

INTRODUCTION

Location

Lookingglass Hatchery is located on the left bank of Lookingglass Creek at river mile 2.2, approximately 85 miles upstream from the mouth of the Grande Ronde River and 324 miles upstream from the mouth of the Columbia River.

Imnaha Facility is located at river mile 46 on the Imnaha River. This facility is used for adult collection, holding and acclimation. During the summer months, Imnaha Weir is installed across the Imnaha River at this site.

Lower Granite Dam is located on the Snake River, 107.5 miles upstream from the mouth.

OBJECTIVES

Mitigation Goals

Lookingglass Fish Hatchery is part of the Lower Snake River Compensation Plan Program and has been in operation since 1982. A satellite station on the Imnaha River is used for smolt acclimation and collection and holding of adults. Mitigation goals are variable according to adult returns and interagency agreements, but generally average about 1.4 million spring chinook smolts annually. Carson River stock has been used in past years when Rapid River stock chinook were below production levels; this last occurred in broodyear 1989. No Carson River stock adults returned to Lookingglass in 1996, and none are expected to return in the future.

CHINOOK SALMON

Adults

Imnaha Weir was installed on July 16, 1996, and chinook collection continued through September 4, 1996. For the second year in a row, high river conditions prevented placement of the weir until July, contributing to the low number of chinook collected. A total of 244 Imnaha (2996) chinook, 128 males, 57 females and 59 jacks, returned to Imnaha facility. Of these, 63 males, 28 females and 14 jacks were collected for broodstock and taken to Lookingglass Hatchery. Forty-three (2996) hatchery-produced jacks were destroyed as excess to program needs. A total of 96 Imnaha (2996) chinook were opercle punched and released back into the Imnaha River above the weir. Those released numbered 63 males, 28 females and 14 jacks. All chinook collected were individually spaghetti tagged and all surviving (2996) chinook were spawned.

The first returning Rapid River chinook of 1996 was captured at Lower Granite Dam on May 3, and trapping of Rapid River (8596) chinook continued through August 6, 1996. During this period 725 fish - 375 males, 311 females, and 39 jacks - were trapped and

transported to Lookingglass Hatchery. These fish were held with swim-in returns to Lookingglass Hatchery until spawning.

During the 1996 adult return season 153 Rapid River stock (8596) chinook returned to Lookingglass Hatchery. Sixty-eight males, 78 females, 6 jacks and 1 subjack were collected. All chinook held at Lookingglass Hatchery were individually spaghetti tagged, with tag color indicating origin. In 1996, 25 pairs of unmarked Rapid River (8596) adults were released above the hatchery into Lookingglass Creek. In addition, 280 (8596) chinook excess to program needs were transferred to Wallowa Hatchery to be held and spawned. Twenty-nine of these chinook were returned unspawned to Lookingglass Hatchery in September due to more advantageous water conditions. Marked and unmarked Rapid River (8596) chinook were spawned separately. Genetic samples from unmarked Rapid River (8596) chinook were collected by Umatilla tribal biologists.

Eyed Egg Production

During the report period a total of 23 Imnaha stock (2996) females was spawned for a yield of 120,000 green eggs. These green eggs produced 103,125 eyed eggs, for an Imnaha stock (2996) eye-up of 85.9%.

Eggs from Rapid River (8596) unmarked parents remained at Lookingglass Hatchery for incubation, and eggs from (8596) marked parents were transported to Irrigon Hatchery for incubation and development. A total of 20 unmarked Rapid River (8596) females produced 72,577 eggs. After eye-up and shock loss 67,941 eggs remained, with an eye-up of 93.6%. Of these, 80,000 have been set aside for early outplanting per agreement with the Confederated Tribes of the Umatilla Indian Reservation.

Captive Brood Program

The Captive Brood Program at Lookingglass Hatchery entered its second year. In 1996, juvenile spring chinook from the Lostine River and Catherine Creek were collected by seine and transported to Lookingglass Hatchery. The goal of the program is to rear these fish to spawning adults and release their progeny as smolts. A total of 481 Lostine River (20095) fish was collected and sustained an early mortality of two. Four hundred and ninety-eight Catherine Creek (20195) chinook were collected and 24 succumbed, leaving 474 on hand. Only two upper Grande Ronde (8095) chinook were collected this year; both were released back into the wild. Later collection will be attempted using a downstream migrant screw trap.

All 1994 brood Lostine River, Catherine Creek and upper Grande Ronde chinook were transferred to either Manchester salt-water rearing facility in Washington state or Bonneville Hatchery.

Additional facility modifications necessary to accommodate the captive brood program include upgrading the existing chiller system to add capacity. An ozone and/or UV treatment plant are in the design stage.

CONSTRUCTION AND MAINTENANCE

There were no capital construction projects completed at Lookingglass Hatchery or Imnaha Facility during the report period.

Maintenance projects accomplished by the hatchery crew

- Repaired incubation trays prior to spawning.
- Repaired water supply line valve.
- Plumbed in two additional captive brood trough for surrogate stocks.
- Repaired damage to raceway screen support system.
- Covered and remodeled top of two troughs for captive brood surrogate stocks.
- Repaired broken PVC spawning tubes and fabricated an additional twenty tubes.
- Fabricated and installed Imnaha fallback channel and fish ladder screen.
- Installed rip rap at Imnaha recovery channel, intake and diversion.
- Regravelled Imnaha access road.
- Excavated fingerling release line from intake building.
- Designed, fabricated and installed two new baffles for incubation head tanks.
- Designed, fabricated and installed water lines for additional captive brood troughs.
- Excavated, filled and repaired flood damaged areas of hatchery road.
- Designed, fabricated and installed new jump screens to cover Imnaha adult fallback channel and fish ladder.
- Cleaned and removed flood related gravel deposits from fish ladder entrance, trap and fish way on Lookingglass Creek.
- Repaired damage to fish ladder grip strut and covers over the fish trap on Lookingglass Creek.
- Mounted new industrial drill press to shop floor and balanced drill arms.
- Installed new surplus industrial flammable storage cabinets in shop, lab, and explosion proof room.

- Repaired bathroom plumbing and linoleum floor in residence.
- Installed new interpretative sign.
- Removed dead and fallen trees from facility.
- Repaired broken domestic water lines.
- Cleared emergency access road of windfall.
- Replaced clutch assembly on well #2.
- Repaired power steering on flatbed.
- Repaired security fence at Imnaha.
- Removed and repaired lib truck fill spout swivel and pipe section.
- Set up and fabricated three isolation troughs for captive brood.
- Cleaned out drain fields and excavated damaged culverts.
- Filled shoulders and eroded portions of roadbed with gravel.
- Replaced hydraulic hose and scoop bracket on the J.D. 312B backhoe.
- Modified weir anchoring cable and weir panel attaching hooks.
- Modified guardrails at fish ladder to accommodate better viewing.
- Repaired ice damage to adult holding pond cyclone fence.
- Fabricated and installed jump-out barrier in the cyclone fence at the head of the fish ladder.
- Remounted and readjusted limit switch on power crowder-adult trap.
- Installed flash back arrestors on oxygen/acetylene gas welder.
- Repaired starter on J.D. 312 B backhoe.
- Repaired fuel lines and tank on snowmobile.
- Repaired ARPS snow blower chain drive and sprocket system.
- Removed and overhauled auxiliary intake pump for transfer to Umatilla.
- Repaired radial arm saw.

- Repaired auxiliary pump for backup system in residences.
- Installed braces and support structures on each tough inlet valve line.
- Designed, built and installed snow/ice shields for windows and vents on buildings.
- Installed electric safety cut out switches.
- Built and installed rain and weather deflector on generator exhaust pipe.
- Painted yellow safety stripe around chillers.
- Rehung black visquine curtains for stress reduction in fry ponded in troughs.

Maintenance projects accomplished by contractors

- Repaired the clutch on the John Deere riding lawn mower and tractor.
- Performed electrical repairs on power crowder.
- Removed and replaced broken pipes in residence. Replaced vanity in bathroom and repaired linoleum floors damaged from leaking pipes.
- Repaired flash pan drain leak on the refrigeration panel in the feed room.
- Installed replacement heaters in hatch house ceilings, reinstalled area light pole in equipment yard, and repaired battery chargers for pallet jack and electric feed cart.
- Repaired devices, relays and wiring of hatchery control system.
- Restored water to intake by removal of flood deposited gravel.
- Protected intake structure by replacing washed-away rip rap at foundation.
- Stabilized stream bank by replacing washed-away rip rap upstream of intake.
- Shore-up hatchery roads by replacing washed-away rip rap at two locations.
- Installed a new transmitter and repaired alarm input points and control panel of the well #2 automated building system.
- Replaced electric heaters in incubation and feed rooms, installed exterior lighting on storage building, installed light pole, replaced timer motor on feed cart battery charger, modified well #2 murphy-matic panel and installed new well clutch speed adjustment controller, replaced high end pressure switch on well #2 system, and replaced two low water float switches in well #2 regulation tank.

- Thawed frozen domestic pipeline, replaced Onan generator governor, and installed the weir's electric hoist (had been removed for repairs).
- Repaired broken water pipes under the Innaha cabin.
- Removed and repaired both pumps for the traveling water screen pumping system.
- Assisted with repairs in fuel line system, replaced fuel pump and blown injector in backup emergency diesel engine.
- Repaired equipment with faulty or suspect wiring.
- Repaired fuel starvation problem on the backup generator on well #2 building, and replaced and updated the Detroit engine automated control box on the backup engine.
- Replaced low water probe, fixed wiring short and rewired VFD automated control system.
- Replaced yard light ballasts.
- Installed phase monitoring equipment for monitoring of the power interrupt and phase imbalance problems affecting chiller operation.

MAJOR PURCHASES

Replace pole building at intake #1	\$ 8,000.00
Replace culverts and repair Intake road	\$ 10,000.00
Asphalt road and hatchery	\$ 12,000.00
Chiller upgrade	\$ 88,000.00
Marking van equipment replacement	\$ 2,500.00
Pit tag station and readers	\$ 25,000.00
Truck for hauling adults and captive brood	\$ 47,000.00
Rip rap replacement	\$ 16,000.00
Dissolved oxygen meter	\$ 1,907.00
Fax/print/scan/copy machine	<u>\$ 1,000.00</u>
Total	\$217,407.00

**CHINOOK ADULT
RETURNS TO IMNAHA FISH FACILITY
IMNAHA 2996**

Stock and broodyear		2996
Where trapped		Imnaha Fish Trap
Date of first return		July 23, 1996
Date of last return		September 4, 1996
Number of males returning		128
Number of females returning		57
Number of jacks returning		59
Date of peak returns		July 31, 1996
Number passed above weir to spawn naturally	Males	65
	Females	29
	Jacks	2
Number transferred to Lookingglass Fish Hatchery	Males	63
	Females	28
	Jacks	14
Mortality		0

**CHINOOK SPAWNING RECORD
IMNAHA 2996**

Spawn date	Number females	Number males	Number jacks	Green eggs	Number of eyed eggs
8/14/96	3	6	0	15,000	9,875
8/22/96	6	12	0	30,000	25,875
8/29/96	6	12	0	30,000	27,125
9/05/96	6	13	1	35,000	32,750
9/12/96	2	7	6	10,000	6,500
Total	23	50	7	120,000	103,125

**CHINOOK ADULT
RETURNS TO LOOKINGGLASS HATCHERY
RAPID RIVER 8596**

Stock and broodyear		8596
Date of first return		May 22, 1996
Date of last return		August 29, 1996
Number of males returning		88
Number of females returning		78
Number of jacks returning		6
Number of sub-jacks returning		1
Date of peak returns		June 27, 1996
Number released to spawn naturally	Males	25
	Females	25
	Jacks	0
Mortality		141

**CHINOOK ADULTS
TRAPPED AT LOWER GRANITE DAM
RAPID RIVER 8596**

Stock and broodyear		8596
Where trapped		Lower Granite Dam Trap
Date of first return		May 3, 1996
Date of last return		August 6, 1996
Number of males trapped		307
Number of females trapped		233
Number of jacks trapped		32
Date of peak returns		June 2, 1996
Number released to spawn naturally		0
Number transferred to Lookingglass Hatchery	Males	233
	Females	307
	Jacks	32
Mortality		0

**CHINOOK SPAWNING RECORD
UNMARKED ONLY
RAPID RIVER 8596**

Spawn date	Number females	Number males	Number jacks	Green eggs	Number of eyed eggs
8/20/96	1	2	0	3,848	3,410
8/27/96	4	6	0	16,617	14,252
9/03/96	9	10	0	31,632	30,028
9/10/96	6	5	1	20,480	20,250
Total	20	23	1	72,577	67,941

**CHINOOK SPAWNING RECORD
MARKED ONLY
RAPID RIVER 8596**

Spawn date	Number females	Number males	Number jacks	Green eggs	Number of eggs to Irrigon
8/20/96	1	2	0	4,000	4,000
8/27/96	3	3	2	10,672	10,672
9/03/96	38	40	0	149,196	149,196
9/10/96	49	50	0	191,085	191,085
9/17/96	9	9	2	38,753	38,753
9/26/96	2	2	0	6,645	6,645
Total	103	106	4	400,351	400,351

**CHINOOK ADULT RELEASES
UNMARKED ONLY
RAPID RIVER 8596**

Stock and broodyear	8596
Date	August 26, 1986
Facility released from	Lookingglass Hatchery
Number of males released	25
Number of females released	25
Destination	Lookingglass Creek

**CHINOOK ADULTS TRANSFERRED
MARKED ONLY
RAPID RIVER 8596**

Stock and broodyear		8596
Transferring facility		Lookingglass Hatchery
Destination		Wallowa Hatchery
Dates transferred		July 10-17, 1986
Number of males transferred		139
Number of females transferred		125
Number of jacks transferred		18
Hauling mortality	Males	0
	Females	0
	Jacks	0

1996 CAPTIVE BROOD CHINOOK PROGRAM

**LOSTINE RIVER
BROODYEAR 1996**

Stock and broodyear		200W95
Dates & numbers into Lookingglass	August 14, 1996	95
	August 15, 1996	104
	August 18, 1996	282
Hauling mortality to hatchery		0
Mortality at Lookingglass		2
Captive brood on hand 9/30/96		479

**LOSTINE RIVER
BROODYEAR 1994**

Stock and broodyear		200W94
Date & number into Lookingglass	August 1995	500
Mortality at Lookingglass		66
Captive brood on hand 8/96		434
Date transferred out		June 17, 1996
Number transferred out		160
Average no/lb of fish transferred out		6.80
Destination		Manchester, WA
Date transferred out		August 6, 1996
Number transferred out		274
Average no/lb of fish transferred out		5.33
Destination		Bonneville Fish Hatchery

**CATHERINE CREEK
BROODYEAR 1995**

Stock and broodyear		201W95
Date & number into Lookingglass	August 29, 1996	500
Hauling mortality to hatchery		0
Mortality at Lookingglass		0
Captive brood on hand 9/30/96		500

1996 CAPTIVE BROOD PROGRAM (cont.)

**CATHERINE CREEK
BROODYEAR 1994**

Stock and broodyear		201W94
Date & number into Lookingglass	August 1995	498
Mortality at Lookingglass		24
Captive brood on hand 8/96		474
Date transferred out		Sept. 7 (20) and 17 (156), 1996
Number transferred out		176
Average no/lb of fish transferred out		6.44
Destination		Manchester, WA
Date transferred out		September 6, 1996
Number transferred out		300
Average no/lb of fish transferred out		5.16
Destination		Bonneville Fish Hatchery

**UPPER GRANDE RONDE RIVER
BROODYEAR 1995**

Only two captive broodfish were taken from the Upper Grande Ronde River in 1996. Both fish were released back into the wild. Later collection will be attempted using a downstream migrant screw trap.

**UPPER GRANDE RONDE RIVER
BROODYEAR 1994**

Stock and broodyear		80W94
Date & number into Lookingglass	August 1995	110
Mortality at Lookingglass		6
Captive brood on hand 8/96		104
Date transferred out		September 6, 1996
Number transferred out		104
Average no/lb of fish transferred out		6.79
Destination		Bonneville Fish Hatchery

**1996 LOOKINGGLASS CHINOOK
FINGERLING PRODUCTION**

	Rapid River Stock 8595
Number of fingerlings stocked	30,880
Weight of fingerlings stocked in lbs	203.8
Average no/lb of fingerlings stocked	151.5
Number of mortalities to stocking	1,389
Percent mortality to stocking	4.3%
Conversion rate	1.48

**1996 LOOKINGGLASS CHINOOK
SMOLT PRODUCTION**

	Imnaha Stock 2994*	Rapid River Stock 8594
Number of smolts stocked	91,240	139,112
Weight of smolts stocked in lbs	4,943	6,956
Average no/lb of smolts stocked	18.5	20.0
Number mortalities to stocking	3,764	11,749
Percent mortality to stocking	4.0%	7.8%
Conversion rate	2.01	1.80

*Imnaha stock (2994) chinook are released from Imnaha Facility.

**LOOKINGGLASS CHINOOK
FOOD FED AND WEIGHT GAINED**

	Imnaha BY 94	Imnaha RY 95	Rapid River BY 94	Rapid River BY 95
Period Fed	3/95 - 4/96	3/96 - 9/96	2/95 - 4/96	2/95 - 9/96
Number	91,240	51,318	139,112	185,475
Weight in lbs	4,942	45	6,956	169
Conversion	3.99	1.22	1.80	1.31

1996
ANADROMOUS STOCKING REPORT
LOOKINGGLASS HATCHERY

Stock	Brood Year	Release Site	Release Date	Number Released	Size No/lb	Pounds	Marks	Marks Released
Imnaha	94	Imnaha R	4/02/96	13,839	18.5	748	AD 71225	13,839
Imnaha	94	Imnaha R	4/02/96	13,890	18.5	751	AD 71226	13,890
Imnaha	94	Imnaha R	4/02/96	6,869	18.5	371	AD 71227	6,869
Imnaha	94	Imnaha R	4/02/96	22,915	18.5	1,239	AD 71228	22,915
Imnaha	94	Imnaha R	4/02/96	22,840	18.5	1,235	AD 71229	22,840
Imnaha	94	Imnaha R	4/02/96	10,887	18.5	589	AD 71230	10,887
Rapid R	94	Lookingglass Cr	4/04/96	34,225	19.9	1,720	ADRV 71231	34,225
Rapid R	94	Lookingglass Cr	4/04/96	35,282	20.2	1,747	ADRV 71232	35,282
Rapid R	94	Lookingglass Cr	4/04/96	34,809	19.6	1,775	ADRV 71233	34,809
Rapid R	94	Lookingglass Cr	4/04/96	34,786	20.3	1,714	ADRV 71234	34,786
Rapid R	95	Little Lkglas Cr	07/25/96	6,888	151.5	46	AD 91728	6,888
Rapid R	95	Little Lkglas Cr	07/25/96	2,760	151.5	18	ADPIT 91728	2,760
Rapid R	95	Little Lkglas Cr	07/25/96	6,977	151.5	46	AD 91728	6,977
Rapid R	95	Little Lkglas Cr	07/25/96	9,796	151.5	65	AD 91728	9,796
Rapid R	95	Little Lkglas Cr	07/25/96	2,421	151.5	16	ADPIT 91728	2,421
Rapid R	95	Little Lkglas Cr	07/25/96	2,029	151.5	14	ADPIT 91728	2,029