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2001 STATEWIDE FISH STOCKING PROGRAM

PUT-GROW-AND-TAKE

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INTRODUCTION

This report is to meet the compliance standards for the Sport Fish Restoration Grant F-81-D-12 to enhance sportfishing statewide. This report is a compilation of the three hatcheries' annual reports and parts of the Upper Snake Region annual report for the calendar year 2001.

Nearly twenty million fish and eggs were produced during 2001 at these hatcheries. The different species raised included Kamloop trout, Hayspur Rainbow trout, Henrys Lake Cutthroat and Coho salmon for non-anadromous fisheries, as well as kokanee salmon.

INTRODUCTION

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

Three permanent employees staff the CGFH. Thirty-three months of temporary labor are available for use during the year. Housing on-station includes two residences for the permanent staff as well as crew quarters for two temporary employees. The newly added fish culturist position is housed at a residence at Clark Fork Hatchery.

Water Supply

Cabinet Gorge Dam is located about one mile upstream from the hatchery. After its completion in 1952, artesian springs began appearing along the Clark Fork River at the present site of the hatchery. The CGFH water supply consists of approximately 4.4 cubic feet per second (cfs) from a spring and approximately 20 cfs from a 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 (pumps #7 and #8) was utilized to incubate eggs until December 19, 2001. At that time, a mixture of the two water sources allowed incubation and early rearing water temperatures to be maintained around 49°F (range 46.5°F to 49.5°F). Production water ranged from 38°F to 45.5°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 (cuft) of rearing space in the hatchery building and the 1,500 cuft of space in the adult holding ponds.

Rearing Facilities

Rearing facilities at the hatchery include 192 upwelling incubators and 64 concrete raceways. The incubators are 12-inches in diameter by 24-inches high with a maximum capacity of 140,000 kokanee eggs each. In addition, a total of 30 upwelling incubators, which are 6-inches in diameter and 18-inches high, are available. The smaller incubators have a maximum capacity of 30,000 kokanee eggs each. The 64 concrete raceways have a rearing space of 31,000 cuft. The hatchery building encloses approximately one-third of each raceway. The adult kokanee holding area consists of two holding ponds (10-ft x 30-ft each) at the head of the fish ladder. Additional adult holding is available in three holding ponds (10-ft x 30-ft each).

PRODUCTION

Between January 1, 2001 and July 1, 2001, CGFH produced a total of 12,122,367 fish weighing 17,361 lbs (Appendix 1). On January 1, 2002, a total of 6,796,407 Lake Pend Oreille kokanee eggs were on hand (Appendix 2). Cabinet Gorge Hatchery also had 268,104 kokanee eggs and newly hatched fry from Lake Mary Ronan, Montana in incubation units. In addition, 268,549 3-inch to 4-inch Westslope cutthroat and 72,713 fall Chinook fry were also on hand at the end of the year.

A total of 21,225 lbs of feed produced 18,803 lbs of gain for an overall (all species reared) feed conversion of 1.17. Total production cost (less capital outlay) was $265,464, resulting in a cost per lb of fish of $14.68, cost per inch of fish of $0.0124, and cost per thousand fish of $21.30 (Appendix 1).

Lake Pend Oreille Kokanee

General Rearing

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

Kokanee were feed trained at approximately 46°F to 48.5°F using Rangen's Trout and Salmon starter for 14 days. Feed training continued from the 15th day to the 28th day utilizing a 50:50 mix of Trout and Salmon starter and Trout and Salmon starter #1. On day 29 the fry were placed on Trout and Salmon starter #1 only. The fry remained on Trout and Salmon starter #1 for the duration of rearing.

Due to colder than normal water temperatures available for early rearing, subsequent slower growth rates, and maximized swim-up fry loading rates, some of the kokanee on-station sustained outbreaks of Bacterial Gill Disease (BGD). Chloramine-T was administered as a treatment at 10-ppm for three consecutive days. By the end of May overall fish health had improved and all of the fry were exhibiting favorable recovery signs.

Egg collection lasted over two months, and a cross-section of the run was required for each release strategy. Growth rates to achieve a universally sized 2-inch fry were not manipulated during the 2001 season. The fish were reared using 35 monthly TUs per inch of growth. For the sixth consecutive season, fish were not taken off feed or overfed to attain the average 2-inch size parameter at release. After approximately 4 weeks of feed training, the fry were extended in the raceway, and water temperatures were lowered to emulate natural production in Lake Pend Oreille.

A total of 12,122,367 late kokanee fry were produced at an average length of 1.68 inches and an average weight of 698.3 fish per lb. These fish gained 15,210 lbs from 16,620 lbs of feed, resulting in a conversion rate of 1.09:1.0. Fish production cost was $15.78 per lb, $0.0118 per inch, and $19.81 per thousand.

Survival of green eggs to feeding fry was estimated at 91.9% (2000, 84%). Survival from first feeding to release was estimated at 97.5% (2000, 95.6%), resulting in survival from green egg to release of 89.6% (2000, 80.3%). This was the highest overall survival rate of Lake Pend Oreille kokanee ever recorded in northern Idaho hatcheries.

Fish Marking

To evaluate the success of a kokanee *Oncorhynchus nerka kennerlyi* stocking program in Lake Pend Oreille, an otolith thermal mass-marking (Volk et al. 1990) program was utilized at CGFH. All kokanee fry received a thermally induced otolith pattern. Differential temperature was about 9°F. This resulted in four distinct dark (coldwater) bands, indicative of the BY2000 thermal marking (Tmarking) pattern. These swim-up released fry will be distinguishable from their wild counterparts by examining otolith growth rings for these distinctive bands.

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

Analysis of pre-release voucher specimens (Grimm et al. 2000) verified the presence of a recognizable otolith mark on all thermally treated fry. Although there was significant variability in the expression of the Tmark, ambiguous marks could be confirmed by carefully observing incremental patterns at the measured area where the Tmark was expected to occur.

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

Creating and recovering the Tmark for the 1996, 1997, 1998, 1999, and 2000 CGFH kokanee brood was successful. Adjustments to spacing between thermal events will be made to the 2002 brood Tmarking effort to create artificial patterns less similar to natural daily increments patterns.

Trawl surveys in Lake Pend Oreille were conducted during the fall of 2001. Fry were collected from three areas of the lake. A number of the fry collected were sent to the Washington Department of Fish and Wildlife (WDFW) otolith lab for analysis. By examining their otolith (ear stones), they are able to differentiate wild fry from hatchery fry. In addition, all of the adults (except 5+ year-olds) returning in the fall of 2001 will be Tmarked. For the first

time we will be able to determine the true age of the fish and whether it is of hatchery or wild origin. To date, no results have been received from last year's samples or this year's adults.

Fish Liberation

On June 19 and 20, 2001, 8,109,789 late kokanee fry were released into Sullivan Springs. On June 4, 2001, 955,820 late kokanee fry were released into Spring Creek. On June 1, 2001, 1,523,018 late kokanee fry were released from CGFH into the Clark Fork River. Also on June 1, 2001, 1,533,740 late kokanee fry were released into Twin Creek. The Twin Creek site was chosen as a possible future adult trapping location to replace or supplement the erratic adult numbers returning up the fish ladder at CGFH.

Numbers at release were based upon Jensorter counter/sorter inventory numbers at eye-up, minus mortality. All fish were off feed for two full days before inventory pound counts were taken. Pound counts were completed on all raceways one to three days prior to fish being loaded onto the transport vehicles or being released into the Clark Fork River. All raceways of fish were displaced onto the transport trucks during the Sullivan Springs release to double-check inventory numbers. Weight displacements were performed to support current fish inventory numbers on hand at the time of release. Weight displacements were also conducted prior to releasing the fish into the Clark Fork River (at the future hatchery ladder extension site).

The Clark Fork River release groups were liberated from 1030 to 1500 hours. The fish were planted in nine trips utilizing the 1-ton stocking truck from the Sandpoint Fish Hatchery.

The scheduled Sullivan Springs release group was transported in two Department tankers (3,000-gallon capacity). Loading densities of small fish in the tankers were kept below 0.60 lbs per gal. Fish were planted below the bridge on the access road to the Department patrol cabin. Two tankers made four releases during the period of June 19-20, 2001.

Other Species

On January 9, 2002, a total of 72,368 fall Chinook salmon were transferred to Nampa Fish Hatchery. The fish averaged 538 fish per lb and were 1.83 inches in length. The Chinook stock came from Big Creek Hatchery in Astoria, Oregon. Fall Chinook salmon survival of eyed eggs to feeding fry was estimated at 94.3% (2000, 84%). These fish were fed NutraPlus fish feed for 19 days prior to transfer. Survival from first feeding to release was estimated at 98%, resulting in survival from eyed-egg to release of 92.4%. Production costs were negligible as the fry were transferred nineteen days after first feeding (Appendix 1).

On November 6, 2001, 362,764 green fertilized kokanee salmon eggs were received from Flathead Lake Fish Hatchery in Montana. Survival from green egg to eyed-egg was 74.1%. On December 31, 2001 the hatchery had on hand 268,104 eyed-eggs and newly hatched fry. These fish will be stocked in lowland lakes of the Panhandle and Clearwater regions.

- Safety posts were positioned around bulk diesel and propane tanks to provide a safety barricade from vehicular collision and to comply with the state safety inspector's recommendations.

- The hatchery boat received routine maintenance and repairs.

HATCHERY RECOMMENDATIONS

Inadequate amounts of available warm water (50°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 4.4 cfs is available from the lower springs. Modification of existing pumping facilities or drilling additional wells at this location is warranted. The lower springs collect approximately 6 cfs of available water but the means to pump it is unavailable. Additional water at this location is also available for collection. Currently generator #1 backs up a total of 17.2 cfs and a total of 7.2 cfs is backed up by generator #2.

Most of the 64 hatchery raceways are in need of outside concrete wall repairs. In addition, all of the raceways need to be sandblasted (inside and out) 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.

Both hatchery residences need metal roofs. The current composite (asphalt shingle) roofs are in need of replacement. Metal roofs are a better choice for this latitude as snow depths routinely exceed ten inches on a daily basis (the maximum recommended snow load for the hatchery houses). Metal roofs will allow the snow to slide off on a regular basis and prevent further roof damage from constant snow shoveling as experienced in the heavy winters of 1996 and 1997.

FISH SPAWNING

Fish Trapping

The Clark Fork River fish trap was in operation from June 21, 2001 to December 15, 2001. The first adult kokanee entered the trap on October 22, 2001 and trapping continued through the middle of December. There were 183 adult kokanee trapped. Trapping records indicated 19% of the spawning run was female (35). From June 21, 2001 to October 22, 2001 the trap was used by Avista Corp personnel to collect and sample bull trout. A total of 29 adult bull trout were trapped, tagged, held, and released. Avista also electro-shocked bull trout that were staged on the spawning beds. Thirty-five adults 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 US Fish & Wildlife Service (USFWS) experiment to utilize traditional spawning habitat in Montana, which became inaccessible to the native bull trout stock

when the Cabinet Gorge Dam was completed in 1952. After spawning, three of the out-migrating adults were recaptured and trucked back to the hatchery ladder. Another three adults went through the dam and also returned to the lower Clark Fork River and Pend Oreille Lake watershed.

The Sullivan Springs trap was in operation from October 23, 2001 to December 28, 2001 and collected 56,036 (94,941 in 2000) adult kokanee salmon. Of these, 8,413 (11,345 in 2000) adults were passed above the trap to spawn naturally in Sullivan Springs Creek. Spawn taking records showed that 40.5% (45.7% in 2000) of the run was female (19,299).

The hatchery crew helped install the Wolf Lodge Creek fall chinook trap on August 22, 2001. Few fish were captured and no adults were spawned. The trap weir was removed in late September.

Spawn taking and Eggs Received

No fish were spawned from the Clark Fork River this year. A total of 109 males and 22 females were transported to the main spawning channel of Spring Creek and released to spawn naturally.

A total of 6,796,407 green fertilized kokanee eggs were collected during the 2001-2002 spawning season. These eggs were obtained from 17,759 female kokanee at the Sullivan Springs trap (Appendix 2).

FISH FEED

The fish produced during 2001 were fed a total of 21,225 lbs of feed. Fish feed was acquired from Rangen Inc, except for 100 lbs of enhanced formula feed purchased from Moore-Clarke Inc for fall chinook. The overall conversion was 1.17 pounds of feed to produce 1 pound of fish, not including the weight of mortality (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 Lake 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, 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 375 people signed our guest registration book this year. An estimated 750 visitors toured the hatchery during the 2000 season. In addition, tours were given to school groups and other organizations.

ACKNOWLEDGMENTS

The CGFH staff would like to thank the Cabinet Gorge Dam and Northern Lights personnel for their continued cooperation with hatchery operations. Thanks also to the Lake Pend Oreille Idaho Club, Bonner County Sportsmen's Association, numerous volunteers, and various Department regional and hatchery personnel for their cooperation during the spawning season. The staff would also like to thank Fish Culturist Mark Olson; CGFH Maintenance Craftsman Dave Heiman; and CGFH Biological Aides Beth Brown, Stacey Taylor, John Suhfras, Corie Kedish, and Steve Lowe for their dedication and hard work in making 2001 a successful year.

Appendix 1. Production Summary, All Species, 2001

Species	Number	Pounds	Length	Fish/lb	Feed Fed	Feed Cost[a]	Annual Cost[b]	Cost/lb Of fish	Cost/1,000 Fish	Cost/inch Of fish	Conversion
PdO KL	12,122,367	17,361	1.68	698	16,260	$7,726.64	$240,151.32	$15.78	$19.81	0.0118	1.09
Ore, FC	72,713	95	1.63	765	25	$72.13	$312.68	$10.22	$4.30	0.0026	0.82
WS Cutt.	268,549	4,096	3.52	66	4,580	$1,795.02	$25,000.00	$8.82	$93.09	0.0264	1.62
Totals/Ave.	12,463,629	21,552	1.72	578	21,225	$9,593.79	$265,464.00	$14.68	$21.30	0.0124	1.17

Appendix 2. Lake Pend Oreille kokanee spawn taking summary, 2001

Spawn taking Site	Total Fish	Females Spawned	Green Eggs	Fecundity	Percent Females
Sullivan Springs	56,036	17,759	6.796,407	383	40.5%
Cabinet Gorge	183	0	0	n/a	19.1%
Totals/Ave	**56,219**	**17,759**	**6.796,407**	**383**	**40.4%**

INTRODUCTION

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

Funding is provided primarily through Department license money. The HFH used approximately $538,122 this year: $472,427 from Hagerman's budget, $7,971 from Dworshak mitigation monies, $4,150 from the Bureau of Reclamation (BOR) mitigation for Lake Walcott, and $53,574 from the fish transportation budget, to rear and stock fish in the 2001 production year, not including capital outlay expenditures (Appendix 1).

The HFH is staffed with a Hatchery Manager II (Joe Chapman), Hatchery Manager I (Walt Rast), two Fish Culturists (Kevin Price and Bill Stutz), and a fish transport operator (Ken Taylor). Approximately 19 months of temporary labor is available from the Hagerman 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. Riley Creek water supplies the 165,600 cubic feet of rearing space available in eight additional raceways. The Tucker Springs water is a constant 59°F year-round while Riley Creek fluctuates from 50°F to 67°F annually.

HATCHERY PRODUCTION

During 2001, HFH stocked 2,646,760 fish weighing 366,551 lbs. Of these, 1,093,197 were stocked 6-inches long and longer, and 1,553,563 were stocked smaller than 6-inches long (Appendix 1). In the past, the break between small and large fish was at eight inches. This year, it was switched to six inches. About 50.9% of the total fish stocked occurred in the Magic Valley Region waters (Appendix 2). The majority of the larger trout were Kamloops rainbows from Troutlodge Inc., with the balance from Hayspur Fish Hatchery. Coho salmon comprised about one-third of this group of larger fish. The 4-inch to 6-inch fish consisted of rainbow trout, Kamloops trout, and steelhead (Appendix 1). Many of the original stocking request numbers were eliminated or modified to compensate for water shortages in area reservoirs due to the drought.

Fish transport operator Ken Taylor, logged 22,222 miles delivering fish to state waters, while the rest of the crew logged 15,403 miles. This amounted to a total of 37,625 miles and 270 stocking trips during 2001.

The 366,551 lbs stocked included 313,301 lbs of put-and-take fish averaging 8.73 inches, and 53,250 lbs of fingerlings that averaged 4.24 inches. The cost of planting the average 7.2 fpp (6.8 inches) was approximately $0.97 per lb, or $134.79 per 1,000 fish (Appendix 1).

In addition to the fish reared and planted, 1,727,614 fish (118,659 lbs) were on hand at the HFH on December 31, 2001. These were comprised of 1,187,752 fish (117,364 lbs, average 10.12 fpp, or 6 inches) in the large raceways and 539,862 fingerlings (1,295 lbs, average 417 fpp, or 1.75 inches) in the west raceways. The cost of producing the larger fish was $1.36 per lb or $134.85 per 1,000, and $16.38 per lb or $39.29 per 1,000 for the fingerlings (Appendix 1).

On hand January 1, 2001 were 1,231,262 fish (75,780 lbs). The HFH also received 886,150 fish (6,442 lbs) of fish from other hatcheries. Consequently, these subtractions yielded a net production for 2001 of 2,256,963 fish (402,988 lbs), mortality excluded (Appendix 1).

A total of 9,349,506 eggs and fry were acquired to yield the fish produced. About 2,635,397 eggs were purchased, and the balance was acquired from government sources at no cost (Appendix 4). Of the 8,463,356 eggs received, 4,515,272 were received for the fish planted, and the balance was used for 2001 production. Eggs were sent to Magic Valley Hatchery to alleviate overcrowded conditions here and were then transferred to Hagerman Hatchery when they were about 129.4 fpp (2.6 inches). Because of the success last year, eggs were again shipped to Magic Valley Hatchery for early rearing and will be transferred here in February 2002.

The overall survival rate was 49%, down from 64% survival last year. Some of this difference can be attributed to poorer survival of the triploid eggs. Also, losses to Infectious Hematopoietic Necrosis Virus (IHNV) were higher than the prior year, while treatments for coldwater disease (CWD) decreased (Appendix 3). Historically, mortality from IHNV is significantly higher than losses from CWD.

In addition to the requests from the regions, the HFH crew also made 26 trips to 13 locations to haul and stock 1,110,711 fish weighing 49,012 lbs from other sources (Appendix 7). These included 478,586 excess steelhead from Niagara Springs Hatchery, 132,572 excess rainbow trout from Clear Springs Hatchery; 835 excess male rainbow trout from Pisces Hatchery; 9,496 golden rainbow trout from Idaho Trout Processors; 342 excess trout from the University of Idaho Hagerman Fish Culture Station; 8,172 trout from Hagerman National Hatchery; 7,200 trout from American Falls Hatchery; and 473,508 trout from Grace Hatchery.

FISH FEED

The fish produced during 2001 were fed a total of 416,490 lbs of feed from Rangen Inc and Moore-Clark (Appendix 5). The net weight gained during 2001 was 402,988 lbs, which resulted in an overall conversion of 1.03 lbs of feed to produce one lb of fish, not including the weight of the mortalities (Appendix 5).

HATCHERY IMPROVEMENTS

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

- The domestic line under Riley Creek was replaced.
- The interior of the shop was painted.
- Carpeting was installed in the basement of Residence #3, sheetrock was installed, and the walls were painted.
- One-inch mesh plastic bird netting was installed around the perimeter of the raceways.
- Heat pumps were installed in Residences #1 and #2, and in the office.
- A deck was installed on Residence #2.
- New toilets were installed in Residences #1 and #3, and in the visitor's bathroom.
- A lift system was developed for the flowmeter on Riley Creek.
- A snow-blade was constructed for the loader on the John Deere tractor.
- A new roof was installed on the shop building.
- Air lines on the large raceways were replaced.
- The Quonset hut was modified to allow parking for the fish truck.
- Motion sensor lights were installed at the Riley Creek intake, shop, and show pond for security purposes.
- A new gas and diesel fuel tank was installed at the shop, and the bulk heating oil tank for the shop furnace was moved outside.

PUBLIC RELATIONS

The HFH received a large number of visitors and sportsmen throughout the year. An estimated 25,000 visitors toured the facility and used the surrounding public grounds this year. The 37 acres of HFH property is surrounded by 880 acres of the Hagerman Wildlife Management Area (WMA). The WMA provides a large variety of outdoor experiences, including fishing and hunting, wildlife viewing, and family picnic uses.

Hatchery personnel were called upon to give numerous school tours during the spring and fall, and several talks were presented to regional personnel and civic groups. The hatchery

also had a display at the Gooding County Fair. The hatchery sponsored a Free Fishing Day clinic here for about 400 participants. The Magic Valley Bassmasters, Hagerman Boy Scouts, Hagerman National Hatchery personnel, and personnel from the Department assisted. Pepsi, Falls Brand Meats, SouthBend Sporting Goods, Eagle Claw, Wal-Mart, and Trader Jack's Sporting Goods in Hagerman contributed to the event.

Again this year, a monthly article was contributed to the Hagerman newspaper, the "Fish Wrap", to keep local anglers informed about fishing hot spots, tips, and miscellaneous fishing adventures.

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

FISH TAGGING OPERATIONS

The HFH crew participated in two tagging operations during the year in which fish were marked (Appendix 6). About 36,654 ad-clipped catchables were stocked into Blackfoot Reservoir in the fall. The purpose of the clipping was to determine the difference in return-to-creel between catchable and fingerling stocking.

ACKNOWLEDGMENTS

Thanks to the permanent HFH staff of Walt Rast, Kevin Price, and Bill Stutz; to transport operator Ken Taylor; and to temporaries Larry Miller, Warden Hawkins, and Kelly and Andrea Buhler.

Regional fisheries and enforcement personnel Fred Partridge, Doug Megargle, Richard Holman, and Gary Hompland also deserve our gratitude. Thanks also to Niagara Springs and Magic Valley hatcheries personnel for their cooperation this year.

Appendix 1. Costs of fish produced at Hagerman Fish Hatchery 2001. Costs reflect all costs budgeted except capital outlay, and include $53,574 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, 2001					
Kamloops rainbow trout (KM, Hayspur)	1.74	263,963	622		
Kamloops rainbow trout (TT,Troutlodge)	5.74	472,286	40,217		
Kamloops rainbow trout (KM, Hayspur)	7.12	66,243	10,772		
Kamloops rainbow trout (KM, Hayspur)	9.90	30,191	12,580		
Kamloops rainbow trout (KT, Hayspur)	1.70	325,785	724		
Rainbow trout (T9, Hayspur)	6.90	72,794	10,865		
Totals	**5.15**	**1,231,262**	**75,780**		
FISH PLANTED					
Hayspur rainbow trout (T9)	9.72	46,506	17,964	$10,191.59	$219.15
Kamloops rainbow trout (TL,TT)	10.00	459,946	192,326	$103,698.75	$225.46
Kamloops rainbow trout, (KT)	6.38	55,580	6,500	$7,994.77	$143.84
Kamloops rainbow trout, (KM)	**8.82**	**171,455**	**53,011**	**$34,094.58**	**$198.85**
Coho salmon (OR)	**6.70**	**359,710**	**43,500**	**$54,336.79**	**$151.06**
Subtotals	**8.73**	**1,093,197**	**313,301**	**$210,316.48**	**$192.39**
Hayspur rainbow trout (T9)	4.44	588,610	23,250	$58,921.97	$100.10
Hayspur rainbow trout (R9)	4.00	58,395	1,700	$5,266.26	$90.18
Kamloops rainbow trout (KT)	4.35	706,680	26,175	$69,307.26	$98.07
Steelhead (SA)	2.87	199,878	2,125	$12,933.42	$64.71
Subtotals Average	**4.24**	**1,553,563**	**53,250**	**$146,428.91**	**$94.25**
Total Planted Average	**6.8**	**2,646,760**	**366,551**	**$356,745.39**	**$134.79**
FISH ON HAND DECEMBER 31, 2001					
Hayspur rainbow trout (T9)	9.0	46,530	15,009	$9,441.53	$202.91
Kamloops rainbow trout (TL, TT)	5.9	1,026,996	94,458	$136,611.55	$133.02
Steelhead (Saw)	5.48	114,226	7,897	$14,112.77	$123.55
Hayspur rainbow trout (T9)	1.44	59,326	79	$1,926.08	$32.47
Kamloops rainbow trout (KT, Hayspur)	1.78	480,536	1,216	$19,284.69	$40.13
Totals		1,727,614	118,659	181,376.61	$104.99
TOTAL FISH PRODUCED					
Planted in 2001		2,646,761	366,551		
On Hand December 31, 2001		1,727,614	118,659		
Totals		**4,374,375**	**485,210**	**$538,122.00**	**$123.02**
From other hatcheries		886,150	6,442		
On Hand January 1, 2001		1,231,262	75,780		
Total gained		**2,256,963**	**402,988**		

Appendix 2. Fish distribution from Hagerman Fish Hatchery, 2001.

Percent of number planted by Region									
	Number	Pounds	1	2	3	4	5	6	7
Catchables >6 inches									
Hayspur rainbow trout (T9)	46,506	17,964	-	-	13.1	80.0	6.9	-	-
Kamloops rainbow trout (TT)	459,946	192,326	-	-	39.2	29.9	25.7	5.2	-
Kamloops rainbow trout (KT)	55,580	6,500	-	-	34.7	-	65.2	-	-
Hayspur Kamloops rbt (KM)	171,455	53,011	-	-	5.8	56.3	37.9		
Coho Salmon	359,710	43,500	-	-	100.	-	-	-	-
Subtotal	**1,093,198**	**313,301**	-	-	**52.6**	**24.8**	**20.4**	**2.2**	-
Fingerlings <6 inches									
Hayspur rainbow trout (R9)	58,395	1,700	-	-	-	100	-	-	-
Kamloops rainbow trout (KT)	706,680	26,175	-	-	31.9	38.4	23.7	6.0	-
Rainbow trout (T9)	588,610	23,250	-	-	3.0	44.4	24.9	27.7	-
Steelhead	199,878	2125	-	-	-	100.0	-	-	-
Subtotal	**1,553,563**	**53,250**	**0.0**	**0.0**	**15.6**	**50.9**	**20.2**	**13.3**	**0.0**
TOTAL	**2,646,761**	**366,551**	**0.0**	**0.0**	**30.9**	**40.1**	**20.3**	**8.7**	**0.0**

Appendix 3. Fish survival from eyed-egg to stocking, 2001.

Species/Strain	Number Stocked	Eggs and Fry Received	Percent Survival
Rainbow trout, Hayspur (R1)	58,395	71,000	82.25
Rainbow trout, Hayspur (T9)	635,116	979,658	64.83
Kamloops, Hayspur (KM)	171,455	360,416	47.57
Kamloops, Troutlodge (TT)	459,946	1,031,835	44.58
Kamloops, Hayspur (KT)	762,260	2,044,105	37.30
Steelhead (SA)	199,878	249,848	80.00
Coho Salmon (WA.)	359,710	664,560	54.13
TOTAL	**2,646,760**	**5,401,422**	**49.00**

Appendix 4. Number of eyed-eggs and fry received, species, and source for fish produced in 2001.

	Eggs/Fry received		
Species/Strain	**For Fish**	**For fish on hand**	
	Planted	**December 31, 2001**	**Source**
Received as eggs			
Rainbow/Kamloops (KM)	360,416	0	Troutlodge, WA
Rainbow/Kamloops (KT)	1,533,105	1,221,818	IDFG Hayspur
Rainbow/Hayspur (T9)	675,508	269,775	IDFG Hayspur
Rainbow/sterile Troutlodge (TT)	1,031,835	1,603,562	Troutlodge, WA
Steelhead	249,848	142,929	IDFG Hayspur
Coho	664,560	710,000	Eagle Creek Hatchery
			Wash. Dept. of Wildlife
Subtotal eggs	**4,515,272**	**3,948,084**	
Received as fry			
Rainbow/R9 from Magic Valley (T9)	304,150	-	IDFG Hayspur
Kamloops (Hayspur)from Magic Valley (KT)	511,000	-	IDFG Hayspur
Rainbow/R1 from Hayspur	71,000	-	IDFG Hayspur
Subtotal fry	**886,150**		
TOTAL	**5,401,422**	**3,948,084**	

Appendix 5. Fish feed used during Brood Year 2001 at Hagerman Fish Hatchery.

Size	Source	Pounds	Cost/pound	Cost
Str	Rangen	600	$0.37	$220.50
#1	Rangen	3,950	$0.37	$1,451.63
#1 TM	Rangen	50	$0.54	$26.85
#2	Rangen	27,200	$0.37	$9,996.00
#2 TM	Rangen	200	$0.54	$107.30
#3	Rangen	51,300	$0.25	$12,717.27
#3 TM	Rangen	900	$0.54	$482.85
Str. Soft moist	Rangen	88	$1.00	$87.96
1/32 soft moist	Rangen	704	$0.93	$657.25
3/64 soft moist	Rangen	308	$0.90	$277.82
3/32 in, EXT450Float	Rangen	100,040	$0.24	$23,669.46
3/32 in, TM	Rangen	3,050	$0.46	$1,396.29
5/32 in, EXT450Float	Rangen	210,610	$0.24	$49,830.33
5/32 in, TM	Rangen	4,000	$0.46	$1,831.20
5/32 in, Romet 30	Rangen	2,050	$0.74	$1,530.74
Subtotal		**405,050**	**$0.26**	**$104,283.45**
#0	Moore-Clark	440	$0.92	$404.80
#1	Moore-Clark	220	$0.91	$200.20
#1 proActive	Moore-Clark	704	$0.98	$689.92
#2	Moore-Clark	528	$0.86	$454.08
1.2 proActive	Moore-Clark	1,892	$0.68	$1,286.56
1.5	Moore-Clark	1,672	$0.47	$785.84
1.5 Trout AB	Moore-Clark	1,144	$0.44	$503.36
2.0 Trout AB	Moore-Clark	792	$0.40	$316.80
2.5 Trout AB proActive	Moore-Clark	4,048	$0.39	$1,578.72
Subtotal		**11,440**	**$0.54**	**$6,220.28**
TOTAL		**416,490**	**$0.27**	**$110,503.73**

Appendix 6. Summary of fish marked at Hagerman Fish Hatchery in 2001.

Date Stocked	Species	Water	Number	Pounds	Clip
14-May	TT	Blackfoot Reservoir	18,290	6,200	Adipose
05-Oct	TT	Blackfoot Reservoir	14,525	7,000	Adipose
09-Oct	TT	Blackfoot Reservoir	3,839	1,850	Adipose
TOTALS			**36,654**	**15,050**	

Appendix 7. Fish stocked by Hagerman Hatchery from other sources, 2001

Date	Species	Number	Pounds	Length	Source	Destination
12-Oct-01	SA	62,613	810	3.3	Niagara Springs	Salmon Falls Crk. Res.
16-Oct-01	SA	331,013	4,550	3.4	Niagara Springs	American Falls Res.
24-Oct-01	SA	84,960	1,600	3.8	Niagara Springs	Snake R.-Bell Rapids
		478,586	**6,960**			
04-Jan-01	R4	104	416	21.0	Pisces Hatchery	Balanced Rock Park
04-Jan-01	R4	65	260	21.0	Pisces Hatchery	Frank Oster #3
04-Jan-01	R4	160	640	21.0	Pisces Hatchery	Dierkes Lake
04-Jan-01	R4	206	824	21.0	Pisces Hatchery	Riley Creek Pond
19-Dec-01	R1	300	1,300	21.7	Pisces Hatchery	Snake R.-Bell Rapids
		835	**3,440**			
26-Jun-01	R1	280	400	15.0	Golden Rainbows from ITP	Riley Creek Pond
26-Jun-01	R1	350	500	15.0	Golden Rainbows from ITP	Frank Oster #1
07-Jun-01	R4	1,003	1,700	16.0	Golden Rainbows from ITP	Frank Oster #1
07-Jun-01	R4	472	800	16.0	Golden Rainbows from ITP	Riley Creek Pond
07-Jun-01	R4	1,560	3,000	16.5	Golden Rainbows from ITP	Riley Creek Pond
07-Jun-01	R4	260	500	16.5	Golden Rainbows from ITP	Frank Oster #2
07-Jun-01	R4	364	700	16.5	Golden Rainbows from ITP	Frank Oster #3
07-Jun-01	R4	364	700	16.5	Golden Rainbows from ITP	Frank Oster #4
07-Jun-01	R4	104	200	16.5	Golden Rainbows from ITP	Riley Creek Pond
19-Jun-01	R1	1,404	1,800	14.5	Golden Rainbows from ITP	Frank Oster #1
19-Jun-01	R1	702	900	14.5	Golden Rainbows from ITP	Riley Creek Pond
19-Jun-01	R1	234	300	14.5	Golden Rainbows from ITP	Frank Oster #3
19-Jun-01	R1	268	400	15.1	Golden Rainbows from ITP	Balanced Rock Park
19-Jun-01	R1	871	1,300	15.1	Golden Rainbows from ITP	Dierkes Lake
26-Jun-01	R1	1,260	1,800	15.0	Golden Rainbows from ITP	Emerald Lake
TOTALS		**9,496**	**15,000**			

Appendix 7. Continued

Date	Species	Number	Pounds	Length	Source	Destination
17-Oct-01	R1	13,582	614	4.7	Clear Springs	Snake R.-Centennial Park
31-Oct-01	R1	13,941	450	4.2	Clear Springs	Dog Creek Res.
05-Nov-01	R1	40,077	4,700	6.4	Clear Springs	Snake R.-Bell Rapids
11-Nov-01	R1	19,872	900	4.6	Clear Springs	Snake R.-Centennial Park
16-Nov-01	R1	28,300	1,000	4.3	Clear Springs	Salmon Falls Crk. Res.
08-Nov-01	R1	16,800	800	4.7	Clear Springs	Blair Trail Res.
		132,572	**8,464**			
30-Oct-01	R1	42	168	21.0	Hagerman Fish Culture Station	Dierkes Lake
19-Dec-01	R1	300	1,300	21.7	Hagerman Fish Culture Station	Riley Creek Pond
		342	**1,468**			
31-May-01	RA	**8,172**	**1,135**	6.8	Hagerman National Hatchery	C.J. Strike Res.
30-Apr-01	T9	462,364	**4,900**	**3.0**	Grace Hatchery	Blackfoot Res.
01-May-01	R1	11,144	**3,980**	**10.0**	Grace Hatchery	Twin Lakes
		473,508	**8,880**			
11-Sep-01	TT	**7,200**	**4,800**	**12.0**	American Falls Hatchery	Ashton Hatchery
TOTALS		**1,110,711**	**49,012**			

HENRYS LAKE HATCHERY

FISH SPAWNING

The 2001 cutthroat trout run consisted of 7,190 cutthroat and 4,391 hybrid trout totaling 11,581 fish. Cutthroat males numbered 4,587 and cutthroat females numbered 2,603. Hybrid males numbered 1,955 and 2,436 females were counted for a total of 4,391. Average length for male cutthroat was 434 mm and females averaged 442 mm total length. Combined average cutthroat total length was 438 mm. Hybrid trout males averaged 491 mm and females averaged 474 mm. Combined mean length for hybrid trout was 482 mm.

Cutthroat green eggs totaled 2,402,108 from 986 females for an average fecundity of 2,436 eggs per female. Eyed cutthroat trout eggs totaled 1,560,114 for an eye-up of 64.9%.

Hybrid trout green eggs totaled 856,800 from 357 female cutthroats for an average fecundity of 2,400 eggs per female. Eyed hybrid trout eggs totaled 376,662 for an eye-up of 44%. During the 2001 trapping season we produced sterile hybrids in a production mode by our current heat-shocking method of holding the fertilized eggs in a 27°C bath for 20 minutes.

No brook trout were trapped or spawned at Henrys Lake in 2001.

HATCHERY IMPROVEMENTS

Main hatchery improvements this year focused on replacing the roofing on the cabin and the hatchery, updating the spawn shed, painting the helixir shed and outhouse, laying carpet in the dorm, and painting a room in the house.

In addition to hatchery work, the Henrys crew assisted the region with electroshocking, fish plants, gill netting, backcountry patrol, and numerous other activities.

FRY TRAPPING

Fry trapping was not conducted this year as our current schedule allows for fry trapping in even-numbered years only.

Creel Survey

From May 26 through October 31, creel clerks interviewed 1,527 individual anglers. Using the creel program, estimates were made and summarized. Catch rate was estimated at .56 fish/hr and harvest rate was .11 fish/hr. Effort was comprised of 48.67% fly-fishing, 29.51% bait fishing, and 21.82% lure fishing. Catch composition was 58.8% hybrid trout, 34.75% Yellowstone cutthroat trout, and 7.18% brook trout. Types of fishing were summarized as 61.61% boat, 21.42% tube, and 16.98% bank. The average time spent fishing was 3.44 hours.

RIPARIAN FENCING

The riparian sections of Henrys Lake, and Howard, Targhee, Timber, Kelly, and Duck creeks were maintained as in past years. New sections of Duck Creek were targeted for inclusion in the habitat maintenance project and permission was obtained to go ahead with the project during the 2002 work season.

INTRODUCTION

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

The hatchery has three full-time and two part-time employees. The part-time employees share 16 months of temporary time. Wages, including benefits, cost $150,500 for the permanent employees and $30,796 for the temporary employees. The operating budget for the calendar year January through December 2000 was $51,000. Included in the year's production were 21 lots of fish, comprised of 6 species and 15 different strains.

Rainbow trout *Oncorhynchus mykiss*
- Arlee (Ennis NFH, MT) 3 year-classes
- Eagle Lake (Ennis NFH, MT)
- Fish Lake (Ennis NFH, MT)
- Hayspur steriles (Hayspur SFH) (2 year-classes)
- Kamloops (Troutlodge, WA)

Cutthroat trout *O. clarki*
- Henrys Lake (Henrys Lk. SFH)
- Yellowstone (Jackson NFH, WY) 3 year-classes

Rainbow x Cutthroat trout hybrids
- Henrys Lake cutthroat females x Hayspur SFH rainbow males

Kokanee salmon *O. nerka kennerlyi*
- Early (Deadwood Res) 2 year-classes
- Early (Payette Lk)
- Early (New Fork, WY)
- Early (Strawberry Res, UT)
- October (Blue Mesa, CO)
- October (Flathead Lk, MT)

Grayling *Thymallus arcticus*

WATER SUPPLY

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

HATCHERY IMPROVEMENTS

Some of the improvements made around the hatchery include:

- A new roof was installed on the storage barn.
- Shade covers were installed over the headrace screens.
- Sunshade cover hold-downs were designed and construction was started.
- The leak in the tail of small raceway #8 was found and repaired.
- The ladder to the tank of the GMC was modified to allow easier and safer access.
- Repairs were continued on the large raceway walls during the extended fall weather.

HATCHERY NEEDS

- Residence #3 needs new siding, windows, and roofing installed. It also needs a new garage built.
- Residence #2 needs the garage either rebuilt or improved and also needs new siding installed.
- A fish-proof screen needs to be installed at the exit of the large raceway tailrace to keep feral fish out of the tailrace.
- A cement pad should be installed in front of the shop in order to perform vehicle maintenance work.

FISH STOCKED

Fingerlings of various species and strains were stocked in seven regions of the state (Appendix 1). These put-grow-and-take fish numbered 3,014,032 fish and weighed 42,498 lbs.

Catchable rainbow trout (10+ inches) were stocked in the Upper Snake and Salmon regions. These put-and-take fish numbered 90,838 and weighed 57,021 lbs. Catchable Yellowstone cutthroat, numbering 1,430 fish and weighing 1,000 lbs were planted into Region 7.

The hatchery also reared 16,000 cutthroat, 7,800 sterile rainbow, and 6,000 grayling fry for planting into forty-five high mountain lakes in Regions 4 and 6. Four-wheelers, pack-stock, and foot travel were used to plant these fish.

The fish transport trucks assigned to MFH made 83 separate fish stocking trips during the year, planting 28 different waters and traveling 24,400 miles. Transport tankers assigned to Nampa Fish Hatchery hauled eight trucks of fish to six different waters for the hatchery during the year.

FISH FEED

A total of 116,360 lbs of fish feed was used during the year at a cost of $34,480. Feed conversion averaged 1.04 lbs of feed fed for every lb of fish produced. Conversions ranged from a high of 1.4 for the 99 C4s to a low of 0.86 for the 01 Arlee rainbows. Naturally occurring foods supplement hatchery foods, enabling the low conversions to occur. Average feed cost per lb of fish produced was $0.348. Feed cost of each fingerling produced was $0.0035 and $0.23 for each catchable.

Rangen dry feeds were used exclusively throughout the year. Fish health and performance showed no ill effects from the Rangen brand. All feed sizes and amounts used are shown in Appendix 3.

FISH MARKING

Of the 973,400 cutthroats planted into Henrys Lake, 100,350 were adipose fin-clipped prior to stocking. This clipping is a never-ending study of natural vs. hatchery fish returning to the creel and ladder.

PUBLIC RELATIONS

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

ACKNOWLEDGEMENTS

At various times during 2000, the Mackay Hatchery crew included Bio-Aides Bob Evans, Jaquoy Vadnais, and Carren Morgan. Without their excellent assistance, we could not have accomplished all that we did during the year. Their care and concern enabled the hatchery to produce the quality of fish we do. Doug Young, Fish Culturist, Mick Hoover, Assistant Hatchery Manager, and Phil Coonts, Hatchery Manager, round out the hatchery's personnel.

Appendix 1. Fish Production at Mackay Fish Hatchery, January 1 to December 31, 2001.

Species/strain	Lot	Source	Received as	Fish Number Received or Carried Into 01	Pounds Received or Carried Into 01	Number Planted	Pounds Planted	Destination
Arlee rainbow trout	9-EN-RA	Ennis NFH	eyed eggs	760	1,500	745	1,517	01 catchables
Arlee rainbow trout	0-EN-RA	Ennis NFH	eyed eggs	111,679	53,569	90,093	55,504	01 catchables
Arlee rainbow trout	1-EN-RA	Ennis NFH	eyed eggs	159,700	eggs	0	0	02 catchables
Hayspur rainbow sterile	1-R9-T9	Hayspur SFH	eyed eggs	34,700	eggs	0	0	02 catchables
Hayspur rainbow sterile	2-R9-T9	Hayspur SFH	eyed eggs	143,922	eggs	0	0	03 catchables
Kamloops rainbow	01-WA-K1	TroutlodgeWA	eyed eggs	19,517	eggs	7,800	7.5	01 mtn lk
Fish Lake rainbow	01-RF	Ennis NFH	eyed eggs	96,200	eggs	70,000	1,217	01 fingerlings
Eagle Lake rainbow	01-R7	Ennis NFH	eyed eggs	319,744	eggs	176,744	3,073	01 fingerlings
Meadow Lk grayling	01-WY-GR	Ashton SFH	eyed eggs	7,500	1.0	6,000	5	01 mtn lk
Henry's Lk cutthroat	01-ID-C3	Henry's Lk H	eyed eggs	1,341,422	eggs	977,625 126,577 16,000	7,732 1,800 15	01 fingerlings Grace SFH 01 mtn lk
Rainbow/cutthroat hybrid sterile	01-ID-RC	Henry's Lk H Hayspur H.	eyed eggs	368,100	eggs	145,360 49,300	1,700 1,000	01 Henry's Lk Grace SFH
Yellowstone cutthroat	99-C4	Jackson NFH	eyed eggs	1,493	743	1,430	1,000	01 catchables
Yellowstone cutthroat	00-C4	Jackson NFH	eyed eggs	13,032	121	10,000	1,250	01 fingerlings
Yellowstone cutthroat	01-C4	Jackson NFH	eyed eggs	50,000	eggs	0	0	03 catchables
Deadwood Kokanee	00-ID-KE	Deadwood	green eggs	848,761	fry	549,304	8,307	01 fingerlings
Strawberry Res Kokanee	00-UT-KE	Strawberry Res	green and eyed eggs	1,100,000	eggs	831,749	9,462	01 fingerlings
Blue Mesa Kokanee	00-CO-KO	Roaring Judy, CO	eyed eggs	300,000	fry	263,250	2,025	01 fingerlings
Deadwood Kokanee	01-ID-KE	Deadwood	green eggs	549,539	fry	0	0	02 fingerlings
Payette Lk Kokanee	01-ID-KE	Payette Lk	green eggs	770,845	fry	0	0	02 fingerlings
New Fork Kokanee	02-WY-KE	Dubois, WY	eyed eggs	185,105	eggs	0	0	02 fingerlings
Flathead Lk Kokanee	02-MT-KE	Somers SFH	eyed eggs	626,256	eggs	0	0	02 fingerlings

Appendix 2. Mackay Fish Hatchery Stocking Summary, 2001

Lot Number	# Planted	Pounds Planted	Size Planted
99-EN-RA	745	1,517	Catchable
00-EN-RA	90,093	55,504	Catchable
99-C4	1,430	1,000	Catchable
00-C4	10,000	1,250	Fingerling
01-RF	70,000	1,217	Fingerling
01-R7	176,744	3,073	Fingerling
01-C3	977,625	7,732	Fingerling
01-C3	16,000	15	Mtn lk fry
01-RC	145,360	1,700	Fingerling
01-K1	7,800	7.5	Mtn lk fry
01-GR	6,000	4.7	Mtn lk fry
00-ID-KE	539,304	8,307	Fingerling
00-UT-KE	831,749	9,462	Fingerling
00-CO-KO	263,250	2,025	Fingerling

Total Fish Planted

	Numbers	Pounds
High Mtn. Fry	29,800	27
Fingerlings	3,014,032	42,498
Total catchables	92,268	58,021
Rainbow	90,838	57,021
Cutthroat	1,430	1,000
Totals	**3,228,368**	**158,567**

TOTAL POUNDS FISH PRODUCED, YEAR 2001

Pounds Fish Planted	92,814
Pounds on Hand, 12/31/01	48,186
Pounds Transferred	2,870
Pounds Produced, 2001	143,870
Minus Pounds on Hand, 1/1/01	41,870
Net Pounds Produced, 2001	102,000

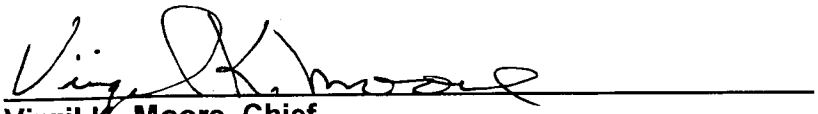
Appendix 3. Mackay Fish Hatchery Feed Used January 1, 2000 through December 31, 2000

Rangen Fish Feeds	Pounds Used		Feed Cost
00 swim-up	50		21
0 swim-up	1,100		451
# 1	5,650		2,314
# 2	13,500		5,530
# 3	3,300		874
Extruded 450 Pellets			
Ext 1/16	10,750		4,000
Ext 3/32	11,500		2,985
Ext 5/32	70,510		18,305
Total Pounds	**116,360**	**Total Cost**	**$ 34,480**

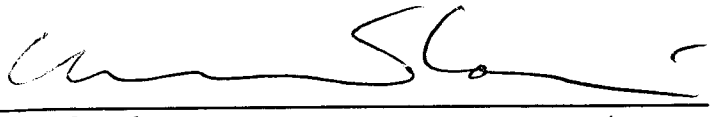
Appendix 4. Fish Transferred To Grace SFH

Lot	Number	Pounds
01-C3	126,577	1,870
01-RC	49,300	1,000

Approved by:



Virgil K. Moore, Chief
Fisheries Bureau



Charles E. Corsi
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