/4 in. Brood pellet	12,780	\$ 6,843.39
8/8/08	1/4 in. Brood pellet	10,900	\$ 5,891.83
Totals		34,500	\$ 17,869.70

Rangens			
	Size	Amount /pounds	Cost
Trout/Salmon Starter #0		100	\$ 76.56
Trout/Salmon Starter #1		200	\$ 152.26
Trout/Salmon Starter #2		650	\$ 493.33
Trout Grower #4		1200	\$ 633.60
Extruded 450 1/8"		1250	\$ 598.75
Extruded 450 3/32"		2000	\$ 1,050.00
Extruded 450 5/32"		5800	\$ 2,672.45
TM Medicated 5/32"		5450	\$ 4,082.20
Totals		16,650	\$ 9,759.15

Appendix 5. Hayspur Fish Hatchery Tour Group Summary, 2008.

Month	Name of Tour Group	Grade/Age	Number in Group
May	Community School	K	13
	Woodside School	10-14 yrs	70
June	Blaine County Recreation District	6-13 yrs.	40
	Free Fishing Day Event	5-15 yrs.	50
	Blaine County Sheriff's Office (PAL)	5-15 yrs.	40
	Sun Valley Adaptive Sports Group		40
	YMCA - Sun Valley	3-6 yrs.	20
July	4th of July		50
October	Valley Elementary	4th	56
Jan - Dec	General Visitors/Campers		1,360

HENRYS LAKE HATCHERY

Damon Keen, Regional Fisheries Biologist

ABSTRACT

The 2008 trapping numbers at Henrys Lake included 5,159 Yellowstone cutthroat trout and 349 hybrid trout. The 2008 spawning operations produced 1,788,710 eyed Yellowstone cutthroat trout eggs and 470,161 eyed hybrid trout eggs. Approximately 70,968 eyed hybrid eggs were designated as surplus and destroyed. Yellowstone cutthroat Lots 12 and 13 were also destroyed, but prior to eye-up. Sub samples of Yellowstone cutthroat trout and hybrid trout in the Hatchery Creek run were recorded for total length. Mean lengths of 453 mm and 526 mm were calculated respectively. The percentage of adipose fin clipped Yellowstone cutthroat returning to the ladder was recorded daily throughout the 2008-spawning run. 12.9% of Yellowstone cutthroat trout returning to the ladder in 2008 were adipose fin clipped.

Henrys lake production hybrids were evaluated for sterility induction success. Induction for 2008 was 98.3% successful for the triploid condition.

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

Riparian fences, fish diversion structures, and fish screens were maintained on the tributaries and other fragile areas surrounding Henrys Lake. Tributary fencing maintained included: Howard Creek, Targhee Creek, Duck Creek, and Timber Creek. In 2008, installation of two new fish screens was completed on tributaries of Henrys Lake; one on Howard Creek and one on Targhee Creek. Fencing was also maintained on the south and north side of the county boat dock. Additionally, the Teton Valley fencing projects have been reassigned to this facility and riparian fencing was maintained in that area also.

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 oxygen levels were predicted to diminish to the area of concern. Therefore, aeration was deployed in late winter, 2008.

Fishery habitat improvement projects were identified, evaluated, and funded at several locations in the Upper Snake region including: Henrys Lake area, Henrys Fork River, Teton River, and the Big Lost drainage.

Author:

Damon Keen

INTRODUCTION

Henry's Lake Hatchery is a license- and federal-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 clarkii* and sterile rainbow trout *Oncorhynchus mykiss* x Yellowstone cutthroat trout *Oncorhynchus clarkii* hybrids 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 1.0 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 Regional Fisheries Biologist, one 5-month temporary employee, and one 3-month temporary employee.

METHODS

Spawning Operation

The Hatchery Creek fish ladder was opened for the spring run on February 18 and remained in operation until April 28. 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 seven males. Hybrid trout were produced with Yellowstone cutthroat trout eggs from the Henry's Lake run and rainbow trout milt obtained from Hayspur Hatchery. The hybrid contribution was sterilized by inducing a triploid condition using pressure to shock the eggs post fertilization. Hybrid eggs were placed in the pressure treatment machine 47 minutes 45 seconds post fertilization at 10,000 psi and held at this level of pressure for 5 minutes. Random samples of the hybrid fry were taken at the Mackay hatchery and sent to the Eagle lab to test induction rates of sterilization. Samples were taken from 60 fish. Hybrid production eggs were shipped to Mackay and Ashton for hatching, rearing, and subsequent release back into Henry's Lake and other waters. Yellowstone cutthroat eggs were shipped to Mackay for hatching, rearing, and release back into Henry's Lake.

Disease samples were taken from the spring spawning run. Ovarian samples were taken from the egg pools of females to detect bacterial disease presence. All female egg pools were tested. Viral samples were taken randomly from 25 seven female egg pools. A mixed-sex group of 60 adult Yellowstone cutthroat trout during the spring run was sacrificed for disease testing. All samples were sent to the Eagle Laboratory for evaluation.

Riparian Fencing and Fish Screening

Electric fencing has been in place at Henrys Lake since the early 1990's. Fencing was stretched and solar panels, batteries, and connections were installed during May 2008 at ten sites on the tributaries of Henrys Lake. 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. Repairs were made as needed. Fences were let down and prepared for winter in November 2008.

Two new riparian fences were installed along Duck Creek and Kelly Springs. The fences were installed with the cooperation of the landowner, Debbie Empey, and with the collaborative help of several partners.

Fish diversion screens are located at eleven sites on the tributaries of Henrys Lake. Screens were maintained, cleaned, and checked for proper operation on a routine basis during the summer and fall months of 2008. Additionally, during the fall of 2008, all screens received major maintenance, by replacing worn seals, bearings, and shafts. The one exception to this was the lower Duck Creek screen, which is scheduled for replacement in summer of 2009. Two new modular screens were installed, one on Howard Creek and one on Targhee Creek. Both new screens were installed on previously unscreened diversions.

Creel Surveys

No creel surveys were conducted this year at Henrys Lake or Island Park Reservoir.

Water Quality

Winter (December 2007; January, February, and March 2008) dissolved oxygen concentrations; snow depth, ice thickness, and water temperatures were taken at established sampling sites. Sites were located using GPS readings from historical sampling sites. Holes in the ice were drilled prior to sampling using a gas powered ice auger. Dissolved oxygen samples were taken using a YSI model 550A oxygen probe. Samples were taken at each site at ice bottom and at subsequent one-meter interval until the bottom of the lake was incurred. Total g/m² of oxygen were calculated for each site.

The purpose of recording dissolved oxygen profiles is to develop a dissolved oxygen depletion model to predict the likelihood of the Henrys Lake environment reaching the critical threshold for fish survival. Upon determining the likelihood of reaching the critical dissolved oxygen threshold, a determination can be made of whether or not to deploy aeration.

Habitat Improvement Projects

During 2008, a portion of the Henrys Lake job function was to identify fish habitat projects and prioritize the same. Funding opportunities were sought to complete said projects and projects were initiated. This job function was a major part of the accomplishments from the Henrys facility in 2008. Further details, accomplishments, and specifics are available in the Upper Snake Regional Fisheries report.

RESULTS AND DISCUSSION

Spawning Operation

5,159 Yellowstone cutthroat trout ascended the spawning ladder between February 18 and April 28, with 3,212 males (Figure 1) and 1,947 females (Figure 2) enumerated. Yellowstone cutthroat trout male and female total length averaged 446 and 462 mm (Figure 5), respectively. Combined mean Yellowstone cutthroat trout length was 453 mm.

349 hybrid trout ascended the spawning ladder between February 18 and April 28, with 296 males (Figure 3) and 53 females (Figure 4) enumerated. Hybrid trout males and females averaged 512 mm and 565 mm (Figure 6), respectively. Combined mean hybrid trout length was 526 mm.

Species/sex ratio at the Henrys Lake trap during 2008 included: YCT females 35%, YCT males 59%, hybrid males 5%, and hybrid females 1% (Figure 7).

Historical species/sex ratio at Henrys Lake for the years 2001-2008 was evaluated (Figure 8). The hybrid fish numbers (both male and female) continues to decrease. The increased success with the sterility program is probably responsible for the decreased trap numbers for hybrid trout. Sterile fish lack the spawning behavior of fertile fish and fewer numbers of those fish could be expected to return to the trap. Creel catch rates for hybrids are still near objective. Likewise, gill net evaluations indicate good numbers of hybrids present in the lake. This indicates that the numbers of hybrids returning to the ladder has little correlation to overall lake population.

Yellowstone cutthroat green eggs totaled 3,445,800 from 1,243 females for a mean fecundity of 2,772 eggs per female (Table 1). Eyed Yellowstone cutthroat eggs totaled 1,788,710 for an overall eye-up rate of 60.5% (Table 1). YCT eye-up varied throughout the spawn season from a low of 39.4% in Lot 11 to a high of 77.8% in Lot 6 (Figure 9). Lots 12 and 13 were destroyed prior to eye-up due to poor egg quality and because the egg quota had been met. These two lots were not considered within the eye-up calculation. All of the eyed Yellowstone cutthroat eggs were shipped to the Mackay facility where they were hatched and reared (Table 3). Subsequently, all Yellowstone cutthroat from the 2008 production were released back into Henrys Lake in the fall of 2008. Eleven spawn days during this year's spring run were devoted to Yellowstone cutthroat spawning.

Hybrid trout green eggs totaled 849,700 from 293 females for a mean fecundity of 2,900 eggs per female (Table 2). Eyed hybrid trout eggs totaled 470,161 for an overall eye-up rate of 55.3 % (Table 2). Hybrid eye-up was 58.6% in Lot 1 and 53.0% in Lot 2 (Figure 10). 346,774 of the hybrid eggs were shipped to Mackay (Table 3) for hatching, rearing, and subsequent release into Henrys Lake and 52,419 of the hybrid production eggs were shipped to Ashton (Table 3) for hatching, rearing, and subsequent release into local waters. All hybrid eggs were treated to induce the triploid condition. Two spawn days were devoted to production of hybrid eggs during this year's spawn take. Sterilization induction rates for the sterile hybrid production indicated 98.3% (59/60) success for the triploid condition.

Subsamples of the identified Yellowstone cutthroat trout were inspected for the presence or lack of an adipose fin. The purpose 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 adipose fins removed to estimate hatchery contribution to the total lake population. However, until 2006, 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 adults' clips at the ladder. Over the last four years, adipose clips have been recorded at the ladder. Results of this year's data (Figure 11) did not indicate a decrease in percentage of adipose clipped fish as the run progressed. However, a higher than expected component of adipose clipped fish was prevalent throughout the run. No correlation between spawn timing and timing relative to a return to the ladder as adults can be established by this data. However, 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.

Historical run numbers (2001-2008) of both Yellowstone cutthroat and hybrids were evaluated (Figure 12). The 2008 Yellowstone cutthroat run numbers were the largest since 2001. It is important to note that correlation between run numbers and lake population has never been established. The downward trend in the hybrids returning to the ladder continues, and this is probably reflective of improved induction during the sterilization process. Sterile fish do not exhibit spawning behavior to the same extent that fertile fish do. Pressure shocking was instituted in 2004, and the induction rate using pressure shocking has been near 100% since that time. Heat shocking was used prior to 2004, and results were variable. Induction results were as low as 50% in some cases.

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

Bacterial disease sampling was taken during spawning from ovarian fluid of all families of eggs. Tray 1 of Lot 1 of the hybrid take was identified as positive for bacterial presence and was 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.

Two new riparian fences were installed along riparian areas of Duck Creek and Kelly Springs. The fences were installed along previously unfenced riparian buffer areas. The fencing construction and funding was a result of a collaborative effort between the landowner, Debbie Empey, and several other entities including Henrys Lake Foundation, USFW, IDFG, and the St. Anthony Work Camp. The project also provided for riparian enhancements, hardened livestock water areas, and approved stream crossings to facilitate vehicle movement without damage to riparian areas.

The fish screens functioned well during the summer of 2008 on Targhee and Howard creeks, but were in need of seal replacement. The Stockton fish screen on Targhee Creek was determined to be too small and plans were initiated to replace that screen. The Duck Creek screens did not function as well. Seals and bearings were in need of replacement on several screens. Additionally, the lower Duck Creek screen was inoperable and plans were made to replace that screen in 2009.

During the fall of 2008, a major maintenance project was initiated on all of the screens in operation on the Henrys Lake tributaries. Seals, bearings, and drive shafts were replaced where

needed. Additional seals were installed along the lower edge of screens to prevent fish escapement under the screens. The crew from the Salmon screen shop completed the maintenance.

Two new, modular screens were installed on previously unscreened diversions. One was installed on Howard Creek on the Cole property, and one was installed on Targhee Creek on the Clements property. Both screens were funded via a FRIMA grant and Henrys Lake Foundation funds. The screens were fabricated and installed by the crew from the Salmon screen shop.

Creel Surveys

Island Park

A creel survey was not conducted on Island Park Reservoir during 2008. Periodic angler reports indicated fishing was good overall and angler satisfaction appeared high.

Henrys Lake

A creel survey was not conducted on Henrys Lake during 2008. Good angling reports were abundant and angler satisfaction appeared to be exceptionally high. A creel survey is planned for 2009.

Water Quality

Oxygen profiles for December 2007-March 2008 were recorded at five sites: Pittsburgh creek, County boat dock, Wild Rose, the Outlet, and the Hatchery. Total oxygen diminished from 40.2 g/m² to 10.25 g/m² at the Pittsburgh site, 29.85 g/m² to 7.95 g/m² at the County dock, 37.05 g/m² to 9.25 g/m² at the Wild Rose site, 12.4 g/m² to 10.95 g/m² at the Outlet site, and 30.95 g/m² to 5.35 g/m² at the hatchery site. The outlet site was last sampled on January 15 and further decline was imminent.

Historically, the level of concern of oxygen levels has been established at 10 g/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 projected recharge date is set at April 1. This date is somewhat arbitrary as well. Recharge varies from year to year based on ice thickness and the onset of warmer conditions. Dissolved oxygen recharge can take place anytime that temperature warms enough to begin ice melt. Recharge from springs and creek inflow can take place throughout the winter months. Recharge from ice melt can begin as early as February and as late as early April. Setting the recharge date at April 1 for the purpose of aeration deployment normally provides a safety buffer.

In the winter of 2007-2008, the initial analysis of the dissolved oxygen depletion model predicted dissolved oxygen remaining above the level of concern throughout the winter. Therefore, aeration was not deployed. However, exceptionally cold March weather extended the dissolved oxygen depletion timeframe and aeration was deployed in mid-March. Critical levels of dissolved oxygen were noted at all sites except the Pittsburgh site. By late March, oxygen profiles began to recharge. However, unseasonable cold March and April temperatures probably slowed recharge rates throughout this period.

Egg and milt quality was compromised by lower dissolved oxygen levels, but exceptional adult mortality was not noted. The winter of 2007-2008 allowed for a better understanding of lethal dissolved oxygen levels in Henrys Lake.

Further evaluation of dissolved oxygen depletion and events are included in the Regional Fisheries 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, Hagerman 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 Randy Poole, volunteer coordinator from the Idaho Falls office, who organized numerous volunteer trips to Henrys Lake to assist in several projects. Special thanks are given to the other volunteers and employees who venture to the site in the name of resource benefit.

Likewise, a special acknowledgement is given to the Henrys Lake Foundation. For many years, the foundation has given unselfishly in the form of donated time and funds to maintain this important fishery. Over thirty thousand dollars was pledged this year alone to improve habitat, purchase fishery equipment, and to improve fish passage for natural production benefits. Without the foundations support, many improvements would not happen.

The Henrys Lake facility remains an important avenue for disseminating information to the public. Hundreds of anglers, 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. It is acknowledged that one of the most important tasks the IDFG faces is relaying the state of the resource to the interested public and to further promote the cooperative atmosphere that is so important in resource management.

LITERATURE CITED

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

TABLES

Table 1. 2008 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>
3/3/2008	3	175	507,500	2900	380,645	Neg.	75.0%
3/6/2008	4	119	345,100	2900	220,968	Neg.	64.0%
3/10/2008	5	90	249,750	2775	177,419	Neg.	71.0%
3/13/2008	6	90	238,500	2650	185,484	Neg.	77.8%
3/17/2008	7	90	253,800	2820	170,968	Neg.	67.4%
3/21/2008	8	105	291,375	2775	161,290	Neg.	55.4%
3/27/2008	9	56	155,400	2775	72,581	Neg.	46.7%
4/2/2008	10	189	524,475	2775	266,129	Neg.	50.7%
4/9/2008	11	140	388,500	2775	153,226	Neg.	39.4%
4/14/2008	12	84	218,400	2600	0	Neg.	0.0%
4/17/2008	13	105	273,000	2600	0	Neg.	0.0%
TOTALS		1243	3,445,800	2772	1,788,710		60.5%*

*Lots 12&13 Excluded in Eye-Up Calculation

Table 2. 2008 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>
2/25/2008	1 Sterile	173	501,700	2900	266,129	Pos.	53.0%
2/28/2008	2 Sterile	120	348,000	2900	204,032	Neg.	58.6%
TOTALS		293	849,700	2900	470,161		55.3%

Table 3. 2008 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>
1-Apr-08	1	Hybrids	3.1	16,500	266,129	486	MACKAY
1-Apr-08	2	Hybrids	3.1	5,000	80,645	445.5	MACKAY
2-Apr-08	2	Hybrids	3.1	3,250	52,419	459	ASHTON
8-Apr-08	3	YCT	3.1	23,600	380,645	486	MACKAY
8-Apr-08	4	YCT	3.1	13,700	220,968	445.5	MACKAY
14-Apr-08	5	YCT	3.1	11,000	177,419	473	MACKAY
14-Apr-08	6	YCT	3.1	11,500	185,484	432	MACKAY
22-Apr-08	7	YCT	3.1	10,600	170,968	486	MACKAY
22-Apr-08	8	YCT	3.1	10,000	161,290	432	MACKAY
2-May-08	9	YCT	3.1	4,500	72,581	486	MACKAY
2-May-08	10	YCT	3.1	16,500	266,129	405	MACKAY
15-May-08	11	YCT	3.1	9,500	153,226	486	MACKAY
TOTALS				135,650	2,187,903		

FIGURES

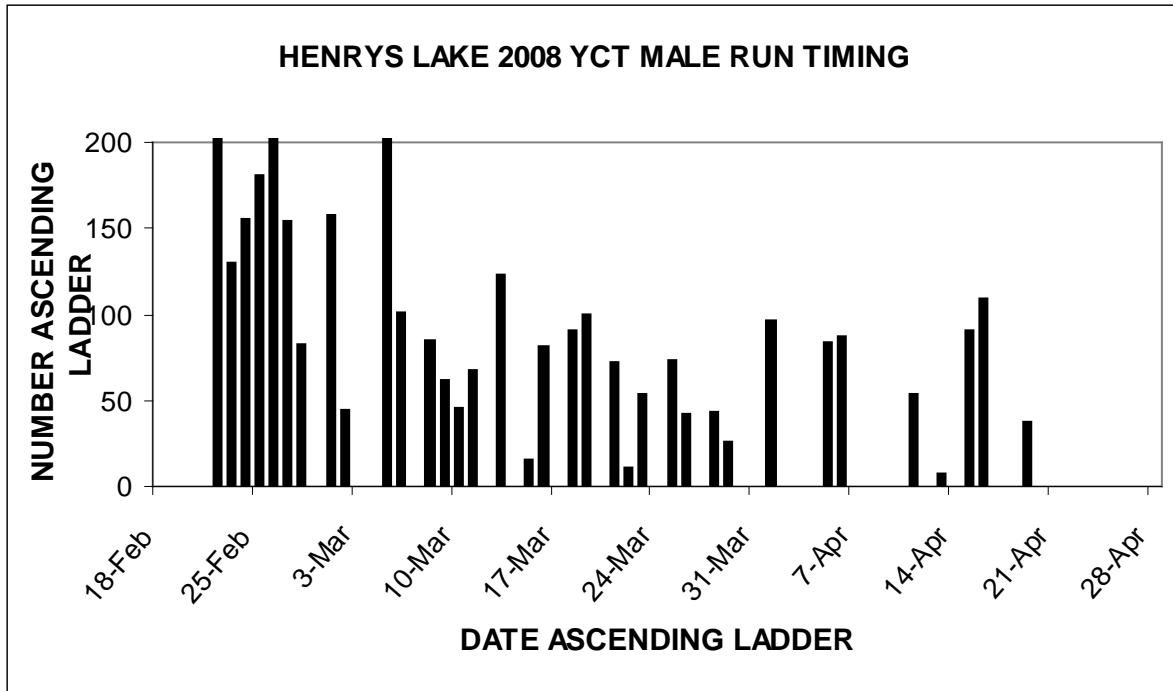


Figure 1. Henrys Lake 2008 Run Timing of Male Yellowstone Cutthroat Trout.

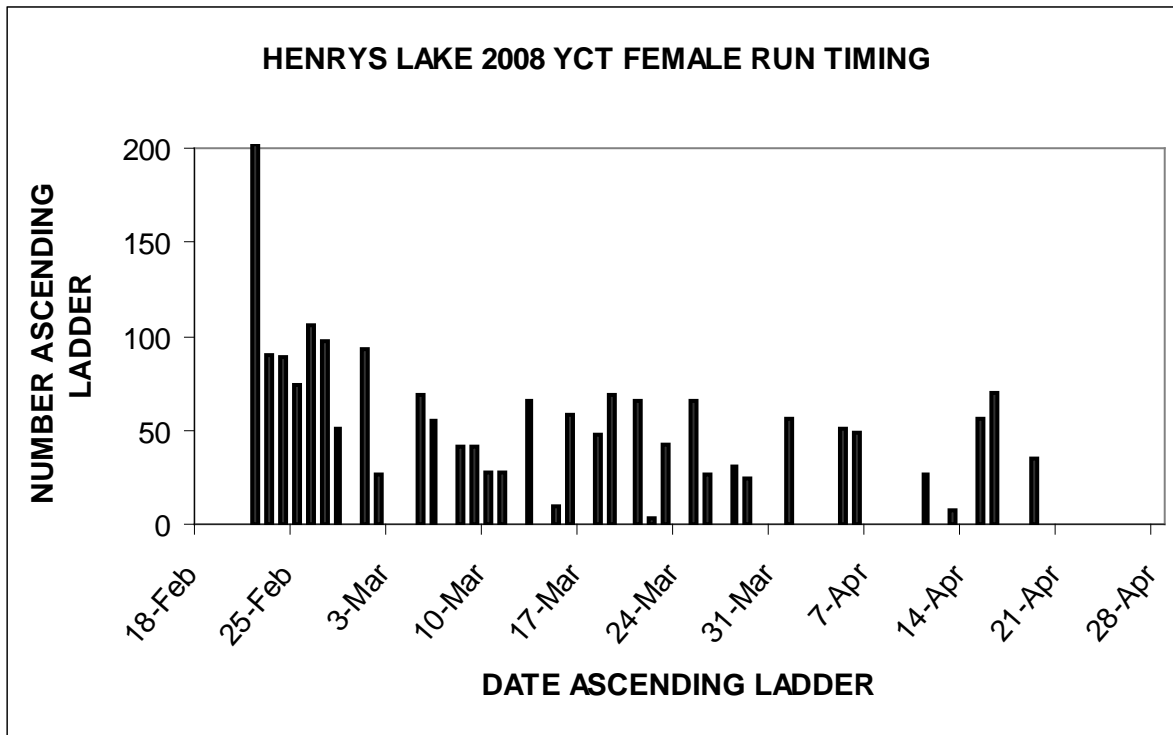


Figure 2. Henrys Lake 2008 Run Timing of Female Yellowstone Cutthroat Trout.

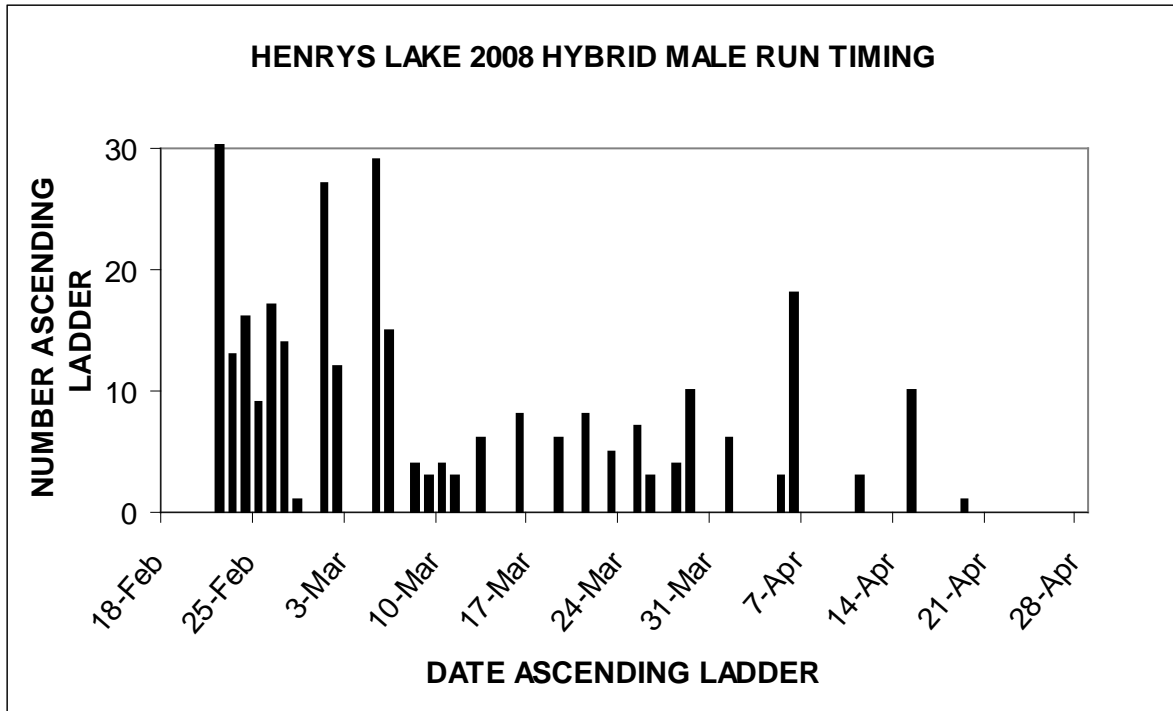


Figure 3. Henrys Lake 2008 Run Timing of Male Hybrid Trout.

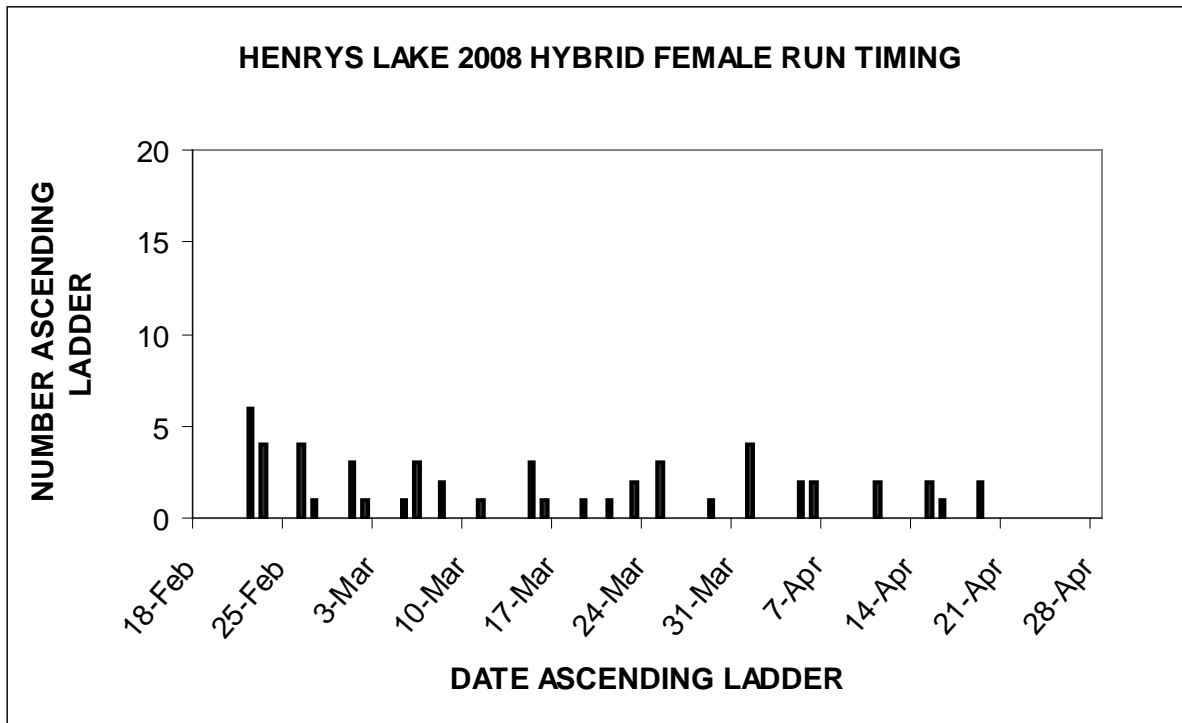


Figure 4. Henrys Lake 2008 Run Timing of Female Hybrid Trout.

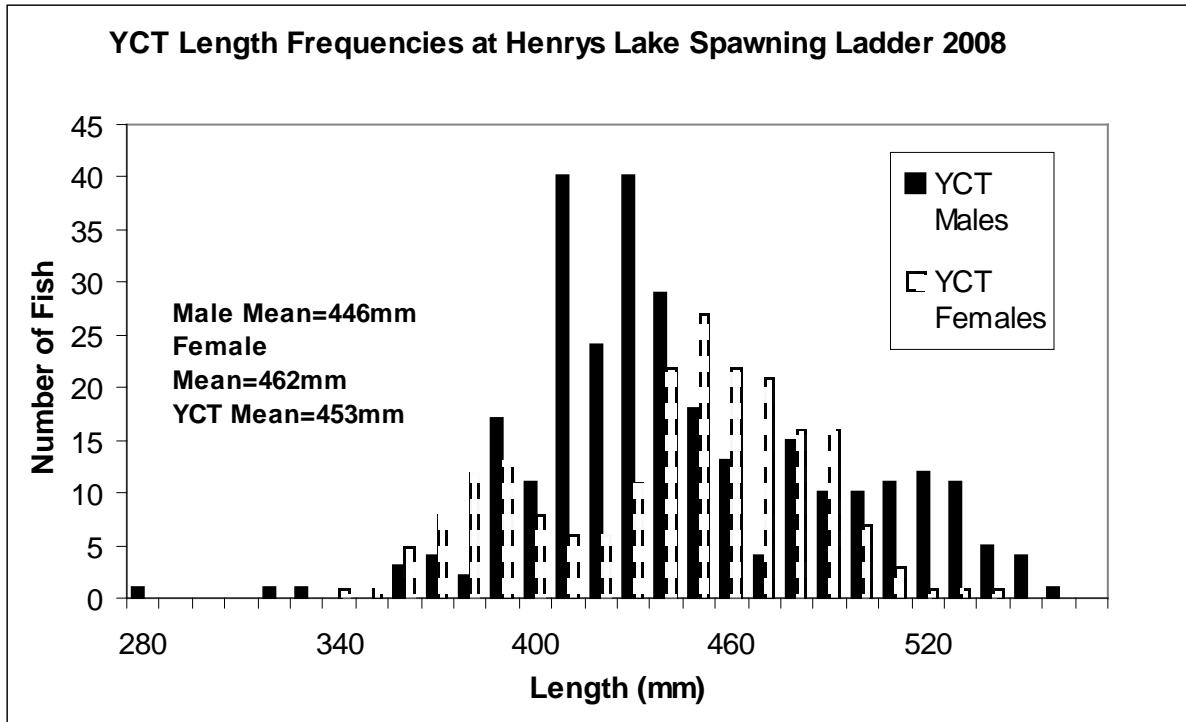


Figure 5. Henrys Lake 2008 Length Frequencies of YCT Spawning Run.

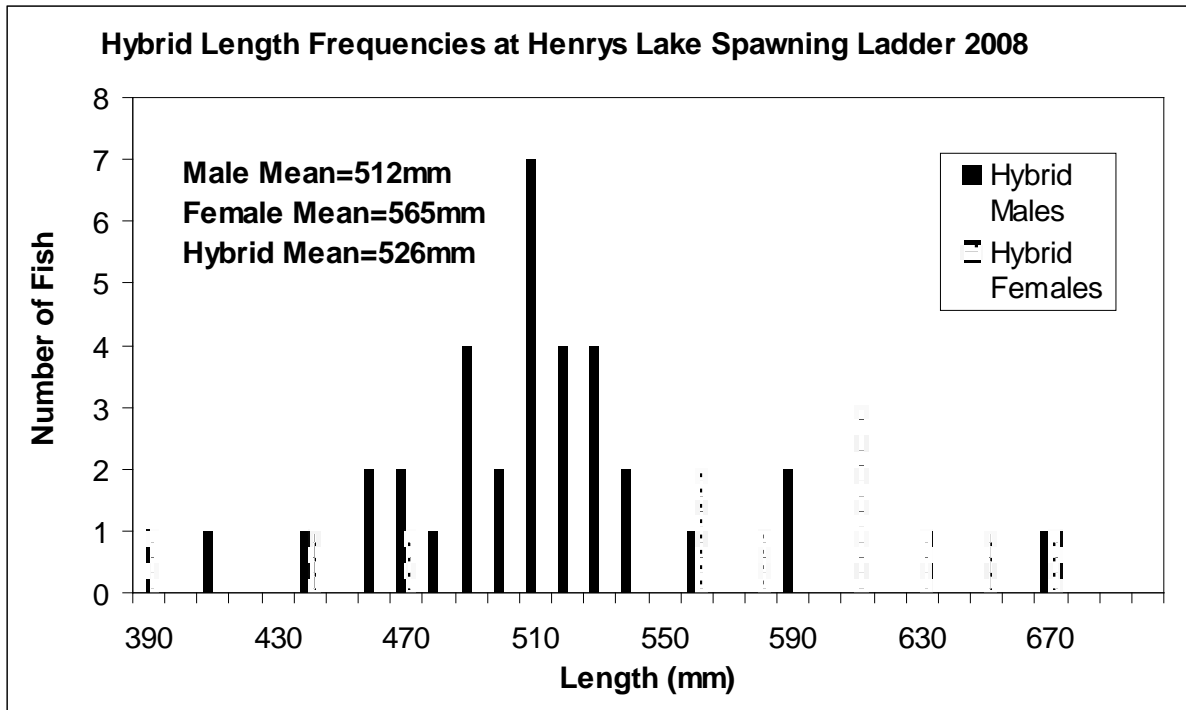


Figure 6. Henrys Lake 2008 Length Frequencies of Hybrid Trout Run.

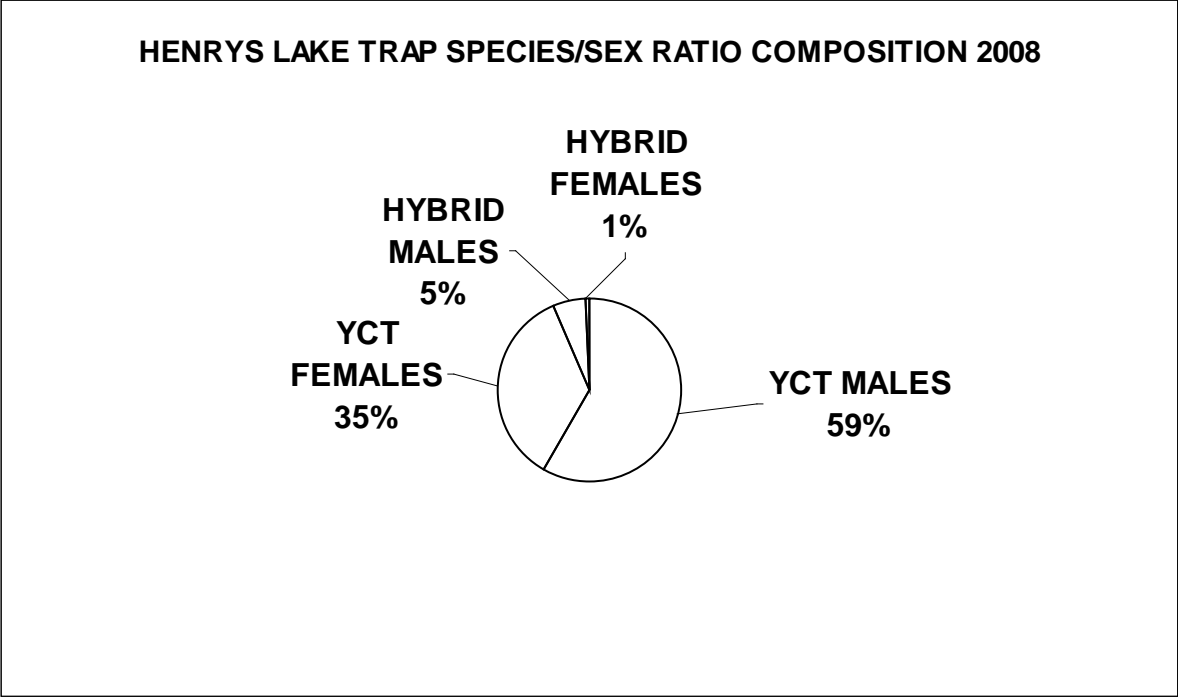


Figure 7. Henrys Lake Trap Species/Sex Ratio Composition 2008.

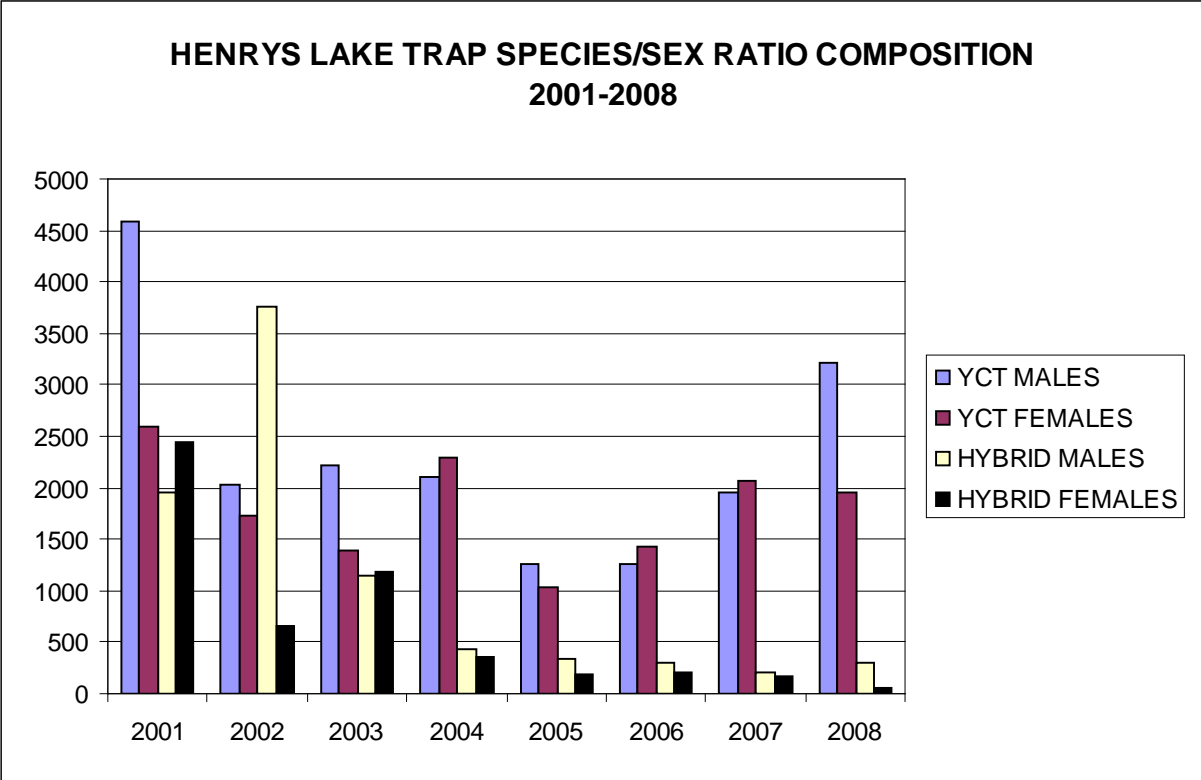


Figure 8. Henrys Lake Trap Historical Species/Sex Ratio Composition 2001-2008.

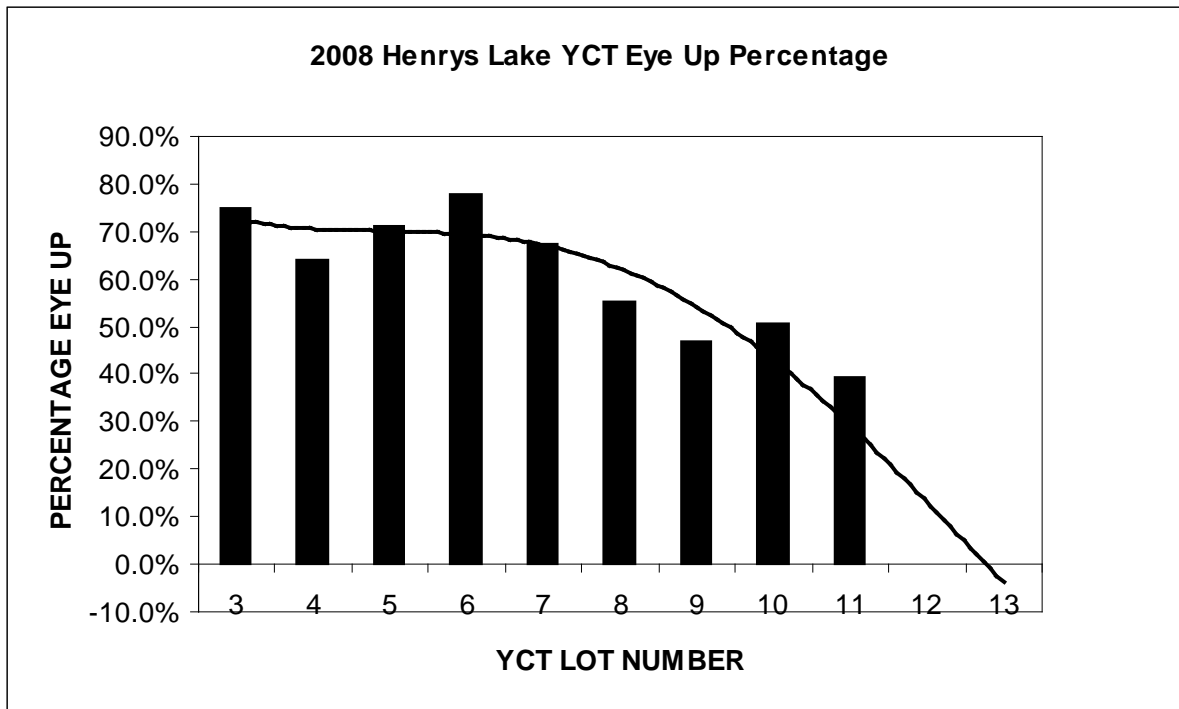


Figure 9. Henrys Lake YCT Eye-Up Percentages By Lot Number.

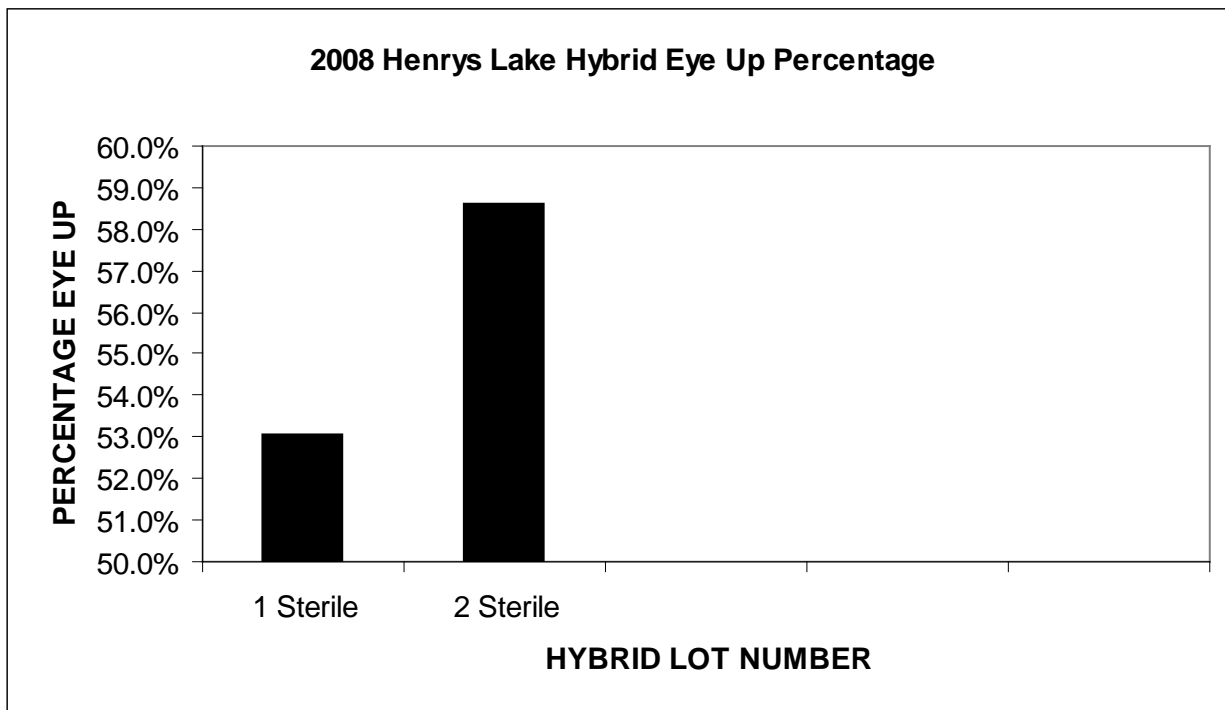


Figure 10. Henrys Lake Hybrid Eye-Up Percentages by Lot Number.

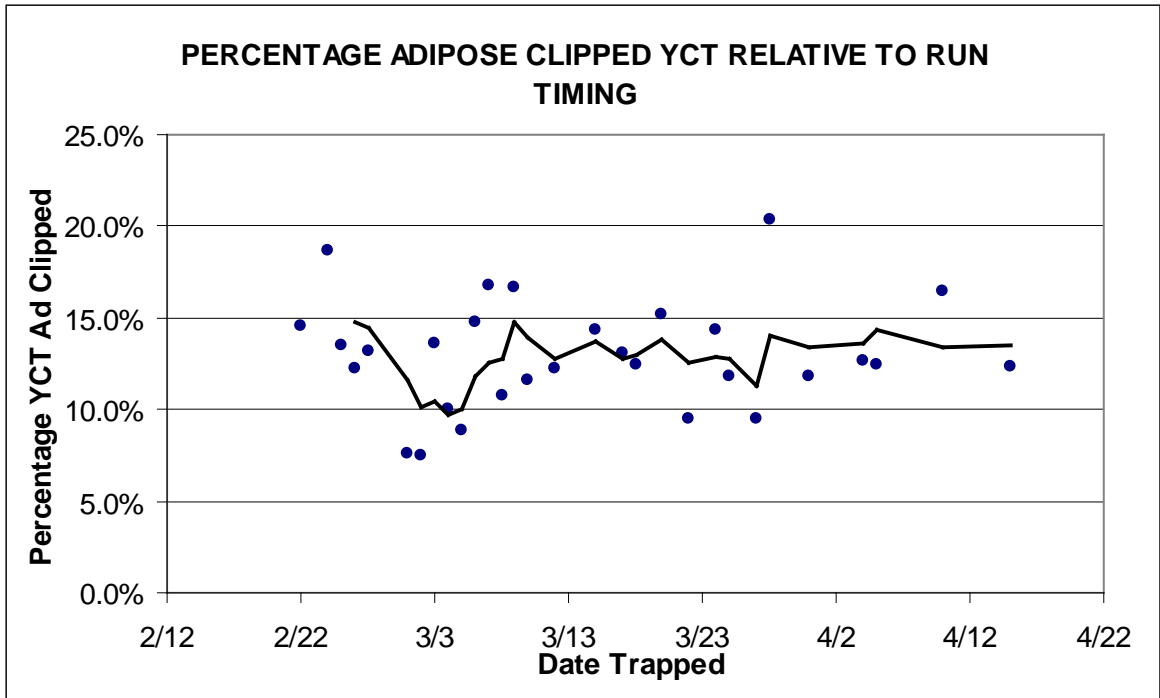


Figure 11. Henrys Lake Adipose Clipped Yellowstone Cutthroat Run Timing.

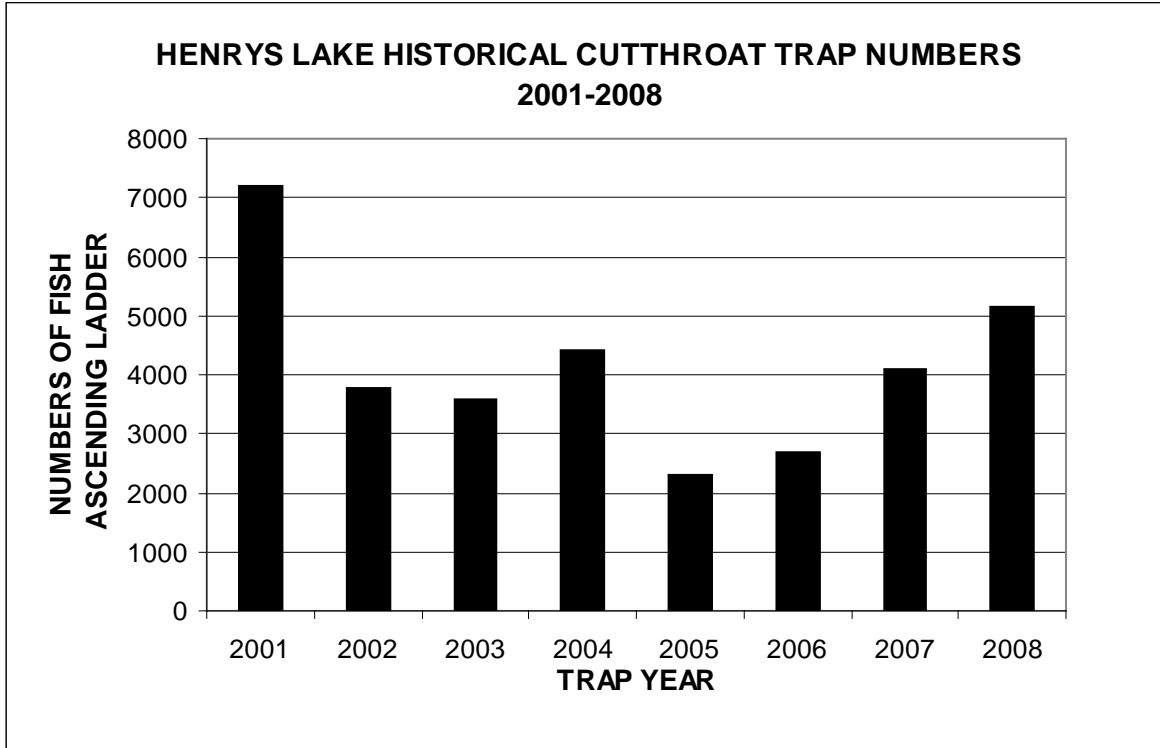


Figure 12. Henrys Lake Cutthroat Run Numbers 2001-2008.

MACKAY FISH HATCHERY

Patrick M. Moore, Fish Hatchery Manager I
Robert M. Hoover, Assistant Fish Hatchery Manager
Jason M. Jones, Fish Culturist

INTRODUCTION

The Mackay Fish Hatchery (MFH) is located approximately 15 miles north of Mackay, in Custer County, Idaho. The hatchery produces fish of various species and strains, from 1 to 12 inches in length, for statewide distribution. Funding comes from state license monies for operational and personnel cost.

The hatchery is staffed with three full-time and two year round part-time Idaho Department of Fish and Game (IDFG) employees. MFH 2009 fiscal year budget is \$280,487. Wages, including benefits, are \$201,167 for all personnel. The operating budget for fiscal year 2009 is \$79,320, a reduction of \$10,000 from fiscal 2008. Actual expenditures for calendar year 2008 are used for production cost calculations (Appendix 1). This year's fish production included five species and six strains (Appendix 2).

Rainbow trout *Oncorhynchus mykiss*
Troutlodge triploid (Sumner, WA)

Yellowstone cutthroat trout *Oncorhynchus clarkii*
Henrys Lake (Island Park, ID - Henrys Lake SFH)
Snake River Fine Spot (Jackson, WY - Jackson NFH)

Rainbow x cutthroat triploid hybrids
Hayspur rainbow male x Henrys Lake cutthroat female

Kokanee salmon *Oncorhynchus nerka*
Early (Deadwood Reservoir, ID)

Golden trout *Oncorhynchus mykiss aquabonita*
California (Mt. Whitney SFH, CA)

WATER SUPPLY

The hatchery's water comes from artesian springs on the hatchery grounds. The spring flows are collected in six distribution boxes that provide water to the raceways and hatchery building. Following the earthquake in 1983 the spring areas were dug out and filled with cobblestone to eliminate any standing water. The available volume of water for hatchery production ranges from 18 CFS during the early months of the year to 23 CFS during the summer months. The temperatures of the springs are 50°F, 52°F, and 54°F. Egg incubation temperature is 52°F.

HATCHERY IMPROVEMENTS

No capital projects were completed nor were any new vehicles or equipment acquired in 2008. MFH staff continues to keep up the hatchery grounds, buildings, and equipment.

FISH STOCKED

Fingerlings were planted in four regions across the state. These put-grow-and-take fish numbered 2,639,182 and weighed 32,525 pounds (Appendix 2).

Catchable rainbow trout were stocked in the Upper Snake and Salmon regions. These put-and-take fish numbered 66,067 and weighed 30,755 pounds (Appendix 2).

Catchable Snake River Fine Spot cutthroat trout were stocked in the Upper Snake region. These put-and-take fish numbered 23,246 and weighed 12,122 pounds (Appendix 2).

Fingerling Golden trout (9,055), Henrys Lake cutthroat (14,294), and Troutlodge triploid rainbow (1,726) were stocked in 26 mountain lakes. Stocking methods included fixed wing aircraft, ATVs, horse, llama, and backpacking.

FISH TRANSFERS

MFH transferred 10,000 catchable rainbows weighing 2,700 pounds to Grace Fish Hatchery March 20. MFH transferred 4,200 catchable rainbows weighing 1,500 pounds to Hayspur Fish Hatchery April 30. MFH received 6,800 catchable rainbows weighing 2,060 pounds on August 20 from Nampa Fish Hatchery (NFH).

TRANSPORT COSTS

The three fish transport trucks assigned to MFH made 76 separate stocking trips during the year. Fish from MFH were planted by truck into 29 different bodies of water. Hatchery personnel traveled 17,018 miles for an average of 224 miles per trip. The fleet rental charges for FY08 were \$355.55/month and 64.0 cents/mile for each of the 2-ton trucks. Fleet rental for the 1-ton truck is \$147.48/month and 40 cents/mile. The fleet rental charges for FY09 are \$421.96/month and 85 cents/mile for each of the 2-ton trucks. Fleet rental for the 1-ton truck is \$158.93/month and 39 cents/mile. MFH fish transport cost totaled \$20,560 for 2008.

The fish transport tanker trucks from NFH made 7 trips to 4 different waters, traveling 3,436 miles for MFH during the year. The cost for the use of the two tankers were \$13,008 bringing our total fish transportation cost to \$33,568.

FISH FEED

A total of 71,126 pounds of feed provided by Rangen, Inc. was fed during the year. This feed cost \$41,077, including shipping charges and fuel surcharges (Appendix 3). Conversions ranged from a low of 0.77 for the 2008 Troutlodge rainbow and to a high of 1.37 for the 2006

Snake River Fine Spot cutthroat. The average conversion for all lots of fish reared at MFH during the year was 1.02 (Appendix 3).

FISH MARKING

Adipose fins were clipped on 130,780 Henrys Lake cutthroat trout during the third week of August 2008. This represents approximately 10% of the Henrys Lake cutthroat planted into the lake. Natividad Wilson and her crew administered these clips.

FISH HEALTH SUMMARY

The 2008 Deadwood Kokanee are doing well up to this point, with one minor exception. In one shipment of eggs received, half of the eggs had been taken the night before shipment and the other half were taken the morning of the flight. The eggs that were held overnight had less than fifty percent survive to the eyed stage. The other half of the shipment achieved greater than seventy percent eye up.

The Snake River Fine Spot cutthroat eggs received from Jackson National Fish Hatchery were of very poor quality. After the eggs hatch and the fry start feeding they survive well.

The Henrys Lake cutthroat and the Triploid Hybrids have a history of Cold Water Disease (CWD) at MFH. A Veterinary Feed Directive was administered in 2008 to reduce mortalities caused by CWD. Aquaflor (Florfenicol) was used in May in early rearing to treat the Henrys Lake cutthroat and the Triploid Hybrid fry. They responded very well to the treatment and did not exhibit any signs of CWD.

PUBLIC RELATIONS

More than 500 people toured the hatchery during the year. Most of these visitors came to fish the diversion pond below the hatchery during the Memorial Day Holiday and free fishing day. Signs are posted suggesting the pond be for youth fishing only and most people complied. Scheduled tours were given to the following groups: three tours affiliated with the Idaho Museum of Natural History, a YCC group, the Mackay High School aquaculture class, and the first grade class from Arco Elementary School. Hatchery employees also participate in the *Adopt a Highway* program by clearing the litter from 6 miles of Highway 93 biannually. MFH provided 1000 rainbow fingerlings to the Mackay High School aquaculture program and 25 Henrys Lake Cutthroat fingerlings to region 5 for a trout in the classroom program.

ACKNOWLEDGEMENTS

MFH would like to thank Steve England, John Lambert, and Robert Nash, bio-aides throughout the year, for their very important contribution to the hatchery's accomplishments. Their work enables the hatchery to produce an excellent quality product for the angler.

APPENDICES

Appendix 1. Mackay Fish Hatchery Production and Costs Summary, 2008.

Pounds of fish stocked, 2008 =	75,402
Pounds of fish on station, 12/31/2008 =	28,608
Total pounds of fish on Site for 2008 =	104,010
Pounds of fish on hand, 12/31/2007 =	26,658
Net pounds of fish produced, 2007 =	77,352
Production Costs	
6 months FY 2008 budget	
personnel =	\$99,708
operating =	\$56,295
total	\$156,003
6 months FY 2009 budget	
personnel =	\$98,212
operating =	\$38,586
total	\$136,797
TOTAL 2008 costs =	\$292,800

Appendix 2. Mackay Fish Hatchery stocking summary, 2008.

Species/Strain	Lot	Number Planted	Pounds Planted	Size at Release
Yellowstone cutthroat-Snake River Fine spot	06-WY-C4	23,246	12,122	catchable
Yellowstone cutthroat-Snake River Fine spot	07-WY-C4	97,987	4,425	fingerling
Yellowstone cutthroat-Henrys Lake	08-ID-C3	1,268,725	11,735	fingerling
Rainbow x Cutthroat Triploid hybrid	08-ID-TH	195,470	2,375	fingerling
Triploid rainbow - Troutlodge	06-WA-TT	4,916	3,700	catchable
Triploid rainbow - Troutlodge	07-WA-TT	61,151	27,055	catchable
Triploid rainbow - Troutlodge	08-WA-TT	20,771	761	fingerling
Early spawner kokanee-Deadwood Reservoir	07-ID-KE	1,047,175	13,223	fingerling
California Golden MT. Whitney, CA	08-CA-GN	9,054	6	fingerling
Total Fish Stocked, 2008				
	Number of Fish	Pounds of Fish		
Fingerlings	2,639,182	32,525		
Rainbow catchables	66,067	30,755		
Cutthroat catchables	23,246	12,122		
Total	2,728,495	75,402		

Appendix 3. Feed used and feed conversions at Mackay Fish Hatchery, 2008.

Rangen Feeds	Cost / pound	Pounds used	Cost
TSS # 0	\$0.761	700	\$532.88
TSS # 0 Aquaflor	\$1.170	400	\$467.80
TSS # 1	\$0.760	4,250	\$3,229.29
TSS # 2	\$0.749	9,526	\$7,131.80
#3 Grower	\$0.510	9,100	\$4,641.00
1/8" Grower	\$0.479	1,400	\$670.60
3/32" 450 sink	\$0.514	8,250	\$4,237.20
5/32" 450 sink	\$0.463	37,500	\$17,375.00
Shipping/freight			\$2,791.59
Totals		71,126	\$41,077.16

Feed conversions	
Stock	Conversion
08-C3	0.82
06-C4	1.37
07-C4	0.95
08-C4	1.26
07-KE	1.31
06-TT	0.93
07-TT	0.97
08-TT	0.77
08-TH	0.77
AVERAGE	1.02

Appendix 4. Eggs Received at Mackay Fish Hatchery, 2008.

Date	Species	Lot Number	Strain	Green Eggs	Eyed Eggs
03/27/08	Rainbow	08-WA-TT-1	Troutlodge triploid	N/A	154,025
TOTAL					154,025
04/01/08	C3XKT	08-TH-1	Henrys Lk/triploid Kam. Cross	N/A	257,825
04/01/08	C3XKT	08-TH-2	Henrys Lk/triploid Kam. Cross	N/A	82,816
TOTAL					340,641
04/08/08	Cutthroat	08-C3-03	Yellowstone (Henrys Lk.)	N/A	382,258
04/08/08	Cutthroat	08-C3-04	Yellowstone (Henrys Lk.)	N/A	232,258
04/14/08	Cutthroat	08-C3-05	Yellowstone (Henrys Lk.)	N/A	186,207
04/14/08	Cutthroat	08-C3-06	Yellowstone (Henrys Lk.)	N/A	182,264
04/22/08	Cutthroat	08-C3-07	Yellowstone (Henrys Lk.)	N/A	168,548
04/22/08	Cutthroat	08-C3-08	Yellowstone (Henrys Lk.)	N/A	159,677
05/02/08	Cutthroat	08-C3-09	Yellowstone (Henrys Lk.)	N/A	66,666
05/02/08	Cutthroat	08-C3-10	Yellowstone (Henrys Lk.)	N/A	263,332
05/15/08	Cutthroat	08-C3-11	Yellowstone (Henrys Lk.)	N/A	146,774
TOTAL					1,787,984
06/27/08	Cutthroat	08-WY-C4-1	Yellowstone (Fine Spot)	N/A	123,074
07/02/08	Cutthroat	08-WY-C4-2	Yellowstone (Fine Spot)	N/A	93,000
TOTAL					216,074
08/28/08	Kokanee	08-KE-1	Deadwood	429,415	303,125
08/31/08	Kokanee	08-KE-2	Deadwood	435,757	315,148
09/02/08	Kokanee	08-KE-3	Deadwood	497,143	361,617
09/10/08	Kokanee	08-KE-6	Deadwood	663,912	401,402
09/17/08	Kokanee	08-KE-8	Deadwood	118,055	81,947
TOTAL				2,144,282	1,463,239

Appendix 5. Mackay Fish Hatchery Cost Summary

Put and Take Number	89,313
Put and Take Pounds	42,877
Put, Grow & Take Number	2,630,134
Put, Grow and Take Pounds	41,573
Fish/lb Average	32.2
Total Pounds of Feed	71,126
Feed Cost	\$41,077
AVG Length in Inches	4.0
Total Cost *	\$292,800
Cost per 1,000 Fish Stocked	\$107.67
Cost per Pound of Fish Stocked	\$3.47

* Total Cost includes permanent & temporary employee wages and benefits, and 2008 operating budget expenditures.

Appendix 6. Fish on Hand December 31, 2008.

Stock	Fish Numbers	Pounds	Avg. Length
07-TT	1,750	921	10.96
07-C4	28,819	7,584	9.10
08-TT	109,214	18,511	7.51
08-C4	146,606	1,173	2.71
08-KE	1,200,000	N/A	N/A

Appendix 7. Feed Purchased in 2008.

Pounds	Size	Cost/lb	Total Cost	Pounds	Size	Cost/lb	Total Cost			
200	TSS#0	0.757	\$151.40	1400	1/8 Grower	0.479	\$670.60			
750	TSS#0	0.7655	\$574.13							
		\$0.00	850					3/32 Grower	0.525	\$446.25
		\$0.00	2500					3/32 Grower	0.468	\$1,170.00
		\$0.00	1000					3/32 Grower	0.525	\$525.00
950	0.7613	\$725.53	2250					3/32 Grower	0.525	\$1,181.25
			1650					3/32 Grower	0.525	\$866.25
1750	TSS#1	0.757	\$1,324.75					8250	0.5136	\$3,742.50
750	TSS#1	0.757	\$567.75							
1750	TSS#1	0.7655	\$1,339.63							
		\$0.00		0	2.5mm Grower	0.457	\$0.00			
		\$0.00								
		\$0.00								
4250	0.7598	\$3,232.13		10000	5/32 Grower	0.432	\$4,320.00			
				10000	5/32 Grower	0.432	\$4,320.00			
4500	TSS#2	0.69	\$3,105.00	10000	5/32 Grower	0.479	\$4,790.00			
5000	TSS#2	0.757	\$3,785.00	5000	5/32 Grower	0.479	\$2,395.00			
3500	TSS#2	0.757	\$2,649.50	2500	5/32 Grower	0.479	\$1,197.50			
500	TSS#2	0.757	\$378.50	10000	5/32 Grower	0.479	\$4,790.00			
250	TSS#2	0.7655	\$191.38	47500	0.4633	\$21,812.50				
2500	TSS#2	0.7655	\$1,913.75							
		\$0.00								
		\$0.00		400	#0 Aquaflo	1.1695	\$467.80			
16250	0.7487	\$12,023.13								
1000	#3 Grower	0.474	\$474.00							
5000	#3 Grower	0.528	\$2,640.00							
4750	#3 Grower	0.528	\$2,508.00							
0	#3 Grower		\$0.00							
0	#3 Grower		\$0.00							
10750	0.51	\$5,622.00		Totals for 2008		Pounds	Cost	cost+ship		
freight						89750	\$48,296.18	\$51,087.77		
			\$371.30	fuel surcharge			\$89.11			
			\$348.80				\$83.71			
			\$357.55				\$107.27			
			\$355.80				\$138.76			
			\$363.80				\$149.16			
			\$361.30				\$65.03			
			\$2,158.55				\$633.04			

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 U.S. Army Corps of Engineers in 1979. The primary objective for MCFH is to produce one million summer chinook salmon *Oncorhynchus tshawytscha* smolts annually. Anadromous funding is provided through the Lower Snake River Compensation Program (LSRCP). Secondary hatchery objectives pertain to resident programs. Resident fisheries program activities are financially supported through Idaho Department of Fish and Game (IDFG) 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 IDFG license sales revenue and provides for 5-months of assistant fish hatchery manager and 6-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 provides limited water temperature control through mixing. The surface intake is located at Lardo Dam at the outlet of Payette Lake. The subsurface intake extends approximately ¼-mile into Payette Lake at a depth of 50 feet. A 2-foot diameter constriction in the 3-foot diameter mainline limits maximum flow capacity to 20 cubic feet per second (cfs).

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

Major resident program objectives

- Hatch and rear westslope cutthroat trout *O. Clarkii lewisi*, domestic kamloop rainbow trout *O. Mykiss*, golden trout *O. Aquabonita* and rear grayling *Thymallus arcticus* fry for stocking into mountain lakes in the Panhandle, Clearwater, and Southwest 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

Waters located in Regions 1, 2, 3B and 3M received 192,980 from MCFH in 2008. Fry available for out-plants included westslope cutthroat trout, sterile rainbow trout, and golden trout (Appendix 1.). A total of 234 lakes, that are a part of the mountain lake stocking program, received 192,020 fry. Two additional locations received 960 fry that were available and in excess of program needs. No arctic grayling were available for stocking. The total number of lakes stocked included make-ups for the lack of westslope cutthroat trout experienced in 2007.

Fourteen fixed-wing fish stocking flights were flown during the period of August 5 through September 27. Fry numbering 170,070 were out-planted into 215 lakes with 5 of these lakes stocked on separate occasions to meet request. In doing so, approximately 4,430 air miles were covered at a flight cost of \$14,940.00. The average cost, based on flight time, to stock a mountain lake out of MCFH in 2008 was \$67.91 and ranged from \$54.26 to \$360.00 for individual Regions. Volunteers backpacked 22,860 fry into 20 lakes (2 lakes received separate species) in the McCall area. It is estimated that these efforts saved the IDFG \$1,085 in comparable flight time costs. The Morrison Knudsen Nature Center received 50 westslope cutthroat trout to place on display for educational purposes.

Skretting BioVita Starter #0 feed was used throughout the rearing period with good results. A total of 29.0 pounds of feed was fed resulting in a conversion of 0.60 (Appendix 2.). Total feed cost for resident fry was \$42.92 and averaged \$0.21 per 1,000 fish stocked.

An additional 16 lakes in the Southwest (3B) Region were stocked out of Sawtooth FH with 14,050 fry to fulfill make-up westslope cutthroat trout requests that MCFH would not have otherwise been able to complete.

Golden Trout fry, numbering 9,460, were transferred to Mackay FH on September 8.

Catchable Rainbow Trout Redistribution

A total of 105,445 sterile TroutLodge rainbow trout triploids were stocked into 39 water-bodies in the McCall vicinity during the period of May 13th to September 22nd. Rainbow trout, reported as numbering 104,316, were reared at Nampa FH then transferred to MCFH. The discrepancy between what Nampa FH reported delivering versus MCFH out-plants plus holding mortality was 1,534 fish, or 1.47%, and likely derived from errors in loading weights and sample counts throughout the redistribution period at MCFH.

Transportation costs to bring catchable size rainbow trout from Nampa FH totaled \$4,148 with 1,112 miles driven by Transport Operators. Hatchery personnel drove 4,564 miles on 108 stocking trips to complete requests at an approximate transportation cost of \$5,303. To maximize efficiency, multiple sites were stocked on 20 occasions eliminating the need to make additional stocking trips. The combined transport redistribution cost was \$89.63 for each 1,000 fish stocked (Appendix 3.). To maintain the condition of fish, while at MCFH, 880 pounds of BioDry-1000 LP feed was used to provide intermittent feeding at a cost of \$978.00.

Payette Lake Net Pens

Two net pens (20' x 20' x 17' each) are utilized to provide for continued rearing of catchable size rainbow trout during the summer months at Brown's Park. All fish rearing activities are directed by the McCall sub-Regional Fishery Management Staff.

Rainbow trout, numbering 6,000, were placed into the nets on June 11th at a size of 3.40 fpp (9.44 inch TL) and an estimated release of 5,950 occurred on August 14th at a size of 2.20 fpp (10.40 inch TL). During the 64-day rearing period, fish were fed 1,892 pounds of BioDry-1000 LP feed at a cost of \$2,026. This resulted in an overall feed conversion of 2.01 in 2008. Rainbow trout realized a growth rate of 0.46 inch per month. Feeding was primarily done at night using a Sweeney Brand automated feeder that broadcast feed into the pens. A coin operated "gum-ball" machine, set up near the pens, was installed to allow visitors the opportunity to feed fish during the day if they wished. Fish rearing activities were curtailed early this year due to vandalism of the automatic feeder.

Special Projects

No special projects were undertaken on part of the resident program at MCFH during 2008.

Hatchery Improvements/ Needs

Seven new 8-tray Vertical Heath Stack Incubators were purchased with Resident funds (FY08 budget) and were used to incubate resident trout eggs in 2008. This was a much needed improvement that replaced 20+ year-old trays that were showing their wear. Resident funds were used to build a deck onto MCFH Hatchery Residence #3 during the spring of 2008.

Public Relations

Fish stocking opportunities were provided to several groups of volunteers who backpacked 22,860 fry into 20 mountain lakes in the McCall area; saving the Department approximately \$1,085 in comparable flight time costs. Hatchery personnel participated in Free Fishing Day events held at Council Park Pond and Kimberland Meadows Pond. Numerous hatchery tours were given to visitors and several school groups throughout the summer.

ACKNOWLEDGEMENTS

Resident program activities were completed with the support and cooperation of the entire staff at McCall Summer Chinook Hatchery. I wish to thank Gene McPherson, MCFH Hatchery Manager II, for his ongoing advice, support and for making available seasonal employees who were utilized on resident program endeavors. Individuals assisting on resident program activities in 2008 include: Joel Patterson, MCFH Fish Culturist, and seasonal bio-aides Justin Herold, Matt Hersel, Nick McConnell, Jerek Richardson, Nikki Sauerland, Tony Folsom and Matt Watterson.

APPENDICES

Appendix 1. Fry redistribution by Region, MCFH, 2008.

Species	Panhandle	Clearwater	Southwest (3B)	Southwest (3M)	Total Stocked
Westslope Cutthroat Trout (Westslope Cutthroat Trout Co – C2)	-	44,000	26,790	60,650	131,440
Rainbow Trout Triploid (Trout Lodge – TT)	900	6,410	10,250	24,150	41,710
Golden Trout (Mt Whitney FH, CA – GN)	5,300	-	7,000	7,530	19,830 ^a
Total	6,200	50,410	44,040	92,330	192,980
# Lakes Stocked by Plane	5	73	60	82	220 ^b
# Lakes Stocked by Other Means	-	1	1	21 ^c	23 ^c
Total Lakes Stocked	5	74	61	103	243
Approximate Flight Costs	\$ 1,800	\$ 4,508	\$ 4,183	\$ 4,449	\$ 14,940
Average Cost to Stock Each Lake by Plane	\$ 360.00	\$ 61.75	\$ 69.72	\$ 54.26	\$ 67.91

^a An additional 9,460 golden trout fry were transferred to Mackay FH.

^b Five lakes were stocked on two occasions to complete request, 3 lakes in Region 3B and 2 lakes in Region 3M.

^c Two lakes in Region 3M were stocked with separate species to complete request.

Appendix 2. Resident feed usage and conversion data, MCFH, 2008.

Species	# Stocked/ Transferred	Feed Used (lb)	Pounds Gained	Conversion	Cost per Lb Gain	Cost per 1000 fish	Total Feed Cost
Westslope Cutthroat Trout (Westslope Cutthroat Trout Co – C2)	131,440	17.3	26.33	0.66	\$ 0.97	\$ 0.19	\$ 25.60
Rainbow Trout Triploid (Trout Lodge – TT)	41,710	8.5	18.31	0.46	\$ 0.69	\$ 0.30	\$ 12.58
Golden Trout (Mt Whitney FH, CA – GN)	29,290 ^a	3.2	3.39	0.94	\$ 1.40	\$ 0.16	\$ 4.74
Fry Total	202,440	29.0	48.03	0.60	\$ 0.89	\$ 0.21	\$ 42.92
Rainbow Trout Triploid (Trout Lodge – TT) Payette Lake Net Pens	5,950	1,892	940	2.01	\$ 2.16	\$ 340.46	\$ 2,025.76

^a Includes 9,460 golden trout fry transferred to Mackay FH.

Appendix 3. Production and distribution costs, MCFH, 2008.

Species	Eggs/ fish Received	Stocked/ Transfer	Transportation Cost	Pounds Gained	Cost per LB Gained	Cost per 1000 Stocked
Fry Redistribution ^a						
Westslope Cutthroat Trout (Westslope Cutthroat Trout Co – C2)	210,300	131,440	\$ 9,964	26.33	\$ 378.86	\$ 75.81
Rainbow Trout Triploid (Trout Lodge – TT)	45,500	41,710	\$ 2,813	18.31	\$ 153.72	\$ 67.44
Golden Trout (Mt Whitney FH, CA – GN)	35,500	19,830	\$ 2,163	0.74	\$ 2,922.97	\$ 109.08
Fry Redistribution Total	291,300	192,980	\$ 14,940	45.38	\$ 329.22	\$ 77.42
Note: ^a Breakdown based on \$14,940 flight redistribution costs. Fry stocked by volunteers, or as excess, are included at no cost.						
Fry Transfers						
Golden Trout (Mt Whitney FH, CA – GN)	-	9,460 ^c	-	2.65	-	-
^c Transferred to Mackay FH.						
Catchable Rainbow Trout Redistribution						
Trout Lodge Rbt Triploid (Reared at Nampa FH)	104,316	105,445	\$ 9,451 ^b			\$ 89.63
Note: ^b Based on transportation costs of \$ 9,451 (\$ 5,303 MCFH and \$ 4,148 Nampa FH).						
Grand Total	395,616	298,425	-	45.38	\$1,916.99	\$ 291.51

Note: Grand total cost is based on the average resident program budget of \$ 86,993; no capital outlay money is included.

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, Idaho. 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 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 2008, were also involved with the Kokanee spawning operation at Granite Creek.

HATCHERY IMPROVEMENTS

Hatchery improvements during 2008 included:

- All of the windows on the East side of the hatchery building were replaced. This was funded by the IDFG, Shoshone County and the Shoshone County Sportsman Club.
- A new domestic water system was installed. This was funded by Hecla Mining Corp. and the Shoshone County Sportsman Club.
- The small shop and half of the main hatchery building were painted.

FISH STOCKED OR TRANSFERRED

A total of 35,004 rainbow trout, 3.5 fish/pound (nine-inches long), were released into 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 Hatcheries annual budget for 2008 was \$12,158. If employee wages of \$20,343 and transportation costs of \$6,222 for Nampa Hatchery to deliver fish to MUFH are included, the stream side cost for MUFH to redistribute fish was \$1.10/fish or \$3.87/pound stocked.

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 13,000 people touring the grounds in 2008. The hatchery also hosted the Silver Valley Good Samaritan RV rally. Many groups of local school children also toured the hatchery.

NAMPA FISH HATCHERY

Rick Alsager, Fish Hatchery Manager II
Bob Turik, Assistant Fish Hatchery Manager
Bob Becker, 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 2008 fish year, the NFH net fish production was 1,134,086 at a net weight of 236,116 pounds (Appendix 1). The net cost for rearing fish at the NFH from grow out through stocking was \$437,862 (Appendix 2). Fish transferred to other hatcheries are included in the total number and pounds produced. Kamloop and rainbow trout *Oncorhynchus mykiss* comprised 87.58% of the fish stocked or transferred from NFH. In addition, Lahontan cutthroat trout *O. clarkii henshawi* were produced at NFH during 2008 (Appendix 3). Another 350 fish weighing 120 pounds were produced at NFH and given to schools for educational purposes and department personnel for various research programs. A total of 2,339,943 eyed-eggs were received during the 2008 fish year (Appendix 4).

From December 2006 to February 2007, Nampa Hatchery lost 250,000 fish due to an *Ichthyophthirius multifiliis* (Ich) outbreak. Ich was again diagnosed in 2008 but with quick detection and treatment with formalin, no elevated mortalities resulted.

In September, NFH received 44,880 Hayspur triploid fingerlings weighing 55 pounds from Sandpoint Hatchery. These fish were sent to Sandpoint Hatchery as eyed eggs to slow down their development. This allows 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 1,578,226 fish, weighing 249,975 pounds, during the 2008 fish year. These fish do not include warm water transfers and fish reared in non-IDFG hatcheries to waters in Idaho. NFH made 195 stocking trips to 280 planting waters during 2008.

NFH stocked or transferred a total of 185,844 fry (Appendix 5), 606,519 fingerlings (Appendix 6) and 785,863 catchables (Appendix 7), which are listed by species/strain in each table. A total of 404,370 catchables (Appendix 8) were transferred to six other hatcheries throughout the state.

FISH TRANSPORTATION

Fish transport operators (Gary Ady and Dick Bittick) stationed at NFH stocked waters in all seven regions throughout the state. They transported fish to and from 15 different state and federal fish hatcheries. The transport operators made 151 trips totaling 49,677 miles during 2008. The little down time the transport operators have is spent assisting the NFH staff in fish rearing and facility and equipment maintenance.

The NFH transport operators stocked 151,071 rainbow trout fingerlings weighing 5322 pounds from Lyons Ferry Fish Hatchery 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. NFH stocked Channel Catfish purchased from Fish Breeders of Idaho to lakes in the Panhandle, Clearwater and Southwest Regions.

In May, Dick and Gary went to Oxbow Fish Hatchery in Western Oregon operated by ODFW to transport ESA sockeye salmon fingerlings back to Redfish Lake. In November the transport operators assisted in transporting and stocking 1000 surplus A-run adult steelhead from Oxbow Fish Hatchery into the Boise River.

LAHONTAN CUTTHROAT TROUT

During 2008, NFH stocked 185,844 Lahontan Cutthroat trout (440.75 pounds) into lakes and reservoirs located in the Southwest. The Lahontan Cutthroat eggs were received from Omak Fish Hatchery in Washington. All of the Lahontan Cutthroat were stocked as fry (Appendix 5). Estimated survival from eyed-egg to stocking was 67.97%. Due to the 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 2008, no Fall Chinook were raised.

FISH FEED

A total of 223,537 pounds of feed was fed during 2008 at a cost of \$111,223.24 (Appendix 9). The average cost per pound of feed was 46.96 cents. Rangen's Inc. made up 98.82% of the feed purchased by weight. An additional 2640 pounds of feed was received from other hatcheries and fed throughout the year. The overall feed conversion was 0.95 pounds of feed fed to produce one pound of fish.

Rangen's continues to carry the feed contract and is used throughout the rearing cycle. The use of Skretting feed was curtailed because of supply problems. The Lahontan Cutthroat

were stocked as fry this year and were only on feed for approximately 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 egg-take goal for 2008 for Mackay was 2 million green eggs. Mackay had received 2,144,282 green eggs by September 17. Another 2,583,495 eggs were sent to Cabinet Gorge in 2008 before ending the spawning season. Percent eye up from Cabinet Gorge was 80.9% and the percent eye up from Mackay was 68.2%. We are trying to improve the eye up at Mackay Hatchery. This year we shipped the first three egg takes to Mackay which put them a little over half of their goal. At Mackay's request, we then shifted the egg shipments to Cabinet Gorge to allow Mackay to put a little more size on their fish before moving them. We shipped about 2 million eggs to Cabinet before shipping back to Mackay. We actually spawned two coolers of eggs the night before the September 10 egg take to increase the number of eggs shipped that day. This was done to try and reach Mackay's goal and save one flight. The coolers were refreshed with water every two hours throughout the night. Mackay reported the percent eye up on these coolers was only around 50% while the eggs spawned on the 10 was about 70%. The last spawn take was split and shipped to both Mackay and Cabinet Gorge.

Following the direction of Southwest Regional biologists no fish were intentionally released above the river weir for natural spawning. A total of 5 weirs were installed on 5 major tributaries of Deadwood reservoir. Trail Creek, South Fork Beaver Creek, Beaver Creek, Basin Creek, and of course the river weir were installed and operated by crews from the region and NFH. After the egg-take goal was reached, region 3 personnel maintained all 5 weirs for Bull trout monitoring through October 12. The NFH crew this year assisted regional personnel in walking Trail Creek and the other tributaries throughout the spawning season conducting adult spawning surveys.

The river weir was installed on August 13. The tributary weirs were also installed on August 13th. The first Kokanee was trapped on August 15 in the river weir. The weir was installed between Wild Buck Creek and Basin Creek this year essentially in the same spot as previous years. A second weir was then placed at the mouth of Basin Creek preventing fish from entering the creek. Region 3 personnel installed a downstream trap box on the river weir for Bull Trout monitoring.

There were a total of 10 spawn takes. The first spawn date was August 28. Due to the large numbers of Kokanee, no green females were held to ripen in live boxes. The last spawn date was on September 17. All fish were spawned at the trap site. A green egg yield of 4.72 million eggs was taken from 13,435 females with an average fecundity of 396 eggs/female (Appendix 11). The average total length of Kokanee females was 271 mm and the males averaged 279 mm (Appendix 12). Eggs were shipped to Mackay Hatchery and Cabinet Gorge Hatchery via fixed-wing aircraft. The shipping techniques were similar to those used in previous years. This year we had no significant high water events and never lost containment on the river.

Deadwood Reservoir continues to be a popular recreation spot during the Kokanee run. The Department again issued an emergency fishing closure to avoid conflicts with anglers near the weir and 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 reservoir. Information and no fishing signs were installed on both sides of the river from the weir down river every 100 yards to the mouth to inform the public about the fishing closure. This year, informational signs to explain the purpose of the weirs were attached to each weir.

HATCHERY IMPROVEMENTS

Several important improvements were implemented at NFH during 2008:

- Replaced "Take Me Fishing" signs on 1- ton transport trucks
- Replaced fishing platform next to settling pond with new one.
- Replaced hatchery fingerling transfer tank with one from Cabinet Gorge
- Repaired broken concrete keyways with bolted on angle iron.
- Dredged settling pond removing 1150 cubic yards of waste.
- Poured sidewalk and finished deck on residence #2.
- Repaired domestic water line to residences #2 & #3
- Modified chain link fence gates on Res #2 and A ponds.
- Rebuilt old generator trailer and modified into a utility trailer.

NFH improvements scheduled for 2009 include:

- Replace carpet and vinyl in office and dorm.
- Do informational pamphlets for hatchery.
- Acquire a camp trailer for kokanee spawning project.

PUBLIC RELATIONS

As in past years, NFH was a focal point for many visitors, tours, and special groups. In 2008, an estimated 2950 tourists visited the NFH. Most visitations came through the late spring and summer months although year around school and educational tours were scheduled throughout the spring, summer, and fall. A total of 53-guided tours were given to area school, church, and Boy Scout groups which included over 2500 visitors. Several disabled veterans groups were allowed to fish the settling pond four times during the summer months. The settling pond was also opened to fishing on Free Fishing Day. The NFH, with the help of regional

personnel, reservists, and the Nampa Recreation Department, hosted the Free Fishing Day clinic, which saw 500 visitors/fishermen, with an estimated 600 fish caught. The largest fish caught was a 3.5 pound rainbow trout and four more over three pounds were caught. Free Fishing Day at NFH was again a big success and will be continued in the future. The “kids only” session from 8:00 a.m. to noon continued 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 instances.

ACKNOWLEDGEMENTS

The NFH staff for 2008 included Rick Alsager, Fish Hatchery Manager II; Bob Turik, Assistant Fish Hatchery Manager; Bob Becker, Fish Culturist; Gary Ady and Dick Bittick, Fish Transport Operators. Bio-aides for 2008 included; Nick Gates, Mike Kren, Travis Balls, Luke Stock and Kyle Sandy. Chuck Kiester trained new NFH Deadwood staff and assisted with the kokanee spawning operation and fish marking. One high school student assisted hatchery personnel through a work-study program in 2008. Volunteers, community service, several kids from the juvenile detention center have also helped on a number of projects throughout the year donating over 154 hours of time.

APPENDICES

Appendix 1. Total net fish production at Nampa Fish Hatchery, 1994 through 2008.

Year	Put-and-Take		Put-grow-and-take		Total Number	Total Pounds	Feed		Feed Conversion
	Number	Pounds	Number	Pounds			Pounds	Costs	
1994	308,023	146,978	793,065	55,014	1,101,088	201,992	220,544	\$72,340	1.09
1995	567,147	193,309	783,722	42,336	1,350,869	235,645	261,589	\$76,793	1.11
1996	694,659	212,011	950,412	34,271	1,645,071	246,282	262,902	\$91,893	1.07
1997	556,718	188,208	693,859	19,006	1,250,577	207,214	240,140	\$94,502	1.12
1998	692,706	228,006	2,172,659	22,901	2,865,363	250,907	267,782	\$96,338	1.07
1999	1,077,110	336,841	348,962	26,677	1,426,072	363,518	345,288	\$112,003	0.95
2000	864,603	250,976	1,100,595	18,197	1,965,198	269,173	281,264	\$81,862	1.04
2001	754,641	241,435	1,197,489	15,513	1,952,130	256,948	282,264	\$75,737	1.10
2002	923,854	346,918	1,155,212	24,334	2,079,066	371,252	356,982	\$100,727	0.96
2003	981,383	285,537	535,119	16,239	1,516,502	301,776	337,630	\$91,742	1.12
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
2006	882,057	269,183	1,316,658	17,060	2,198,715	286,243	294,160	\$95,925	1.03
2007	657,640	172,669	1,012,943	14,511	1,670,583	187,180	217,415	\$94,694	1.16
2008	739,450	227,052	394,636	9,064	1,134,086	236,116	223,537	\$111,223	0.95

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

Appendix 2. Total cost of net fish production at Nampa Fish Hatchery, 1994 through 2008.

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
2006	\$418,182	\$190.26	\$1.47	\$0.037	5.11	\$455,674	\$207.31	\$1.59	\$0.041
2007	\$466,723	\$279.48	\$2.49	\$0.052	5.38	\$501,323	\$300.19	\$2.68	\$0.056
2008	\$396,508	\$349.65	\$1.68	\$0.050	7.78	\$437,862	\$386.12	\$1.85	\$0.055

Appendix 3. Fish Requested and produced at Nampa Fish Hatchery, 2008.

Species/Strain	Size	Production Goal	Actual Production	% of Goal Achieved
Brown Trout	3-5 Inches	40,000	10,170	25.43%
Lahontan cutthroat trout (C6)	1-3 inches	200,000	185,844	92.92%
Triploid rainbow trout (T1)	3-5 inches	600,000	543,049	90.51%
Triploid Kamloops trout (KT)	3-5 inches	50,000	53,300	106.60%
Triploid Kamloops x steelhead trout (TT)	6-12 inches	900,000	753,201	83.69%
				99.04%
Triploid rainbow trout (T9)	8-12 inches	18,000	32,622	181.23%
Totals:		1,808,000	1,578,226	87.29%

Appendix 4. Eyed-eggs received at Nampa Hatchery, January 1 to December 31, 2008.

Date Received	Species/Strain	Source	Number	Pond	Destination	Cost/1000 eggs
1/8/2008	Triploid rainbow trout(T1)	Hayspur	324,485	A7,8,9,10,15	SW/Reg	N/C
1/15/2008	Triploid rainbow trout(T9)	Hayspur	200,519	A7,8,16	SW/Reg	N/C
1/24/2008	Triploid kamloop trout(KT)	Hayspur	75,917	A14	SW/Reg, C Reg	N/C
4/14/2008	Lahontan cutthroat trout(C6)	Omak	273,408	A11,12	SW/Reg	N/C
6/26/2008	Troutlodge Triploid Kamloop(TT)	Trout Lodge	308,988	A1-5	Statewide	\$27.50
7/24/2008	Troutlodge Triploid Kamloop(TT)	Trout Lodge	494,940	A6-12	Statewide	\$27.50
10/28/2008	Triploid rainbow trout(T1)	Hayspur	76,984	A14	Statewide	N/C
11/4/2008	Triploid rainbow trout(T1)	Hayspur	96,900	A15	Statewide	N/C
11/18/2008	Brown trout	Daniel, WY	104,125	A16	SW/Reg	N/C
12/16/2008	Triploid kamloops trout(KT)	Hayspur	215,887	A1-3	SW/Reg	N/C
12/16/2008	Triploid rainbow trout(T9)	Hayspur	167,790	A4-6	SW/Reg	N/C
Total:			2,339,943			

Designation Key

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

Appendix 5. Fry produced at Nampa Hatchery.

Species/Strain	Number Received	Number Produced	Pounds Produced	% Survival Egg to Plant	Destination
Lahontan cutthroat trout	273,408	185,844	440.75	67.97%	Southwest Region
Totals:	273,408	185,844	440.75	67.97%	

Appendix 6. Fingerlings produced at Nampa Fish Hatchery in 2008.

Species/Strain	Source	Number Received	Number Produced	Pounds Produced	% Survival Egg to Plant	Designation
Triploid Kamloops Trout (KT)	Hayspur	75,917	53,300	4,100	70.21%	SW Reg/Clwtr
Triploid Kamloops Trout & Triploid Rainbow Trout Mix (T1)	Hayspur	947,739	543,049	5750	57.29%	Southwest Region
Brown Trout	Daniel Hatchery, WY	50,000	10,170	450	20.34%	SW Reg/ Clearwater Region
Totals:		1,073,656	606,519	10,300	56.49%	

Appendix 7. Catchables produced at Nampa Fish Hatchery in 2008.

Species/Strain	Source	Number Received	Number Produced	Pounds Produced	% Survival Egg to Plant	Designation
Triploid Rainbow (T9)	Hayspur	43,000	32,662	9664	75.96%	Salmon Region, Southwest Region
Triploid Kamloops x Steelhead (TT)	Troutlodge	1,228,415	753,201	229,570	61.31%	Statewide
Totals:		1,271,415	785,863	239,234	61.81%	

Appendix 8. Catchable transfers from Nampa Hatchery to other Hatcheries throughout the state.

Hatchery	Species	Number	Pounds	Fish/pound
Clearwater Fish Hatchery	TT	90,243	25,650	3.52
McCall Fish Hatchery	TT	104,260	30,850	3.38
Mullan Fish Hatchery	TT	34,825	9,950	3.50
Sawtooth Fish Hatchery	TT	49,130	15,150	3.24
Sandpoint Fish Hatchery	TT	112,932	34,706	3.25
Hayspur Fish Hatchery	TT	6,180	2,100	2.94
Mackay Fish Hatchery	TT	6,800	2,000	3.40
Totals:		404,370	120,406	3.36

Appendix 9. Nampa Hatchery feed costs in 2008.

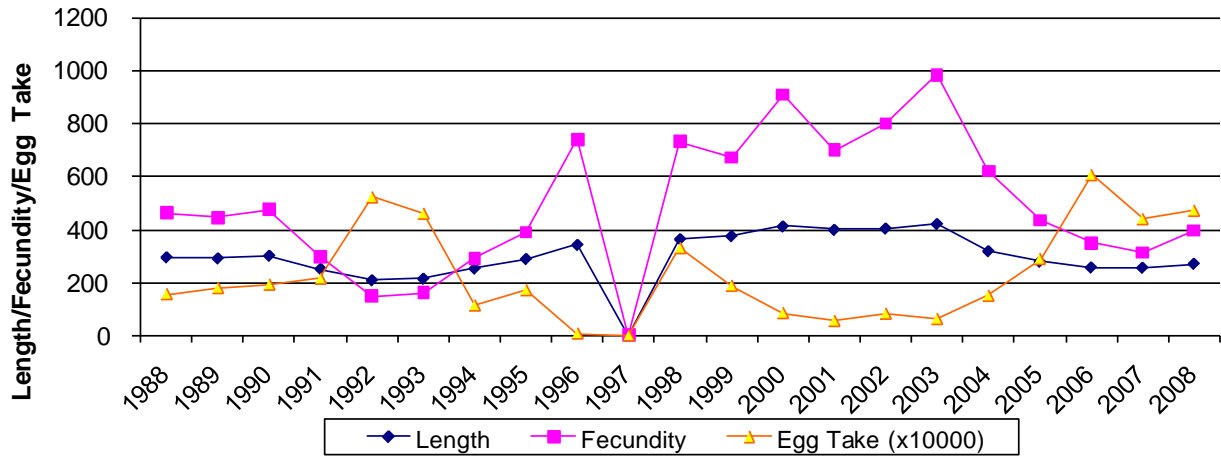
Supplier/Source	Size/Type	Pounds	Price/lb.	Feed Charges
Rangen				
Dry Crumble	Starter #0	350	0.757	\$264.95
Dry Crumble	Starter #1	700	0.757	\$529.90
Dry Crumble	Starter #2	4,850	0.757	\$3,671.45
Dry Crumble	Starter #3	9,450	0.528	\$4,989.60
Soft Moist	Starter #0	88	1.39	\$122.32
Soft Moist	1/32"	264	1.26	\$332.64
Soft Moist	1/16"	308	1.25	\$385.00
Soft Moist	3/32"	132	1.20	\$158.40
450 Floating	1/16" sack	4,600	0.565	\$2,599.00
450 Floating	3/32" sack	4,500	0.434	\$1,953.00
450 Floating	1/8" sack	15,900	0.399	\$6,344.10
450 Floating	5/32" sack	2,400	0.432	\$1,036.80
450 Floating	3/32" bulk	15,260	0.525	\$8,011.50
450 Floating	1/8" bulk	92,220	0.422	\$38,916.84
450 Floating	5/32" bulk	60,600	0.469	\$28,421.40
Dry Crumble med. TM	Grower #2	300	0.804	\$241.20
Dry Crumble med. TM	Grower #3	500	0.804	\$402.00
Dry Crumble med. TM	Grower #4	1800	0.804	\$1,447.20
Dry Crumble med. TM	3/32 pellet	2400	0.70	\$1,680.00
Dry Crumble med. TM	1/8 pellet	3100	0.675	\$2,092.50
Dry Crumble med. Aquaflor	Grower #3	625	1.018	\$692.50
Dry Crumble med. Aquaflor	3/32 pellet	550	1.24	\$682.00
Bio-Oregon				
Dry Crumble	2.0 mm	2640	\$0	DONATED
Total:		223,537		\$104,974.30
Freight:				\$6,248.94
Grand Total:		223,537		\$111,223.24

Appendix 10. Kokanee egg take at Deadwood Reservoir Nampa Fish Hatchery in 2008.

MACKAY						
Spawn Date	Lot Number	Females Spawnd	Green Eggs	Eyed Eggs	% Eye-up	
8/28/2008	1	1300	429,415	303,125	70.5	
8/31/2008	2	1461	435,757	315,148	72.3	
9/02/2008	3	1482	497,143	361,617	72.7	
9/10/2008	4	1926	663,912	401,402	60.0**	
9/17/2008	5	300	118,055	81,947	69.4	
Totals:		6469	2,144,282	1,463,239	68.2	
**2 Coolers were held overnight and shipped next day						
CABINET GORGE						
Spawn Date	Lot Number	Females Spawnd	Green Eggs	Eyed Eggs	% Eye-up	
9/4/2008	1	1455	539,700	430,080	79.8	
9/5/2008	2	1403	525,000	415,520	79.1	
9/6/2008	3	1037	334,645	265,720	79.4	
9/8/2008	4	1325	525,700	421,400	80.2	
9/12/2008	5	1202	473,850	426,300	89.9	
9/17/2008	6	544	184,600	131,194	71.1	
Totals:		6966	2,583,495	2,090,214	80.9	
2008 Spawning Totals:		13,435	4,727,777	3,553,453	75.16	

Appendix 11. Kokanee spawning length, fecundity and egg take Nampa Fish Hatchery, (1988-2008)

Deadwood Kokanee Spawning Spawning Summary (1988-2008)



SANDPOINT HATCHERY

Jamie Mitchell, 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, Idaho. The Idaho Department of Fish and Game (IDFG) constructed SPFH in 1908, with additional funding from the Bonner County Sportsman Club. The hatchery is currently owned and operated by IDFG and is funded with revenue generated from hunting and fishing license sales.

SPFH 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 late kokanee *Oncorhynchus nerka* spawning operation and egg incubation. The Manager II position at CGFH oversees operations at SPFH and supplies additional labor when needed. During normal operations there is a great deal of facilities maintenance at Sandpoint Hatchery that needs to be completed on a regular basis.

Catchable redistribution in the Northern Panhandle is the primary purpose of this facility. The catchables are delivered to SPFH via IDFG semi-tanker trucks from the Nampa Fish Hatchery (NFH) where they are raised. Twenty-two lowland lakes receive catchables throughout the spring, summer, and fall. Along with the catchable redistribution, SPFH also raises 50,000 two inch Hayspur rainbow trout *Oncorhynchus mykiss* (T9) fingerlings for NFH. Additionally, on even years, 70,000-80,000 westslope cutthroat *Oncorhynchus clarkii* (C2) fry and 30,000 sterile Troutlodge kamloop rainbow trout (TT) are raised for planting 29 mountain lakes in the Idaho Panhandle.

WATER SUPPLY

The hatchery receives water via enclosed PVC pipeline from Murphy Spring, which is collected a quarter mile southwest of the hatchery. The spring is covered and supplies the facility with 400-500 gallons per minute (gpm) of pristine groundwater. Throughout the year, the spring water temperature may fluctuate between 43-48 degrees Fahrenheit.

REARING FACILITIES

The hatchery rearing facilities include eight half-stack Heath tray incubators (8 trays), and 18 concrete vats (15 x 2.5 x 3 ft) located inside the main hatchery building. There are also two outdoor concrete raceways measuring (10 x 60 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 the Panhandle Region. Fish supplied for redistribution in 2008 were Troutlodge triploid rainbows from NFH. A total of 112,513 fish weighing 33,145 lbs (3.41 f/lb) were stocked between the third week of April and the fourth week of September. Twenty-two different bodies of water received catchable rainbows in 2008. Streamside cost to redistribute fish was \$0.46 per fish (Appendix 1). The cost of stocking fish from SPFH included employee wages, transportation cost from NFH, and operating expenses that totaled \$52,174.

Mountain lake stocking began the last week of August and ran into the third week of September. The two species stocked into these lakes were Westslope cutthroat trout (C2) and Sterile Kamloop rainbow trout (TT). Twenty-seven mountain lakes in the Northern panhandle were successfully stocked predominantly by foot and two by horse. Twenty-eight lakes received 68,207 C2 swim up fry, and Hidden Lake received 5,240 TT feeding fry and 8,260 C2 swim up fry. See Appendix 2. Six volunteers and one reservist contributed approximately 80 hours to help meet the stocking request for all of the lakes this year.

PRODUCTION

Sandpoint Hatchery received 61,110 eyed T9 rainbow eggs from Hayspur Fish Hatchery (HFH) in three shipments thorough the month of May. The T9's were hatched and reared on 43°F water delaying growth to fit a specific Region 7 stocking criteria. Upon shipping, 45,562 fingerlings were transferred to NFH on September 18.

On June 26, SPFH received 29,250 TT eggs from Troutlodge in Sumner, WA for mountain lake stocking. The shipment was 5000 eggs short of the request and of mediocre quality. This abnormal Troutlodge experience would prove irrelevant in the coming week as the plug on the top incubator tray fell out and over 90% of the eggs went anoxic subsequently expiring on July 2. Of the 29,250 eggs received, 5,240 fry survived and were stocked into Hidden Lake.

The 86,800 C2 eggs were personally delivered on July 28 by Rick Jore, president and CEO of the Westslope Trout Company in Ronan, Montana. The C2 eggs arrived several weeks later than usual but proved to be of very high quality. Please refer to Appendix 3 for more detailed production results.

HATCHERY IMPROVEMENTS

- New Murphy spring collection box cover.
- New pressure tank for domestic water system.

HATCHERY NEEDS

- Repair hatchery building interior ceiling panels and windows.
- Catwalk over headbox and tailbox of new raceways.
- Upgrading interior electric service of workshop in main hatchery building.
- Pipeline structure for loading water on to fish trucks.
- Replace water supply line under hatchery building.

PUBLIC RELATIONS

The hatchery receives a fair amount 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, the hatchery personnel conduct educational tours, provide information to the public, and attend community events on the department's behalf. Hatchery staff frequently interacts with the public during fish plants and use those opportunities for up keeping a positive departmental image and education. In addition, hatchery personnel attend meetings with local sportsman's groups to communicate department/hatchery information and issues to them. SPFH staff also participates in free fishing day (FFD) activities. Three ponds were specifically stocked for FFD: Priest Lake Golf Course Pond, Rathdrum Creek, and the Clark Fork Lodge Pond.

Construction has continued on the Water Life Discovery Center, which will increase public educational opportunities in the future. The Center now consists of a pond with viewing windows, interpretive trail system, public boat dock on the Pend Oreille River, and an educational building that is rapidly nearing completion.

ACKNOWLEDGMENTS

The SPFH staff would like to thank the staff at CGFH: John Rankin (Fish Hatchery Manager 2), Bruce Thompson (Assistant Manager), and Todd Braunschweig (Maintenance Craftsman) for their assistance when additional manpower was needed. Thanks to Gary Ady and Dick Bittick for transporting catchable rainbows from Nampa Fish Hatchery throughout the stocking season. Appreciation must be given to Region 1 IDFG staff, (Ryan Hardy, Kathy Gidley, The Greg Johnson Posse, and Jim Fredericks and family), reservists, and volunteers (Earl Chapin and group, Derrek Antonelli and group, Jes Erling, Brian Griffith, and Lester) who made high mountain lake stocking possible. We would also like to thank Doug Bopp of Southside Water and Sewer for his assistance with the pipeline access, repair, and clean up and with snow removal in the winter months.

Appendix 1. TT Catchable Redistribution Cost:

Employee Costs	\$19,400
Nampa Transportation cost	\$22,811
SPFH Transport Cost	\$7,440
Operating	\$2,523
Total	\$52,174

Cost	Number of Catchables	Streamside Cost Per Fish
\$52,174	112,531	\$0.46

Appendix 2. TT and C2 Mountain Lake Stocking Cost:

Employee Costs	\$4,592
Transportation Cost	\$1,306
Operating	\$4,821
Total	\$10,367*

Cost	Number of Fry Produced	Streamside Cost per Fish
\$10,367	73,447	\$0.14*

*Figures do not include other IDFG Staff wages or volunteer time, only reflective of SPFH costs.

Appendix 3. Production Summary:

T9 Hayspur Sterile Rainbow Trout

# Eyed Eggs Received	61,110
Transfer to Nampa	45,562
Overall % Survival	74.6
End Weight	40.5 lbs
End F/lb	1125

TT Troutlodge Sterile Rainbow Trout

# Eyed Eggs Received	29,500
# Fish Stocked	5,240
Overall % Survival	17.7

C2 Westslope Cutthroat Trout

# Eyed Eggs Received	86,800
# Fish Stocked	68,207
Fish Transferred to CGFH	13,105
Overall % Survival	93.7

Appendix 4. Feed costs:

	Rangen Starter #0	Rangen Starter #1	Rangen 1/8 th
Amount Fed	4.9 lbs	17.3 lbs	850 lbs
Total Cost	\$0*	\$0*	\$0*

*Surplus feed from CGFH Kokanee production and NFH Rainbow production

SAWTOOTH FISH HATCHERY

Mel Hughes, Fish Hatchery Asst. Mgr.

INTRODUCTION

Sawtooth Fish Hatchery (SFH) is a U.S. 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 operates this facility. The primary goal of SFH is to trap, spawn, rear, and release spring Chinook salmon, *Oncorhynchus tshawytscha*. Also, adult steelhead are trapped and spawned with the eyed eggs being sent to other hatcheries for hatching and rearing. In 1990, a program to stock rainbow trout, *Oncorhynchus mykiss*, into surrounding area waters for improved angling opportunities began. In 1996 SFH began participating in a program to stock high mountain lakes with Westslope cutthroat trout fry for future angling opportunities.

FISH STOCKING

Sawtooth Fish Hatchery (SFH) met its stocking request in 2008 for the rainbow trout stocking program. Between May 21 and August 16, a total of 46,129 hatchery rainbows were stocked in 55 stocking trips. (Appendix 1).

Nampa Fish Hatchery (NFH) supplied SFH with Troutlodge triploid rainbows for stocking. A total of 46,129 fish were delivered to SFH from May 21 to July 14. Based on 8 sample counts the fish averaged 3.38 fish per pound and 9.06 inches in length (230 mm). SFH employees drove approximately 2,327 miles to stock fish in local lakes and streams. NFH stocked Stanley, Pettit, Perkins, and Alturas lakes in 2008.

National Marine Fisheries Service (NMFS) permit # 1188 that expired December 31, 2004, outlines resident rainbow trout release in anadromous waters in the Salmon River drainage. The permit allows that hatchery-reared rainbow trout be released in rivers, streams, and lakes with ESA-listed fish. Stocked fish should average in size no greater than 250 mm with no individual larger than 300 mm in length. The 250 mm size restriction would include fish planted in the Salmon River, Valley Creek, and the Yankee Fork Dredge Ponds. The permit stipulates the upper Salmon River cannot be stocked before June 15 and stocked fish must be adipose fin-clipped. Only fish with the adipose fin-clipped may be kept, thereby protecting wild fish. Rainbow trout received at SFH stocked into the river were adipose clipped by NFH personnel and then delivered to SFH over 21 days later to allow for withdrawal of MS-222 to comply with label directions. Trout stocked into ponds were unclipped.

The rainbows were fed a maintenance diet of Rangen's 450 extruded pellets 3/16 inch size. A total of 308 pounds of 3/16 pellets were purchased at a cost of \$126.00.

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

High Mountain Lake Stocking

SFH personnel continued high mountain lake stocking of westslope cutthroat trout by fixed wing aircraft in the Salmon Region. On September 24, 29, 30, and October 1, Sawtooth Flying Service using a Cessna 185 flew five flights to complete stocking of lakes in rotations "C" and "A". Forty-four lakes were stocked in rotation "A" for a total of 23,950 fry. In addition to "A" lakes, 29 lakes that were not stocked last year in rotation "C" we stocked. A total of 22,375 were stocked into these lakes. Another 3 lakes located in Region 4 were stocked with 3,500 fry. Sixteen lakes in Region 3B were stocked with 14,050 fry. Excess fry totaling 11,000 were stocked into Yellowbelly Lake.

Approximately 75,000 Westslope cutthroat eggs were received on July 15, 2008. Unfortunately, all of the eggs died. A second group of 75,000 eggs were received July 30, 2008. Size of the fish at stocking was between 8 and 9 fish per gram or about 4000 per pound. Cost of the seven flights was \$5,624.00. Based on stocking numbers and mortality counts, the second group totaled 76,000. (Appendix 2).

Free Fishing Day

On June 7, 2008 free fishing day was held throughout the state and Sawtooth Hatchery participated by providing assistance to anglers from 10:00 to 14:00. 103 people attended, 40 of which were children under the age of 12. Sawtooth Hatchery Fish Culturist Danielle Dorsch was assisted by one Data Technician, Tomi Quigley-Baker; and two Biological Aides, Liz Crawford, and Kelly Peterson.

All kids under the age of 12 were provided a baggy of goodies, which included a Fishing Regulation Book, Coloring Book, and various other informative pamphlets. They also received a number on their bags. The numbers on the bags were then entered into a raffle for prizes that were donated by area businesses. All children received a numbered bag thus receiving a prize.

Refreshments and snacks were also provided by the Hatchery staff, consisting of juice, Gatorade, cookies and chips. The staff received many compliments and appreciative comments from adults and kids. The fishing was excellent and everyone who attended caught fish on almost every cast. There were ten kids that caught their first fish ever. The weather was moderate with a high near thirty-eight and partly cloudy, which made for a good day Stanley fishing.

Prizes were donated by the following local businesses: Bent Rod Outdoors, Sawtooth Adventure Company, Jerry's Country Store, Times News, River 1, Riverwear, Stanley Baking Company, McCoy's Tackle Shop, and Red Fish Lake general store.

PLANS FOR 2009

Sawtooth Hatchery will stock flowing water sites and small ponds with Nampa Fish Hatchery stocking Sawtooth Basin lakes. Fish for stocking will be provided by NFH.

In 2009, SFH plans to continue high mountain lake stocking of westslope cutthroat trout, *Oncorhynchus clarki lewesi* by airplane in the Salmon and Magic Valley Regions. SFH plans to participate in Free Fishing Day program in June.

ACKNOWLEDGEMENTS

The SFH would like to thank Rick Alsager and the Nampa Hatchery crew for their cooperation in making 2008 successful. Special thanks go to Gary Ady, Dick Bittick, Bob Becker, and Bob Turik for transporting fish from Nampa and stocking the big lakes in the Stanley Basin. Bio Aide Peter Starr did a good job of stocking fish and delivering stocking notices.

APPENDICES

Appendix 1. Planting sites and numbers of catchable rainbow trout stocked in the Salmon Region by Sawtooth Fish Hatchery from June through September 2008.

Site	Number
Sawtooth Kids Pond	875
Stanley Lake	3,000
Little Bayhorse Lake	1,000
Kelly Creek Pond	1,200
Salmon River	28,200
Yankee Fork Dredge Ponds	3,500
Valley Creek	4,000
Blue Mountain Meadow Pond	300
Squaw Creek Pond	954
Grouse Lake	100
Big Bayhorse Lake	1,000
Alturas Lake	200
Totals	46,129

Appendix 2. Planting sites and numbers of cutthroat fry stocked in the high mountain lakes by Sawtooth Fish Hatchery in late September 2008.

High Mountain Lakes Stocking:

Site Rotation C Region 7	Number
Basin Creek L #05	1,000
Bear Valley L #03	150
Birdbill L	500
Broncho L	725
Devils L	350
Everson L	1,500
Harbor L	3,000
Heart L	1,675
Hidden L	1,125
Iron L #01	1,000
Line L	350
M F Hat Creek L #05	1,075
McNutt L (Basin Creek L #04)	350
N F E F Reynolds L #02	1,325
N F E F Reynolds L #04	1,000
Paragon L (Wilson Creek L #03)	275
Park Fork Creek L	150
Patterson Creek L #01	125
Patterson Creek L #02	200
Puddin Mtn L #10 (Turquoise L)	275
Puddin Mtn L #!% (Skyhigh L)	675
R F Big Eightmile L	150
Ramshorn L (Wilson Creek L #02)	350
Ship Island L #05 (Airplane L)	1,000
Ship Island L #07 (Sheepeater)	325
U P L	1,000
Welcome L	1,225
Wilson L	1,000
Total	21,875

Site Rotation A Region 7	Number
Big Frog L #02	1,000
Cache Creek L #01	250
Castle L	650
Castle L #01	125
Castle View L	250
Challis Creek L #02	750
Challis Creek L #03	950
Chamberlain L #07	500
Cirque L	1,150
Cove L	1,100
Crater L	875
Drift L	375
East Basin Creek L #01	475
Elk L	675

Fourth Of July L	725
Garland L #01	500
Garland L #02	500
Garland L #03	350
Goat L	1,150
Gunsight L	450
Honey L	200
Hoodoo L	250
Lightning L	275
Little Redfish L	250
Martindale L	200
Mystery L	75
Ocalkens L #03	500
Ocalkens L #02	750
Phyllis L	375
Pipe L (Blackrock L)	200
Rainbow L	200
Sapphire L	1,250
Sheep L	500
Six L #01	475
Slide L	275
Snow L	375
Swimm L	875
Thunder L	225
W F Bear Creek L #01	200
W F Camas L #01	1,200
W F Camas L #03	750
W F Camas L #05	500
Washington L #02	750
Hindman L #01 (all rotations)	1,000
Total	24,450

Site All Rotations Region 4	Number
Big Trinity L	2,000
Hideaway L	500
Little Trinity L	1,000
Total	3,500

Site Region 3B	Number
Hidden (Payette Peak)	1,000
Edna #01	1,500
Virginia	1,000
Heart L	1,000
Camp L	500
Timpa L #01	1,000
Surprise (Timpa L #02)	1,000
Lake Ingeborg	1,000
Benedict L	1,000
Every L	1,000
Pats L	750
Triangle (Pear L)	750

Diamond L	750
Big Scenic Creek L	1,000
Little Scenic Creek L	500
Cow L	300
Total	14,050

Excess Region 7	Number
Yellow Belly L	11,000
	Grand Total 74,875

SPRINGFIELD HATCHERY

Jeffrey D. Seggerman, Fish Hatchery Manager
Lars Alsager, Assistant Fish Hatchery Manager
Bryan Grant, Assistant Fish Hatchery Manager

INTRODUCTION

Springfield Hatchery is a 73 acre facility located in Bingham County, Idaho, approximately 20 miles west of Blackfoot, Idaho. In 2006, the Yanke Family donated the private Crystal Springs Hatchery to the Idaho Fish and Wildlife Foundation (Foundation). The Foundation has arranged for the Idaho Department of Fish and Game (Department) to manage the facility. The Department now refers to the former Crystal Springs Hatchery as Springfield Hatchery.

Located on station are a residence, a shop/garage building, an office/early rearing vat building and a fish processing plant building which is currently being utilized as a storage warehouse.

Also located on site is Crystal Springs Pond, an approximately 6-acre pond which was opened to the public as an IDFG Family Fishing Water on the 2007 fishing opener.

WATER SUPPLY

The Springfield Hatchery water is provided by 9 artesian wells located at numerous sites on the facility grounds. The water right (est. 1945) allows for 50 cfs, although the wells are currently not providing that amount for available use. Clearwater Geosciences, LLP Ground Water Development and Exploration conducted pumping data analysis of the wells in 2008. Preliminary tests concluded the aquifer can provide the water required, but the wells do not have the efficiency to yield the required flow. Temperatures of the wells have remained constant at 50°F. Hatchery personnel have maintained water discharge monitoring records to get an idea of what the available use will be on an annual basis (Appendix 1). Idaho Department of Water Resources and Idaho Power Company have installed a water flow monitoring station on site as well.

FACILITY AND GROUNDS IMPROVEMENTS

- Monthly well measurements, using the California pipe method, with data entry onto spreadsheets and graphs.
- Monthly piezometer measurements to track ground water fluctuations.
- Grounds clean-up and junk removal. This included hauling rubbish to the dump or salvage yard, brush mowing and noxious weed control.
- Removed mold under the residence at SH. This included drying up the crawl space, adding vents, putting in a vapor barrier cloth, and adding insulation under the house.
- Built a deck and improved landscaping at the hatchery residence.
- Completed a sealed bid sale on the 1957 Ford 600 Tractor and acquired a new Case Tractor under Matt Kreizenbeck, IDFG Access Coordinator.

- Bryan Grant, Assistant Manager, took a lateral transfer to Grace FH in March and Lars Alsager was promoted to Assistant Manager in April of 2008.
- Lars Alsager took a lateral transfer to Pahsimeroi Hatchery in September and the Assistant Manager Position was changed to fill a full time Fish Culturist position at Grace FH.
- Currently Matt Kreizenbeck resides at the residence, providing security at the hatchery and helping maintain the grounds and buildings.

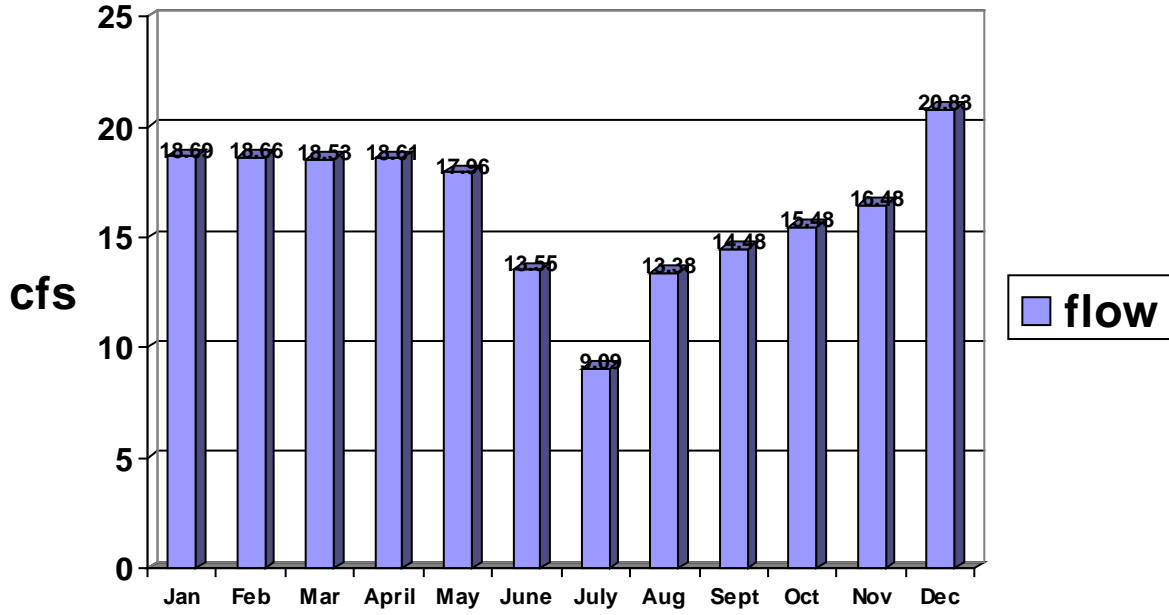
CRYSTAL SPRINGS POND IMPROVEMENTS

- Eagle Scout Troop 262 out of Blackfoot built a bridge to allow safer fishing access to the east end of Crystal Springs Pond.
- The Department Engineering crew built a concrete spillway at the east end of Crystal Springs Pond to regulate the water level at the dam and dry up the old outdoor raceways at SH.
- A protective chain link fence was built around the concrete spillway to keep the public away from it.

ACKNOWLEDGEMENTS

SH would like to thank the Yanke Family, the Idaho Fish and Wildlife Foundation, the crew at American Falls Fish Hatchery, Matt Kreizenbeck-IDFG Access Coordinator, Bryan Grant, Lars Alsager, Bingham County Mosquito Abatement, and Bingham County Noxious Weed Control.

Appendix 1. Springfield Hatchery Water Discharge 2008.



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 (IDFG) resident fish hatcheries and to assist hatchery personnel in maintaining good health in cultured resident fish. These same services are provided to IDFG 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 as Fish Health Inspectors by the American Fisheries Society Fish Health Section.

With the assistance of EFHL personnel, I examined 91 cases for IDFG resident hatchery programs during 2008 (50 diagnostic cases, 20 routine hatchery inspections, 17 inspections of feral brood fish, and 4 research inspections for triploidy). I was also responsible for 3 inspections done on rainbow trout from Rangens Aquaculture (fish purchased by Idaho Power Co. for release), 19 wild fish inspections, and 1 private hatchery (tilapia) certification inspection. In addition, Doug Munson, the Anadromous Hatchery Pathologist, examined 1 diagnostic and 2 inspection cases of resident rainbow trout *Oncorhynchus mykiss* that were used to test the new facilities at Pahsimeroi Hatchery.

The most significant fish disease in the resident hatchery system continued to be bacterial coldwater disease (CWD), caused by *Flavobacterium psychrophilum*. Clinical CWD was diagnosed 26 times at resident hatcheries in 2008. Twenty clinical cases were in rainbow trout, while another 6 carrier states were identified, 3 in rainbow, 2 in cutthroat trout *O. clarkii*, and 1 in spawning adult kokanee salmon *O. nerka*. Oxytetracycline (OTC) and Aquaflor are the only antibiotics registered to treat CWD when mixed into the fish feed. Results from treating CWD with these drugs in IDFG resident hatcheries were generally successful.

The Pacific Northwest Fish Health Protection Committee, of which IDFG is a member, classifies fish pathogens in three categories: Class A (Exotic), Class B (Regulated Endemic Agents), and Class C (Endemic Pathogens of Significant Concern). No Class A pathogens were detected in Idaho in 2008, while the only Class B pathogens detected in the Resident hatchery system were found exclusively at Hagerman Hatchery. These were infectious hematopoietic necrosis virus (IHNV) and two parasitic agents *Tetracapsuloides bryosalmonae* (PKX) and *Nucleospora salmonis* (NS). The former is a myxozoan that causes proliferative kidney disease (PKD) and the latter is a microsporidian that infects the nuclei of immature blood cells and causes a leukemia-like condition.

I am the Investigational New Animal Drug (INAD) Monitor for the IDFG resident hatcheries and biologists. The INAD process is the means by which the U.S. Food and Drug Administration (FDA) 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. Both OTC and Aquaflor were registered to treat CWD through this process. Idaho

Department of Fish and Game joined the U.S. Fish and Wildlife Service Aquatic Animal Drug Approval Partnership Program (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 IDFG personnel and the AADAPP administrators. Chemicals used by IDFG resident hatcheries in 2008 under the INAD program included OTC and Chloramine-T. Oxytetracycline is an antibiotic used to treat fish with systemic bacterial infections while Chloramine -T is used to treat external bacterial infections such as bacterial gill disease.

I issued IDFG fish import/transport permits for the State of Idaho in cooperation with Dr. Debra Lawrence of Idaho State Department of Agriculture (ISDA) 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 IDFG personnel, other government or Tribal agents, and private individuals. This duty involved collecting fish health inspection and certification information from various sources to meet state permitting regulations. The goal of this process is to reduce jeopardy to Idaho's aquatic resources by reducing the likelihood of importing unwanted pathogens or exotic species. Idaho State laws and regulations give IDFG and ISDA parallel, and sometimes overlapping, regulatory authority for such importations. Dr. Debra Lawrence has been my contact with ISDA and has been outstanding to work with in this cooperative effort. I also coordinated the paperwork needed to obtain a Federal Title 50 certificate to import sterile brook trout *Salvelinus fontinalis* eggs to the Ashton Hatchery from British Columbia, Canada.

The following is a summary of the work done for each IDFG resident hatchery in 2008, including the results of all sampling done at those hatcheries. A list of acronyms used in this report is given in Appendix L.

AMERICAN FALLS HATCHERY

Four of five diagnostic examinations of rainbow trout at American Falls determined that CWD was the cause of mortality (Appendix A). Three CWD episodes were treated successfully with the standard dose of OTC under INAD protocols (prior to FDA registration), and the other was treated at the high dose and duration that remains under the INAD program. The final diagnostic case detected carrier levels of a *Pseudomonas* species of bacteria for which the mortality rate never justified antibiotic treatment.

Gas saturation was checked in the incubation building in November. Total gas pressure was estimated at about 104% without the use of packed columns. No evidence of gas bubble disease could be seen in the fish, but this is a marginal level that may or may not have long-term effect.

ASHTON HATCHERY

I inspected the BY07 rainbow trout at Ashton in March (Appendix B). No replicating viral agents or *Myxobolus* (MYXOB) spores were detected. Direct fluorescent antibody tests (DFAT) detected no evidence of *Renibacterium salmoninarum* (RS). Increasing mortalities in the BY08 rainbow were reported in late June. Samples were mailed to EFHL but arrived in suboptimal condition. Bacterial coldwater disease was suspected but cultures from the samples only

detected *F. psychrophilum* from one individual. This was enough to initiate the Veterinary Feed Directive process to treat the fish with Aquaflor, but a second set of samples was requested for confirmation. That set arrived in better condition and *F. psychrophilum* was cultured from 5 of 5 individuals. The fish were treated with Aquaflor and responded well.

Gyrodactylus sp. infestations (presumptively *G. salmonis*, a monogenetic trematode) have been reported for years at Ashton, but because they have not caused elevated mortality, little has been done to control the parasite. Signs of infection have always been more evident during the winter months. The new hatchery manager decided that a program to reduce the infestation might have beneficial effects on fish growth and general quality. Formalin used in a 1-hour flow-through treatment is registered for use against external fish parasites and is very effective against *Gyrodactylus*. The first formalin treatments appeared to be effective, as expected, but the fish became reinfested within 6-8 weeks. Because there seems to be a persistent reservoir of parasites in the open spring water above the hatchery, it was decided to initiate a weekly treatment during the winter months. Reports to date indicate the signs of *Gyrodactylus* have been controlled, while it will take time to determine any other benefits. If this method of treatment continues, the hatchery will need to build a better heated storage facility for barrels of formalin.

Work has been done on the spring area to improve the efficiency of the intake, but the hatchery manager reports that there is still surface water where ducks or other animals could possibly convey new infectious organisms to the hatchery water source.

CABINET GORGE HATCHERY

This was the second consecutive year that Cabinet Gorge Hatchery received green westslope cutthroat trout eggs collected from King's Lake in Washington State. I traveled to King's Lake to sample the 60 feral adult fish (30 female and 30 male) from which these eggs were taken. No replicating viral agents were detected by EFHL from kidney/spleen tissue samples, while the Washington Dept. of Fish and Wildlife pathologist tested ovarian fluid samples (also negative for viruses). No MYXOB spores were detected by pepsin/trypsin digest (PTD). Direct FAT tests detected no RS, while the enzyme-linked immunosorbent assay (ELISA) detected RS antigen from 48 of 60 individuals (47 low and 1 high optical densities). In addition, fin clips were taken from all individuals for genetic analysis. The Eagle Genetics Laboratory reported rainbow trout alleles from 4 individual males. Fortunately, one of those males had been crossed with the high-ELISA female. Because these eggs were intended as the foundation of a new hatchery brood population of westslope cutthroat, eggs were culled from the high ELISA positive female and from all crosses that utilized milt from the introgressed hybrid males.

I was called to do a diagnostic on the small BY08 King's Lake fish in September. The primary external sign was a distended abdomen. Internally, I found an impaction of intestinal contents in the stomach with nothing in the hindgut. By mixing 3% Epsom salts (magnesium sulfate) with a reduced amount of feed for 3 days, the impaction was relieved but the situation began to reoccur as soon as the treatment ended. Samples from the fish detected no viral agents or RS. I did culture a number of common enteric bacteria from the kidney and spleen suggesting peritonitis, probably due to damage and leakage from the grossly stretched stomach. The fish had been on a dry commercial diet and were switched to a larger pellet according to both the manufacturer's guidelines and experience with other stocks of westslope cutthroat. The fish were switched back to the smaller pellet and that seemed to solve the

problem. Another solution to try next year will be to use a soft moist diet only rather than the dry feed.

I inspected spawning kokanee salmon adults at Sullivan Springs in December. Tests detected no replicating viruses or MYXOB spores. The DFAT tests for RS were negative, while 5 of 12 ELISA pooled samples were low positives for RS antigen. Carrier numbers of *F. psychrophilum* were cultured from kidney/spleen samples from 12 of 12 individuals. These RS and *F. psychrophilum* detections were consistent with historic results. A light infection of encysted cestodes was evident in the pyloric caecae of most of the fish. These organisms are observed every year and do not appear to have any adverse effect upon their hosts.

GRACE HATCHERY

One diagnostic case was examined from Grace Hatchery rainbow trout (Appendix D). The diagnosis was CWD with a concurrent carrier level of motile aeromonad septicemia (MAS). The fish were treated with standard dose of OTC-medicated feed under an INAD protocol.

One research case involved drawing blood from fish that originated as eggs from Hayspur Hatchery to test for triploidy. Blood samples were sent to Dr. Paul Wheeler at the Thorgaard Laboratory, Washington State University where they were run through a flow cytometer to measure the size of the red blood cells. A total of 93 individuals were tested and all were determined to be sterile triploids (100%).

A short section of open ditch remains between the main springs and the intake to the hatchery raceways. Biosecurity for the facility would be enhanced if this were enclosed. The middle springs remain open, but would require much more difficult engineering to capture.

HAGERMAN STATE HATCHERY

A total of 21 diagnostic, 3 inspection, and 2 research cases were examined from Hagerman State Fish Hatchery in 2008, slightly over half the total number from 2007 (Appendix E). The decrease was likely because four diagnostic cases were done in January by the Rangens Aquaculture Research Center while I was restricted in travel by blood clots in my leg, and because there was a 25-30% reduction in reported cases of both CWD and MAS.

There is an obvious progression of disease problems at Hagerman that tends to match both the group of raceways in use and the life stage of the fish that are typically held in those raceways. Fry are hatched and early rearing is done inside an incubation building using water from Tucker Springs. Historic high losses of early feeding fry were attributed to bacterial and fungal gill infections. A protocol of treating all fish in the incubator building with hydrogen peroxide baths has controlled this problem. This was the second consecutive year in which no infectious disease problems were reported or diagnosed in the incubator building.

As the fish outgrow the indoor rearing units, they are moved outside to a group of small "West" raceways supplied with water from Tucker Springs. Depending on water and space needs, the fish are moved from the West raceways to the first set of "Large" raceways (numbered L-1 through L-16) at a size of 2 to 4 inches. These raceways are also supplied with Tucker Springs water. Most episodes of infectious hematopoietic necrosis virus (IHNV) and/or bacterial septicemias occur in the West raceways and L-1 to L-16 because they hold the

greatest concentration of fish at the most susceptible life stages in Hagerman's production scheme. Seven cases were examined from the west raceways in 2008, with CWD diagnosed five times, IHNV diagnosed once, and one case failed to detect any pathogen. Nine diagnostic and two inspection cases involving fish from raceways L-1 through L-16. Bacterial CWD was detected six times, once in conjunction with IHNV and once with bacterial furunculosis (FUR). Clinical FUR was diagnosed once with no other pathogens and MAS was diagnosed once. Two cases failed to detect any pathogens.

Finally, some of the fish are moved into raceways L-17 through L-24 for final rearing to catchable-size. These are the largest raceways on the hatchery and are supplied with surface water from Riley Creek, the outflow stream from Hagerman National Fish Hatchery. *Nucleospora salmonis* (NS) and *Tetracapsuloides bryosalmonae* (PKX) are two internal parasites prevalent in the Riley Creek system. These organisms may not cause a great deal of direct mortality, but they both affect the kidney, an important organ in a fish's ability to mount an immune response. Reoccurring episodes of the more virulent pathogens, particularly IHN and FUR, seem to occur more often in these raceways than happened before NS was first detected. In addition, these later episodes have historically not responded as well to standard treatments. The loss of larger fish at this stage in the production cycle is much more costly to the program because more has been invested in feed and labor than in smaller, younger fish. Five diagnostic cases were examined from raceways L-17 through L-24. Replicating virus (IHN) was detected twice, once with CWD, NS, and PKX, and once with *Flavobacterium columnare* (COL) and *Pseudomonas aureofaciens*. Clinical FUR was diagnosed three times, twice by itself and once with NS and PKX.

The protozoan parasite *Ichthyophthirius multifiliis* (ICH) was detected by hatchery personnel during routine checks in December 2007. One-hour flush treatments of potassium permanganate (KmNO₄) were initiated until mid-February 2008. The parasite was detected again in December 2008 and the treatments were resumed. No actual losses to ICH were documented in either episode, indicating that the treatments were both timely and effective. My first recommendation for ICH treatment would be formalin rather than KmNO₄ but the quantity of formalin needed to treat the water volume at Hagerman is almost prohibitive.

Two research cases involved drawing blood from fish that originated as eggs from Hayspur Hatchery to test for triploidy. Blood samples were sent to Dr. Paul Wheeler at the Thorgaard Laboratory, Washington State University where they were run through a flow cytometer to measure the size of the red blood cells. A total of 363 individuals were tested with 362 determined to be sterile triploids (99.7%).

HAYSPUR HATCHERY

The primary focus of my efforts at Hayspur Hatchery was sampling the Hayspur-stock (R9) rainbow trout adult females whose eggs were used for broodstock replacement. With the assistance of hatchery personnel, ovarian fluid was collected from every female to be tested for viruses and for RS using fluorescent antibody methodology on the centrifuged ovarian fluid cell pellet (OCP-FAT). Lethal sampling of a portion of the same females provided kidney smears for DFAT and kidney tissues for ELISA. Eggs from individual females were kept separate until the test results were complete. Following established protocol, eggs were to be culled from the replacement program if the parent female tested positive for any virus or for RS. Sampling of the K1 "Kamloops" population was limited to the BY06 subadults because no brood stock

replacement eggs were taken. This was the 16th consecutive year with no replicating viral agents detected at Hayspur Hatchery (since 1992).

The R9 brood stock replacement spawning was done on four separate days between October 14 and November 19 (Appendix F). A total of 192 females were tested from both BY05 (3-year-old) and BY06 (2-year-old) populations. All lethal samples were taken from the BY05 fish. No viruses were detected from any ovarian fluid or tissue samples; including 20 samples that were either blind-passed or carried out 21 days to check for VHS virus. For the first time since 2002, all RS tests were negative. Following the detection of clinical BKD in a K1 brood population and numerous high ELISA optical densities in the R9 populations, an aggressive antibiotic treatment regimen was initiated at Hayspur, including multiple feedings of OTC-medicated feed at high doses (10 g OTC/100 lbs of fish for 14 days) and injections of erythromycin. All fish treated in this manner will be destroyed when they are done spawning.

One diagnostic examination was done in June on BY06 K1 fish that had just been moved into a circular pond and were experiencing elevated mortality. The only pathogen detected was a single colony of *F. psychrophilum*, which I did not consider more than a carrier lever. The mortality rate eventually returned to normal without intervention. Sixty-fish inspection samples (lethal) were taken from both BY06 Hayspur-stock (R9) and Kamloops (K1) rainbow trout populations. No replicating viruses, RS, cultured bacteria, or MYXOB spores were detected from either population.

HENRYS LAKE HATCHERY

Fish health inspection samples were taken from spawning Yellowstone cutthroat trout at Henrys Lake Hatchery from February 25 through April 17, 2008 (Appendix G). Ovarian fluids were collected by hatchery personnel and shipped to EFHL where they were tested for viruses (150 females in 23 pools) and RS by OCP-FAT (1442 females in 231 pools). No viruses were detected in any of the ovarian fluid samples, including 6 pools (41 fish) that were blind-passed to check for viral hemorrhagic septicemia virus (VHS). One 7-fish pool was positive for RS by OCP-FAT, and the eggs from that single group were discarded.

I visited the hatchery on March 18 and took lethal samples from a group of 60 fish (both males and females) for kidney DFAT, ELISA, tissue virology, bacteriology, and MYXOB tests. No replicating viruses or MYXOB spores were detected. None of the kidney smears were positive for RS by DFAT, while 2 of 12 pooled kidney samples were positive by ELISA at low levels. This was a reduction in detections from previous years (0 of 60 DFAT and 7 of 12 ELISA pools in 2007; 20 of 60 DFAT and 12 of 12 ELISA pools in 2006). Bacteriology samples isolated *F. psychrophilum* from 4 of 20 individuals (7 of 16 in 2007; 14 of 16 in 2006) and very low levels of a *Pseudomonas* species from 1 fish. No signs of clinical CWD have ever been evident in the adult cutthroat trout at Henrys Lake, but significant losses to CWD have occurred in their offspring at Mackay Hatchery. The *Pseudomonas* was probably an opportunist taking advantage of the fish's compromised condition at spawning. *Myxobolus cerebralis* (MC), the causative agent of salmonid whirling disease (WHD), has been confirmed in this population in previous years and was likely present in this year's fish at levels below our test's ability to detect. It was reported that the over-winter conditions in the lake were good which would reduce stresses on the fish and likely explain the better general condition of the fish observed at spawning.

MACKAY HATCHERY

First-feeding Henrys Lake cutthroat fry have historically experienced significant losses due to CWD. Treatments using OTC-medicated feed were never successful. This was the third consecutive year that the first-feeding fry were given a metaphylactic treatment of Aquaflor (VFD from Dr. Phil Mamer). Mortality rates never exceeded the expected normal levels, so the treatment was presumed to be successful. The importance of these fish to the Henrys Lake program makes it very difficult to justify keeping untreated controls.

One lot inspection was done on the Yellowstone cutthroat trout fingerlings received as eggs from Jackson NFH. No replicating viruses, RS, or MYXOB spores were detected.

Mackay Hatchery receives green eggs every year from the early-spawning kokanee in Deadwood Reservoir. Spawning adults at the trap site were sampled on September 4. No replicating viruses were detected. The kidney DFAT samples were all negative for RS, but 3 of 12 pooled ELISA samples were positive at low optical densities. This is consistent with previous year's detection levels. Large spores were detected in 10 of 12 pooled samples consistent in morphology with *Myxobolus neurotropis* (MN) that has previously been confirmed in kokanee from Deadwood Reservoir.

Triploid induction samples were taken from the Henrys Lake hybrids in August. Individual blood samples from sixty fish were collected and sent to Dr. Paul Wheeler at the Thorgaard Laboratory, Washington State University where they were run through a flow cytometer to measure the size of the red blood cells. Results were 59 triploids out of 60 samples for a 98% sterility rate. The sample size was adequate to provide 95% confidence of detecting a 5% prevalence of triploids in the population. So by sampling the fish just prior to release, we can now document with reasonable certainty that the hybrids returned to Henrys Lake in 2008 met the management goal of 95% sterility.

MCCALL HATCHERY RESIDENT PROGRAM

Westslope cutthroat trout fry destined for mountain lake planting were checked to assure that they would not require treatment for any bacterial infections prior to release (Appendix I). No replicating viruses were detected and only a carrier state of *Pseudomonas* bacteria (PSEU) was cultured. No treatment was applied.

NAMPA HATCHERY

Fourteen diagnostic cases, 9 inspection cases, and 1 research case were examined at Nampa Hatchery in 2008 (Appendix J). Twelve of the diagnostic cases detected clinical CWD and/or MAS, while 2 confirmed ICH. Both OTC and Aquaflor were used to treat the bacterial infections and results were mixed. Most of the inspection cases were done to screen groups of fish for ICH before the fish could be transferred to other hatcheries for redistribution. In order to minimize the chance of transmitting ICH to the receiving hatcheries, a protocol has been established in which a raceway of fish destined for transfer are treated with formalin for 5 consecutive days. A microscopic inspection is then done on gills from 60 fish per raceway. If no ICH trophonts are detected, the transfer is then allowed. If ICH is detected, the formalin treatments continue for a minimum of a week. Another 60-fish inspection is then required before

the fish can be transferred, or that raceway of fish may be excluded from the transfer program and used for local plants in waters where ICH is assumed to be endemic.

One research case involved drawing blood from fish that originated as eggs from Hayspur Hatchery to test for triploidy. Blood samples were sent to Dr. Paul Wheeler at the Thorgaard Laboratory, Washington State University where they were run through a flow cytometer to measure the size of the red blood cells. A total of 49 individuals were tested and all were determined to be sterile triploids (100%).

The design of Nampa Hatchery is significantly flawed, in that the raceway floors are below the level of the outflow to the settling pond. Thus the raceways can never be dried up nor can they be isolated from the settling pond or outflow stream. This is a likely reason for the recurring problems with ICH. Major changes, requiring either significant costs in reconstruction or reductions in production, will be necessary before this parasite can be eliminated at Nampa. In the meantime, the redistribution of Nampa fish to other hatcheries or hatchery water sources must be considered as a potential risk, even with lot inspections prior to every shipment. Another design flaw at Nampa is the existing water line to the "A" raceways is too small to provide adequate flow when all 16 raceways are in use. In my opinion, many of the CWD/MAS problems mentioned above were either caused by or exacerbated by inadequate water flow. It would certainly cost less to install a larger water line to this bank of raceways than to make the physical changes needed in the larger raceways.

OTHER ACTIVITIES

Stocking sterile rainbow trout from all IDFG hatcheries has become an important part of statewide fishery management. All rainbow or Kamloops eggs taken at Hayspur Hatchery for general hatchery production were pressure treated to induce a state of triploidy, in which the embryonic cells retain an extra set of chromosomes from the parent female. All triploid trout are sterile. Because induction techniques are not perfect, IDFG has established a goal to stock hatchery rainbow trout that are at least 95% triploid. To determine if this goal was met, groups of juvenile Hayspur rainbow at Grace, Nampa, and Hagerman Hatcheries were tested. The number of individuals tested at each hatchery was relative to the number of eggs received from Hayspur. Individual blood samples were taken and sent to the Thorgaard Laboratory at Washington State University for analysis by flow cytometry. A total of 506 samples were run with 505 triploids detected (99.8%).

The Pahsimeroi Hatchery is a Chinook salmon and steelhead facility operated by IDFG, but is owned and funded by Idaho Power Company as part of the company's mitigation for three lower Snake River dams. A new Chinook rearing facility was completed in 2007 with the primary purpose of improving fish health by rearing the fish in well water instead of surface river water known to contain both MC and ICH. A group of rainbow trout eggs from Hayspur Hatchery were used as initial trial animals to test the new incubation and rearing facilities. After the tests were complete, the fish were stocked out for the IDFG resident program. Doug Munson, the Anadromous Fish Pathologist, sampled these fish three times (Appendix K). The first sample diagnosed MAS/PSEU as a cause of mortality and an OTC-medicated feed treatment was applied. The other inspection cases detected no replicating viral agents, bacteria, or MYXOB spores.

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. The efforts of Fish Health Technologists Roberta Scott, Carla Hogge, and Sharon Landin are greatly appreciated. Their timely and accurate laboratory results are essential in managing the resident hatchery system's fish health challenges. Doug Marsters, Utility Craftsman, was great at keeping Eagle Fish Health Laboratory's physical plant operating and in keeping our vehicles on the road. Administrative Assistant Lani Clifford has kept us all organized and operating smoothly. I also thank Dr. Phil Mamer for his gracious assistance in providing veterinary feed directives to treat coldwater disease and for his willingness to assume the challenges involved with becoming the new Eagle Fish Health Laboratory Supervisor. Most importantly, I wish to gratefully acknowledge the Hatchery Managers, Assistant Managers, and Fish Culturists with whom I work. I would be unable to do my job without their cooperation. 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, 2008.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	VHS	BKD	FUR	ERM	CWD	MAS	WHD	ICH	Diagnoses
2007	Troutlodge	Rainbow trout--3N	08-016	2/06/08					-	-	+	-			DX: CWD; <i>Flavobacterium psychrophilum</i> 5/5
2007	Troutlodge	Rainbow trout--3N	08-031	2/23/08	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, <i>F. psychrophilum</i> 3/5, <i>Aeromonas hydrophila</i> 1/5
2008	Troutlodge	Rainbow trout--3N	08-157	6/26/08					-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 4/4
2008	Troutlodge	Rainbow trout--3N	08-158	6/26/08					-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 1/3
2008	Troutlodge	Rainbow trout--3N	08-352	12/05/08					-	-	-	-			DX: PSEU; <i>Pseudomonas</i> sp. 1/5

Appendix B. Summary report of Eagle Fish Health Laboratory results for Ashton Hatchery, January 1 – December 31, 2008.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	VHS	BKD	FUR	ERM	CWD	MAS	WHD	ICH	Diagnoses
2007	Hayspur	Rainbow trout--3N	08-064	3/17/08	-	-		-							IX: NPD; VIRO 0/60, DFAT 0/60, PTD-MYXOB 0/60
2008	Hayspur	Rainbow trout--3N	08-162	6/30/08					-	-	+	+			DX: CWD, MAS; <i>Aeromonas hydrophila</i> 3/8, <i>Flavobacterium psychrophilum</i> 1/8
2008	Hayspur	Rainbow trout--3N	08-169	7/07/08	-	-			-	-	+	+			DX: CWD, MAS, PAST; VIRO 0/5, <i>F. psychrophilum</i> 5/5, <i>A. hydrophila</i> 3/5, <i>Pasteurella</i> sp. 3/5

Appendix C. Summary report of Eagle Fish Health Laboratory results for Cabinet Gorge Hatchery, January 1 – December 31, 2008

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	VHS	BKD	FUR	ERM	CWD	MAS	WHD	ICH	Diagnoses
Brood	King's Lake	Westslope Cutthroat trout	08-147	5/28/08	-	-	-	+							IX: BKD: VIRO 0/60, DFAT 0/60, ELISA 48/60 (Females 22 low & 1 high; Males 25 low)
2008	King's Lake	Westslope Cutthroat trout	08-282	9/18/08	-	-		-	-	-	-	-			DX: PSEU; VIRO 0/6, DFAT 0/9, <i>Pseudomonas fluorescens</i> 2/5, <i>Pseudomonas sp.</i> 2/5, <i>Sphingomonas paucimobilis</i> 1/5
2007	King's Lake	Westslope Cutthroat trout	08-283	9/18/08	-	-		-	-	-	+	-			IX: CWD; VIRO 0/3, DFAT 0/3, <i>Flavobacterium psychrophilum</i> 1/3
Brood	Sullivan Springs	Kokanee salmon	08-353	12/08/08	-	-		+	-	-	+	-	-		IX: RS, CWD; VIRO 0/60, DFAT 0/60, ELISA 5/12 (x5, ALL LOW), <i>F. psychrophilum</i> 12/12, PTD-MYXOB 0/60

Appendix D. Summary report of Eagle Fish Health Laboratory results for Grace Hatchery, January 1 – December 31, 2008

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	VHS	BKD	FUR	ERM	CWD	MAS	WHD	ICH	Diagnoses
2007	Troutlodge	Rainbow trout--3N	08-041	3/03/08					-	-	+	+			DX: CWD, MAS; <i>Flavobacterium psychrophilum</i> 4/4, <i>Aeromonas caviae</i> 1/4
2008	Hayspur	Rainbow trout--3N	08-360	6/02/08											IX: RESEARCH: Triploid induction rate 93/93 (100%)

Appendix E. Summary report of Eagle Fish Health Laboratory results for Hagerman State Hatchery, January 1 – December 31, 2008.

Brood year	Stock	Species		Accession	Sample Date	IHN	IPN	VHS	BKD	FUR	ERM	CWD	MAS	WHD	ICH	Diagnoses
2007	Hayspur	Rainbow 3N	trout--	08-032	2/25/08	-	-			-	-	+	-			DX: CWD; VIRO 0/5, <i>Flavobacterium psychrophilum</i> 4/4
2007	Hayspur	Rainbow 3N	trout--	08-033	2/25/08	-	-			-	-	+	-			DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 2/4,
2007	Troutlodge	Rainbow 3N	trout--	08-034	2/25/08	-	-			-	-	+	-			DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 2/4,
2007	Troutlodge	Rainbow 3N	trout--	08-035	2/25/08	-	-			-	-	-	-			DX: NPD; VIRO 0/6, BACTE 0/6
2007	Troutlodge	Rainbow 2N	trout--	08-072	3/26/08	-	-			-	-	+	-	-	-	IX: FUR, CWD; VIRO 0/20, DFAT 0/20, <i>F. psychrophilum</i> 1/20, <i>Aeromonas salmonicida</i> 2/20, PTD-MYXOB 0/20
2007	Troutlodge	Rainbow 3N	trout--	08-073	3/26/08	-	-			-	-	-	-	-	-	IX: NPD; VIRO 0/20, DFAT 0/20, BACTE 0/20, PTD-MYXOB 0/20
2008	Hayspur	Rainbow 3N	trout--	08-074	3/26/08	-	-			-	-	-	+			DX: MAS, HAF; VIRO 0/5, <i>A. sobria</i> 2/4, <i>Hafnia alvei</i> 1/4
2007	Troutlodge	Rainbow 3N	trout--	08-075	3/26/08					+	-	-	-			DX: FUR; <i>A. salmonicida</i> 3/4
2007	Troutlodge	Rainbow 3N	trout--	08-104	4/18/08	+	-			-	-	+	-			DX: IHN, CWD, NS, PKX; IHNV 1/2 (X5), IPNV 0/5, <i>F. psychrophilum</i> 2/9, PCR- <i>Nucleospora salmonis</i> 5/5, PCR- <i>Tetracapsuloides bryosalmonae</i>

Appendix E. Continued.

Brood year	Stock	Species		Accession	Sample Date	IHN	IPN	VHS	BKD	FUR	ERM	CWD	MAS	WHD	ICH	Diagnoses
2007	Troutlodge	Rainbow 3N	trout--	08-150	6/03/08	-	-		-	+	-	-	-			DX: FUR, NS, PKX; VIRO 0/5, DFAT 0/4, <i>A. salmonicida</i> 2/5, PCR- <i>N. salmonis</i> 4/4, PCR- <i>T. bryosalmonae</i> 3/4
2007	Troutlodge	Rainbow 3N	trout--	08-151	6/03/08	+				-	-	-	-			DX: IHN, PSEU, COL; IHNV 1/1 (X5), <i>Pseudomonas aureofaciens</i> 3/5, <i>F. columnare</i> 1/5
2007	Hayspur	Rainbow 3N	trout--	08-154	6/09/08	+										DX: IHN; IHNV 1/1 (X5)
2008	Hayspur	Rainbow 3N	trout--	08-159	6/26/08	+	-			-	-	+	-			DX: IHN, CWD; IHNV 1/1 (X5), IPNV 0/5, <i>F. psychrophilum</i> 5/5
2007	Hayspur	Rainbow 3N	trout--	08-165A	6/09/08											IX: RESEARCH: Triploid induction rate 200/200 (100%)
2008	Hayspur	Rainbow 3N	trout--	08-165B	6/09/08											IX: RESEARCH: Triploid induction rate 163/164 (99.4%)
2008	Troutlodge	Rainbow 3N	trout--	08-166	7/07/08	+	-			-	-	-	-			DX: IHN; IHNV1/1 (X5), IPNV 0/5, BACTE 0/5
2007	Troutlodge	Rainbow 3N	trout--	08-182	7/22/08					-	-	-	-			DX: NPD; BACTE 0/3
2007	Troutlodge	Rainbow 3N	trout--	08-183	7/22/08					+	-	-	-			DX: FUR; <i>A. salmonicida</i> 2/4
2008	Troutlodge	Rainbow 3N	trout--	08-188	8/04/08					-	-	+	+			DX: CWD, MAS, PSEU; VIRO 0/10, <i>F. psychrophilum</i> 7/10, <i>A. caviae</i> 5/10, <i>Pseudomonas sp.</i> 7/10

Appendix E. Continued.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	VHS	BKD	FUR	ERM	CWD	MAS	WHD	ICH	Diagnoses
2008	Hayspur	Rainbow trout--3N	08-247	9/08/08	-	-			-	-	+	-			DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 6/6
2008	Hayspur	Rainbow trout--3N	08-248	9/08/08	-	-			-	-	+	-			DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 3/4
2008	Troutlodge	Rainbow trout--3N	08-300	10/13/08					-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 8/8
2008	Troutlodge	Rainbow trout--3N	08-319	10/28/08					-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 7/7
2008	Troutlodge	Rainbow trout--3N	08-320	10/28/08	-	-			-	-	-	-			DX: NPD; VIRO 0/5, BACTE 0/4
2008	Troutlodge	Rainbow trout--3N	08-349	12/02/08	-	-			-	-	+	-			DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 4/5

Appendix F. Summary report of Eagle Fish Health Laboratory results for Hayspur Hatchery, January 1 – December 31, 2008.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	VHS	BKD	FUR	ERM	CWD	MAS	WHD	ICH	Diagnoses
2006	Hayspur	Kamloops trout	08-149	6/03/08	-	-		-	-	-	+	-			DX: UNDETERMINED ETIOLOGY; VIRO 0/4, DFAT 0/4, ELISA 0/2, <i>Flavobacterium psychrophilum</i> 1/4 (1 colony)
2006	Hayspur	Rainbow trout	08-285	9/25/08	-	-		+	-	-	-	-	-		IX: RS; VIRO 0/60, DFAT 0/60, ELISA 1/13 (X5, low), BACTE 0/16, PTD-MYXOB 0/60
Brood (BY05-06)	Hayspur	Rainbow trout	08-301	10/14/08	-	-	-	-							IX: NPD: VIRO 0/48, VHS 0/5; DFAT 0/15, OCP-FAT 0/48, ELISA 0/15
Brood (BY05-06)	Hayspur	Rainbow trout	08-322	10/29/08	-	-	-	-							IX: NPD: VIRO 0/48, VHS 0/5; DFAT 0/15, OCP-FAT 0/48, ELISA 0/15
2006	Hayspur	Kamloops trout	08-329	11/5/08	-	-		-						-	IX: NPD: VIRO 0/60, DFAT 0/60, ELISA 0/60, PTD-MYXOB 0/60
Brood (BY05)	Hayspur	Rainbow trout	08-333	11/12/08	-	-	-	-							IX: NPD: VIRO 0/48, VHS 0/5; DFAT 0/15, OCP-FAT 0/48, ELISA 0/15
Brood (BY05)	Hayspur	Rainbow trout	08-344	11/19/08	-	-	-	-							IX: NPD: VIRO 0/48, VHS 0/5; DFAT 0/15, OCP-FAT 0/48, ELISA 0/15

Appendix G. Summary report of Eagle Fish Health Laboratory results for Henrys Lake Hatchery, January 1 – December 31, 2008.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	VHS	BKD	FUR	ERM	CWD	MAS	WHD	ICH	Diagnoses
Brood	Henrys Lake	Yellowstone Cutthroat trout	08-036	2/25/08	-	-		+							IX: RS; VIRO 0/14, OCP-FAT 1/24(x7)
Brood	Henrys Lake	Yellowstone Cutthroat trout	08-038	2/28/08	-	-		-							IX: NPD; VIRO 0/12, OCP-FAT 0/120
Brood	Henrys Lake	Yellowstone Cutthroat trout	08-039	3/03/08	-	-		-							IX: NPD; VIRO 0/21, OCP-FAT 0/175
Brood	Henrys Lake	Yellowstone Cutthroat trout	08-048	3/06/08	-	-		-							IX: NPD; VIRO 0/18, OCP-FAT 0/120
Brood	Henrys Lake	Yellowstone Cutthroat trout	08-049	3/10/08	-	-		-							IX: NPD; VIRO 0/12, OCP-FAT 0/90
Brood	Henrys Lake	Yellowstone Cutthroat trout	08-062	3/13/08	-	-		-							IX: NPD; VIRO 0/12, OCP-FAT 0/90
Brood	Henrys Lake	Yellowstone Cutthroat trout	08-063	3/17/08	-	-	-	-							IX: NPD; VIRO 0/18, VHS 0/6, OCP-FAT 0/90
Brood	Henrys Lake	Yellowstone Cutthroat trout	08-065	3/18/08	-	-	-	+	-	-	+	-	-	-	IX: RS, CWD, PSEU; VIRO 0/60, VHS 0/10, DFAT 0/60, ELISA 2/12 (X5, 2 lows), PTD-MYXOB 0/60, <i>Flavobacterium psychrophilum</i> 4/20, <i>Pseudomonas fluorescens</i> 1/20, <i>Pseudomonas sp.</i> 1/20
Brood	Henrys Lake	Yellowstone Cutthroat trout	08-069	3/21/08	-	-	-	-							IX: NPD; VIRO 0/14, VHS 0/14, OCP-FAT 0/105
Brood	Henrys Lake	Yellowstone Cutthroat trout	08-081	3/27/08	-	-		-							IX: NPD; VIRO 0/14, OCP-FAT 0/56
Brood	Henrys Lake	Yellowstone Cutthroat trout	08-088	4/02/08	-	-		-	-						IX: NPD; VIRO 0/21, VHS 0/21, OCP-FAT 0/189
Brood	Henrys Lake	Yellowstone Cutthroat trout	08-096	4/09/08					-						IX: NPD; OCP-FAT 0/140
Brood	Henrys Lake	Yellowstone Cutthroat trout	08-097	4/14/08					-						IX: NPD; OCP-FAT 0/84
Brood	Henrys Lake	Yellowstone	08-106	4/17/08					-						IX: NPD; OCP-FAT 0/15

Lake Cutthroat trout

Appendix H. Summary report of Eagle Fish Health Laboratory results for Mackay Hatchery, January 1 - December 31, 2007.

Brood year	Stock	Species	Accession	Sample											Diagnoses		
				Date	IHN	IPN	VHS	BKD	FUR	ERM	CWD	MAS	WHD	ICH			
Brood	Deadwood Reservoir	Kokanee salmon	08-234	9/04/08	-	-		+									IX: RS, MN; VIRO 0/60, DFAT 0/60, ELISA 3/12 (x5, all low), PTD- <i>Myxobolus neurotropis</i> 10/12 (x5)
2007	Jackson NFH	Yellowstone Cutthroat trout (fine spot)	08-276	9/12/07	-	-		-	-	-	-	-	-	-	-	-	IX: NPD: VIRO 0/60, DFAT 0/36, ELISA 0/60, PTD-MYXOB 0/60
2008	Henrys Lake	Rainbow X Cutthroat hybrids	08-280	9/15/08													RESEARCH: Triploid induction rate 59/60 (98.3%)

Appendix I. Summary report of Eagle Fish Health Laboratory results for McCall Hatchery Resident Programs, January 1 - December 31, 2007.

Brood year	Stock	Species	Accession	Sample											Diagnoses		
				Date	IHN	IPN	VHS	BKD	FUR	ERM	CWD	MAS	WHD	ICH			
2008	Westslope Trout Co.	Westslope Cutthroat trout	08-203	8/18/08	-	-				-	-	-	-				DX: PSEU; VIRO 0/10, <i>Pseudomonas spp.</i> 1/10

Appendix J. Summary report of Eagle Fish Health Laboratory results for Nampa Hatchery, January 1 - December 31, 2008.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	VHS	BKD	FUR	ERM	CWD	MAS	WHD	ICH	Diagnoses
2007	Troutlodge	Rainbow trout--3N	08-002	1/15/08					-	-	+	-			DX: CWD; <i>Flavobacterium psychrophilum</i> 4/6
2007	Troutlodge	Rainbow trout--3N	08-010	1/30/08					-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 3/4
2007	Troutlodge	Rainbow trout--3N	08-017	2/11/08					-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 6/8
2008	Hayspur	Rainbow trout--3N	08-047	3/10/08					-	-	-	+			DX: MAS; <i>Aeromonas hydrophila</i> 3/4
2008	Hayspur	Rainbow trout--3N	08-070	3/25/08					-	-	-	+			DX: MAS; <i>A. hydrophila</i> 3/5
2008	Hayspur	Rainbow trout--3N	08-078	3/31/08					-	-	-	+			DX: MAS, PSEU; <i>A. hydrophila</i> 3/4, <i>Pseudomonas</i> spp. 3/4
2007	Troutlodge	Rainbow trout--3N	08-079	3/31/08										+	DX: ICH; <i>Ichthyophthirius multifiliis</i> 2/2
2007	Troutlodge	Rainbow trout--3N	08-093	4/11/08										-	IX: NPD; ICH 0/67
2007	Troutlodge	Rainbow trout--3N	08-116	4/28/08										+	DX: ICH; <i>I. multifiliis</i> 2/3
2008	Hayspur	Rainbow trout--3N	08-125	5/06/07											IX: RESEARCH: Triploid induction rate 49/49 (100%)
2007	Troutlodge	Rainbow trout--3N	08-130	5/09/08										-	IX: NPD; ICH 0/120
2007	Troutlodge	Rainbow trout--3N	08-131	5/09/08										+	IX: ICH; <i>I. multifiliis</i> 2/4
2007	Troutlodge	Rainbow trout--3N	08-139	5/15/08										+	IX: ICH; <i>I. multifiliis</i> 2/4
2007	Troutlodge	Rainbow trout--3N	08-140	5/19/08										-	IX: NPD; ICH 0/60
2007	Troutlodge	Rainbow trout--3N	08-155	6/11/08										-	IX: NPD; ICH 0/120
2008	Hayspur	Rainbow trout--3N	08-156	6/11/08					-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 4/4
2007	Troutlodge	Rainbow trout--3N	08-161	6/30/08										-	IX: NPD; ICH 0/6
2007	Troutlodge	Rainbow trout--3N	08-196A	8/07/08										+	IX: ICH; <i>I. multifiliis</i> 1/4
2007	Troutlodge	Rainbow trout--3N	08-196B	8/18/08										-	IX: NPD; ICH 0/60
2008	Troutlodge	Rainbow trout--3N	08-334	11/13/08					-	-	+	-			DX: CWD; <i>F. psychrophilum</i> 3/4

Appendix J. Continued.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	VHS	BKD	FUR	ERM	CWD	MAS	WHD	ICH	Diagnoses
2008	Troutlodge	Rainbow trout--3N	08-346	11/25/08					-	-	-	+			DX: MAS; <i>A. hydrophila</i> 1/1 (external)
2008	Troutlodge	Rainbow trout--3N	08-355	12/10/08					-	-	+	+			DX: CWD, MAS; <i>F. psychrophilum</i> 5/5, <i>A. hydrophila</i> 4/4 (external), <i>A. sobria</i> 4/4 (external)
2008	Troutlodge	Rainbow trout--3N	08-357	12/15/08					-	-	+	+			DX: CWD, MAS; <i>F. psychrophilum</i> 4/4, <i>A. sobria</i> 4/4 (external)
2008	Troutlodge	Rainbow trout--3N	08-359	12/29/08	-	-			-	-	+	-			DX: CWD; VIRO 0/5, <i>F. psychrophilum</i> 5/5

Appendix K. Summary report of Eagle Fish Health Laboratory results for Pahsimeroi Hatchery resident rainbow trout, January 1 – December 31, 2008.

Brood year	Stock	Species	Accession	Sample Date	IHN	IPN	VHS	BKD	FUR	ERM	CWD	MAS	WHD	ICH	Diagnoses
2007	Hayspur	Rainbow trout--3N	08-018	2/11/08	-	-			-	-	-	+			DX: MAS, PSEU; VIRO 0/8, <i>Aeromonas sobria</i> 3/8, <i>Pseudomonas sp.</i> 3/8
2007	Hayspur	Rainbow trout--3N	08-101	4/16/08	-	-			-	-	-	-			IX: NPD; VIRO 0/4, BACTE 0/4
2007	Hayspur	Rainbow trout--3N	08-152	6/04/08	-	-			-	-	-	-	-		IX: NPD; VIRO 0/20, BACTE 0/20, PTD-MYXOB 0/20

Appendix L. List of Acronyms used in the Resident Hatcheries Fish Health Report-2008.

AADAPP	Aquatic Animal Drug Approval Partnership Program
BACTE	Bacteriology test results.
BKD	Bacterial kidney disease, caused by <i>Renibacterium salmoninarum</i> .
COL	Columnaris disease, caused by <i>Flavobacterium columnare</i> .
CWD	Bacterial coldwater disease, caused by <i>Flavobacterium psychrophilum</i> .
DFAT	Fluorescent antibody test
DX	Diagnostic examination
EFHL	Eagle Fish Health Laboratory
ELISA	Enzyme-linked immunosorbent assay
ERM	Enteric redmouth disease, caused by <i>Yersinia ruckeri</i> .
FUR	Furunculosis, caused by <i>Aeromonas salmonicida</i> .
IDFG	Idaho Department of Fish and Game
IHN	Infectious hematopoietic necrosis disease, caused by IHN virus.
IHNV	Infectious hematopoietic necrosis virus; acronym used in diagnoses to indicate presence of virus without signs of clinical disease.
INAD	Investigational New Animal Drug
ICH	<i>Ichthyophthirius multifiliis</i> ; a protozoan parasite of skin and gills.
ISDA	Idaho State Department of Agriculture
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.
MN	<i>Myxobolus neurotropis</i> ; new species of <i>Myxobolus</i> found in nerve tissues.
MYXOB	<i>Myxobolus</i> ; acronym used when a species is not identified.
NPD	No Pathogens Detected
NS	<i>Nucleospora salmonis</i> , an intranuclear, microsporidian parasite
OCP-FAT	Ovarian cell pellet fluorescent antibody test
OTC	Oxytetracycline antibiotic
PCR	Polymerase chain reaction test; used to detect specific DNA fragments of a targeted organism
PKX	<i>Tetracapsuloides bryosalmonae</i> : causative agent of proliferative kidney disease
PSEU	Septicemia due to a variety of <i>Pseudomonas</i> species of bacteria.
PTD	Pepsin/trypsin digest method for detecting <i>Myxobolus</i> 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
VFD	Veterinary Feed Directive; required to treat CWD with the antibiotic Aquaflor.
VHS	Viral hemorrhagic septicemia; viral disease/agent not yet detected in Idaho.
VIRO	Virology test results
WHD	Whirling disease of salmonids, caused by <i>Myxobolus cerebralis</i>