

**LOWER SNAKE RIVER FISH AND WILDLIFE COMPENSATION PLAN
GRANDE RONDE AND IMNAHA BASINS ANNUAL OPERATION PLAN**

**FOR THE PERIOD OF
FEBRUARY 1, 2007 – JANUARY 31, 2008**

**PREPARED BY:
OREGON DEPARTMENT OF FISH AND WILDLIFE
CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION
NEZ PERCE TRIBE
FOR
LOWER SNAKE RIVER COMPENSATION PLAN
U.S. FWS ADMINISTRATION
and
BONNEVILLE POWER ADMINISTRATION**

**Final
February 2, 2007**

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NPT (Cleary, Harbeck, Michaels, Sealy, Zollman)

In Attendance January 9, 2007 AOP 2007: CTUIR (McLean, Zimmerman), ODFW
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Steelhead (*Oncorhynchus mykiss*)

I. Summer Steelhead - 2006 Brood Year (Grande Ronde & Imnaha basins)

This is third year for releasing smolts from fall collected brood stock evaluation. Fall component is 100,000 smolts marked 100% with an AdRV clip and CWT. A portion (~3,600 smolts) are implanted with a PIT tag. The release is paired with spring-collected brood with similar numbers, AdLV clip, CWT, and PIT tags. The identifying external difference is the ventral fin clip.

A. Allocations –The estimated number of smolts from Irrigon is 1,065,000 fish weighing 253,000 pounds. A total of 800,000 are Wallowa stock at 4fpp. Wallowa fish will be acclimated at the Wallowa and Big Canyon facilities and released both with an early group and late group component. A total of 265,000 are Little Sheep stock at 5fpp. The Little Sheep stock will be acclimated in the Little Sheep facility and also direct released in Big Sheep. Smolt transfers and releases are summarized in Table 1 and Appendix A.

B. Liberations

1. Schedule

- a. Wallowa Acclimation:** Approximately 480,000 smolts will be released from the Wallowa acclimation site, 360,000 in the early group and 120,000 in the late group.

Early Group: Approximately 360,000 smolts will be released after 5 to 6 weeks of acclimation			
Location	Transfer in date	Release dates	Comments
Lower Acclimation Pond	February 14-20	April 8-Su 24 hr-volitional	The screens in the lower sections will be pulled on April 8 allowing fish to leave for 24 hours. On April 9, the remaining fish will be forced out of the lower section
		April 9-M Forced	
Upper Acclimation Pond	February 20-23	April 9-M 24 hr-volitional	The screens in the upper sections will be pulled on Monday allowing fish to leave for 24 hours. On April 10, the remaining fish will be forced out of the lower section
		April 10-T Forced	
Note: Approximately 150,000 smolts released will be used for fall collected brood evaluations.			

Late Group: Approximately 120,000 smolts will be released after 2 to 3 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
Lower Acclimation Pond	April 16-18	April 28-Sa 12 day volitional	The screens in the lower section will be pulled on April 28 allowing fish to leave for 12 days. On May 10, the remaining fish will be forced out of the upper and lower sections
		May 10-Th Forced	
Note: Approximately 50,000 smolts released will be used for fall collected brood evaluations			

- b. Big Canyon Acclimation:** Approximately 320,000 smolts will be released from the Big Canyon acclimation site, 160,000 in the early group and 160,000 in the late group.

Early Group: Approximately 160,000 smolts will be released after 5 to 6 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
Lower Acclimation Pond	March 5-6	April 11-W 24 hr-volitional	The screens in the lower sections will be pulled on April 11 allowing fish to leave for 24 hours. On April 12, the remaining fish will be forced out of the lower section
		April 12-Th Forced	
Upper Acclimation Pond	March 6-7	April 12-Th 24 hr- volitional	The screens in the upper sections will be pulled on April 12 allowing fish to leave for 24 hours. On April 13, the remaining fish will be forced out of the lower section
		April 13-F Forced	

Late Group: Approximately 160,000 smolts will be released after 2 to 3 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
Lower Acclimation Pond	April 18-19	May 1 -T 10 day volitional	The screens in the lower section will be pulled on May 1 allowing fish to leave for 10 days. On May 11, the remaining fish will be forced out.
		May 11 - F Forced	
Upper Acclimation Pond	April 19-20	May 2 -W 10 day volitional	The screens in the upper section will be pulled on May 2 allowing fish to leave for 9 days. On May 11, the remaining fish will be forced out.
		May 11 - F Forced	
Note: Prior to May 12 ODFW Fish Research will sample smolts in the acclimation pond. If >70% of the sample contains males, fish will be enumerated and up to 2,000 released in Wallowa Wildlife pond and 500 in Victor.			

- c. **Little Sheep Acclimation:** Approximately 265,000 smolts will be released in the Little Sheep and Big Sheep tributaries, 165,000 acclimated in Little Sheep and 100,000 direct stream released in Big Sheep

Acclimation. Approximately 165,000 smolts will be released after 5 to 9 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
Acclimation Pond	March 7-9	April 10-T 20 day volitional	Screens will be pulled on April 10 allowing fish to leave for 20 days. On May 1, the remaining fish will be forced out.
		May 1 - T Forced	
Note: Prior to May 1 ODFW Fish Research will sample smolts in the acclimation pond. If >70% of the sample contains <i>maturing males</i> , non-migrating fish will be enumerated and released in Kinney Lake. Kinney Lake out flow is diverted into irrigation canal that discharges into the Grande Ronde.			

- d. **Big Sheep direct release:** Approximately 100,000 smolts will be released directly into Big Sheep April 9-11. NPT will check with Thompson’s to make sure the gate is open to access Big Sheep.

C. Monitoring and Evaluation

1. Summary of marked steelhead released in 2007

- a. **Wallowa**
 - 100,000 Ad, RV, CWT
 - 100,000 Ad, LV, CWT
 - 280,000 Ad only
- b. **Big Canyon marks include:**
 - 50,000 Ad, LV, CWT
 - 270,000 Ad only
- c. **Little Sheep**
 - 140,000 Ad only
 - 25,000 Ad, LV, CWT
- d. **Big Sheep** (direct release) marks include:
 - 100,000 no mark

2. Fish Research—Fish Research staffs will coordinate efforts with the hatchery staffs for pre-release sampling and other marking efforts (Tables 2 and 3).

3. Irrigon Hatchery –Irrigon staff will measure fish lengths for the Big Sheep release.

D. Fish Health—Fish Health staff will coordinate efforts with Fish Research and hatchery staffs to conduct pre-release health examine (Appendix B). Standard disinfection and sanitation guidelines will apply (Appendix C).

E. Satellite Operation—Wallowa staff will set-up Big Canyon acclimation facility ponds in late-February. Big Canyon adult trap will be deployed in late-January, and adult traps for Wallowa and Little Sheep will be installed in February, weather permitting.

F. Key Contacts

1. ODFW (Davis) will notify the following Van Dyke (ODFW) of steelhead releases
2. ODFW (Becker) will notify juvenile trapping personnel – NPT- (Michaels (426-3198; ext. 4), Vogel (208-816-1405) of any change in the scheduled Little Sheep or Big Sheep direct stream smolt releases.

II. Summer Steelhead -2007 Brood Year - Wallowa Stock

The LSRCP mitigation goal is 9,200 adults.

A. Smolt Goal – Produce 800,000 smolts at 4.0fpp for release in 2008. Target production includes:

- 700,000 production
- 100,000 fall collected brood evaluation

Note: Production from fall collected brood stock above CWT evaluation needs will be AdRV clipped as part of standard production group from Wallowa Acclimation site.

B. Egg Take Goal – Collect 1,112,472 green eggs to produce 990,100-eyed eggs (89% survival green to eyed eggs). Transfer 990,100-eyed eggs to Irrigon Hatchery to produce 800,000 smolts (80.8% survival eyed eggs to smolt).

C. 2007 Adult Collection

I. Predicted Run (Table 4)

- Marked –3,020,
- Unmarked –87
- Total – 3,107

a. Wallowa Hatchery –

- Marked –1,932 (585 – 3,279 95% CI)
 - 1,260 1:1-salt; 652 1:2-salts; 17 2:1-salt; 3 2:2-salt.

b. Big Canyon Satellite –

- Marked –1,088 (58 – 2,119 95% CI)
 - 691 1:1-salt; 391 1:2-salts; 6 2:1 salt.
- Unmarked – 87 (46 – 129 95% CI)
 - 29 2:1-salt; 21 2:2-salts, 23 3:1 salt; 14 others
- Total – 1,175

D. Trap Operations

I. Wallowa Trap Operation – Wallowa trap will be installed when winter conditions allow typically in late-February. Collections will continue until no fish are caught for 10 consecutive days.

a. Trap/sorting Frequency - Work trap Wednesdays with hatchery staff as needed.

b. Disposition of Trapped Fish - The estimated surplus of Wallowa stock (Wallowa and Big Canyon combined) is 2,326 adults. The majority of surplus fish will be distributed to food banks. ODFW Grande Ronde Fish District has requested stocking 50 fish in Roulet pond and 40 fish in Ladd pond; and ODFW Wallowa district has requested 100 fish in Marr Pond and 70 fish in Wallowa wildlife pond. Stocking should occur by April 11th. Stocked fish will be identified by a missing adipose fin and 2-left opercle punched (2-LOP). Fish not out planted or given to Food Banks will be taken to the county landfill. Fish spawned will be taken to the county landfill.

1) *Unmarked*—Unmarked fish will be transported to the Fish Hatchery Lane Bridge and released. Samples include genetic (from opercle punch), sex, length.

- 2) *Residual Steelhead* – Count and sample all residuals weekly, take snouts from all AdLV's, and euthanize all fish marked Ad only. After smolts have been released from acclimation pond, discontinue residual sampling.
- 3) *Bull Trout* – Record date, number trapped, and estimated fork length (minimizing handling effects and avoid anesthetics). Send summary to Smith (ODFW) and Krakker (USFWS).

2. Big Canyon Trap Operations—No broodstock will be required from Big Canyon. The Big Canyon trap will be installed when winter conditions allow which is typically in early-February. Collections will continue until no fish are caught for 10 consecutive days.

- a. **Period of Trap Operation** - From initial start-up through April 9, the ladder will be operated from 5 pm Monday through Friday morning. After sorting on Fridays, the ladder will remain closed through Monday 5 pm to keep hatchery fish more available to the angler. After April 9, the ladder will remain open throughout the trapping operation.
- b. **Trap/sorting/recycle Frequency** - Work trap on Friday's.
- c. **Disposition of Trapped Fish**
 - 1) *Unmarked*--Pass all fish above the weir in Deer Creek. All released fish will be measured and marked with a 1-LOP.
 - 2) *Marked* – No marked fish will be passed. All adults marked AdLV or AdRV will not be releases and sampled for CWT recovery. Surplus hatchery fish will be outplanted, recycled or transferred to Wallowa Hatchery for disposition.
 - 3) *Re-cycle fish*--Starting in late February and continuing through 6 April, approximately 50 fish will be re-cycled in the fishery every Friday. Fish will be uniquely marked with OP and outplanted at the Minam boat ramp (70%) and above Deer Creek confluence (30%). Recorded data should include fish checked in creel surveys, release location, OP punch, number of weeks to return to Big Canyon, number fish unaccounted, number that returned to Wallowa Hatchery (stray). Re-captures will be processed to food banks or landfill.
 - 4) *Bull Trout* – Record date, number trapped, and estimated fork length (minimizing handling effects and avoid anesthetics). Send summary to Smith (ODFW) and Krakker (USFWS).
 - 5) *Residual Steelhead* - Count weekly until first smolt release. Sample all AdLV's and take snouts and euthanize all Ad only. Efforts will be made to prevent residual steelhead from escapement when working the adult trap.
- d. **Disposition of Fallback Fish** - Staff will collect and sample all fish that fallback on the Deer Creek weir to determine; passed to un-passed ratio, h/w ratio, and number spawned out. Collect otoliths or head from moribund or dead unmarked steelhead and pass live fish downstream.

E. Hatchery Broodstock/Collection Guidelines

1. Wallowa Hatchery- All Wallowa steelhead are held and spawned at Wallowa Hatchery.

- a. **Fall collected**—A total of 76 adults were collected in October 2006. In late February or early March, the surviving fall collected broodstock will be enumerated, sex determined, and externally marked with a Tyvek tag and LOP punched. A total of ~75 fish may survive to January 1, 2007.
- b. **Winter/spring collection**—Approximately 359 additional steelhead should be spawned for broodstock needs. Production will consist of Ad only or AdLV's. Swim-in AdRV will not be utilized for the production group.
- c. **Broodstock Needs**—A total of 434 adults should be spawned to meet production goals.
 - Males – 217
 - Females – spawn 217.Pre-spawning mortality of spring-collected adults is estimated at 1.3% for females and 3.0% for males. Pre-spawning mortality of fall-collected adults is estimated at 3.5%. The five-year average fecundity is 5,120 eggs/female.

2. Wallowa Hatchery Spawning Guidelines

a. **Expected 1st Spawn** – Wednesday, March 14. Thirty to thirty-five pairs are expected to spawn from fall-collected broodstock. The number below will be reduced proportionately for those specific spawn days.

- b. **Spawning Dates** – Wednesday.
 - March 14 – 19 females (3 stacks)

- March 21 – 33 females
- March 28 -- 39 females
- April 4 -- 39 females
- April 11 -- 39 females
- April 18 -- 31 females
- April 25 – 17 females

If 9 females not ripe on March 14, production will be comprised from only six egg takes. The total of 217 females will be spawned.

c. Spawning Strategies - 1:1 ratio and incubate 1 female per tray. Segregate the eggs collected from fall returning broodstock. Males from fall-collected brood may be used twice in the spawning protocols.

F. Incubation Strategies-Wallowa/Irrigon Green eggs will be incubated at Wallowa Hatchery.

Embryos will be transferred to Irrigon Hatchery as eyed eggs and will represent seven egg takes. The first egg take will be delayed until March 14.

G. Rearing Program-Irrigon

Eggs will be hatched and reared at Irrigon Hatchery.

- a. Programmed for Release** - The target transfer size is 4.5fpp for an April and May releases.
- b. Grade** – Progeny from fall-collected adults will not be graded. Production releases will be graded. Fish will be fed at differing rates for targeted transfer dates.
- c. Excess** – No excess is expected, however, if survival is greater than expected, eggs can be culled, smolts produced, or released in Kinney Lake.
- d. Progeny** from fall-collected broodstock will be segregated. Progeny not required for evaluation will be mixed after RV marking in the general production and used in Wallowa releases.

H. Fish Health

- a. Broodstock** monitoring plan (Appendix B).
- b. Disinfection** and Sanitation Guidelines (Appendix C).

I. Monitoring & Evaluation

a. Proposed marking includes: Progeny from fall-collected broodstock will be reared in two release groups. The first release will consist of 75% of the production and second 25% of the production. This will complete the third year of marking for this fall v winter/spring brood evaluation.

1. Wallowa (480,000 total, 360,000 first acclimation and 120,000 second)

- 100,000 Ad, LV, CWT
 - 75,000 AdLV first acclimation
 - 25,000 AdLV second acclimation
- 100,000 Ad, RV, CWT (fall returning broodstock)
 - 75,000 AdRV first acclimation
 - 25,000 AdRV second acclimation
 - 280,000 Ad only

2. Big Canyon (320,000 total)

- 50,000 Ad, LV, CWT
- 270,000 Ad only

b. Tagged groups are summarized in Table 5.

c. PIT-tagging in each release group (Table 6).

d. Re-cycle—ODFW Fish Research (Flesher) will provide a short summary of fish re-cycled in the fishery.

III. Summer Steelhead -2008 Brood Year - Wallowa Stock—Fall Collection

No fall brood collections are expected in 2008.

IV. Summer Steelhead - 2007 Brood Year – Little Sheep Stock

Co-managers have agreed to manage production to meet the LSRCP mitigation goal of 2,000 adults. The goal consists of fish returning to Little Sheep, Big Sheep, and compensation area harvest.

A. Smolt Goal — Produce 265,000 smolts at 5.0fpp for release in 2008.

Production and releases include:

- 165,000 Little Sheep Cr. (acclimated) smolts (at least 5% wild parents)
- 100,000 Big Sheep Cr. (direct stream) smolts

B. Egg Take Goal – A total 367,595 green eggs will be taken to produce 327,160 eyed eggs (89%) and 265,000 smolts (81% eyed eggs to smolts).

C. Adult Collection

1. Predicted Run – (Table 5).

- Marked – 1,637 (549 to 2,724 95% CI);
 - 1,229 1:1-salt; 388 1:2-salts; 18 2:1-salts; 2 3:1
- Unmarked – 90 (0 to 180 95% CI)
 - 48 2:1-salt and 19 2:2-salts; 17 3:1-salts; 6 3:2-salts and 4:1-salts.

D. Weir Management and Trap Operations

1. Little Sheep Trap Operation – Little Sheep trap will be installed when winter conditions allow typically in late-February. Collections will continue until no fish are caught for 10 consecutive days.

a. Trap/sorting Frequency - Work trap Mondays and Thursdays.

b. Disposition of Trapped Fish

1) *Wild* – 1 of 4 males and 1 of 7 females will be taken for brood (total wild fish collected is estimated at 8 males and 8 females). Wild composition in hatchery brood is estimated at 10.1 %. The other wild adults collected will be 1-LOP and placed above the weir. Number wild fish released above the weir is estimated at 74 fish with a wild composition of 33% for natural spawning.

2) *Hatchery* – For males, 1 of 10 will be collected for brood, 1 of 10 marked with 1-LOP and placed above the weir, and 8 of 10 marked with 2-LOP and out planted to Big Sheep. For females, 1 of 12 will be collected for broodstock, 1 of 12 marked with 1-LOP and released above the weir, and 10 of 12 marked with 2-LOP out planted to Big Sheep. The run size will be reviewed around April 1 and adjustment can be made for broodstock collections. NPT will provide two people two days per week for Big Sheep adult outplants. Number hatchery fish released above the weir is estimated at 150 fish with a hatchery composition of 67% for natural spawning.

3) *Bull Trout* – Record date, number trapped, and estimated fork length (minimizing handling effects and avoid anesthetics). Send summary to Smith and Zakel (ODFW) and Krakker (USFWS).

4) *Residual Steelhead* – Count and sample all residuals weekly until first smolt release, take snouts from all AdLV's and euthanize all Ad only.

5) *Genetics tissue samples*. All wild and hatchery fish passed above the weir will be tissue sampled for genetic analysis by ODFW (for NMFS).

6) *Big Sheep out plants*. Approximately 1,345 adults will be transferred from Little Sheep to Big Sheep. Outplants will be identified with 2-LOP. Outplants can be discontinued after May 10 if < 2 fish per week are collected. Fish captured after May 10 may be released above the weir.

7) *Fallback or Recaptured Fish* -All recaptured Big Sheep (2-LOP) and Little Sheep (1-LOP) fish will be counted and released in their target stream at recapture and subsequent recaptures.

8) *Carcass Disposal*-Spawned fish and mortalities will be placed in the local landfill.

9) *Strays* – All unidentified marked fish will be sacrificed.

10) *Scales*—Samples will be collected from all wild adults

E. Collection Guidelines—Adults returning to Little Sheep trap will have a variety marks. Summary of marks include:

Mark	Disposition
Ad	Out plant or pass above the weir
AdLV+CWT	Out plant, pass above weir, or spawn
No Mark+CWT (blank wire)	Out plant or pass above weir
No Mark wild	Spawn or pass above weir
No Mark hatchery	Out plant or pass above weir
AdRV (out of basin)	Kill not spawn (recover CWT)

* Check all no marks for CWT

* For Passed or Outplanted -- record clip, sex, location, genetic sample for passed fish, fork length

* For KNS -- record date and Clip, then save for sampling

* The dorsal fin will be inspected to help identify no mark hatchery fish.

1. Broodstock Needs-

- Males –80 collected (77 spawned)
- Females –78 collected (77 spawned)

Broodstock numbers were determined based on a 5-year average of pre-spawning mortality (1.0% females; and 3.0% males) and mean fecundity of 4,700.

a. Wild broodstock– 8 males and 8 females needed for brood. Approximately 74 wild fish will be released above Little Sheep weir.

b. Hatchery broodstock– 72 males and 70 females are needed for brood. Approximately 150 adults will be released above the Little Sheep weir. The balance of hatchery origin adults may be outplanted in Big Sheep Creek

F. Spawning Guidelines

1. Little Sheep Satellite

a. First Spawn - March 20.

b. Expected Spawning Frequency – Weekly on Tuesdays.

2. Spawning Strategies – A 3 x 3 matrixes with hatchery and wild fish will be utilized. A matrix will include at least one natural fish, when ever possible. When eggs have been fertilized, the embryos will be combined into groups of three females. These groups will be tracked.

- Note: Live spawn all wild males retained for broodstock and release (genetic sample).

G. Incubation Strategies

Green eggs will be incubated at Wallowa Hatchery. Embryos will be transferred to Irrigon Hatchery as eyed eggs and will represent all egg takes.

H. Rearing Program

Embryos will be hatched and fish reared at Irrigon Hatchery.

1. Programmed for Release - 265,000 smolts

- 100,000 Big Sheep
- 165,000 Little Sheep

Target size at transfer is 5.0fpp. Single acclimation is expected with early May release.

2. Grade – No Little Sheep stock will be graded.

3. Excess production - Fish in excess of program needs will be reared to smolts and incorporated with the Little Sheep Creek release.

I. Fish Health - Monitoring Plans

1. Disinfection and Sanitation Guidelines (Appendix C).

2. Broodstock monitoring plan (Appendix B)

J. Monitoring & Evaluation

1. Proposed marking includes:

a. Little Sheep:

- o 25,000 Ad, LV, CWT
 - o 140,000 Ad only
 - b. Big Sheep** (direct release):
 - 100,000 no mark
2. **PIT tagging** in each release group (Table 6).
3. **Pedigree genetic analysis**—Little Sheep adults are being evaluated on their origin (hatchery or wild) using genetic samples. All fish released above the weir and used for brood stock are sampled.

K. Key contacts

1. **ODFW** (Flesher) will provide ODFW (Smith, Davis, Patterson), NPT (B. Johnson, Hesse, Vogel) and CTUIR (Zimmerman, Boe, McLean, Schwartz) with weekly summary on collected and passed StS adults at Little Sheep.

V. Summer Steelhead Monitoring: Catherine Creek/Grande Ronde River/Lookingglass Creek-2006

Goal-to monitor natural escapement and hatchery strays into natural production areas and collect basic life history information for management planning—No fish production goals.

A. Monitoring and Evaluations

1. Adult Enumeration/Weir Collections

- a. **Weir location**—Catherine Creek (CC), Grande Ronde River (UGRR), and Lookingglass Creek (LGCR). CC and UGRR weirs installed, operated and maintained by CTUIR. LGCR weir installed and operated by ODFW
- b. **Period of Trap Operation** – Environmental conditions permitting, March through August 1, typically no steelhead captured after mid-June. Lookingglass trap will be operated into early September to collect chinook.

2. Disposition of fish at weir-

- a. **Steelhead** – Unmarked adults will be sampled (enumerated, weighed, fork length, sex, marks, condition) opercle punched and passed above the weir. Marked steelhead will be sacrificed and AdLV marked fish will be sampled for CWT recovery.
- b. **Bull trout** – Record date, number trapped, and estimated fork length (minimizing handling effects and avoid anesthetics). Send summary to Smith, Zakel, and Jacobs (ODFW) and Krakker (USFWS).
- c. **Genetic** – Collect tissue samples from all wild steelhead for future genetic analysis.
- d. **Adult mortality** – Retain Lookingglass Creek mortality only. Sample immediately or freeze for sampling. Other weir locations, remove otolith (ODFW) and return carcass to river. Collaborate with Fish Health when working dead fish.
- e. **Fallback** fish will be collected and released below the weir. Recaptured fish will be released above weir.

3. Juvenile Sampling

- a. Operate rotary trap(s) on Lookingglass Creek - Trap year-round, collect data, PIT tag, release..

B. Key Contacts

1. CTUIR (Boe). Distribute bull trout and steelhead data collected to ODFW District offices.

VI. Summer Steelhead - Imnaha Tributaries (Lightning and Cow Creeks)

Goal-to quantify adult escapement (NPT)—No Production goals.

A. Monitoring and Evaluations

1. Adult Escapement - Enumeration Weir using angled upstream and downstream portable picket weirs

- a. **Weir location**—Lightning Creek and Cow Creek.

2. Trap Operations

- a. **Wild/Hatchery** – No fish retained. Trap, collect data, and release only.
- b. **Wild Kelts** – No collection.
- c. **Period of Trap Operation** – February through June, or until 10 days after last capture.
- d. **Trapping Strategies**—check trap twice daily.

e. *Disposition of fish at weir-*

1) Steelhead – Steelhead in the upstream movement box will be dipped out with cotton dip net and placed into a moist canvas sling/measuring box. Data including fin clips, sex, spawning condition (pre/post), and fork length will be recorded. Scales will be collected from just behind the dorsal fin and above the lateral line using a blunt knife and forceps. A paper hole punch will be used to collect fin tissue from the dorsal fins for DNA genetic characterization before release upstream of the trap. A double right opercular punch will be given using a paper hole punch and a Tyvek disk tag will be applied to the left operculum. Non-target species will be measured (sub-sample 25/day/species) and released. Steelhead and non-target species will be released into a pool/slack water above the weir.

Steelhead captured in the downstream movement box will be examined for opercular punches and Tyvek disk tags. Marked fish will be checked for spawning condition (pre or post-spawn) and released downstream. Downstream moving non-marked steelhead and non-target species will be handled with the same procedures as upstream moving fish with the exception of a downstream release.

2) Bull trout – Record date, number trapped, and estimated fork length (minimizing handling effects and avoid anesthetics). Report take to US Fish and Wildlife Service Under Section 6 (4d limitation) Bull Trout Permit #TE001598-1 with copy of data to ODFW (Smith) and LSRCP (Krakker).

3) Genetic - Collect tissue samples from all wild and hatchery fish for future genetic analysis.

f. *Disposition of adult mortality* – Natural mortalities will be sampled for biological information and their otoliths collected.

C. Key Contacts

I. NPT (Vogel, Hesse)

CHINOOK (*O. tshawytscha*)

Fish production will prioritize 12 raceways for Grande Ronde tributary production and 6 raceways for Imnaha production at Lookingglass Hatchery. Priorities include:

- *Lostine; 4 raceways; 3 raceways conventional and 1 raceway captive broodstock*
- *Upper Grande Ronde; 4 raceways.*
- *Catherine Creek; 2 raceways*
- *Lookingglass Creek; 2 raceways*
- *Imnaha; 6 raceways*

VII. Grande Ronde Basin -2005 Brood Year Spring/Summer Chinook– Catherine Creek, Lookingglass Creek, U. Grande Ronde & Lostine River

Smolts target size is 25fpp by October 31 with a expected release size of 20fpp in April.

A. Allocation—The estimated number of smolts for the Grande Ronde Subbasin 2007 release is 441,300 fish weighing 20,000 pounds. Breakdown by tributary is as follows:

- Catherine Creek (CC)- 71,300
 - CBS-21,500
 - Conv-49,800
- Lostine River (LR)- 230,400
 - CBS-24,700
 - Conv-205,700
- U. Grande Ronde (UGR)- 139,600
 - CBS-20,600
 - Conv-119,000
- Lookingglass (LGCR)-0

B. Liberations

1. Schedule—All facilities will be set-up and operational at least 2 days prior to scheduled delivery of smolts. Weather permitting; the Lostine is scheduled for delivery of fish on March 5, Catherine Creek on March 12, and on Upper Grande March 13. Acclimation facility operator will notify Bob Becker, Bob Lund, or Scott Patterson if their facility is not operational on scheduled dates (Appendix A). Release number will be determined by last physical inventory minus mortality. Facility operators will report final numbers to the ODFW LGH or Shari Beals.

a. Lostine Acclimation schedule

Early Group: Approximately 105,300 smolts will be released after 1 to 3 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
LGH ½ R10 to pond A	March 5 - 6	March 16-F	The screens will be pulled on March 16 allowing fish to leave for 10 days. On March 26, the remaining fish will be forced out
LGH ½ R10 to pond B		10 day volitional	
LGH ½ R8 to pond C		March 26-M	
LGH ½ R8 to pond D		Forced	

Late Group: Approximately 125,100 smolts will be released after 1 to 3.5 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
LGH 2/3 R9 to pond A	March 27-28	April 7-Sa	The screens will be pulled on April 7 allowing fish to leave for 10 days. On April 17, the remaining fish will be forced out
LGH 1/3 R9 and 1/3 R7 to pond B		0 day volitional	
LGH R11 to pond C		April 17-T	
LGH 2/3 R7 to pond D		Forced	

Note: R11 captive brood progeny

b. Catherine Creek

Approximately 71,300 smolts will be released after 3 to 4 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
LGH ½ R1 to pond A	March 12	March 26-M	The screens will be pulled on March 26 allowing fish to leave for 16 days. On April 11, the remaining fish will be forced out
LGH ½ R1 to pond B		16 day volitional	
LGH R2 to pond C		April 11-W	
MT pond D		Forced	

R1 and R3 are captive production, R2 conventional production

c. Upper Grande Ronde

Approximately 139,600 smolts will be released after 3 to 4 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
LGH R3 to pond A	March 13-14	March 26-M	The screens will be pulled on March 26 allowing fish to leave for 16 days. On April 11, the remaining fish will be forced out
LGH R4 to pond B		16 day volitional	
LGH R5 to pond B		April 11-W	
LGH R6 to pond B		Forced	

R6 is captive brood production: CTUIR requested a contingency for captive brood releases if smolts are larger than 22fpp at transfer.

d. Lookingglass Creek

No fish were released from Lookingglass Creek			
Location	Release dates	Comments	
NA			

Notes:

Contingency—Fish may be released earlier than schedule if conditions warrant. Downstream rotary traps operators should be notified immediately and co-manager within 24 hours: Erick VanDyke (541) 962-3783; Jeff Yankee (541) 426-6057; Pat Keniry (541) 962-3026.

All acclimation mortalities will be scanned for PIT tags. Tags or code numbers will be provided to NPT (Cleary) and ODFW (Jonasson). Mortalities will be offered to fish health for examination

D. Monitoring and Evaluation—A variety on M&E efforts are ongoing (Table 2, 3 and 5).

1. Genetic tissue collection for monitoring and potentially pedigree analysis.
2. Pre-liberation weight and length
3. Downstream migration.
4. PIT survival studies
5. Tag retention and fin clip quality.
6. Captive vs. Conventional production
7. Hatchery vs. Natural
8. Marked Groups
 - a. AD/CWT - 100% in CC, LR, and uGR captive brood and 100% in CC and LR conventional brood
 - b. CWT only (no Ad clip)- 100% uGR conventional smolts.
 - c. PIT tag *by stock*— CC 21k, LGCR 5k, uGR 1k, LR Captive brood 8k, LR Conventional brood 6.5k.
 - d. Visual Implant Elastomer (VIE) –
 - CC-Blue-left eye in captive
 - LR –Red- left eye in captive

E. Fish Health-- Fish Health staff will coordinate efforts with Fish Research and hatchery staffs to conduct pre-release health examine (Appendix D). Standard disinfection and sanitation guidelines will apply (Appendix C).

F. Key contacts

1. **Hatcheries:** CTUIR (McLean), ODFW (Lund, Deal), NPT (Zollman).
2. **Fish Research:** CTUIR (Boe) ODFW (Hoffnagle, Monzyk), and NPT (Hesse, Harbeck, Vogel).

VIII. Grande Ronde Basin -2006 Brood Year Spring/Summer Chinook –Catherine, Lookingglass, Lostine & U. Grande Ronde

Smolts target size is 25fpp by October 31 and 20fpp at release.

A. Allocation –Scheduled for transfer target size of 22fpp in mid-March 2008.

1. **Anticipated Grande Ronde basin production** at Lookingglass hatchery is 636,000 smolts for release in 2008.

- a. **Estimated Captive brood** numbers are:
 - Catherine Creek 0
 - Lostine River 14,000
 - U. Grande Ronde 0 (outplanted ~1,400 eyed eggs in Meadow Creek 11-2006)
 - Lookingglass Creek 48,000
- b. **Estimated Conventional brood** numbers are:
 - Catherine Creek 120,000
 - Lostine River 198,000
 - U. Grande Ronde 256,000

B. Final Rearing—LGH fry will be transferred outside in April or early May (Appendix F).

Approximately 100,000 Lostine River fry will be transferred from Oxbow to Lookingglass Hatchery in April at 250fpp.

C. Marking Program--

1. **AD/CWT** is scheduled for June through July 2007. Catherine Creek, Lostine River conventional, and the captive brood Lookingglass Creek (CC-stock) production will be marked. The Lostine River captive brood will be CWT for M&E purposes. Marking of the Upper Grande Ronde was not resolved during in US v Oregon on January 24, and is still under discussion.

Catherine Creek

- 60,000 Ad CWT
- 60,000 Ad only

Lostine River

- 198,000 Ad CWT
- 14,000 CWT only (M&E mark)

Lookingglass Creek

- 48,000 Ad CWT

Note: During marking, equipment will be disinfected between stocks. Within a stock, operations will start with low titer group and progress to higher titer groups. Raceways with abnormal mortality rates will be marked last by stock. Additional efforts will be made for equipment disinfections.

2. **PIT tagging** is scheduled for October 2007 (Table 7). Numbers by stock include:

- Catherine Creek—21,000
- U. Grande Ronde—2,000
- Lostine (captive)—1,500
- Lostine (conventional)—5,000

4. **No Visual Implant Elastomer (VIE)** is scheduled in 2007 for BY06.

D. Fish Health

Only one medicated feed treatment is planned for conventional 2006 brood. In lieu of an early treatment, a proactive diet (immune enhancer) will be applied. Captive brood fry will receive a medicated treatment, if feed is available.

1. **Disinfection** and Sanitation Guidelines (Appendix C).
2. **Juvenile and disease outbreaks** (Appendix D).

E. Key contacts

1. **Fish Marking** (Lund, Mallette, Onjukka, Harbeck, Vogel, Monzyk and Jonasson)

IX. Grande Ronde Basin-Conventional-2007 Brood Year - Spring/Summer Chinook Catherine, Lookingglass, Lostine, and Upper Grande Ronde

The LSRCP production goal is 900,000 smolts to produced 5,800 adults. However, co-managers will target 880,000 smolts for release in 2008.

A. Smolt Production -

1. Production targets include:

- Catherine Creek: 130,000 smolts
- Lookingglass Creek: 250,000 smolts
- Lostine: 250,000 for Lostine River
 - 187,500 from conventional brood
 - 62,500 from captive brood
- Upper Grande Ronde: 250,000 smolts

B. Anticipated Egg Needs – A total of 1,047,600 green eggs should be collected to produce 880,000 conventional smolts based on 84% green eggs to smolts survival. Captive brood component can be used to supplement production numbers.

C. 2007 Adult Collection

1. Predicted Runs (Tables 8, 9, 10,11) female contribution estimated at 50% of adults.

a. Catherine Creek –

ODFW-248 adults (31 jacks)

- Natural-182 adults (plus 14jacks)
- Hatchery-66 adults (plus 17 jacks)

CTUIR-213 adults (6 jacks)

- Natural-150 adults (plus 4 jacks)
- Captive-21 adults (plus 1 jacks)
- Conventional-47 (plus 1 jacks)

b. Lostine River

ODFW-665 Adults (212 jacks)

- Natural-506 adults (plus 47 jacks)
- Hatchery-159 adults (plus 165 jacks)

NPT-603 Adults (43 jacks)

- Natural- 400 adults (plus 23 jacks)
- Captive- 59adults (plus 10 jacks)
- Conventional-145 adults (plus 10 jacks)

Deleted:

c. Upper Grand Ronde –

ODFW-130 adults (20 jacks)

- Natural-68 adults (plus 17 jacks)
- Hatchery-62 adults (plus 3 jacks)

CTUIR-77 adults (29 jacks)

- Natural-56 adults (plus 29 jack)
- Captive-6 adults (plus 0 jacks)
- Conventional-15 adults (plus 0 jacks)

d. Lookingglass Creek 475 adults (30 jacks)

CTUIR

- Natural-40 adults (plus 2 jacks)
- Hatchery CC-435 adults (plus 28 jacks)

2. Broodstock Needs (Appendix J)

a. CC—A target of 42 pairs should be collected to produce 130,000 smolts. The estimate is based on a female survival of 95%, fecundity of 3,824, and green eggs to smolt survival of 86%.

b. LG CR—An estimated number of 80 pairs should be collected to produce 250,000 smolts. This is based on performance history of the CC stock.

c. LR—A target of 70 a pairs should be collected to produce 250,000 smolts. If captive brood production is utilized, only 54 pairs should be collected (51 spawned). These estimates are based on female survival of 95%, fecundity of 4,370, and 85% green egg to smolt survival.

d. UGR— A target of 83 a pairs should be collected to produce 250,000 smolts. This is based on a female survival of 92%, fecundity of 4,062, and 81% survival from green egg to smolt.

D. Trap Operation

1. CC and UGR Trap Operation (CTUIR)– Trapping will begin in March 2007 to monitor steelhead abundance. Overnight staffing will occur after April 16 and will continue, if river conditions allow, through July 31.

2. LR Trap Operation (NPT)--Trapping on Lostine River will begin in May and continue through October 1.

3. Lookingglass (ODFW)— The intake trap at Lookingglass Hatchery will be operated from mid-May (environmental conditions allow) through mid-September. Known returns of CC smolts released into Lookingglass, and unmarked jacks, will be used for outplants or broodstock. Unmarked adults will be given to the Tribes for C/S purposes.

4. General Guidelines –

- a. Trapping facilities will be checked daily.
- b. Water temperature data will be collected. When water temperature exceeds 65°F (18.3°C) fish will not be handled. Picket will be pulled and fish will be allowed to pass. It is expected that as water temperatures increase facility operates will adjust their schedule to best coincide their work with the coolest water temperatures. Water temperatures can be monitored with Onset temperature loggers.
- c. Surveys will be conducted by walking the stream bank for a mile section below each weir. Surveys frequency ranges from daily to weekly depending on water temperatures and fish activity. Information is used to determine if salmon are accumulating below the weirs. Surveys may include snorkeling.
- d. Attempts will be made to haul captured adults on a daily basis. However, adults in CC and UGR will be worked on M, W, F schedule, but will be worked more often during the peak of the run, if necessary. Fish may be held up to 72 hours.

5. Weir Management Guidelines

a. **CC--** At the projected run level of 213 to 248, the adult sliding scale for broodstock collection in Catherine Creek supplementation programs calls for collection of <40% of wild and hatchery-origin fish. Hatchery-origin adults released above the weir is not a decision factor. Ten percent of the males above the weir may be age-3 hatchery males.

1) Catherine Creek

- Wild fish—keep 2 of 5 for brood (40%), pass 3 of 5
- Conventional—keep 2 of 5 for brood (40%), pass 3 of 5
- Captive—pass 100% of captive adults

b. U. Grande Ronde

1) UGR -- Grande Ronde conventional program calls for collection of 50% of natural fish and up to 100% conventional returns. Pass 100% of captives.

c. **Lostine--** At the projected run level of 603 to 665 adults, the adult sliding scale for broodstock collection in Lostine River supplementation programs calls for collection of <20% of wild fish. Hatchery-origin adults released above the weir should be ≤ 50%, and the hatchery brood stock should contain ≥30% wild origin fish. Ten percent of the males above the weir may be age-3 hatchery males. Pass or out plant all Captive Brood F₁ returning adults.

- Wild fish—keep 1 of 5 for brood (20%), pass 4 of 5
- Conventional—keep 2 of 5 for brood (20%), pass 3 of 5
- Captive—pass or outplant 100% of captive adults

Surplus adults are not expected, but maybe out planted in Bear Creek or Wallowa River.

d. Lookingglass Creek—Work trap as needed

- 1) Unmarked chinook, considered progeny of Rapid River origin stock, will be given to the Tribes for C/S.
- 2) Up to 150 ad clipped adults will be held at Lookingglass Hatchery. Outplants of adults can occur when the run is assessed in June. Weir management plan is under development.
- 3) Surplus hatchery jacks can be euthanized.
- 4) All Chinook passed upstream of the intake trap will have tissue collected for future genetic analysis (pedigree)

Notes:

General comments—Less than 5% marked fish from other streams or basins will be passed upstream. If an unmarked PIT fish is detected, it will be passed upstream or used for brood stock after verification of origin. Surplus captive brood jacks from CC or UGR may be sacrificed for CWT recovery.

6. Disposition of Trapped Fish --Adults considered fish age-4 (two ocean) and age-5 (three ocean). NPT plans to collect scales from passed adults and jacks to help delineate between age-three, age-four and age-five fish estimates using length frequencies.

a. Bull Trout – Enumerate and estimate length (minimize handling). Data and reports sent to ODFW (ODFW District and Regional offices), and LSRC (Krakker).

b. Returning Adults from Captive Brood (F₁) – Pass or out plant. Data include fish length, genetic (tissue), and sex prior to release above the weir. Excess jacks may be sacrificed for CWT recovery

c. Unmarked Chinook can be anesthetized with Aqui-S or MS 222 prior to handling. A data sheet should be provided to Lookingglass Hatchery for all transferred fish (AAT). Each fish trapped will be measured to the nearest mm fork length, sex determined, and a tissue sampled (opercle or caudal punches) for genetic analysis. Fish passed above the weir will be allowed to fully recover in sheltered flow before being released. Fish placed above the weir will be opercle punched (UGR=1ROP, CC=1ROP, LR=Unique opercle punch bi-weekly) for population estimates. *The opercle tissue is generally saved for genetic analysis.* LR fish taken to the Lookingglass will receive three opercle punches (3-ROP) and Tyvek tag. Catherine Creek fish taken to Lookingglass will be PIT tagged. Wild fish from Upper Grande Ronde transferred to Lookingglass will have an orange Tyvek tag and hatchery fish a white Tyvek tag. Hatchery fish trapped on Lookingglass Creek, identified as CC, LR, UGR, will either be released back to the stream of origin or held for with their respective brood, and marked with 2ROP. Adult may be outplanted after July 25 or spawned for production. If outplanted, Lookingglass returning fish will be opercle punched and tissue saved for genetic analysis.

d. Carcasses weirs – Trapping mortalities will be processed as kept fish and transported to Fish Health, fresh if possible, for pathological examination. Fish dead for less than 24 hrs keep on ice. Fish dead more than 24 hours freeze. Other pre-spawning mortalities discovered during weir-effect surveys will also be sent to Fish Health. Data will be sent to ODFW Fish Research (Monzyk). Following examination, the carcasses may be disposed of by Tribal distribution, habitat or landfill.

Note: Tumors- Fish will be inspected for tumors along the gum line. If a tumor is suspected, fish will be held for consultation.

7. Broodstock Transportation Procedures – CTUIR will provide transportation of adult fish from CC and uGR and NPT will provide transportation from the Lostine. ODFW Regional Transport coordinator will provide back-up transportation.

a. Attempt to haul broodstock adults daily. Adults will not be held more than 72 hours.

b. Driver is responsible to complete a transfer data sheet to the Lookingglass Hatchery staff upon arrival for data entry in the HMIS system.

c. Thermal shock will be minimized during transport. Hauling will normally occur in the morning to take advantage of cooler stream temperatures. Temperature differences between transport container and facility water will not exceed 10°F or 5.6°C. Tempering may be necessary to reduce temperature difference.

d. Fish Handling- Fish will be netted from the transport tank and placed in holding tanks at Lookingglass Hatchery. Lookingglass Hatchery personnel will record all observations on data sheets and report to Fish Health at the end of the season.

8. Adult holding

a. Catherine Creek – All fish will be held in one adult holding raceway.

b. Lookingglass Creek-All fish will be held in one adult holding raceway.

c. Lostine River-All fish will be held in circular tank in endemic building (number TBA).

d. Upper Grande Ronde—All adults will be held in two circular tanks in the endemic building (numbers TBA). After first sort, males and females will be segregated.

E. Spawning Guidelines (for each stock)

1. Anesthetic MS222 or Aqui-S.

2. Sorting – Final sexing and inoculation week should occur the week of August 1. Lostine and Lookingglass fish will be given IP injections. Upper Grande Ronde and Catherine Creek fish will be given dorsal sinus (DS) injections. No inoculation of jacks.

3. Expected First Spawn – The week of August 15th.

4. Spawning Frequency - Once per week or as required (deceased females will not be spawned).

Schedule: Tuesday-IM, Wednesday-LR, LGCR, Thursday-UGR, CC.

5. Spawning Strategies - All spawning will be done at Lookingglass Hatchery. Sorting and spawning to take place the same day. Hatchery and co-manager staffs will determine fertilization matrices. Most spawning matrices will be 2x2, but matrices of 1 female x 2 males or 1x1 or 2x1 can be used if necessary. Fertilized eggs will be incubated at Lookingglass hatchery. Fecundity will be determined at eye-up. If a ripe female is observed during sorting and no ripe male is available, the female will be returned to the holding pond until a ripe male is located. Ripe male gametes can be collected in an emergency (priority intended):

a. Sperm on ice from fish passed at weirs - These fish will be given a ILOP opercle punch so they can be identified during spawning surveys and counted as “taken”.

b. Cryopreserved sperm Fill out request form (Appendix G).

c. If milt is not available after 7 days of holding a ripe female, transport female(s) to river of origin.

Note: Gene Banking – Sperm from males will be cryopreserved on the day of spawning. NPT will provide staffing and coordination with Lookingglass Hatchery.

F. BKD Management.

Progeny are categorized based on their maternal parent. Categories include:

- ≤ 0.199 = Low
- $0.2 - 0.399$ = Moderate/Low
- $0.4 - 0.799$ = Moderate/High
- 0.800 –above= Clinical

Note – Production groups are based on (*R. Salmoninarum*) antigen levels of the maternal parent. Antigen levels are determined by enzyme-linked immunosorbent assay (ELISA). Fish Health recommends rearing progeny from parents with lowest BKD titer levels or segregated by category.

G. Incubation Strategies – All stocks will be incubated at Lookingglass Hatchery using a combination of chilled well water and UV treated ($>60,000$ uw/cm²/sec) creek water.

1. Hatchery Program – Each female’s eggs will be incubated in one tray until disease screening profiles results are completed. Eggs may combine after fecundity estimates are completed.

Incubation temperatures will be manipulated to bring all spawn dates together during incubation and early rearing.

H. Early Rearing Program –

1. Lookingglass – Catherine, Grande Ronde, Lostine, and Lookingglass (CC captive brood) fry will be loaded at 30 to 50 thousand per trough.

2. Segregation of eyed-eggs and progeny will occur based on BKD ELISA values of kidneys from spawned females if space allows.

3. Catherine Creek, Lostine, and Grande Ronde smolts produced will target 25fpp in October 2008.

4. Lookingglass Creek production above 150,000 may be transferred to Irrigon for rearing between May and September 2008. Prior to steelhead marking at Irrigon, pre-smolts will be transferred back to Lookingglass in October 2008 and released from the adult holding pond in April 2009.

I. Fish Health Monitoring Plans

1. Disinfection and Sanitation Guidelines (Appendix C).

2. Broodstock monitoring plan (Appendices E, H and I)

J. Key Contacts

1. Transportation

- a. **Facility Operators (NPT and CTUIR)** will coordinate all hauling and notify LGH (Lund) of the stock, number being hauled and estimated arrival time.
2. **Captive Brood-TOT leader** (Hoffnagle) is responsible for providing TOT meeting notes and an agenda for the upcoming meeting.
3. **Adult records (AAT's)** will be completed weekly by ODFW (requires timely completion of weekly trapping data).

X. Grande Ronde Basin-2007 Captive Brood Spring/Summer Chinook– Catherine, Grande Ronde & Lostine

Smolt production (F₁) and potential out lets of production will be consistent with locations identified by co-managers.

A. Allocation – Production estimates: (Fecundity=1,100, green egg to smolt survival 45%)

- LR— 141♀ = 70,000 smolts
- CC/Look— 118♀ = 58,000 smolts
- UGR— 140♀ = 69,000 smolts

Note: Production estimates from captive brood program are extremely variable.

B. Spawning--See Captive Brood 2007 AOP.

C. Incubation

1. **Captive Brood** incubation to eyed stage at Oxbow Hatchery. After eye-up, inventory, and disease profiles, Oxbow staff will combine eggs by females, treatments, and BKD level in groups of about 5,000 eggs. Eyed eggs will be shipped to Lookingglass Hatchery.

D. Key Contact

1. Captive Brood TOT project leader (Hoffnagle)
2. Oxbow Hatchery manager (Banks)

XI. Imnaha -2005 Brood Year-Spring/Summer Chinook

A. Anticipated smolt release – A total of 433,000 smolts at 22fpp.

- Acclimated: 433,000
- Direct stream: 0

B. Liberations (See Appendix A)

1. **Transfer and Acclimation** – Approximately 310,000 smolts (5 raceways) will be transferred to Imnaha Satellite between March 12 and 14 and held for acclimation. Satellite personnel will begin volitional release March 21. In late March, the balance (2 raceways) or approximately 123,000 smolts will be transferred to acclimation pond. The acclimation pond screens will be reset for 2 days. After two days, the volitional period will resume. Any remaining fish will be forced out on April 12. Release number will be determined by transfer inventory minus mortality.

C. Imnaha Satellite Operation

1. **Schedule and Operations** – Open road to facility and begin set-up the first week in March. Close down facility in late April.
2. **Scan mortality for PIT tags** by ODFW staff

D. Monitoring and Evaluation

1. **Imnaha** summary of marked chinook released in 2007.
 - 186,000 AdCWT

- 247,000 Ad only
 - 21,000 PIT
2. Fish Research staffs will coordinate efforts with hatchery staff for pre-release sampling efforts (Tables 2, 3, and 5).

E. Fish Health-- Fish Health staff will coordinate efforts with Fish Research and hatchery staffs to conduct pre-release health examines (Appendix D). Standard disinfection and sanitation guidelines will apply (Appendix C).

F. Key Contacts

1. **ODFW** (Lund) will notify NPT (B. Johnson, Hesse, Harbeck, Vogel (208.816-1405), Michaels (426-3198)), ODFW (D. Eddy, Monzyk, Hoffnagle), LSRCP office and FPC (TBA) of date and numbers of fish release.

XII. Imnaha –2006 Brood Year-Spring/Summer Chinook

1. **Smolt Production**- An estimated 360,000 smolts will be produced at a target size of 22fpp in mid-March 2008.

a. **Early Rearing** – Fry will be reared in 8 double deep troughs at Lookingglass Hatchery on UV treated water Lookingglass Creek water. Fish will be fed a 14-day “pro-active” feed in lieu of a 28-day medicated feed treatment prior to transferring outside. Fish will be transfer outside to raw creek water in April or May.

b. **Final Rearing** - After marking, fish will be divided into 6 raceways with approximately 60,000 fish per raceway (Appendix F). In August, a prophylactic feed treatment will be administered to control BKD.

B. Monitoring and Evaluation

1. **Fish marking**- All fish will be ad clipped in June and July 2007. Approximately 180,000 fish will receive CWT (Table 6).
2. **PIT tag**- 21,000 fish will be PIT tagged in October 2007 (Table 8).

C. Marking Program

1. **AdCWT** – 180,000
2. **AD**- 180,000 .
3. **Pit tag** –21,000 .

E. Key Contacts

1. **Lookingglass** (Lund)
2. **Fish Health** (Onjukka)
3. **Fish Research** (Monzyk and Vogel)

XIII. Imnaha –2007 Brood Year-Spring/Summer Chinook

The production goal is 360,000 smolts for the Imnaha River reared in 6 raceways. NEOH the long- term goal will be to produce 490,000 smolts.

A. Smolt goal - 360,000 smolts at 20fpp for release 2009.

B. Adult Collection

1. **Predicted Runs**- Total estimated return to river is 956 adults. The total with jacks is 1,348 fish. This includes 1,021 hatchery produced (males and females) and 327 naturally produced (males and females) fish. Approximately 51% of fish entering the Imnaha River are expected to be collected at the weir and the collection of adults is estimated at: 501 hatchery-origin (males, females) and 167 natural-origin (males and females) (Table 12).

C. Trap Operations

1. Period of Trap Operation – Install trap as soon as river conditions allow and operate until September 11.

2. Trap/sorting Frequency—The trap will be worked on Mondays or more often if needed.

3. Disposition of Trapped Fish

a. Adults and jacks –Fish retained for broodstock, will be injected intraperitoneally (IP) with erythromycin and oxytetracycline and opercle punched (Appendix I). If sport or Tribal fishery occurs, only fish retained for broodstock will be injected. Hatchery-origin jacks and hatchery-origin adults, collected above broodstock needs, can be held at Wallowa Hatchery for 21-days and provided to the Tribes for C/S.

b. Tumors - Fish will be inspected for tumors along the gum line. If a tumor is suspected, fish with will be held for consultation.

c. Adults for outplanting in Big Sheep and Lick Creek. Up to 300 hatchery-origin adults can be outplanted. Adults collected prior to July 16th and targeted for outplanting, will be held at Lookingglass Hatchery. Adults collected after July 16th, and targeted for outplanting, can be direct stream released.

Note: ODFW has proposed using surplus adults for a jack spawning study on Lick Creek. The projected levels suggest 27 adults may be available. This proposal requires additional consultation.

d. Disposition of Carcasses. Trapping mortalities will be processed as kept fish and the carcasses provided to Fish health for examination, if possible. Other pre-spawning mortalities discovered during weir-effect surveys will also be sent to Fish Health. Biological data will be sent to ODFW Fish Research (Monzyk). Following examination, the carcasses may be disposed of by Tribal distribution, habitat or landfill.

D. Hatchery Broodstock Collection Guidelines

1. Weir management—At 956 adult estimated escapement, the sliding scale guidelines suggests that: $\leq 70\%$ of the fish released above the weir may be of hatchery origin; $\geq 25\%$ broodstock of natural origin; take $\leq 40\%$ of the wild return for brood; 10% of the males above the weir may be age-3 hatchery males.

2. Broodstock Needs

a. Egg take- Need 450,000 green eggs at 80% survival from green egg to smolt and estimated five-year fecundity average of 4,826.

b. Adult Collection- Based on adult survival of 90%:

Males – 104 (spawn 93)

- 26 natural (spawn 24)
- 78 hatchery (spawn 69-6 jacks equal one male)

Females – 104 (spawn 93)

- 26 natural (spawn 24)
- 78 hatchery (spawn 69)

3. Brood collections guidelines: The current projection for adult spring/summer chinook returns to Imnaha River is 956 adults: 706 ad-clipped and 250 unmarked fish. However, it is expected that only 51% of the run will be intercepted at the weir. Fish released above the weir will be managed below or equal to 70% hatchery to 30% wild origin ratio.

Estimated Totals:	Estimate 51%		Escapement	
Escapement to mouth	collected	Broodstock	OP	above the weir
706-Hatchery	360	156	27	177
250-Wild	128	52	0	76

Collections will be based on the following:

Collection guidelines for Imnaha spring chinook in 2007.

	June 1-22	June 23-30	July 1-8	July 9-16	July 17-23
HOB-156	4	16	36	32	24
NOB-52	4	2	14	12	8
Outplants		up to 30	up to 10	up to 10	up to 0

July24-31	Aug 1 - 8	Aug 9 - 16	Aug 17 - 23	Aug 24 - Sep	Sept 1 - 15
14	12	4	4	8	2
6	2	2	0	2	0

*Release all wild jacks

**Retain all hatchery-produced jacks until the run is reassessed in late July.

The intent is to collect brood stock in pairs or female and jack-male equivalent. Six hatchery jacks is the equivalent of one male. If adult and jack return numbers exceed brood stock and outplant needs, the balance will be transferred to Wallowa Hatchery for Tribal C/S. Jacks and surplus adults should not be transferred to Wallowa Hatchery after August 8.

4. Natural escapement projections--A total of 748 adults (26.5% wild) are prognosticated to spawn in the Imnaha sub-basin, 721 in the Imnaha River and 27 in Big Sheep and Lick Creek. Natural-origin fish returning to Big Sheep and Lick Creek is unknown. Estimates do not include harvest or jacks.

E. Spawning Guidelines

1. **Anesthetic Used** – AQUI-S.
2. **Expected First Spawn** - Tuesday, August 14.
3. **Spawning Frequency** – Once per week.
4. **Spawning Strategies** - All salmon spawned will be incubated at Lookingglass Hatchery.

F. Incubation

1. **Imnaha eggs** will be incubation to eyed stage at Lookingglass Hatchery. The intent is to incubate one female’s eggs per tray. After eye-up, eggs will be enumerated and segregated by disease profile.
2. **Water Sources** –Lookingglass-chilled well water, and UV treated Lookingglass Creek.

G. Fish Health Monitoring plans

1. **Disinfection** and Sanitation Guidelines (Appendix D).
2. **Broodstock** monitoring plan (Appendices E, H and I)

H. Imnaha Fishery Proposal Summary –The projected return of natural fish is 327 in which 250 are adults. At this level of wild fish escapement, no recreational fishery is proposed.

I. Key Contacts

1. **Lookingglass** (Lund) monthly reports to ODFW (La Grande & Wallowa fish districts and Hoffnagle), CTUIR (Zimmerman and McLean), NPT (B. Johnson, Hesse, Harbeck, Zollman), LSRCP office.
2. **Fish Health** (Onjukka) monthly reports to ODFW (La Grande & Wallowa fish districts, and Research), CTUIR (Zimmerman and McLean), NPT (B. Johnson, Hesse, Harbeck, Zollman).
3. **Fish Research** (Monzyk) monthly reports to ODFW (La Grande & Wallowa fish districts, and Hoffnagle), CTUIR (Boe, James, McLean), NPT (B. Johnson, Hesse, Vogel, Zollman).

Table 1. Irrigon Hatchery Transfer schedule, 2007.

(06 brood)

<u>Date</u>	<u>Stock</u>	<u>From Ponds</u>	<u>To</u>	<u>Number</u>	<u>Est. Pounds</u>
Feb.14-20	5606	7*,8,9*,10,11*	Wallowa Lower Acc	180,000	40,000
Feb. 20-23	5606	12,13*, 14*,15*	Wallowa Upper Acc	180,000	40,000
Mar. 5,6	5606	16*,17,	Big Canyon Upper Acc	80,000	17,778
Mar. 6,7	5606	18, 19,	Big Canyon Lower Acc	80,000	17,778
Mar. 7-9	2906	25,26,27*,29	Little Sheep Acc	165,000	33,000
Apr. 9-11	2906	28, 30	Big Sheep (Direct)	100,000	20,000
Apr. 16-18	5606	5*, 6, 21*	Wallowa Lower Acc	120,000	26,667
Apr. 18-19	5606	20, 22,	Big Canyon Lower Acc	80,000	17,778
Apr. 19-20	5606	23*,24	Big Canyon Upper Acc	<u>80,000</u>	<u>17,778</u>
				1,065,000	230,779

~Denotes partial pond
 *Denotes CWT pond

Table 2. Juvenile spring Chinook salmon and summer steelhead sampling schedule at LSRCP facilities, 2007. PS = Periodic sampling which includes length and weight. RS = Release sampling which includes length and weight by fin clip. CWT = sampling for CWT and VIE retention and associated fin clips. NA indicates not applicable.

Species,	Sample Date	Stock	Location	Pond	Purpose
<u>Spring Chinook</u>					
	Feb. 6-9	Catherine (05)	Lookingglass	1-2	CWT, release samples
		U. Grande Ronde (05)	Lookingglass	3-6	CWT, release samples
		Lostine (05)	Lookingglass	7-11	CWT, release samples
	Feb. 6-9	Imnaha (05)	Lookingglass	12-18	CWT, release samples
	Feb.21-23	Catherine (06)	Irrigon		Ponding samples
	Feb. 21-23	U. Grande Ronde (06)	Irrigon		Ponding samples
	Feb. 21-23	Lostine (06)	Irrigon		Ponding samples
	Feb. 21-23	Lostine (06)	Lookingglass		Ponding samples
	Feb. 21-23	Imnaha (06)	Lookingglass		Ponding samples
	June 7-8	All	Lookingglass	1 – 18	INAD samples
<u>Summer Steelhead (brood 06)</u>					
	Jan. 8-9	Wallowa	Irrigon	9, 11,13,15	CWT
	Jan. 16-17	Wallowa	Irrigon	21, 23, 27	CWT
	Jan. 22-23	Wallowa/Imnaha	Irrigon	5,7,14,16	CWT
	April 6	Wallowa	Wallowa	LAP, UAP	Release samples
	April 9	Wallowa	Big Canyon	LAP, UAP	Release samples
	April 10	Imnaha	Little Sheep	AP	Release samples
	April 27	Wallowa	Wallowa	LAP	Release samples
	May 11	Wallowa	Big Canyon	LAP	Release samples
	April 30	Wallowa	Big Sheep	LAP, UAP	Release samples

Table 3. Genetics Monitoring Sampling for spring Chinook brood year 2005 and summer Steelhead brood year 2006, both released in 2007.

Sample Date	Stock	Location	Pond	Number of Fish
<u>Spring Chinook</u>				
Feb. 7-9	Catherine	Lookingglass	1-2	50
Feb. 7-9	Grande R	Lookingglass	3-6	50
Feb. 7-9	Lostine	Lookingglass	7-11	50
Feb. 7-9	Imnaha	Lookingglass	12-18	50
<u>Summer Steelhead</u>				
April 9	Wallowa	Big Canyon	LAP	50
April 10	Imnaha	Little Sheep	AP	50

Table 4.
Summer Steelhead run projections to LSRCP Facilities in 2007.

2006 PROJECTED Returns to Wallowa Hatchery						
MARKED FISH						
	Age	Males	Females	Total	95%C.I.	
Marked	1:1	768	492	1,260		
Marked	1:2	172	480	652		
Marked	2:1	9	8	17		
3						
	Total		950	982	1,932	Marked 2:2 1 2 (585 - 3,279)
Deleted: ¶						
Deleted: ¶						

2006 PROJECTED Returns to Big Canyon Satellite						
MARKED AND UNMARKED FISH						
	Age	Males	Females	Total	95%C.I.	
Marked	1:1	375	350	725		
Marked	1:2	80	276	356		
Marked	2:1	3	4	7		
subtotal		458	630	1,088	(58 - 2,119)	
UnMarked	2:1	13	16	31		
UnMarked	2:2	7	14	23		
UnMarked	3:1	13	10	22		
UnMarked	other	5	9	11		
subtotal		40	47	87	(46-129)	
Total		498	977	1,175		

2006 PROJECTED Returns to Little Sheep Creek Satellite						
MARKED AND UNMARKED FISH						
	Age	Males	Females	Total	95%C.I.	
Marked	1:1	628	601	1,229		
Marked	1:2	79	309	388		
Marked	2:1	11	7	18		
Marked	3:1	0	2	2		
subtotal		718	919	1,637	(510 - 2,849)	
UnMarked	1:2	0	0	0		
UnMarked	2:1	19	29	49		
UnMarked	2:2	4	15	19		UnMarked 3:1 8 9
16						
UnMarked	3:2;4:1	2	4	6		
subtotal		33	57	90	(1-180)	
Total						
Deleted: ¶						

Table 5. Summary of projected number of tagged releases for the 2007 brood summer steelhead and 2006 brood spring Chinook salmon.

Species, Stock	Number Marked	Type of Mark	Marking Period	Marking Location
Summer Steelhead				
2007 Brood Year (Ad and RV clips in September)				
Little Sheep	25,000	Ad-LV+CWT	November	Irrigon
Wallowa	150,000	Ad-LV+CWT	November	Irrigon
Wallowa	100,000	Ad-RV+CWT	November	Irrigon
Spring Chinook Salmon				
<u>2006 Brood Year (Ad clips in June/July)</u>				
Imnaha River	180,000	Ad+CWT	June/July	Lookingglass
	180,000	Ad only	June/July	Lookingglass
Catherine CB _{mod/lo}	28,000	Ad+CWT	June/July	Lookingglass
Catherine CB _{mod/hi}	20,000	Ad+CWT	June/July	Lookingglass
Lostine	198,000	Ad+CWT	June/July	Lookingglass
Lostine	14,000	CWT only	June/July	Lookingglass
Upper GR.	130,000		June/July	Lookingglass
Upper GR.	130,000		June/July	Lookingglass
Catherine	60,000	Ad+CWT	June/July	Lookingglass
	60,000	Ad only	June/July	Lookingglass

Table 6. PIT-tagging schedule for 2007 brood summer steelhead at Irrigon Hatchery scheduled over three week period in November 2007. Fish need to be off feed 2 days prior to and after PIT-tagging to reduce tag loss. In a given week, 2-4 raceway groups will be hauled to inside tanks on Fridays; PIT tagged the following Monday and/or Tuesday and returned to raceways Wednesday and Thursday. False bottoms will be used to recover shed tags.

Experimental group	Number to PIT tag	Number in tank
Wallowa production, forced April release	900	950
Wallowa production, forced April release	900	950
Wallowa production, forced April release	900	950
Wallowa production, volitional May release	900	950
Wallowa fallbrood, forced April release	900	950
Wallowa fallbrood, forced April release	900	950
Wallowa fallbrood, forced April release	900	950
Wallowa fallbrood, volitional May release	900	950
Big Canyon, production, forced April release	300	350
Big Canyon, production, volitional May release	300	350
Subtotal	7,800	8,300
Little Sheep, production, volitional April release	300	350
Big Sheep supplementation, direct stream April release	300	350
Subtotal	600	700
Grand total	8,400	9,000

^A PIT-tag a random sample by crowding each raceway to obtain target number. When tagging, note whether the fish is AdLV, AdRV, Ad-only, or no clip.

Table 7. Fish PIT-tagging numbers for spring Chinook salmon at Lookingglass Fish Hatchery, October 2007 (BY2006). Note: Fish must be off feed 2 days prior and 2 days after PIT tagging to reduce tag loss.

Experimental group	Raceway	Estimated # per raceway	Number to PIT tag
Catherine Conventional	1	60,000	10,500
Catherine Conventional	2	60,000	10,500
Catherine Creek CBS/Lookingglass Cr	3	28,000	1,000
Catherine Creek CBS/Lookingglass Cr	4	20,000	1,000
U. Grande Ronde Conventional	5	65,000	500
U. Grande Ronde Conventional	6	65,000	500
U. Grande Ronde Conventional	7	65,000	500
U. Grande Ronde Conventional	8	65,000	500
Lostine Conventional	9	66,000	1,667
Lostine Conventional	10	66,000	1,667
Lostine Conventional	11	66,000	1,667
Lostine CBS	12	14,000	1,500
Imnaha	13	60,000	3,500
Imnaha	14	60,000	3,500
Imnaha	15	60,000	3,500
Imnaha	16	60,000	3,500
Imnaha	17	60,000	3,500
Imnaha	18	60,000	3,500
Grand total		1,000,000	50,500

Table 8. Projected spring Chinook salmon returns to Catherine Creek in 2007.

Mark	Age	Males	Females	Total	95%CI		
Return to River							
Marked	3	17	0	17	1	to	33
Marked	4	19	22	41	4	to	78
Marked	5	16	9	25	0	to	61
Total		52	31	83	5	to	172
Unmarked	3	14	0	14	0	to	31
Unmarked	4	78	64	142	0	to	292
Unmarked	5	21	19	40	1	to	79
Total		113	83	196	1	to	402
Grand Total		165	114	279	6	To	574
Total to weir (87% of run trapped at weir - five year average)							
		144	99	243	5	to	499

Table 9. Projected spring Chinook salmon returns to the Upper Grande Ronde in 2007.

Mark	Age	Males	Females	Total	95%CI		
Return to River							
Marked	3	3	0	3	0	to	8
Marked	4	9	11	20	0	to	50
Marked	5	31	11	42	0	to	122
Total		43	22	65	0	to	180
Unmarked	3	17	0	17	0	to	43
Unmarked	4	17	13	30	0	to	92
Unmarked	5	21	17	38	0	to	111
Total		55	30	85	0	to	247
Grand Total		98	52	150	0	To	427
Total to weir (80% of run trapped at weir - five year average)							
		78	42	120	0	to	342

Table 10. Projected spring Chinook salmon returns to the Lostine River in 2007.

Mark	Age	Males	Females	Total	95%CI		
Return to River							
Marked	3	165	2	167	0	to	371
Marked	4	50	62	112	29	to	196
Marked	5	27	20	47	0	to	123
Total		242	84	326	29	to	690
Unmarked	3	47	1	48	24	to	71
Unmarked	4	219	226	445	267	to	622
Unmarked	5	38	22	60	7	to	114
Total		304	249	553	298	to	807
Grand Total		546	333	879	326	To	1,497
Total to weir (69% of run trapped at weir - five year average)							
		377	230	607	225	to	1,033

Table 11. Projected spring chinook salmon returns to Lookingglass Fish Hatchery in 2007.

	Age	Total
Mark		
Marked (CC)	3	28
Marked (CC)	Adult	435
UnMarked	3	2
UnMarked	Adult	40
	Total	505

Table 12. Projected spring Chinook salmon returns to the Imnaha River in 2007.

Mark	Age	Males	Females	Total	95%CI		
Return to River							
Marked	3	315	0	308	115	to	514
Marked	4	200	198	399	274	to	522
Marked	5	120	188	308	80	to	536
Total		635	386	1,021	469	to	1,572
Unmarked	3	77	0	77	11	to	143
Unmarked	4	70	38	108	79	to	137
Unmarked	5	61	81	142	80	to	204
Total		208	119	327	170	to	484
Grand Total		843	505	1,348	639	To	2,056
Total to weir (51% of run trapped at weir - five year average)							
		430	258	688	276	to	793

APPENDIX A. PROPOSED JUVENILE SALMONID RELEASES IN THE GRANDE RONDE (GR) AND IMNAHA (IM) BASINS IN 2007

Basin	Species	Stock	Hatchery	Number ⁽¹⁾	Lbs	fpp	Location	In Facility	In River	Pond # ⁽²⁾	Release Method ⁽³⁾	Marks
GR	STS	5606	IR	180,000	40,000	4.5	Wallowa Lower Acc	Feb 14-20	Apr 8-9	7*,8,9*,10,11*	Forced	75K AdRVCWT; 75K AdLVCWT; 210K Ad only,
GR	STS	5606	IR	180,000	40,000	4.5	Wallowa Upper Acc	Feb 20-23	Apr 9-10	12,13*, 14*, 15*	Forced	
GR	STS	5606	IR	80,000	17,778	4.5	Big Canyon Lower	Mar. 5, 6	Apr 11-12	18,19	Forced	80K Ad
GR	STS	5606	IR	80,000	17,778	4.5	Big Canyon Upper	Mar. 6, 7	Apr 12-13	16*,17	Forced	25K AdLVCWT; 55K Ad
IM	STS	2906	IR	165,000	33,000	5.0	Little Sheep Acc	Mar 7, 9	Apr 10- May 1	25,26,27*, 29	Volitional	25K AdLVCWT; 140K Ad
IM	STS	2906	IR	100,000	20,000	5.0	Big Sheep Cr	NA	Apr 9-11	28, 30	Direct Stream	100K no mark
GR	STS	5606	IR	120,000	26,667	4.5	Wallowa Lower Acc	Apr. 16-18	Apr 28-May 10	5*,6, 21*	Volitional	25K AdLVCWT; 25KAdRVCWT; 70K Ad 80K Ad
GR	STS	5606	IR	80,000	17,778	4.5	Big Canyon Lower Acc	Apr 18-19	May 1-May 11	20, 22	Volitional	80K Ad
GR	STS	5606	IR	80,000	17,778	4.5	Big Canyon Upper Acc	Apr 19-20	May 2-May 11	23*,24	Volitional	25K AdLVCWT; 55K Ad
				1,065,000	230,779	4.61						
GR	CHS	80F05	LG	20,600	936	22	Grande Ronde Acc	Mar. 13-14	Mar.-26 Apr 11	6	Volitional	AdCWT 100%
GR	CHS	8005	LG	119,000	5,409	22	Grande Ronde Acc	Mar 13	Mar 26- Apr 11	3,4,5	Volitional	CWT 100%
GR	CHS	20005	LG	105,300	4,786	22	Lostine Acc	Mar 5-6	Mar 16-26	8,10	Volitional	AdCWT 100%,
GR	CHS	200F05	LG	24,700	1,123	22	Lostine Acc	Mar 27-28	Apr 7-17	11	Volitional	AdCWT 100%, VIE
GR	CHS	20005	LG	100,400	4,564	22	Lostine Acc	Mar 27, 28	Apr 7-17	7, 9	Volitional	AdCWT 100%
GR	CHS	20105	LG	49,800	2,264	22	Catherine Cr Acc	Mar 12	Mar.26- Apr 11	1	Volitional	AdCWT 100%
GR	CHS	201F05	LG	21,500	977	22	Catherine Cr Acc	Mar 12	Mar.26- Apr 11	2	Volitional	AdCWT 100%, VIE
IM	CHS	2905	LG	433,000	19,682	22	Imnaha Acc	March 12-14	Mar. 21-Apr 12	12-18	Volitional	250K Ad; 183K AdCWT
				874,100	39,741	22.0						

⁽¹⁾ Numbers of fish based on recent hatchery estimates, not AOP goal numbers

⁽²⁾ * Indicates AdLVCWT or AdRVCWT group in pond

⁽³⁾ Forcing occurs following a minimum 24 hr. volitional opportunity. Volitional and forced releases are all acclimated.

Appendix B. Steelhead Fish Health Monitoring Plan & Disease Treatments

Location	Broodyear	Species	Stock	Examination Category	Protocol	Comment
Irrigon Hatchery	2006 & 2007	StS	Wallowa (56) and Little Sheep (29)	Monthly & Preliberation	-10 mort/moribund per stock examined -kidney smears on TYE-S agar -Gill culture smears on agar if suspect gill disease -Gill and skin wet mounts from a combination of moribund and healthy fish	Treat with Florfenicol under INAD if CWD losses become a problem
Irrigon Hatchery	2006	StS	56 or 29	Annual Myxobolus cerebralis	60 smolts that have been on the water supply for at least 6 months	Prefer using saved mortalities
Steelhead acclimation sites – WA, BI & LI	2006	StS	56 & 29	Preliberation	Steelhead acclimated more than 3 weeks will be monitored as in monthly protocol above	Fish Health guidelines are that these non-migrants (infected with the agent of Whirling Disease) should not be stocked to other areas
Wallowa Hatchery		Rb		Annual Myxobolus cerebralis	Will need to rear Rb on each water supply (well and spring) – brought in as eyed eggs	Must be on water supply for 6 months
Wallowa & Little Sheep	2007	StS	56 & 29	Adult Spawners	Minimum of 60 per stock for culturable viruses (30 from fall collected fish) using ovarian fluid and caeca/kidney/spleen sample pools not to exceed 5 fish per pool.	A weekly sample (N=24) of ovarian or milt fluid may be sampled.
Wallowa & Little Sheep	2007	StS	56 & 29	Adult Mortality	-kidney smears on TYE-S agar -A minimum of 20 or all mortality less than 20 will be examined	Save fall brood mortalities as well for examination
Lookingglass Creek	2007	StS or others		Adults	-mortalities examined for culturable viruses, bacteria, R. salmoninarum by ELISA -If possible viral samples (ovarian fluid or milt) will be taken from “ripe” steelhead passed above Lookingglass Hatchery.	The scope of what can be learned from these mortalities will depend on the degree of degradation.

Appendix C (page 1 of 3): Disinfections and Sanitation Guidelines for all LSRCP Hatcheries

Goal: To bring all individuals involved in activities at all LSRCP facilities in the Grande Ronde and Imnaha Basin program to an understanding of what is expected and what is reasonable in minimizing infectious disease risk factors. **Prevention** of infectious fish disease problems is the overall goal.

Background: Since the La Grande Fish Pathology Laboratory was established in 1987, there have been disinfection and procedural recommendations made when needed by the responsible fish pathologist. In 1998 and 1999 two documents (cited below) summarized fish disease data and included recommendations to reduce the impacts of infectious disease. The concepts behind most of the specific operational recommendations included in the attachment (page 2) are taken from these documents. In 1999 there were efforts made through placards and the AOP process to alert everyone to a higher standard of sanitary practices for disease prevention at Lookingglass Hatchery. Given that Lookingglass Hatchery was and still is used as a fish culture facility for multiple ESA programs, an increased awareness and application of **Quarantine Mode of Operation** should exist. With the passage of anadromous adults and the presence of resident fish above Lookingglass Hatchery there is the certain risk of pathogen introduction into the creek water supply. Aside from the Lookingglass Hatchery situation, it is important to note that the statewide fish health management policy (September 12, 2003) states that preventative and therapeutic fish health strategies must be implemented at all facilities. The recommended guidelines in this AOP should be consistent with this state policy and be standard practice at all LSRCP facilities.

Groberg, W., S.T. Onjukka, and K.A. Brown. July 22, 1998. A Synopsis of Infectious Disease in Fish at Lookingglass Hatchery.

Groberg, W., S.T. Onjukka, K.A. Brown and R.A. Holt. November 30, 1999. A Report of Infectious Disease Epidemiology among Spring Chinook Salmon at Lookingglass Hatchery.

Definitions:

Quarantine - At Lookingglass Hatchery and other LSRCP facilities there are multiple programs on station. Each program and raceway within each program must be treated as an isolated unit with the goal to prevent cross-contamination with fish pathogens among the many ESA and non-ESA stocks. All personnel (ODFW, Tribal, volunteers and the visiting public) need to be aware of these guidelines for maximum disease prevention benefit.

Disinfection - A process that substantially reduces or completely eliminates all pathogenic microorganisms except spores. The possibility of a disinfected object transmitting disease-producing organisms is greatly reduced.

Examples: Disinfection of gear and equipment (boots, bibs or raingear, nets, crowders, raceways, lib trucks, PIT tag needles). Note: Disinfection only occurs if proper procedures are implemented to maintain proper concentration of disinfectant and exposure time.

Sanitation – A process that brings microbial contamination to a “safe” level.

Examples: Quick sanitation (decontamination step) – use of footbaths while moving from one area to another, dipping hands in a tub of iodophor disinfectant, wiping down fish to be spawned with iodophor prior to spawning.

Note: A summary of recommended disinfectants and for what applications follows on page 3 of this attachment.

**Appendix C (page 2 of 3): Disinfections and Sanitation Guidelines for all LSRCP Hatcheries
Specific Operational Recommendations**

Applies to Who?	Prevention Control Measure or Sanitary Practice	Guideline Comment
All	Disinfect all gear/equipment prior to entering or leaving hatchery grounds	-As per attached iodophor protocol -Hatchery crew responsible for providing tub of 100 ppm iodophor
All	Disinfect equipment when moving from raceway to raceway or tank to tank for <u>any</u> fish handling or pond cleaning activities	-As per per attached iodophor protocol -Includes CWTing, fin clipping and PIT tag operations. See footnote for marking*.
All	Use footbaths upon entering or leaving the work area for a given program	-Use larger tub of disinfectant if involved in a spawning
All	Use a new disposable apron or disinfected personal rain gear while working with fish	
CTUIR Personnel operations at Lookingglass Hatchery	Disinfect all gear/equipment prior to entering or leaving hatchery grounds, Lookingglass Creek, or the intake building and when done with operations at intake	-CTUIR personnel responsible to maintain and use a tub of 100 ppm iodophor at intake building workstation
Hatchery Crew	Assure that individual raceway and tank mortality “picker equipment” is in place at each raceway and tank	-All use these for the specifically designated raceway
Hatchery Crew	Sanitize each raceway prior to use for the next brood year. (see page 3 for recommendation)	-dry for a minimum of three days
Hatchery Crew	Keep footbaths located at strategic locations refreshed with disinfectant	-As per iodophor label, refreshed as needed
People at Spawnings	Disinfect the spawning table and spawning work area between stocks and at the end of the day	-As per attached iodophor protocol
Research, Hatchery Crew & Pathology Personnel	Handle and necropsy dead fish only in designated areas	-Adult morts: use concrete pad outside spawn area or concrete pad in endemic building at LGH -Juvenile morts: store in freezer in designated area for this purpose.
PIT taggers	-PIT tagging supervisors maintain and keep footbaths by each door of PIT tagging trailer for use during operations -Assure that PIT tagging needles are new or clean and sharp -Disinfect in 70% Isopropyl alcohol -No re-use of PIT tag needles until air dried	-if PIT tag needles are re-used disinfect as per isopropyl protocol attached
Lib Truck Operators	Assure proper disinfection of tank and equipment prior to collection or transfer of fish	-As per attached disinfectant application summary
Captive Brood Operations	See Captive Broodstock AOP	-Appendix 6 Captive Broodstock AOP

*Footnote: Within a stock, operations will start with low BKD segregation groups or groups determined to be of lowest disease risk proceeding to raceways of higher disease risk. The latest fish health information should be used to determine the least risky raceway sequence.

**Appendix C (page 3 of 3): Disinfection and Sanitation Guidelines for all LSRCP hatcheries
Summary of Recommended Disinfectants (Concentration and time) and for what Application**

Disinfectant*	Application	Concentration	Time	Comment
Iodophor	Nets, gear and equipment, clipping & tagging van, PIT tag stations, large tub disinfectant containers, spawning colanders and buckets, lib truck, footbaths, floors Note: For raceway sanitization** – thoroughly clean the unit to remove dirt, spray or brush on 75-100 ppm iodophor and let this remain for a minimum of 10 minutes. Leave it to dry for a minimum of 3 days. Allow iodophor to dry and break down with exposure to light. **If the above recommendation cannot be done then sanitize raceways by thoroughly cleaning them and leaving to dry for a minimum of 3 days.	100 ppm Note: to make 100 ppm solution mix 6.7 oz of jug strength iodophor to 5 gallons H ₂ O or 6.7 oz.=189ml	10 min.	-Equipment should be pre-rinsed to remove dirt, mucus or other organic material which reduces the efficacy of disinfection and sanitization -Rinse equipment to remove harmful residue if equipment is going into standing water containing fish or fish are being placed into the equipment (tank or bucket). Remember that iodine at 1:20,000 is harmful to fish. -Argentyne or other buffered iodophors such as Western Chemicals “PVP iodine” would be acceptable. Note: if DRAW 476 is used remember this product is 1.75% active iodine and unbuffered so should not be used for water- hardening eggs
	Water hardening eggs	100 ppm	15 minutes	This is the statewide general practice
	Egg transfers - disinfection at receiving station	100 ppm	10 minutes	
Chlorine or Aqueous solution as sodium hypochlorite (Household Bleach)	Lib truck tanks	10 ppm	10 min.	Organic matter binds and neutralizes

***All chemical use will be done in accordance with label use and reporting requirements. Disinfecting and disinfected water must be disposed of in an approved manner.**

Appendix D. Juvenile Chinook Fish Health Monitoring Plan & Disease Treatments

Location	Brood year	Species	Stock	Examination Category	Protocol	Comment/Disease Treatment
Oxbow Hatchery	2006	ChS	200W	Pretransfer	10 mort/moribund per stock, kidney smears on TYE-S agar, R. salmoninarum (BKD), Gill & skin wet mounts from a minimum of 5 fish/stock	One planned medicated treatment in July/august 2006
Lookingglass Hatchery	2006	ChS	200W 201W 80W 29 *200F *201F *80F	Monthly	-10 mort/moribund per stock, kidney smears on TYE-S agar, gill culture smears if suspect gill disease, R. salmoninarum (BKD), Gill & skin wet mounts from a combination of moribund and healthy fish. -tissues (gill/ kidney/spleen) will be assayed for culturable viruses from a sub-sample of fish -5 grab-sampled fish every other month and any moribund fish for EIBS (blood smears and hematocrits).	*1st Aquamycin feeding in March/April/May 2006 at ~500 fpp for 200F, 201F and 80F fish. An Aquamycin feeding will be implemented for all fish after marking in July/August Disease outbreaks - treated on a case-by-case basis. Therapies and remedial measures are based on conventional and available treatments, new information, and innovation. Warm water temperature therapy would be used if EIBS became a problem on a priority basis determined by co-managers. Formalin treatments would be implemented for Ichthyobodo infestations. Fungus - Formalin flushes (1 hour) are prescribed after fin clipping and coded wire tagging for two consecutive days. Formalin is used under a local veterinarian prescription. Coldwater disease- Oxytetracycline or Florfenicol maybe used.
Lookingglass Hatchery	2005	ChS	200W 200F 201W 201F 80W 80F 29	Monthly Pre-transfer & Annual Myxobolus cerebralis testing	Monthly: As above Pre-transfer: 60 grab-sampled smolts per stock -R. salmoninarum by ELISA -tissues (gill/kidney/spleen) from 3 fish pools for culturable viruses -wet mounts of skin & gill tissue from a minimum of 5 fish -sub-sample for EIBS -one stock (60 fish) for Myxobolus cerebralis	Pre-transfer grab-sample numbers may vary depending on disease history and number of fish for a given brood year.
Chinook acclimation IM, LR, CC & UGR	2005	ChS		Pre-liberation	-Smolt groups held at acclimation sites longer than 3 weeks will be evaluated with a lesser number of “grab-sampled” fish as in pre-transfer protocol above. -Mortalities will be examined (as in monthly)	Pre-liberation grab-sample numbers at acclimation sites may vary depending on disease history and number of fish for a given brood year.

Appendix E. Adult Chinook Fish Health Monitoring Plan & Disease Treatments

Location	Brood year	Species	Stock	Examination Category	Protocol	Comment
Lookingglass	2007	ChS	200W 201W 80W 29	Adult Spawners (Broodstock)	*All spawned fish will be sampled for culturable viruses – individual fish ovarian fluid and milt, minimum of 60 or all fish if <60 using caeca/kidney/spleen sample pools not to exceed 5 fish. - All females for BKD by ELISA	ELISA results will be used to implement BKD prevention control through culling of eggs known to be of higher risk. *Imnaha stock: virus sample a minimum of 60 fish – a minimum of 24 subsamples per week of sex fluids (ovarian fluid or milt)
Lookingglass	2007	ChS	200W 201W 80W 29	Adult Mortality	All mortality less than 20: -Kidney sampled for BKD by ELISA -systemic bacteria by culture	Note: additional mortality may be sampled Lookingglass Creek mortalities will be worked up with CTUIR staff to assure data collection covers all the needed information

Disease Treatments and other Drugs for Adult Chinook Broodstock

Location	Brood year	Stock	Treatment for	Chemical/Drug	Protocol	Comment
Lookingglass	2007	200W 201W 80W 2900	Fungus Control	Formalin Hydrogen Peroxide	Formalin administered a minimum of 3 days per week at 167 ppm for 1 hr. (Veterinary prescription) Hydrogen peroxide 3 days per week at 100 ppm	If formalin cannot be used then use hydrogen peroxide (second choice) Continue treatments throughout the entire spawning season.
Lookingglass, Catherine Creek, Upper Grande Ronde and Lostine River weirs	2007	200W 201W 80W 29W	BKD Furunculosis	Erythromycin Oxytetracycline	Injection 20 mg/kg (Veterinary Prescription) Injection 10 mg/kg (Veterinary Prescription)	Erythromycin 100 – new product now available New charts will be provided, if needed.
Lookingglass	2007	200W 201W 80W 29W	Anesthetic	Aqui-S	INAD	Send reports to Monitor by December 1st 2007.

Appendix F. Ponding plan for 2007 at Lookingglass Hatchery.

Group	Strategy Treatment	BKD	Eyed Eggs (Dec 06)	Initial Ponding (fry)	Initial Pond #		Smolts marked	Final Pond #	Smolt Numbers	Mark	Release Site
Catherine Creek	Conventional	Low	121,800	121,800	3	From rcy 3 into 1	60,900	1	60,900	AdCWT	CC
						From rcy 3 into 2	60,900	2	60,900	Ad only	CC
Catherine Creek	CBS	Low/mod-low	29,000	29,000	4	From rcy 4 into 3	29,000	3	29,000	AdCWT	Look
Catherine Creek	CBS	Mod-hi	21,000	21,000	5	From rcy 5 into 4	21,000	4	21,000	AdCWT	Look
U. Grande Ronde	Conventional	Low	256,000	85,333	7	From rcy 7 into 5	64,000	5	64,000	AdCWT	UGR
				85,333	8	From rcy 7&8 into 6	64,000	6	64,000	Ad	UGR
				85,333	9	From rcy 8&9 into 7	64,000	7	64,000	Ad	UGR
						From rcy 9 into 8	64,000	8	64,000	Ad	UGR
Note: UGR marking is under dispute and may change through US v Oregon resolution											
Lostine River	Conventional	Low	206,300	101,400	11	From rcy 11 to 9&10	67,600	9	66,000	AdCWT	LR
Lostine River	Conventional from Oxbow	Low		101,400	12	From 11&12 to 10	67,600	10	66,000	AdCWT	LR
Lostine River		Low				From rcy 12 io 11	67,600	11	66,000	AdCWT	LR
Lostine River	CBS	Low; Mod/low	14,000	14,000	13	From rcy 13 into 12	14,000	12	14,000	Ad only	LR
Imnaha River	Conventional	Low	366,000	91,200	15	From 15 into 13&14	60,800	13	60,800	AdCWT	IM
				91,200	16	From 16 into 14-15	60,800	14	60,800	AdCWT	IM
				91,200	17	From 17 into 16-17	60,800	15	60,800	AdCWT	IM
				91,200	18	From 18 into 17&18	60,800	16	60,800	Ad only	IM
							60,800	17	60,800	Ad only	IM
							60,800	18	60,800	Ad only	IM

Appendix G. Snake River Germplasm Repository Cryopreserved Semen Request Form

Snake River Germplasm Repository Committee

Bill Young
P.O. Box 1942, 125 South Mission St
McCall, ID 83638
Phone: (208) 634-5290
Fax: (208) 634-4097

Snake River Germplasm Repository Cryopreserved Semen Request Form

Name: _____ Affiliation: _____
Phone number: (____) _____ Address: _____
Date of request: _____ Date need by: _____
Species/stock requested: _____ Hatchery or wild/natural: _____
Number of individuals: _____ Number of straws needed: _____ 0.5ml _____ 5.0ml
Reason for request (clearly demonstrate need or type of hatchery program): _____

Fertilization experience using cryopreserved semen: _____

Name, address, and phone number of person samples should be delivered to: _____

Please use additional pages as necessary.

The salmon managers of the Snake River Basin are concerned with how cryopreserved samples are being used and retain the right to refuse samples for inappropriate use of the threatened salmonid species gametes. The Nez Perce Tribe can arrange to deliver and assist in the fertilization of eggs. Please call Bill Young at the McCall Field Office (address above) to coordinate transfer. The Nez Perce Tribe also may request data on the performance of the semen (percent of eggs fertilized, post-thaw sperm motility, etc.).

Signature: _____ **Date:** _____

Appendix H. Table Summarizing Adult Collection Fish Health Injection Protocols for Grande Ronde and Imnaha chinook

Plan A: Operations under the assumption that weir is in place for each respective system by July 1, 2007

Arrival Dates	Injection ^a (Yes or No)		When	Which Fish	Comment
	Erythro-100 @20mg/Kg	Oxytetracycline @ 10mg/Kg			
Up to July 14	Yes	Yes	Upon Collection	broodstock	Only fish kept for broodstock
Jul 15-July 31	Not at collection	Not at collection	During sorting at Lookingglass	broodstock	Only fish kept for broodstock
After July 31	Yes	Yes	Upon Collection	broodstock	At Lookingglass on or about August 1. 2 nd injection for arrivals before July 14 1 st Injection for arrivals after July 14 Note: more than one day may be needed for all injections

Plan B: Assumes weirs were unable to be placed in river by July 1, 2007

Arrival Dates	Injection (Yes or No)		When	Which Fish	Comment
	Erythro-100 @20mg/Kg	Oxytetracycline @ 10mg/Kg			
Entire Run Period	Yes	Yes	Upon Collection	All unripe fish	No planned re-injection under this scenario

Injection Route Plan for Antibiotic Injections 2007

Stock/Group	Erythromycin first injection	Erythromycin second injection (or first injection for late arrivals)	Oxytetracycline all injections – first & second	Comment
Imnaha & Lostine	IP	IP	IP	
CC & GR Conventional	DS	DS	IP	
LG-CK production fish	IP	IP	IP	Swim-ins or fish trucked for broodstock, If released need 21 detox period or no injection

Appendix I. Attachment for Innaha and Grande Ronde Broodstock Antibiotic Injection Protocols

Modified by Sam Onjukka for 2007
Oregon Department of Fish and Wildlife
La Grande Fish Health Services Laboratory

The La Grande Fish Health Services Laboratory provides fish health support services for these programs. The required prescriptions for the antibiotic treatments will be obtained from state veterinarian Dr. Collin Gillin via ODFW Fish Health staff. These prescriptions and protocols apply to the injection of the antibiotics erythromycin and oxytetracycline. Note: Erythromycin-100 is available from Bimeda. Contact person: David A Hance (1-877-672-6762). Note: The new product has 100 mg erythromycin/ml (old product had 200 mg/ml) thus you will have to double the volume to achieve the prescribed 20 mg/kg. A 3 cc syringe will probably be necessary in most cases.

At collection sites

Injection schedule: (Follow Appendix E and injection route plan table at bottom of page)

Methods:

- 1) Use erythromycin or gallimycin 100 and oxytetracycline 100 (200 mg/mL).
- 2) For Intraperitoneal (IP) injections use 1 inch 20 gauge needle. For Dorsal Sinus (DS) use a 1 inch or 1 ½ inch 20 Gauge needle. Though both needle lengths can be used, stick with one needle length for DS injections so the technique for injecting the dorsal sinus is consistent and accurate. More leakage will occur if you are not injecting the erythromycin into the sinus.

Use a separate syringe and needle for each antibiotic and fish. See points below to minimize egg mass loss with IP injection of erythromycin

Dosage:

Inject a volume of each antibiotic according to the fish specific length or weight corresponding to the 10 mg/Kg OXY-200 chart for Oxytetracycline and the 20 mg/Kg Ery-100 chart for Erythromycin. Note: injections may also be given based on bracketed size ranges (as per information provided in 2006). Fish Health Services will provide specific charts and information in May 2007, if needed..

At Lookingglass Hatchery

On or about August 1, inject all adults on hand per the protocol (Appendix H). This will be a second injection for fish that arrived before July 14 and it will be a first injection for fish that arrived between July 15 and August 1.

Do not inject ripe fish!

Dispose of all needles in sharps containers and all will be properly disposed of at Grande Ronde Recycling at the end of the season.

To minimize egg mass loss due to IP injections:

Insert needle no deeper than necessary. Place the bevel of needle towards the body wall of fish so drug goes out against the wall rather than the eggs or body cavity. Keep the head slightly down to help shift away the egg skein from the injection location.

Appendix J. Catherine Creek, Lostine, and Upper Grande Ronde fish culture production metrics summarized for Grande Ronde sub-basin Chinook stocks.

Catherine Creek spring/summer Chinook salmon spawning data for the 2001-06

Brood Year	Marked Females Spawned	Unmarked Females Spawned	% Un-marked	Spawning Ratio F/M	Average Fecundity	Egg Take	Fry Poned	Smolt releases
2001	0	12	100%	1.71:1	3,651	43,813	26,426	24,392
2002	0	20	100%	1.18:1	4,096	81,926	71,750	70,959
2003*	0	28	100%	1.47:1	4,639	129,888	123,394	120,753
2004	0	9	100%	1.50:1	2,912	26,204	24,465	23,216
2005	9	8	30.0%	1.42:1	3,149	53,533	49,222	49,863
2006	28	8	22.2%	1.24:1	3,642	131,139	121,868	
	37	85	69.7%		3,824	466,503		289,183

*Inventory correction; In 2004, eggs have been electronically counted

Numbers in blue current inventory

2001-05 brood, estimate survival from green egg to smolt at 86.2%

Upper Grande Ronde River spring/summer Chinook salmon spawning data 2001-06

Brood Year	Marked Females Spawned	Unmarked Females Spawned	% Un-marked	Spawning Ratio F/M	Average Fecundity	Egg Take	Fry Poned	Smolt releases
2001	0	8	100%	1.00:1	4,420	35,360	*25,339	26,923
2002	0	25	100%	1.09:1	3,454	86,355	70,250	70,088
2003	0	23	100%	1.10:1	5,249	120,733	105,374	104,347
2004	0	7	100%	1.00:1	2,979	20,850	19,057	18,901
2005	37	3	9%	1.54:1	3,877	155,080	119,963	119,000
2006	71	13	15%	1.45:1	3,539	297,244	269,439	
Total	108	79	42.2%		3,827	715,622		339,259

*Inventory correction; In 2004, eggs have been electronically counted

Numbers in blue current inventory

2001-05 brood, estimate survival from green egg to smolt at 81.1%.

Lostine River spring/summer Chinook salmon spawning data, 1997-2006

Brood Year	Marked Females Spawned	Unmarked Females Spawned	% Un-marked	Spawning Ratio F/M	Average Fecundity	Egg Take	Fry Poned	Smolt releases (1,000's)
1997	0	4	100%	0.92:1	4,496	17,000	12,000	11,871
1998	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0
2000	0	8	100%	0.66:1	4,329	34,630	32,000	31,490
2001	11	25	69%	1.06:1	4,463	*160,680	105,000	101,012
2002	1	27	96%	1.03:1	4,766	133,444	130,000	116,370
2003	0	21	100%	1.31:1	5,078	106,646	103,000	102,557
2004	29	22	43%	1.30:1	4,351	221,888	206,421	199,716
2005	39	17	30%	1.37:1	4,182	234,192	207,291	205,000
2006	45	12	21%	1.26:1	4,393	241,715	206,313	
	125	136	52.1%		4,370	1,150,195		768,016

*Inventory correction due to large losses with egg shipment;

In 2004, eggs have been electronically counted

Numbers in blue current inventory

2001-05 brood, estimate survival from green egg to smolt at 84.5%

Appendix K. Preliminary CTUIR data from Catherine Creek releases between 1998 and 2007 summarized by ODFW.

Brood Year	Release Year	Release Type	Number	Return Years			Total Return	SAR Percent
1998	2000	Conventional	0	<u>2001</u>	<u>2002</u>	<u>2003</u>	-	-
		Captive	38,149	157	205	57	419	1.10
		Natural-Redds	34	46	190	192	428	
1999	2001	Conventional	0	<u>2002</u>	<u>2003</u>	<u>2004</u>	-	-
		Captive	136,833	17	194	19	230	0.168
		Natural-Redds	40	19	71	9	99	
2000	2002	Conventional	0	<u>2003</u>	<u>2004</u>	<u>2005</u>	-	-
		Captive	180,343	73	570	24	667	0.3699
		Natural-Redds	34	6	77	7	90	
2001	2003	Conventional	24,392	<u>2004</u>	<u>2005</u>	<u>2006</u>	54	0.2214
		Captive	105,292	39	89	2	130	0.1235
		Natural-Redds	133	5	49	7	61	
2002	2004	Conventional	70,071	<u>2005</u>	<u>2006</u>	<u>2007</u>	79	0.1113
		Captive	91,791	19	138		157	0.1710
		Natural-Redds	158	4	114		118	
2003	2005	Conventional	120,753	<u>2006</u>	<u>2007</u>	<u>2008</u>	7	
		Captive	68,827	7			0	
		Natural-Redds	167	12			12	
2004	2006	Conventional	23,216	<u>2007</u>	<u>2008</u>	<u>2009</u>		
		Captive	45,604					
		Natural-Redds	96					
2005	2007	Conventional	49,783	<u>2008</u>	<u>2009</u>	<u>2010</u>		
		Captive	21,647					
		Natural-Redds	74					
2006	2008	Conventional	121,800	<u>2009</u>	<u>2010</u>	<u>2011</u>		
		Captive	0					
		Natural-Redds	117					

Appendix L. Preliminary CTUIR data from Upper Grande Ronde releases between 1998 and 2007 summarized by ODFW.

Brood Year	Release Year	Release Type	Number	Return Years			Total Return	SAR Percent
				<u>2001</u>	<u>2002</u>	<u>2003</u>		
1998	2000	Conventional	0					
		Captive	1,508	0	3	1	4	0.2653
		Natural-Redds	42	0	83	229	312	
				<u>2002</u>	<u>2003</u>	<u>2004</u>		
1999	2001	Conventional	0					
		Captive	2,560	0	8	6	14	0.5469
		Natural-Redds ¹	0	1	6	0	7	
				<u>2003</u>	<u>2004</u>	<u>2005</u>		
2000	2002	Conventional	0					
		Captive ^{2,3}	228,385	60	545	26	631	0.2763
		Natural-Redds	20	3	43	9	55	
				<u>2004</u>	<u>2005</u>	<u>2006</u>		
2001	2003	Conventional	26,923	12	92	0	104	0.3863
		Captive ⁴	242,913	73	276	7	356	0.1465
		Natural-Redds	15	6	12	2	20	
				<u>2005</u>	<u>2006</u>	<u>2007</u>		
2002	2004	Conventional	69,856	9	159		168	0.2405
		Captive	75,063	0	1		1	0.0013
		Natural-Redds	23	0	52		52	
				<u>2006</u>	<u>2007</u>	<u>2008</u>		
2003	2005	Conventional ⁵	104,350	2			2	
		Captive	1,019	0			0	
		Natural-Redds	40	4			4	
				<u>2007</u>	<u>2008</u>	<u>2009</u>		
2004	2006	Conventional	19,061					
		Captive	90					
		Natural-Redds	186					
				<u>2008</u>	<u>2009</u>	<u>2010</u>		
2005	2007	Conventional	119,002					
		Captive	20,687					
		Natural-Redds	91					
				<u>2009</u>	<u>2010</u>	<u>2011</u>		
2006	2008	Conventional	260,000					
		Captive	0					
		Natural-Redds	28					

¹ No survey in Vey Meadows. Unknown number of redds.

² 76,941 were released as parr.

³ Does not include 50,100 smolts lost in acclimation pond accident prior to release

⁴ 32,800 released as parr in Sheep Creek

⁵ 11,800 smolts were lost in downstream trap accident

Appendix M. Preliminary data from Imnaha River releases between 1982 and 2007.

Brood Year	Release Year	Release Type	Number	Returns			Total Return	SAR Percent
				Age 3	Age 4	Age 5		
1982	1984	Conventional	24,920	195	48	4	247	0.9911
		Natural-Redds	129	358	704	147	1,209	
1983	1985	Conventional	115,830	24	18	38	80	0.0691
		Natural-Redds	95	77	406	580	1,063	
1984	1986	Conventional	35,035	55	40	16	111	0.3168
		Natural-Redds	119	14	129	154	297	
1985	1987	Conventional	123,530	101	96	9	206	0.1668
		Natural-Redds	462	40	189	81	310	
1986	1988	Conventional	199,066	183	269	46	498	0.2502
		Natural-Redds	284	59	184	97	340	
1987	1989	Conventional	142,320	69	228	65	362	0.2544
		Natural-Redds	183	15	133	91	239	
1988	1990	Conventional ¹	253,042	260	551	440	1,251	0.4944
		Natural-Redds	237	19	150	349	518	
1989	1991	Conventional	267,670	100	472	98	670	0.2503
		Natural-Redds	116	18	133	71	222	
1990	1992	Conventional	262,500	24	64	12	100	0.0381
		Natural-Redds	115	5	65	7	77	
1991	1993	Conventional	157,659	11	76	12	99	0.0628
		Natural-Redds	178	2	95	35	132	
1992	1994	Conventional	438,699	102	94	7	203	0.0463
		Natural-Redds	240	140	289	40	469	
1993	1995	Conventional ²	394,255	91	351	62	504	0.1278
		Natural-Redds	468	14	106	154	274	
1994	1996	Conventional	91,240	7	31	4	42	0.0460
		Natural-Redds	154	6	104	48	158	
1995	1997	Conventional	50,911	161	585	32	778	1.5282
		Natural-Redds	60	31	155	46	232	
1996	1998	Conventional	93,108	689	530	131	1,350	1.450
		Natural-Redds	136	88	318	314	719	

¹ Includes only Ad marked hatchery releases and returns.² Does not include 195,814 smolts released with LV mark.

Appendix N. continued.

Brood Year	Release Year	Release Type	Number	Returns			Total Return	SAR Percent
				Age 3	Age 4	Age 5		
1997	1999	Conventional	194,967	1,091	2,479	343	3,913	2.007
		Natural-Redds	224	340	2,245	359	2,944	
1998	2000	Conventional	179,716	1,153	3,212	1,077	5,442	3.028
		Natural-Redds	143	107	633	709	1,449	
1999	2001	Conventional	123,014	469	1,162	67	1,698	1.380
		Natural-Redds	189	111	862	82	1,055	
2000	2002	Conventional	303,737	1616	1199	106	2,921	0.9617
		Natural-Redds	261	113	345	75	533	
2001	2003	Conventional	268,426	747	957	33	1,737	0.6471
		Natural-Redds	635	27	225	29	281	
2002	2004	Conventional	398,185	238	1006		1,244	0.3124
		Natural-Redds	1,111	14	213		227	
2003	2005	Conventional	435,186	156			156	
		Natural-Redds	726	15			15	
2004	2006	Conventional	448,268					
		Natural-Redds	495					
2005	2007	Conventional						
		Natural-Redds	349					
2006	2008	Conventional						
		Natural-Redds	235					