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

FOR THE PERIOD OF

JANUARY 1 – DECEMBER 31, 2012

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 ADMINSTRATION

Final
May 09, 2012

In Attendance January 05, 2012 pre-AOP: CTUIR (Bliesner, Boe, Crump, McLean, Shippentower), ODFW (Aschenbrenner, Bailey, Blessing, Clarke, Eddy, Elmore, Fagan, Feldhaus, Flesher, Garst, Harrod, Myatt, Onjukka, Stanton, White, Woods, Yanke), NPT (Cleary, Edwards, Vogel, Zollman), FWS (Yundt).

In Attendance February 14, 2012 AOP: CTUIR (Crump, McLean), ODFW (Aschenbrenner, Bailey, Blessing, Clarke, Elmore, Fagan, Feldhaus, Flesher, Garst, Gibbs, Harrod, Herold, Hoffnagle, Onjukka, Woods, Yanke), LSRCP (Yundt), NPT (Cleary, Edwards, Harbeck, Johnson, Vogel, Yearout, Zollman), BPA (McCloud).

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Steelhead (Oncorhynchus mykiss)

I. Summer Steelhead - 2011 Brood Year (Grande Ronde & Imnaha basins)

This is the fourth year for releasing smolts from adults returned 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) is implanted with a PIT tag. The release is paired with smolts from 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 1,066,000 fish weighing 232,132 pounds. A total of 849,000 are Wallowa stock transferred at 4.5 fish per pound (fpp). Wallowa fish will be acclimated at the Wallowa and Big Canyon facilities. Wallowa release will occur in two acclimation periods and the Big Canyon release will also have an early group and late group component. A total of 217,000 are Little Sheep stock transferred at 5.0 fpp. The Little Sheep stock will be acclimated in the Little Sheep facility. Smolt transfers and releases are summarized in Table 1 and Appendix A.

B. Liberations

1. Schedule

a. **Wallowa Acclimation:** Approximately 511,000 smolts will be transferred from Irrigon Hatchery to Wallowa Hatchery acclimation ponds in 2012.

Early Group: Approximately 386,000 smolts will be released after 5 to 7 weeks of acclimation			
Location	Transfer in date	Release dates	Comments
Lower Acclimation Pond	February 21-22	April 7-Sat April 8-Sun	The screens in the lower sections will be pulled on April 7 allowing fish to leave for 1 day. On April 8, the remaining fish will be forced out of the lower pond.
Upper Acclimation Pond	February 23-24	April 8-Sun April 9-Mon	The screens in the upper sections will be pulled on Sunday April 8. On April 9, the remaining fish will be forced out of the upper pond.
Note: Approximately 75,000 smolts released will be used for early brood evaluations.			
Late Group: Approximately 125,000 smolts will be released after 1 to 3 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
Lower Acclimation Pond	April 10-11	April 21-Sat May 3-Th	The screens in the lower section will be pulled on April 21 allowing fish to leave for 12 days. On May 3, the remaining fish will be forced out.
Note: Approximately 25,000 smolts released will be used for fall collected brood evaluations.			

b. **Big Canyon Acclimation:** Approximately 338,000 smolts will be transferred from Irrigon Hatchery to the Big Canyon acclimation ponds, 170,000 in the early group and 168,000 in the late group.

Early Group: Approximately 170,000 smolts will be released after 5 to 7 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
Lower Acclimation Pond	Feb 27	April 14-Sat April 15-Sun	The screens in the lower sections will be pulled on April 14 allowing fish to leave for 24 hours. On April 15, the remaining fish will be forced out of the lower pond.
Upper Acclimation	Feb 28	April 15-Sun	The screens in the upper sections will be pulled

Pond		April 16-Mon	on April 15 allowing fish to leave for 24 hours. On April 16, the remaining fish will be forced out of the lower pond.

Late Group: Approximately 168,000 smolts will be released after 1 to 3 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
Lower Acclimation Pond	April 17-18	April 24 -T May 7 - M	The screens in the lower section will be pulled on April 24 allowing fish to leave for 13 days. On May 7, the remaining fish will be forced out.
Upper Acclimation Pond	April 18	April 25-W May 7-M	The screens in the upper section will be pulled on April 25 allowing fish to leave for 12 days. On May 7, the remaining fish may be forced out.
Note: On May 7, 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. If outplanted, Fish Research will scan for PIT tags.			

c. Little Sheep Acclimation: Approximately 217,000 smolts will be transferred to the Little Sheep Acclimation facility for release in Little Sheep. This included fish programmed for Big Sheep release.

Acclimation. Approximately 217,000 smolts will be released after 4 to 8 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
Acclimation Pond	Feb 29-Mar 2	March 27-T April 24 - T	Screens will be pulled on March 27 allowing fish to leave for a minimum of 28 days. In late April, the river conditions will be assessed and fish may be retained longer to coincide with higher flows. Downstream rotary trap operators will be notified if changes are made to the April 24 release date.
Note: Prior to forced release, ODFW Fish Research will sample smolts in the acclimation pond. If >70% of the sample contains *males,* remaining fish will be enumerated and up to 7,500 fish released in Kinney Lake.			

d. Big Sheep Direct Release: Because of safety concerns with the bridge to access the release location in Big Sheep, approximately 44,000 smolts targeted for direct release into Big Sheep will instead be transferred to Little Sheep Acclimation facilities March 02. These smolts will be volitionally released into Little Sheep beginning March 27 with a forced release April 24. The NPT will take the lead in evaluating options for bridge repair.

C. Monitoring and Evaluation

1. Summary of marked steelhead for release in 2012

Comparative survival studies (CSS) continue for the fourth consecutive year for steelhead with 14,000 PIT tagged fish released in 2012 (Table 5). PIT tagged released fish are a representative sample of the marked population.

a. Wallowa

- 74,000 AdRV
- 100,000 AdRVCWT
- 100,000 AdLVCWT
- 237,000 Ad only
- 9,500 PIT
- 4,200 PIT CSS

b. Big Canyon

- 50,000 AdLVCWT
- 288,000 Ad only
- 6,000 PIT
- 2,800 PIT CSS

c. Little Sheep
- 148,000 Ad only
- 25,000 AdLVCWT
- 12,000 PIT
- 5,600 PIT CSS

d. Big Sheep (volitional release into Little Sheep)
- 44,000 Ad only
- 3,000 PIT
- 1,400 PIT CSS

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

3. Irrigon Hatchery –Irrigon staff do not need to measure fish lengths for the Big Sheep release in 2012.

D. Fish Health—Fish Health will coordinate with hatchery staff to conduct a pre-release health examination (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 and Wallowa adult traps will be deployed in late-January. Little Sheep adult trap will be installed in February, weather permitting.

F. Key Contacts

1. ODFW (Harrod) will notify Yanke, Garner and P. Keniry (ODFW) and Harbeck and Young (NPT) of steelhead releases

II. Summer Steelhead - 2012 Brood Year - Wallowa Stock

The LSRCP mitigation goal is 9,184 adults above the project area.

A. Smolt Goal – Produce 800,000 smolts at 4.0 fpp for release in 2013. Target production includes:
- 560,000 Production
- 240,000 Early Brood

Note: Production from early brood stock above CWT evaluation needs will be AdRV clipped.

B. Egg Take Goal – Collect 1,212,121 green eggs to produce 1,066,666 eyed eggs (88% survival green to eyed eggs). Transfer 1,066,666 eyed eggs to Irrigon Hatchery to produce 800,000 smolts (75% survival eyed eggs to smolt).

C. 2012 Adult Collection

1. Predicted Run (Table 3)
- Marked – 4,695
- Unmarked – 91
- Total – 4,786

a. Wallowa Hatchery
- Marked – 2,744 (1,407-4,081 95% CI)

b. Big Canyon Satellite
- Marked –1,951 (702-2,806 95% CI)
- Unmarked – 91 (38-144 95% CI)

- Total – 2,042

D. Trap Operations

1. Wallowa Trap Operation – Wallowa trap will be installed when winter conditions allow, typically in late January. 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 4,308 adults. The majority of surplus fish will be distributed to food banks. ODFW Grande Ronde Fish District has requested stocking of 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 3rd. Stocked fish will be identified by a missing adipose fin and 2-left opercle punches (2-LOP). Fish not outplanted or given to food banks will be buried at Wallowa Hatchery.

1) *Unmarked*—Transport unmarked fish to the Fish Hatchery Lane Bridge and release. Sampling shall include genetic (from opercle punch), sex, and length.

2) Residual Steelhead – Count and sample all residuals weekly, take snouts from all AdLV's and AdRV'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 Yanke (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 14, 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 increase hatchery fish availability to anglers. Beginning April 15, the ladder will remain open throughout the trapping operation.

b. Trap/sorting/recycle Frequency - Work trap weekly with a preference for Fridays.

c. Disposition of Trapped Fish

1) *Unmarked* - Pass all fish above the weir in Deer Creek. Measure all released fish and mark with a 1-LOP.
2) *Marked* - No marked fish will be passed. No marked (AdLV or AdRV) adults will be released, but will be sampled for CWT recovery. Surplus hatchery fish will be outplanted, recycled or provided to local food banks.
3) *Recycle fish* - Between late February and 06 April, approximately 100 Ad only fish will be recycled in the fishery, being outplanted at the Minam boat ramp with a 2 LOP punch. Recorded data of recycled and recaptured fish should include number and OP punch of fish checked in creel surveys, returns to Big Canyon and returns 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 Yanke (ODFW) and Krakker (USFWS).
5) *Residual Steelhead* - Count weekly until first smolt release. Sample all AdLV's and take snouts. Euthanize all Ad only. Efforts will be made to prevent residual steelhead from escaping when working the adult trap. After smolt release, discontinue sampling.

d. Disposition of Fallback Fish - Staff will collect and sample all fish that fall back on the Deer Creek weir to determine passed to un-passed ratio, h/w ratio, and number spawned out. Staff will collect otolith or head from moribund or dead unmarked steelhead and pass live fish downstream.

E. Hatchery Broodstock/Collection Guidelines

1. Wallowa Hatchery- Wallowa steelhead are held and spawned at Wallowa Hatchery. Production will consist of approximately 70% Production Brood and 30% Early Brood.

a. Broodstock Needs –A total of 478 adults should be spawned to meet production goals.
- Males – 242 (167 Ad or AdLV and 75 RV)
- Females – spawn 242 (167 Ad or AdLV and 75 RV).
  The five-year average fecundity is 5,000 eggs per female.

2. Wallowa Hatchery Spawning Guidelines

a. Expected 1st Spawn – Wednesday, March 7.

b. Spawning Dates – Wednesday.
- March 7 – RV's from holding pond/trap
- March 14 – 24 females (Ad or AdLV); RVs as needed
- March 21 - 31 females (Ad or AdLV); RVs as needed
- March 28 - 37 females (Ad or AdLV); RVs as needed
- April 4 - 33 females (Ad or AdLV); RVs as needed
- April 11 - 27 females (Ad or AdLV); RVs as needed
- April 18 – 15 females (Ad or AdLV); RVs as needed

c. The first 200 RV clipped fish trapped will be held. After 200 adults have been collected, all remaining fall brood fish (RV) captured will be killed and not spawned. In-season adult collection adjustments will be made depending on mortality and spawning success. Ripe fish will be spawned weekly. A total of 150 (75 males and 75 females) will be spawned (Appendix U).

d. Spawning Strategies - 1:1 ratio and incubate eggs from 1-2 females 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.

G. Rearing Program - Irrigon

Eggs will be hatched and reared at Irrigon Hatchery. Eyed eggs will be trayed at 50 ounces per tray, with vexar screens used as a substrate.

a. Programmed for Release - The target transfer size is 4.5 fpp for 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, used for resident trout production, or ODFW will propose release location such as Kinney Lake or Brownlee Reservoir.

d. Progeny from early-brood will be segregated. Progeny not required for evaluation will be mixed after AdRV marking 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 Early Brood will be reared in two release groups. The first release will consist of 75% of the production and the second 25% of the production.

1. Wallowa (480,000 total, 360,000 first acclimation and 120,000 second)
- 100,000 AdLVCWT (Production)
  - 75,000 AdLVCWT first acclimation
  - 25,000 AdLVCWT second acclimation
- 140,000 Ad only
- 4,500 PIT
- 2,100 PIT CSS

- 100,000 AdRVCWT (Early Brood)
  - 75,000 AdRVCWT first acclimation
  - 25,000 AdRVCWT second acclimation
- 140,000 AdRV
- 4,500 PIT
- 2,100 PIT CSS

2. Big Canyon (320,000 total, 160,000 in the each period)
- 50,000 AdLVCWT
- 270,000 Ad only
- 6,000 PIT
- 2,800 PIT CSS

b. Tagged groups are summarized in Table 4.

c. PIT-tagging in each release group.

d. Genetic sampling - ODFW Fish Research (Flesher, Eddy) will collect tissue samples from all brood used in production for Matt Campbell's (Eagle Genetics Lab, ID) parental based tagging study.

e. Coldwater Disease – Based on Fish Health recommendation, a new starter feed from BioOregon/Skretting, Bio Pro Starter, will be fed to 75% of the Wallowa stock and 50% of the Imnaha stock, to help with CWD.

III. Summer Steelhead - 2012 Brood Year – Little Sheep Stock

Co-managers have agreed to manage production to meet the LSRCP mitigation goal of 2,000 adults above the project area. The goal consists of fish returning to Little Sheep, Big Sheep, and compensation area harvest. Co-managers will monitor returns in-season to determine if mitigation goal will be met. Guidelines for the program are located in Appendix D.

A. Smolt Goal — Produce 215,000 smolts at 4.5 fpp for release in 2013 with >46.7% natural origin adults.

Production and releases include:
- 215,000 Little Sheep Cr. (acclimated) smolts

B. Egg Take Goal – A total 315,960 green eggs will be taken to produce 282,152 eyed eggs (89.3%) and 215,000 smolts (76.2% eyed eggs to smolts).

C. Adult Collection

1. Predicted Run – (Table 3).
- Marked – 1,841 (639-3,034 95% CI); (842 males and 999 females)
- Unmarked – 194 (95 - 285 95% CI); (77 males and 117 females)

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.

2. Broodstock Needs
- Total – 126 (38.1% wild)
- Males – 63
- Females – 63
- Broodstock numbers were determined based on a fecundity of 5,000.

a. Wild broodstock – 24 males and 24 females needed for brood. Release remainder above the weir. Approximately 146 wild fish (58%) will be released above Little Sheep weir.

b. **Hatchery** broodstock – 39 males and 39 females are needed for brood. Approximately 104 hatchery adults will be released above the Little Sheep weir.

	Wild – keep 48		**Hatchery – keep 78 (+4 males)***	
Week Ending	Avg. % by Week	Number Kept	Avg. % by Week	Number Kept
March 16-	5.4	3	6.9	5
March 23	9.7	5	8.6	7
March 30	8.6	4	12.6	10
April 6	16.0	8	18.8	15 (+1 male)
April 13	16.5	8	19.2	15 (+1 male)
April 20	15.2	7	13.9	11 (+1 male)
April 27	14.8	7	11.6	9 (+1 male)
May 4	9.2	4	5.7	4
May 11	2.6	1	1.8	1
May 18	1.3	1	0.7	1
May 25+	0.7	0	0.2	0
Totals		48		78+4=82

* Keep one extra hatchery male per week in April
* Pass two hatchery fish for every three wild fish passed, plus one extra hatchery fish for each 20 wild released, match sex ratios
* Last spawn can include the last three fish in the Table and added to the May 13 egg take
* If short for a particular week, make up the difference at the first opportunity

3. Disposition of Trapped Fish

a) **Wild** – Keep 48 wild fish (total wild fish collected is estimated at 77 males and 117 females). Wild composition in hatchery brood is estimated at 38.1%. The other wild adults collected will be 1-LOP and placed above the weir. Number of wild fish released above the weir is estimated at 146 fish with a wild composition of 58.4% for natural spawning.

b) **Hatchery** – Keep 78 hatchery fish plus one additional male each time the trap is operated in April. Two hatchery fish should be released above the weir for every three wild fish released above the weir plus one extra hatchery fish for every 20 wild fish passed. Hatchery fish released above the weir should be opercle punched 1-LOP.

c) **In season modification** - The run size will be reviewed around April 1 and adjustment can be made for broodstock collections. NPT will provide two people one day per week for Big Sheep adult outplants.

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

e) **Residual Steelhead** – Count and sample all residuals weekly until first smolt release, take snouts from all AdLV's and euthanize all Ad only. After volitional release begins, discontinue residual sampling.

f) **Genetics tissue samples** - Tissue sample all wild and hatchery fish passed above the weir for genetic analysis by ODFW (for NOAA Fisheries).

g) **Big Sheep outplants** - Surplus steelhead trapped and handled on Thursday will be outplanted to Big Sheep (up to 500). Surplus fish trapped and handled on Monday will be used for distribution. If a third day is required to work through the fish, they can be outplanted in Big Sheep. Live outplanted fish will be opercle punched with 2-LOP.

h) **Surplus fish** may be used for distribution (food bank). Approximately 1,655 surplus hatchery fish will be available for Big Sheep (500) and food bank, etc.

i) **Recaptured and fall back fish** - All recaptured Big Sheep (2-LOP) hatchery fish will be processed according to the day re-collected. Fallback (fish passed above the weir but fall back below the weir and recaptured) Little Sheep fish (1-LOP) will be released above the weir again.
j) **Carcass Disposal** - Spawned fish not suitable for distribution can be placed in the stream for nutrient enhancement or buried in a landfill.
k) **Strays** - All unidentified marked fish (e.g. RV only, maxillary clip) will be sacrificed.
l) **Scales** - Samples will be collected from all wild adults.

4. Adult Identification Guidelines — Adults returning to Little Sheep trap will have a variety of marks. Summary of marks include:

Mark	Disposition
Ad	Subsistence, carcass, outplant or pass above the weir
AdLV+CWT	Subsistence, carcass, outplant, pass above weir, or spawn
No Mark wild	Spawn or pass above weir
No Mark hatchery	Outplant or Kill not spawn (missed clip)
AdRV (out of basin)	Kill not spawn (recover CWT)

* For Passed or Outplanted -- record clip, sex, location, genetic sample for passed fish, fork length
* For KNS - record clip, sex, OP punch, fork length, and snouts from all AdLV clipped fish
* The dorsal fin will be inspected to help identify no mark hatchery fish.

5. Spawning Guidelines

a. **Little Sheep Satellite**
   1) **First Spawn** - March 20.
   2) **Expected Spawning Frequency** – Weekly on Tuesdays and/or Thursdays.
b. **Spawning Strategies** – A 2 x 2 or 3 x 3 spawning matrix will be utilized. A matrix will include at least one natural fish, whenever 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, collect genetic tissue sample (1 LOP), and release above the weir.

6. 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.

7. Rearing Program

Embryos will be hatched and fish reared at Irrigon Hatchery. Eyed eggs at Irrigon will be trayed down to 50 ounces/tray, with a vexar screen as substrate.

a. **Programmed for Release** - 215,000 smolts
   - 215,000 Little Sheep
   - Target size at transfer is 5.0 fpp. Single acclimation is expected with April volitional release.
b. **No Little Sheep stock will be graded.**
c. **Excess production** - Fish in excess of program needs will be reared to smolts and incorporated with the Little Sheep Creek release providing they can be acclimated in one release group.

8. Fish Health - Monitoring Plans

a. **Broodstock Monitoring Plan** (Appendix B)
b. **Disinfection and Sanitation Guidelines** (Appendix C).

9. Monitoring & Evaluation

a. **Proposed marking includes:**
   1) **Little Sheep**:

- 25,000 AdLVCWT
- 140,000 Ad only
- 11,500 PIT
- 5,400 PIT CSS

2) **Big Sheep** (Acclimated release into Little Sheep):
- 50,000 Ad only
- 3,500 PIT
- 1,600 PIT CSS

b. Tagged groups are summarized in Table 4.

c. PIT tagging in each release group (Table 5).

d. Genetic sampling — ODFW fish research (Flesher, Eddy) will collect tissue samples from all brood used in production for Matt Campbell's (Eagle Genetics Lab, ID) parental based tagging study.

e. 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.

f. Coldwater Disease – Based on Fish Health recommendation, a new starter feed from BioOregon/Skretting, Bio Pro Starter, will be fed to 75% of the Wallowa stock and 50% of the Imnaha stock, to help with CWD.

10. Key contacts

1. ODFW (Flesher, Clarke) will provide ODFW (Yanke, Fagan), NPT (B. Johnson, Hesse, Vogel, Harbeck, Young) and CTUIR (Zimmerman, Boe, McLean) with weekly summary on collected and passed steelhead adults at Little Sheep.

IV. Summer Steelhead Monitoring: Catherine Creek/Grande Ronde River/Lookingglass Creek/Lostine River/Joseph Creek - 2012

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 locations - Catherine Creek (CC), Grande Ronde River (UGRR), Lookingglass Creek (LGCR), Lostine River (LR), and Joseph Creek (JC). CC and UGRR weirs installed, operated and maintained by CTUIR. LGCR weir installed and operated by ODFW and CTUIR. LR and JC weirs installed and operated by NPT.

b. Period of Trap Operation – CC, UGRR, and LGCR will be operated March 1 through August 1, environmental conditions permitting. Few steelhead are captured after mid-June. Lookingglass trap pickets may be pulled in May due to high run-off, but staff will attempt to operate from March 1 through September 10 to collect steelhead, bull trout and spring Chinook. LR weir will begin operating mid-February but may be periodically lowered when debris or high flow threaten the structure. JC weir will begin operating in January.

2. Disposition of steelhead at weirs

a. Catherine Creek, Upper Grande Ronde, and Lookingglass Creek Weirs

i. Live, unclipped, first-time captures – Enumerate, fork length, maturity, migration status, scales, sex, marks/tags, condition, take ONE opercle punch (preserve in vial for genetic analysis) and pass above the weir (or below if kelt). All UGR and LGCR fish will have scales collected. Catherine Creek fish will be sub-sampled for scales (schedule to be given to CTUIR O&M). All steelhead will be scanned for CWTs and PIT tags.

ii. Live, unclipped, previously punched captures - Enumerate, fork length, maturity, migration status, sex, marks/tags, and pass above the weir (or below if kelt). Note the

number and position of existing opercle punches and the direction of capture (upstream or downstream).

iii. **Live, clipped captures or clipped mortalities -** Enumerate, fork length, maturity, migration status, sex, marks/tags, condition. At CC, UGRR, and LGCR weir euthanize Ad- or AdLV-clipped steelhead and collect snouts from AdLV- clipped fish for CWT recovery.

iv. **Weir/Trap Unclipped Mortalities - (First time captures at CC or UGRR)** Enumerate, fork length, maturity, migration status, scales, sex, marks/tags, condition, take two opercle punches (preserve one in vial for CTUIR), take otolith and preserve with second opercle punch in vial for ODFW-Research (Flesher). Return carcass to stream. (**Recaptures at CC or UGRR**)– Enumerate, fork length, maturity, migration status, sex, marks/tags, condition, take ONE opercle punch and otolith and preserve both in vial for ODFW-Research (Flesher). Return carcass to stream. (**First time capture or recapture at Lookingglass Creek)** Collect same data and tissues as for CC or UGRR**. Retain mortalities in freezer in labeled bag.** Collaborate with Fish Health when working dead fish at any of the three streams.

b. Lostine River Weir

Goal: to quantify natural and hatchery adult escapement and determine life history characteristics (NPT)—No Production goals.

i. **Adult Escapement –** Population estimate using mark-recapture methodology.

ii. **Live unclipped first time captures -** LR unclipped steelhead will have the following noted: number captured, direction of capture (upstream or downstream), fork length, maturity (green, ripe, or kelt), sex, fin clips/marks/tags, condition. A single right opercle punch (1 ROP) will be taken to mark the fish and the tissue will be stored in a uniquely labeled envelope for later genetic analysis. All steelhead will be scanned for CWTs and PIT tags. Steelhead will be released in the direction in which they were traveling (i.e. fish captured in the upstream trap box will be released upstream of the weir).

iii. **Live, unclipped, previously punched captures** – Spawned out kelts that wash downstream onto the weir will serve as recaptures for the mark-recapture estimate. Downstream captures of steelhead may also be obtained by seining or dip netting at the upstream face of the Lostine River weir. No attempt will be made to capture steelhead occupying a redd. Previously captured steelhead will be identified by the presence of a 1 ROP. In addition to the existing opercle punch, the following will be noted: number captured, direction of capture (upstream or downstream), fork length, maturity (green, ripe, or kelt), sex, fin clips/marks/tags, condition. All steelhead will be scanned for CWTs and PIT tags.

iv. **Live clipped first time captures –** LR fin clipped steelhead will be treated the same as unclipped steelhead.

v. **Live, clipped, previously punched captures –** Recaptured LR fin clipped steelhead will be treated the same as unclipped steelhead.

vi. **Weir/Trap Mortalities -** Note the location of all steelhead carcasses and mortalities as upstream of weir, in trap box, in pickets, or downstream of weir. Inspect all steelhead carcasses for fin clips/marks/tags and scan for coded wire and PIT tags. Collect fork length, sex, percent spawned (if female) and inspect the operculum plates for a punch. If no punch exists, take a 1 ROP punch for genetic analysis. If no fin clips are present, collect scales. If a fin clip is present, collect the snout. Cut the tail off and place downstream of the weir.

c. Joseph Creek Weir

Goal: to quantify natural and hatchery adult escapement and determine life history characteristics (NPT)—No Production goals.

i. **Adult Escapement -** Enumeration using floating weirs with standoff structures going to the bank and a PIT tag array.

ii. **Wild/Hatchery** – No broodstock collection. Trap, collect data, and release only.

iii. **Kelts** – No broodstock collection. Trap, collect data, and release only.

iv. **Period of Trap Operation** – January through June, or until 10 days after last capture. Trap is operated on an every other day basis. Meaning trap will be operational to capture fish on one day and then trap will be opened to allow volitional fish passage on the next day.
v. **Trapping Strategies** - Traps checked every other day.
vi. **Disposition of Steelhead** – Steelhead in the upstream movement box will dipped out with cotton dip net and placed into a moist canvas sling/measuring box. Steelhead will be scanned for the presence of PIT tags. 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. Tissue from a single right opercle punch will be taken for genetic analysis. Each untagged fish will be PIT and floy tagged. Steelhead captured moving downstream will be examined for the presence of opercle punches, Floy, and PIT tags. Marked fish will be checked for spawning condition (pre or post-spawn) and released downstream. Unmarked steelhead moving downstream will be handled according to the same procedures as upstream moving fish with the exception of a downstream release.
vii. **Disposition of 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 (Yanke) and LSRCP (Krakker).
viii. **Disposition of other non-target species** – Enumerate, subsample for length and release.
ix. **Adult Mortalities** – Natural mortalities will be sampled for biological information and their heads retained for otolith extraction.

3. **Disposition of bull trout at weirs** - Record date, number trapped, and estimated fork length (no anesthetics, minimize handling effects). Send summary to Bailey, Jacobs, and Yanke (ODFW) and Krakker (USFWS).

4. **Juvenile *O. mykiss* Sampling**
   a. Operate rotary trap(s) on Lookingglass Creek - Trap year-round, collect data, PIT tag, and release sampled fish below the intake.

B. Remote PIT Tag Array Monitoring Section

The Nez Perce Tribe operates five (two more will be installed summer of 2012) remote Biomark PIT tag arrays in the Grande Ronde River Basin as part of the larger Integrated Status Effectiveness Monitoring Project (ISEMP) to monitor juvenile and adult salmon and steelhead abundance. These PIT tag arrays will be operated year round and are part of a long-term monitoring effort. Information about PIT tag recapture information can be viewed at "www.ptoccentral.org/dbaccess/InStrmDtctn/InStrmDtctn_query.html". Imnaha and Grande Ronde Basin PIT Arrays, Site code, and GPS locations include:

- *Site Code JOC – Joseph Creek — N 46.0301, W 117.016117*
- *Site Code (to be determined) - Upper Grande Ronde - N 45.359442, W 117.90249- install scheduled for summer 2012.*
- *Site Code (to be determined) - Wallowa River - N 45.63378, W 117.73412- install scheduled for fall 2012-summer 2013.*

C. Key Contacts

1. CTUIR (McLean). Distribute bull trout and steelhead data collected to ODFW District offices (Bailey, Yanke, Fagan).
2. NPT (Vogel, Hesse, Young, Harbeck). Distribute bull trout and steelhead data collected to ODFW District offices.

V. Summer Steelhead - Imnaha Tributaries (Horse, Mahogany, Gumboot and Camp creeks)

Goal: to quantify natural and hatchery adult escapement and determine life history characteristics (NPT)—No Production goals.

A. Weir Monitoring

1. **Adult Escapement** - Enumeration using floating weirs with standoff structures going to the bank and a new small stream PIT tag array.
   - **a.** *Floating weir locations* **–** Horse, Mahogany and Gumboot creeks.
   - **b.** *PIT tag Array* - Camp Creek – Installation summer 2012.

2. **Trap Operations**
   - **a.** *Wild/Hatchery* – No broodstock collection. Trap, collect data, and release only.
   - **b.** *Kelts* – No broodstock collection. Trap, collect data, and release only.
   - **c.** *Period of Trap Operation* – March through June, or until 10 days after last capture.
   - **d.** *Trapping Strategies*-Traps checked twice daily.
   - **e.** *Disposition of Fish*
     - **1)** Steelhead – Steelhead in the upstream movement box will dipped out with dip net and placed into a moist canvas sling or watered measuring box. Steelhead will be scanned for the presence of PIT tags. 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. Tissue from two right opercle punches (2 ROP) will be taken for genetic analysis in Horse Creek and a single right opercle punch (1 ROP) in Mahogany and Gumboot creeks. Each untagged fish will be PIT tagged. Steelhead captured moving downstream will be examined for the presence of opercle punches and PIT tags. Marked fish will be checked for spawning condition (pre or post-spawn) and released downstream. Unmarked steelhead moving downstream will be handled according to 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 (Yanke) and LSRCP (Krakker).
     - **3)** Other non-target species – Enumerated, subsampled for length and released.
   - **f.** **Adult Mortalities** – Natural mortalities will be sampled for biological information.

B. Remote PIT Tag Array Monitoring Section

The Nez Perce Tribe operates five remote PIT tag arrays in the Imnaha River Basin as part of the larger Integrated Status Effectiveness Monitoring Project (ISEMP) and the Imnaha Adult Steelhead Monitoring Project (ISAM) to monitor juvenile and adult salmon and steelhead abundance. These PIT tag arrays will be operated year round and are part of a long-term monitoring effort. Information about PIT tag recapture information can be viewed at "www.ptoccentral.org/dbaccess/InStrmDtctn/InStrmDtctn_query.html". Imnaha Basin PIT Arrays, Site code, and GPS locations include:

- *Site Code IR1 - Imnaha River as Cow Creek Bridge —N 45.76107, W 116.75065*
- *Site Code IR2 - Imnaha River upstream of confluence to Lightning Creek - N 45.74279, W 116.76456*
- *Site Code IR3 – Imnaha River Km 41- N 45.54115, W 116.82928*
- *Site Code COC – Cow Creek - N 45.767742, W 116.744037*
- *Site Code BSC - Big Sheep Creek (Imnaha Basin) - N 45.50957, W 116.85271*

C. Key Contacts

1. NPT (Vogel, Hesse, Young, Harbeck)

CHINOOK (O. tshawytscha)

Eleven raceways will be prioritized for Grande Ronde tributary production and 7 raceways for Imnaha production at Lookingglass Hatchery. Priorities for the adult ponds have not been determined. Current priorities include:

- *Lostine; 4 raceways*
- *Upper Grande Ronde; 4 raceways – 2 for conventional and 2 for captive/SNP*
- *Catherine Creek;3 raceways*
- *Lookingglass Creek; AHP's*
- *Imnaha; 7 raceways*

VI. Grande Ronde Basin - 2010 Brood Year Spring/Summer Chinook – Catherine Creek, Lookingglass Creek, U. Grande Ronde & Lostine River

Smolts target size was 25 fpp (actual~ 31.5 fpp) by October 31 with an expected release size of 22 fpp in April.

A. Allocation — The estimated number of smolts for the Grande Ronde Subbasin 2012 release is 955,000 fish weighing 47,750 pounds (Appendix A). Breakdown by tributary is as follows:

1. Catherine Creek (CC) – 162,500
   - Conv - 162,500
2. Lostine River (LR) – 267,500
   - Conv - 267,500
3. U. Grande Ronde (UGR) – 295,000
   - CBS - 0
   - Conv - 295,000
4. Lookingglass (LGCR) – 228,000
   - Conv - 228,000

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 12 and April 3, Catherine Creek on March 20, and the Upper Grande on March 19 and April 4. Acclimation facility operator will notify Jack Woods if their facility is not operational on scheduled dates. Release number will be determined by last physical inventory minus mortality. Facility operators will report final numbers to the ODFW LGH staff or Shari Beals.

   a. Lostine Acclimation schedule

Approximately 135,000 smolts will be released after 1.5 weeks of acclimation.				
Location	Transfer in date	Release dates	Force Release Date	Comments
LGH ½ R8 to pond A	March 12 M	March 22 Th	April 2 M	The screens will be pulled on March 22 allowing fish to leave for 10 days. On April 2, the remaining fish will be forced out
LGH ½ R8 to pond B				
LGH ½ R10 to pond C				
LHG ½ R10 to pond D				
Approximately 133,000 smolts will be released after 1.5 weeks of acclimation.				

Location	Transfer in date	Release dates	Force Release Date	Comments
LGH ½ R9 to pond A	April 3 T	April 13 F	April 22 Su	The screens will be pulled on April 13 allowing fish to leave for 10 days. On April 22 the remaining fish will be forced out.
LGH ½ R9 to pond B				
LGH ½ R11 to pond C				
LGH ½ R11 to pond D				

b. Catherine Creek Acclimation Schedule

Catherine Creek Acclimation				
Location	Transfer in date	Volitional Release Date	Forced Release Date	Comments
LGH R1 to pond A	Mar 20 T	Mar 22 Th	Apr 16 M	Conventional
LGH R1, 2 to pond B	Mar 20 T	Mar 22 Th	Apr 16 M	Conventional
LGH R2 to pond C	Mar 20 T	Mar 22 Th	Apr 16 M	Conventional
LGH R3 Direct Release[a]	NA	NA	April 19	Conventional
Approximately 163,048 smolts will be released after 28 days of acclimation. The fish will be split equally into the acclimation raceways.				

[a] Because of IHN concerns, fish in R3 will be direct stream released April 19, shortly after the fish in the acclimation facility are forced out.

c. Upper Grande Ronde Acclimation Schedule

Upper Grande Ronde Acclimation				
Location	Transfer in date	Volitional Release Date	Forced Release Date	Comments
LGH R4 to pond A	Mar 19 M	Mar 21 W	Apr 2 M	Conventional
LGH R4 to pond B	Mar 19 M	Mar 21 W	Apr 2 M	Conventional
LGH R7 to pond C	Mar 19 M	Mar 21 W	Apr 2 M	Conventional
LGH R7 to pond D	Mar 19 M	Mar 21 W	Apr 2 M	Conventional
Approximately 148,355 smolts will be released after 15 days of acclimation.				
Late Group				
LGH R5 to pond A	Apr 4 W	Apr 6 F	Apr 16 M	Conventional
LGH R5 to pond B	Apr 4 W	Apr 6 F	Apr 16 M	Conventional
LGH R6 to pond C	Apr 4 W	Apr 6 F	Apr 16 M	Conventional
LGH R6 to pond D	Apr 4 W	Apr 6 F	Apr 16 M	Conventional
Approximately 147,652 smolts will be released after 14 days of acclimation.				

d. Lookingglass Creek Acclimation Schedule

Approximately 228,000 smolts will be released into Lookingglass Creek			
Location		Release dates	Comments
LGH AHPs A, B, C, D	NA	April 2 - through April 13	The screens will be pulled on April 2 allowing fish to leave for 12 days. On April 14, the remaining fish will be forced out

Notes: Contingency— Fish may be released earlier than scheduled if conditions warrant. Downstream rotary trap operators should be notified immediately and co-manager within 24 hours: Scott Favrot, Brad Garner, Pat Keniry, Steve Boe, Steve Yundt.
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 provided to fish health for examination.

C. Monitoring and Evaluation— A variety of M&E efforts are ongoing (Tables 2 and 6).

1. **Genetic tissue collection** for monitoring and pedigree analysis, 50 samples/stock.
2. **Pre-liberation sampling** – in each raceway
   - **a.** Collect 50 weights
   - **b.** Collect 250 lengths
   - **c.** Check 500 fish for tag retention and fin clip quality
3. **Monitor:**
   - **a.** Downstream migration survival and rate
   - **b.** PIT survival studies (CSS) for Catherine Creek and Lostine River
   - **c.** Hatchery vs. Natural production, growth and survival (in collaboration with ODFW Early Life History Project)
4. **Studies**
   - **a.** CSS

D. Marked Groups.

- **a.** Catherine Creek
  - 55,900 Ad
  - 107,000 AdCWT
  - 21,000 PIT CSS
- **b.** Lostine River
  - 143,500 AdCWT (raceways 8 and 9)
  - 124,500 Ad (raceways 10 and 11)
  - 6,000 PIT (~1,500 per raceway)
- **c.** Upper Grande Ronde
  - CV 147,000 Ad CWT
  - CV 149,000 CWT
  - CB 0 ADCWT
  - 3,000 PIT
- **d.** Lookingglass Creek-
  - CV 122,000 ADCWT
  - 106,000 Ad
  - CB 0 Ad
  - 2,000 PIT

E. Fish Health - Fish Health will coordinate with hatchery staff on pre-release health examinations (Appendix E). Standard disinfection and sanitation guidelines will apply (Appendix C).

F. Key contacts
1. Hatcheries: CTUIR (McLean), ODFW (Elmore), NPT (Zollman).
2. Fish Research: CTUIR (Boe) ODFW (Hoffnagle, Feldhaus), and NPT (Hesse, Harbeck, Vogel, Cleary, Young).

VII. Grande Ronde Basin - 2011 Brood Year Spring/Summer Chinook – Catherine, Lookingglass, Lostine & U. Grande Ronde

Smolt target size is 30 fpp by October 31 and 25 fpp at release for Catherine, Lostine and Upper Grande Ronde. The CTUIR would prefer a smolt target release size of 20 fpp. Expected transfer size is 26 fpp. Lookingglass Creek target release size is 20 fpp.

A. Allocation – Scheduled for transfer target size of 26 fpp in mid-March 2013.

4. **Anticipated Grande Ronde basin production** is 964,945 smolts for release in 2013 produced from Lookingglass Hatchery.
    a. **Estimated Conventional brood** numbers are:
        - Catherine Creek 135,000 – (3 raceways)
        - Lostine River 255,000 – (4 raceways)
        - U. Grande Ronde 136,000 – (4 raceways)
        - Lookingglass Creek 280,000 – (adult ponds A, B, C, D)

B. Final Rearing — LGH fry will be transferred outside in April or early May. All 250,000 fry will be transferred to Irrigon in April and returned to Lookingglass in late September (Appendix F).

C. Monitoring and Evaluation

1. Monitor
    a. Downstream migration and survival rate
    b. PIT tag survival studies (CSS) for Catherine Creek and Lostine River
    c. Hatchery vs. Natural production, growth and survival (in collaboration with ODFW Early Life History Project)
2. Studies
    a. CSS

D. Marking Program-

1. **AD/CWT** is scheduled for August 2012.

Catherine Creek
- 92,000 AdCWT
- 46,000 Ad only

Lostine River
- 136,000 AdCWT
- 136,000 Ad only

Lookingglass Creek
- 125,000 AdCWT
- 125,000 Ad only

Upper Grande Ronde
- 125,000 AdCWT (Captive/SNP)
- 125,000 CWT only (Conventional)

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 2012 (Table 6). Numbers by stock include:
   - Catherine Creek - 21,000 CSS
   - U. Grande Ronde - 2,000
   - Lostine (conventional) - 6,000
   - Lookingglass Creek - 3,000

E. Fish Health

A 28 day Aquamycin medicated feed treatment (2.25%) is planned for 2011 brood year progeny in July 2012. Lookingglass Creek progeny transferred to Irrigon Hatchery will receive a 28-day Aquamycin medicated feeding in June after marking is completed.

1. **Disinfection and Sanitation Guidelines** (Appendix C).
2. **Juvenile health monitoring and disease treatments** (Appendix E).

F. Key contacts

1. **Fish Marking** (Haugen, Onjukka, Harbeck, Vogel, Feldhaus, LaPoint and Jonasson)

VIII. Grande Ronde Basin - Conventional - 2012 Brood Year - Spring/Summer Chinook Catherine, Lookingglass, Lostine, and Upper Grande Ronde

The LSRCP production goal is 900,000 smolts to produce 5,720 adults.

A. Smolt Production -

1. Production targets include:
   - Catherine Creek - 150,000 smolts
   - Lookingglass Creek - 250,000 smolts
   - Lostine - 250,000 smolts
   - Upper Grande Ronde - 250,000 smolts

B. Anticipated Egg Needs – A total of 1,071,429 green eggs should be collected to produce 900,000 conventional smolts based on 84% green egg to smolt survival. Safety Net component can be used to supplement production numbers for the Upper Grande Ronde River stock.

C. 2012 Adult Collection

1. **Predicted Runs** (Tables 7, 8, 9, 10) female contribution estimated at 50% of adults.
   a. **Catherine Creek**
      1) ODFW – **2,462 adults (495 jacks)**
      - Natural – 1,125 adults (plus 121 jacks)
      - Hatchery – 1,337 adults (plus 374 jacks)

      2) CTUIR – **2,562 adults (unknown jacks)**
      - Natural - 994 adults (unknown jacks)
      - Captive – 864 adults (unknown jacks)
      - Conventional – 704 adults (unknown jacks)

   b. **Lostine River**

      ODFW and NPT**– 4,573 Adults (551 jacks)**
      - Natural – 1,071 adults (plus 187 jacks)
      - Hatchery – 3,502 adults (plus 364 jacks)

   c. **Upper Grande Ronde**

      ODFW- **942 adults (651 jacks)**
      - Natural - 66 adults (plus 32 jacks)
      - Hatchery - 876 adults (plus 619 jacks)

      CTUIR – **2,073 adults (unknown jacks)**

- Natural - 193 adults (unknown jacks)
- Captive – 1,246 adults (unknown jacks)
- Conventional – 634 adults (unknown jacks)

d. Lookingglass Creek

ODFW – **1,730 adults (350 jacks)**

- Natural - 395 adults (60 jacks)
- Hatchery – 1,335 adults (290 jacks)

CTUIR **– 1,615 adults (unknown jacks)**

- Natural - 132 adults (unknown jacks)
- Hatchery – 1,483 adults (unknown jacks)

2. **Wallowa River -** Fishery will target Lostine River hatchery-origin adults (Appendix G).
   a. **Open Season**: May 19 - July 15, may extend if wild fish impact allows
   b. **Bag Limit**: Two adipose clipped adult Chinook per day, bonus bag of 5 jack salmon per day (consistent with Oregon salmon bag limits). Bag limits may be increased accordingly to meet harvest goals.
   c. **Open area**: Wallowa River from a deadline at the lower end of Minam State Park upstream to the confluence of the Lostine River.

Expected and Maximum Harvest (ODFW est.)

- Maximum hatchery fish harvest rate: 15.3% of expected return, 594 fish.
- Maximum incidental wild mortality of 29 fish from Wallowa-Lostine population (1.5%) and 13 fish on Minam (1.0%)
- Additional harvest of Ad clipped (470) and natural-origin (153) Chinook is expected in treaty fisheries.

Monitoring:

ODFW will estimate harvest with a statistical creel survey.

3. **Lookingglass Creek –** Fishery will target Lookingglass Creek hatchery-origin adults (and surplus Catherine Creek, if available) (Appendix S).
   a. **Open Season:** May 26 – July 15, may extend if harvest goal is not reached
   b. **Bag Limit:** Two adipose clipped adult Chinook per day, bonus bag of 5 jack salmon per day (consistent with Oregon salmon bag limits)
   c. **Open area:** Lookingglass Creek from the Moses Creek Lane bridge near the mouth upstream to the confluence of Jarboe Creek.

Expected and Maximum Harvest (ODFW est.)

- Maximum hatchery fish harvest of 336 fish.
- Maximum incidental natural-origin mortality of 8 (3%) Lookingglass-origin fish is estimated.

Monitoring:

ODFW will estimate harvest with a statistical creel survey.

4. **Catherine Creek –** Fishery will target Catherine Creek hatchery-origin adults (Appendix T).
   a. Open Season: May 26 – July 15, may extend if harvest goal is not reached and wild impact allows
   b. Bag limit: Two adipose clipped adult Chinook per day, bonus bag of 5 jack salmon per day (consistent with Oregon salmon bag limits)
   c. Open Area: Catherine Creek from Miller Lane bridge near Union upstream to Hwy 203 Bridge near Catherine Creek State Park.

Expected and Maximum Harvest (ODFW est.)

- Maximum hatchery fish harvest rate: 22.6% of expected return, 329 fish.

- Maximum incidental wild mortality of 24 (2.26%) fish

Monitoring:
ODFW will estimate harvest with a statistical creel survey.

5. **Broodstock needs** are based on fecundity and green egg to smolt survival summarized in Appendix H.
   a. **CC -** A target of 46 pairs should be collected to produce 150,000 smolts. The estimate is based on a fecundity of 3,917 and green egg to smolt survival of 87.7%.

   b. **LGCR -** An estimated 79 pairs should be collected to produce 250,000 smolts. This is based on performance history of the CC stock. Additional production can be obtained from the Catherine Creek captive brood production.

   c. **LR -** A target of 70 adult pairs, plus 6 natural jacks, should be collected (67 spawned) to produce 250,000 smolts. These estimates are based on female survival of 95%, fecundity of 4,448, and 84.3% green egg to smolt survival.

   d. **UGR -** A target of 85 pairs should be collcted to produce 250,000 smolts. The estimate is based on a fecundity 4,068 and green egg to smolt survival of 80.9%.

D. Trap Operation

1. **CC and UGR Trap Operation (CTUIR) –** Trapping will begin in March 2012 to monitor steelhead abundance. Overnight staffing will occur after April 16 and trapping will continue, if river conditions allow, through July 31.

2. **LR Trap Operation (NPT) -** Trapping for Chinook salmon brood on the Lostine River will begin in May and continue until 10 days without capturing a fish after September 1. LR trap operation will begin in mid-February for steelhead brood and continue through Chinook broodstock collection.

3. **Lookingglass (ODFW) —** The intake trap at Lookingglass Hatchery will be operated from March (as environmental conditions allow) through mid-September. If pickets are removed due to debris and high water, notes will be made on the trap sheet.

4. **General Guidelines**
   a. Trapping facilities will be checked daily.
   b. Water temperature data will be collected. It is expected that as water temperatures increase, facility operators will adjust their schedule to best coincide their work with the coolest water temperatures. Water temperatures can be monitored with Onset temperature loggers. When water temperature exceeds 68^{o} F on the Upper Grande Ronde, the trap will be removed.
   c. Surveys will be conducted by walking the streambank below each weir. Survey 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. Adults in CC and UGR will be worked on a 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. Catherine Creek - The projected adult run estimates range from 2,462 to 2,562, averaging 2,512. The range for the natural run is 994 to 1,125 with an average of 1,060. The adult sliding scale for broodstock collection with a projected run exceeding 500 adults is ≤20% of wild return. Hatchery-origin adults released above the weir should be ≤50% of the total. Ten percent of the males above the weir may be age-3 hatchery males. The goal is to have 56% (49 of 88) broodstock from natural origin adults with a minimum of 51% (45 of 88) brood stock of natural origin under current projections. In-season PIT tag projections will used to reassess the run.

2) Catherine Creek Spring Chinook broodstock/upstream passage management guidelines

Estimated total adult escapement to the mouth (hatchery plus natural)[a]	Ratio of hatchery to natural adults at the mouth	Maximum % of natural adults to retain for broodstock	% of hatchery adults to retain for broodstock[b]	% of adults released above the weir can be of hatchery origin	Minimum % of broodstock of natural origin	% strays allowed above the weir[c]
<250	Any	40	40	d	d	≤5
251-500	Any	20[d]	20	≤70	≥20	≤5
>500	Any	≤20	e	≤50	≥30	≤5

[a]Pre-season estimate of total escapement
b Conventional hatchery adults only, all captive brood adults released to spawn naturally or outplanted
c For hatchery adults originating from different gene conservation groups (Rapid River stock or strays from outside the Grande Ronde basin)
d Not to exceed 150,000 smolt production
e Not decision factor at this level of escapement, percentage determined by other criteria

2) Catherine Creek Broodstock Collection Guidelines

	Adults		Jacks	
	Natural	Hatchery	Natural	Hatchery
6-May	0	0	0	0
13-May	0	0	0	0
20-May	2	0	0	0
27-May	5	0	0	0
3-Jun	6	6	0	0
10-Jun	8	4	0	0
17-Jun	13	13	1	1
24-Jun	7	9	1	1
1-Jul	4	2	0	0
8-Jul	3	2	0	0
15-Jul	2	2	0	0
22-Jul	0	0	0	0
29-Jul	0	0	0	0
5-Aug	0	0	0	0
12-Aug	0	0	0	0
19-Aug	0	0	0	0
26-Aug	0	0	0	0
2-Sep	0	0	0	0
9-Sep	0	0	0	0
16-Sep	0	0	0	0
23-Sep	0	0	0	0

30-Sep	0	0	0	0
7-Oct	0	0	0	0
14-Oct	0	0	0	0
	50	38	2	2
	88		4	

- Pass 1 hatchery fish per 1 natural fish above the weir, surplus hatchery adults can be transferred to Lookingglass Creek and released below the hatchery. Up to 50 pairs of adults (5 jacks) that are surplus can be released into Indian Creek.

b. Upper Grande Ronde – The projected adult run estimates range from 942 to 2,073. The average of the projections is 1,508 adults. The range for the natural run is 66 to 193, with an average of 130. Grande Ronde conventional program calls for collection of up to 50% of natural fish and up to 100% of conventional return to reach the broodstock goal. Pass 100% of captives.

1) Grande Ronde Broodstock Collection Guidelines

	Adults	Jacks
13-May	0	0
20-May	0	0
27-May	6	0
3-Jun	23	2
10-Jun	18	1
17-Jun	35	2
24-Jun	16	1
1-Jul	22	1
8-Jul	24	1
15-Jul	4	0
22-Jul	6	0
29-Jul	2	0
5-Aug	4	0
12-Aug	0	0
19-Aug	0	0
26-Aug	0	0
2-Sep	0	0
9-Sep	0	0
16-Sep	0	0
23-Sep	0	0
30-Sep	0	0
	160	**8**

c. Lostine River - At the projected run level of >1,000 natural adults (i.e. Chinook salmon ≥63 cm), 100% of the broodstock take should consist of natural adults and passage of natural-to-hatchery origin adults should occur at a ratio of 9 natural:1 hatchery. Observations of PIT tagged Lostine River hatchery Chinook salmon at Bonneville Dam will be monitored in-season by ODFW and the NPT to determine if run projections will be realized and, if it is determined they will not be

realized, co-managers will discuss options. An additional 75 radio tagged hatchery Chinook adults may be passed above the weir and will not be considered part of the natural-to-hatchery passage ratio. The basic collection guidelines are as follows:

1) Lostine Broodstock Collection Guidelines

Date	Natural	Hatchery
May 29	2	0
June 5	2	0
June 12	7	0
June 19	12	0
June 26	23	0
July 3	27	0
July 10	20	0
July	13	0
July 24	3	0
July 31	1	0
August 7	1	0
August 14	3	0
August 21	11	0
August 28	11	0
Sept 4	4	0
Totals	140	0

Surplus is expected. Surplus fish at the Lostine weir will be available for outplanting after July 20.

- Fish will be outplanted to the Wallowa River in proximity to the McDaniel's and 6-Ranch restoration projects.
- Outplanted fish will have representative age and sex structure to those captured at the Lostine weir after July 20.
- A subset of outplanted fish will be radio tagged to evaluate site fidelity, straying to other tributaries, and returns to the weir. NPT will monitor radio-tagged fish.
- Both restoration reaches will be surveyed to evaluate spawning activity and carcass recoveries. Only the McDaniel reach will require an additional survey.
- Outplants to the restored reaches of the Wallowa River will be experimental in 2012. Co-managers will evaluate site fidelity and spawning success before continuing these outplants in future years.
- Surplus fish beyond those outplanted in Wallowa River will be outplanted in previously agreed to streams.
- Fish may be transferred to Wallowa hatchery for distribution. Fish held for distribution will be sampled according to Appendix I.

Note: CTUIR does not agree with the current spring Chinook disposition plans at the Imnaha and Lostine River weirs.

d. Lookingglass Creek

Lookingglass Creek Broodstock Collection Guidelines.

Date	Natural	Hatchery
May 20 - June 6	2	3
June 7-20	20	46
June 21-July 4	14	40

July 5 - 18	1	6
July 19 – August 1	2	2
August 2 - 16	3	4
August 17 –31	5	10
	47	111

1) Adults (ad clipped and unmarked) allocated for natural production will be identified with an opercle punched (1-ROP), then released upstream of the weir. Fish collected for hatchery broodstock will be injected and transported to the hatchery.

2) Hatchery jacks will be incorporated into the broodstock at a target rate of one for every 10 adult males collected (8 fish). All natural jacks will be released upriver. No hatchery jacks will be released upriver. All CWT hatchery jacks will be sacrificed for tag recovery. Other hatchery jacks will either be sacrificed with carcasses provided to the Tribes or food banks or recycled into lower Lookingglass Creek for harvest benefits.

3) All Chinook passed upstream of the intake trap will have tissue collected (opercle punch; 1 ROP) for future genetic analysis (pedigree)

4) Additional information can be found in the Lookingglass Creek Spring Chinook Management Plan, finalized January 2011.

Notes: General comments - No marked fish from other streams or basins will be passed upstream. UGR fish may be added to the broodstock or held for return to the Upper Grande Ronde River. CC fish can be used consistent with Lookingglass Creek management. Captive brood jacks may be sacrificed for CWT recovery.

6. Disposition of Trapped Fish

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

b. Steelhead -- Enumerate and determine hatchery or wild origin. Ad clipped fish can be euthanized. Data and reports sent to ODFW (ODFW District and Regional offices), and LSRCP (Krakker).

c. Unmarked Chinook - 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 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=1 LOP) for population estimates. Lookingglass fish receive a ROP prior to release above the Lookingglass Hatchery weir. Opercle tissues are used for both a mark/recapture population estimate and for genetics analysis. LR fish taken to Lookingglass Hatchery will receive one opercle punches (1-ROP) and white Tyvek tag.

d. Hatchery Chinook trapped on Lookingglass Creek, and identified as CC or UGR, will be disposed of as follows: UGR returned to UGR, CC released below the weir or added to CC or LG broodstock if needed.

e. Trapping mortalities – Because of take permit issues, trapped mortalities will be processed as kept fish and transported to Fish health, fresh if possible, for examination. Fish dead for less than 24 hrs keep on ice. Fish dead more than 24 hours freeze. Weir mortalities or other pre-spawning mortalities discovered during stream bank surveys or unusual loss will be coordinated with Fish Health. Data will be sent to ODFW Fish Research (Feldhaus). Following examination, the carcasses may be disposed of in the landfill.

f. Wallowa Hatchery – Surplus Chinook can be transferred to Wallowa Hatchery for Tribal and non-Tribal subsistence, or recycled in a sport fishery. Subsampling for CWT while fish are held at Wallowa Hatchery will follow the guidelines in Appendix I.

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 for completing a transfer data sheet** and providing 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^{o} F or 5.6^{o} 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** - The adult holding plan includes:
   - **Catherine Creek -** Endemic building
   - **Lookingglass Creek -** One adult holding pond
   - **Lostine River -** One adult holding pond
   - **Imnaha -** One adult holding pond. Outplants will be held at Imnaha facility
   - **Upper Grande Ronde -** One adult holding pond

E. Spawning Guidelines (for each stock)

1. **Anesthetic** - MS222
2. **Sorting** – The first sort will occur the week of August 13th
3. **Expected First Spawn** – The week of August 13th
4. **Spawning Frequency** - Once per week or as required (deceased females will not be spawned). Tentative Schedule: Tuesday-IM, LR; Thursday-UGR, CC, LG CR. Two additional days will be added during peak of spawning on Wednesday to spawn LR and IM fish due to both stocks being held in AHPs.
5. **Spawning Strategies** - All surviving broodstock collected will be spawned at Lookingglass Hatchery. Sorting and spawning to take place the same day. Hatchery and co-manager staffs will determine fertilization matrices. All Tyvek tag numbers will be recorded on the spawning matrix sheets. A maximum of 10% of the eggs can be fertilized with three year old males and a target of 30% of the eggs will be spawned with assumed five year old males (UGR and CC males >80cm and LR males >85cm). Large males may be spawned up to 3 times. Jack spawning will be conducted with 1 female to 1 jack matrix. Most adult spawning matrices will be 2 females x 2 males, but matrices of 1 x 1, 1 x 2, 2 x 1, or 3 x 2 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):
   - **Sperm on ice** from fish passed at weirs - These fish will be given a 1LOP opercle punch so they can be identified during spawning surveys and counted as "taken".
   - **If milt is not available after 7 days** of holding a ripe female, transport female(s) to river of origin.

   a. General fertilization techniques
   - Sort and euthanize ripe females
   - Collect eggs preventing addition of outside containments (other body parts)
   - Store individual female eggs separately
   - Drain ovarian fluid from eggs

- Sort males, spawn in dry cup
- Mix sperm with eggs, activate with pathogen free water (~100 ml)
- Wait 60 seconds, rinse eggs
- Fertilized and rinsed eggs in 100 ppm iodophore solution for minimum of 45 minutes
- Tray eggs, 1 female eggs per tray

6. Surplus brood - may be returned to stream of origin, provided that MS 222 withdrawal time has been met. CC stock return will be dependent on percentages above CC weir. CC fish could be released into LGC.

F. BKD Management

Progeny are categorized based on their maternal parent. Titles of the groups were changed from moderate-low to moderate and moderate-high to high in 2010, with no changes in the categories. Categories include:

- *≤0 .199 =Low*
- *0.2 - 0.399 = Moderate*
- *0.4 - 0.799 = 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 only rearing progeny from parents with low BKD titer levels.

G. Incubation Strategies – All stocks will be incubated at Lookingglass Hatchery using a combination of chilled and un-chilled well water, UV treated (>60,000 uw/cm^2/sec) creek water and Moist Air Incubator (Lookingglass Creek stock).

1. **Hatchery Program** – Each female's eggs will be incubated in one tray until disease screening profiles results are completed. Eggs may be combined after fecundity estimates are completed.
2. **Moist Air Incubator** will be used for eggs from all Lookingglass Creek adults. Additional moist air incubators will be acquired with the capacity to incubate approximately 500,000 eggs. When acquired stocks and eggs to incubate will be determined.

H. Early Rearing Program

1. **Lookingglass –** Catherine, Grande Ronde, Lostine, and Lookingglass 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 at all possible, only BKD lows will be reared (<0.200 OD units).
3. **Catherine Creek, Lostine, and Grande Ronde** smolts produced will be targeted for ~250 fpp April 30, 2013 and 30 fpp October 2013.
4. **Lookingglass Creek** production may be transferred to Irrigon for rearing in April, returned in September 2013, and released from the adult holding ponds in April 2014. The intent is to pressure wash, disinfect, and dry the holding ponds for a minimum of one week before fish are transferred.

I. Monitoring and Evaluation

1. Spawning ground surveys
    - **a.** Carcasses – count, length, marks/tags, snout/scales, kidney sample, genetic sample
    - **b.** Live fish – count
    - **c.** Redds – count, GPS
2. Hatchery Spawning
    - **a.** Data collection – length (all fish), weight (females), marks/tags, eyed egg weights, individual fecundity
    - **b.** Tissue collection – snout/scales, kidney sample, genetic sample
3. Weir/trap morts
    - **a.** Data collection – count, length, scan, marks/tags

b. Tissue collection – snout/scales, kidney sample, genetic sample

4. Monitor
   a. Hatchery vs. Natural production, growth and survival (in collaboration with ODFW Early Life History Project)
   b. PIT tag detections at dams and weirs for run timing – Catherine Creek and Lostine River
5. Studies
   a. CSS
6. Fish Health Monitoring Plans
   - **Disinfection and Sanitation Guidelines** (Appendix C).
   - **Broodstock Monitoring and Treatment Plan** (Appendices J, K, L)
   - Within each tributary, collect 40 kidneys from natural spawning females (20 N and 20 H) above the weir (Appendix J).
7. Hatchery versus Natural egg weights at eyed egg stage

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J. Key Contacts

1. **Transportation**
   a. Facility Operators (NPT and CTUIR) will coordinate all hauling and notify LGH (Elmore) of the stock, number being hauled and estimated arrival time.
2. **Adult records (AAT's)** will be completed weekly by ODFW (requires timely completion of weekly trapping data).
3. **Communications -** Weekly or bi-weekly draft summaries of adult collections will be distributed to co-managers. Wallowa hatchery will provide a summary of fish provided for subsistence.

IX. Grande Ronde Basin - 2012 Safety Net Spring/Summer Chinook Grande Ronde

Smolt production (F_1) and potential outlets of production will be consistent with locations identified by co-managers. The program will transition into a safety net for Upper Grande Ronde population beginning in 2013.

A. Allocation – In 2012, all Grande Ronde Captive brood will be spawned for the egg vs. parr experiment being conducted by that program. Any eggs from this experiment not needed for Grande Ronde Production to meet the 250,000 smolt release goal, will be outplanted into Meadow and/or Sheep Creek. Beginning with brood year 2013, production will be utilized as follows:

1. If production from the conventional program is anticipated to be 150,000 smolts or more in a given year, mature SNAP adults will be outplanted into Meadow and/or Sheep Creek.
2. If less than 150,000 smolt production from the conventional program is anticipated in a given year, all mature SNAP adults will be spawned.
3. Enough eggs will be retained and reared to smolt in order to maintain a total release program of 150,000 (conventional + SNAP). The remaining SNAP eggs will be outplanted into Meadow and/or Sheep Creek.

In 2012, there may be a few maturing male SNAP fish that will be held at LGH and sacrificed after they have fully matured. Beginning in 2103, maturing SNAP adults will be transported to LGH and held in the circular tanks for holding until possible spawning (see A. Allocation above) or if not needed in the production, they will be outplanted into Sheep or Meadow Creek in the first week of August. If the SNAP fish are spawned at LGH, the same spawning protocols as for the Upper Grande Ronde stock will be used.

B. Spawning - See Safety Net/Captive Brood 2012 AOP.

C. Incubation

1. **Safety net/Captive Brood** incubation to eyed stage at Oxbow Hatchery. If needed, eyed eggs will be inventoried, culled as prescribed in disease profiles, and shipped to Lookingglass Hatchery.

D. Key Contact

1. Safety Net/Captive Brood TOT project leader (Hoffnagle, McLean)
2. Oxbow Hatchery manager (Banks)

X. Imnaha - 2010 Brood Year - Spring/Summer Chinook

A. Anticipated smolt release – A total of 471,000 smolts at 22 fpp (current size 28 fpp).

- Acclimated: 334,000
- Direct stream: 137,000

B. Liberations (See Appendix A)

1. **Transfer and Acclimation** – Approximately 471,000 smolts will be transferred to Imnaha Satellite between March 21 and 22 and held for acclimation. Satellite personnel will begin volitional release March 30. Any remaining fish will be forced out on April 13. Release number will be determined by transfer inventory minus mortality.
2. **Direct Stream Release** – Approximately 137,000 smolts will be direct released from 2 raceways (12 and 13) on March 30.

C. Imnaha Satellite Operation

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

D. Monitoring and Evaluation

1. **Imnaha** summary of marked Chinook for release in 2012.
   - 270,500 AdCWT
   - 200,000 Ad only
   - 21,000 PIT
2. **Fish Research** staffs will coordinate efforts with hatchery staff for pre-release sampling efforts (Table 3).
3. **Genetic tissue collection for monitoring and pedigree analysis –** 50 samples
4. **Pre-liberation sampling –** in each raceway
   a. Collect 50 weights
   b. Collect 250 lengths
   c. Check 500 fish for tag retention and fin clip quality
5. **Monitor**
   a. Downstream migration survival and rate
   b. PIT tag survival studies (CSS)
   c. Hatchery vs. Natural production, growth and survival (in collaboration with ODFW Early Life History Project)
6. **Studies**
   a. CSS
   b. Direct Stream Release

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

F. Key Contacts

1. ODFW – LGH staff will notify NPT (B. Johnson, Hesse, Harbeck, Young, Vogel), ODFW (Fagan, D. Eddy, Feldhaus, Hoffnagle), CTUIR (Mclean, Zimmerman), LSRCP office and FPC (Tuomikoski (503-230-4287)) of date and numbers of fish released.

XI. Imnaha – 2011 Brood Year - Spring/Summer Chinook

A. Smolt Production - An estimated 409,000 smolts will be produced at a target size of 25 fpp at release.

1. **Early Rearing** – Fry will be reared in double deep troughs at Lookingglass Hatchery on UV treated Lookingglass Creek water. Fish will be transferred outside to raw creek water in April or May. Tim Hoffnagle, Roger Elmore, and Rick Zollman will work together to provide details of a fish rearing program for the tentative growth modulation study. A draft plan will be submitted to managers for review and comment by May 30th. The plan will be coordinated with ODFW Fish Health and CSS. The final study plan will be appended to the AOP.

2. **Final Rearing -** After marking, fish will be divided into 7 raceways with approximately 59,285 fish per raceway (Appendix F). In July, a therapeutic 28-day Aquamycin 2.25% feed treatment will be administered to control BKD.

B. Monitoring and Evaluation

1. **Fish marking-** All fish will be ad clipped August-September 2012. Approximately 409,000 fish will receive a CWT.
2. **PIT tag**- 21,000 fish will be PIT tagged in October 2012 for CSS (Table 6).
3. **Monitor**
   - **a.** Downstream migration survival and rate
   - **b.** PIT tag survival studies (CSS)
   - **c.** Hatchery vs. Natural production, growth and survival (in collaboration with ODFW Early Life History Project)
4. **Studies**
   - **a.** Acclimated vs. Direct Release
   - **b.** CSS

C. Marking Program –

1. **AdCWT** – 409,000
2. **AD –** 0
3. **Pit tag** – 21,000 CSS

D. Fish Health

1. **Disinfection and Sanitation Guidelines** (Appendix C).
2. **Juvenile health monitoring and treatments** (Appendix E).

E. Key Contacts

1. **Lookingglass** (Elmore)
2. **Fish Health** (Onjukka)
3. **Fish Research** (Feldhaus and Vogel)

XII. Imnaha – 2012 Brood Year - Spring/Summer Chinook

The production goal is 420,000 smolts for the Imnaha River reared in 7 raceways. NEOH the long- term goal will be to produce 490,000 smolts.

A. Smolt goal - 420,000 smolts at 25 fpp for release 2014.

B. Adult Collection

1. **Predicted Runs-** Total estimated return to river is 4,145 adults and 1,859 jacks. The breakdown includes 2,978 hatchery origin and 1,167 natural origin adults. Approximately 56.2% of fish

entering the Imnaha River are expected to be collected at the weir. The collection of adults and jacks is estimated to be: 2,658 hatchery-origin and 718 natural-origin (Table 11).

C. Imnaha Fishery Proposal Summary –The projected return of 4,145 adult (1,167 wild and 2,978 hatchery) Chinook salmon to the Imnaha River in 2012 will exceed the necessary escapement levels for natural spawning, outplanting and broodstock collection. We plan to use 228 adults (68 wild and 160 hatchery) for artificial propagation, allowing surplus hatchery and the remaining wild adults and jacks to spawn in the Imnaha River at a rate of 60% wild to 40% hatchery, and a release of up to 300 hatchery adults and possibly some hatchery jacks into Big Sheep and Lick Creeks. Therefore, recreational and tribal fisheries are recommended (Appendix N).

Proposed Recreational Fishery:

1. **Season** – May 19 through July 15, may extend if wild fish impact allows
   - **Bag Limit:** Two adipose clipped adult Chinook per day, bonus bag of 5 jack salmon per day (consistent with Oregon salmon bag limits). Bag limits may be increased accordingly to meet harvest goals.
   - **Open area**: Imnaha River from mouth upstream to Summit Creek Bridge

   Expected and Maximum Harvest
   - Maximum hatchery fish harvest rate: 25.7% of expected return, 994 fish.
   - Maximum incidental wild mortality of 30 fish (3.0%)
   - Additional harvest of Ad clipped (786) and natural-origin (237) Chinook is expected in treaty fisheries.
2. **Monitoring:**
   - ODFW will estimate harvest with a statistical creel survey.

D. Trap Operations

1. **Period of Trap Operation** – The trap will be installed as soon as river conditions allow and operated until September 11, or until the last scheduled spawning ground survey.
2. **Facility Staffing and Operations**
   - **a.** ODFW will provide two staff people stationed at the Imnaha satellite facility Monday-Thursday and one Friday-Sunday, 24/7.
   - **b.** The NPT will provide two technicians Monday through Friday and a transportation vehicle to recycle fish for harvest.
   - **c.** LSRCP will fund two 3 month seasonal technicians, one for ODFW and one for NPT, to assist with weir and facility operations and culture activities at Lookingglass Hatchery. LSRCP will also provide funding to cover increased costs associated with fish transport to Lookingglass and Wallowa hatcheries.
   - **d.** ODFW staff will determine which fish are selected for broodstock, passed above the weir, recycled to the fishery, transported to Wallowa Hatchery for CWT recovery, provided for subsistence or foodbank use, and outplanted.
   - **e.** ODFW will collect all the relevant data from fish worked at the Imnaha weir, and provide this information daily (upon request) and in weekly summaries of trap operations.
   - **f.** Prior to 2012 Chinook trapping operations commencing at the Imnaha weir, ODFW and NPT staff will hold a preseason meeting at the facility and walk through logistics, fish handling, holding, pass:keep, recycling, transportation, communication operations, etc.
3. **General Guidelines**
   - **a.** Trapping facilities will be checked daily and fish removed and worked up Monday-Friday.
   - **b.** Broodstock collection will occur on Monday and Thursday of each week. If there is a deficit in brood numbers collected one week that number will be added to the broodstock collection target for the following week.

c. Tuesday, Wednesday, and Friday and fish collected above broodstock needs on Monday and Thursday will be passed, recycled for harvest (1 LOP), transported to Wallowa Hatchery for CWT recovery, distributed for subsistence or food bank use, or outplanted

d. If 200 or more fish are in the trap on Friday, the trap will be worked on Saturday. Likewise, if 200 or more fish are in the trap on Saturday, the trap will be worked on Sunday. Distribution of fish trapped on the weekend will be as for Tuesday, Wednesday, and Friday.

4. **Weir Management Guidelines –** at 1,167 natural origin Chinook escapement, the sliding scale guidelines are that 40% of the fish released above the weir can be of hatchery origin and 40% of the broodstock should be natural origin. Natural jacks will be released above the weir and hatchery jacks maybe released above the weir to meet a jack composite of 10% of the total males. Typically, natural jacks exceed 10% of the males.
5. **Disposition of Trapped Fish**
   - **a. Bull Trout -** Enumerate and estimate length (minimize handling). Data and reports sent to ODFW (ODFW District and Regional offices), and LSRCP (Krakker).
   - **b. Steelhead** - Enumerate, estimate length and determine hatchery or wild origin. Ad clipped fish will be euthanatized. Data and reports sent to ODFW (ODFW District and Regional offices), and LSRCP (Krakker). Wild fish collected in the trap will be released upstream and wild kelts downstream of the weir.
   - **c. Chinook Adults and jacks** – Only fish retained for broodstock will be injected, intra-peritoneally (IP), with erythromycin and oxytetracycline (Appendices J, K, and L). Surplus hatchery jacks and adults are expected. Priority of use for hatchery origin surplus fish includes:
     - Adults and jacks recycled (early in season) for a fishery and released downstream at co-manager agreed to locations on agreed to dates. All recycled fish will receive a 1 LOP.
     - Adults and jacks can be used for Tribal and non-tribal distribution/foodbank. These fish may be transported to, and held at, Wallowa Hatchery. If fish are exposed to MS-222, a 21-day period is required before they are used for consumption. Fish held for distribution will be sampled according to Appendix I.
     - All CWT jacks will be taken to Wallowa Fish Hatchery for M&E and subsequently tribal or non-tribal distribution.
     - 300 adults can be outplanted (later in season) to Big Sheep and Lick Creek tributaries combined;
     - Carcasses can be placed in Imnaha River and other out-planted sites; and
     - Surplus live jacks can be released in Big Sheep after the last redd count survey.
   - **d. Tumors -** Chinook will be inspected for tumors along the gum line. If a tumor is suspected, fish with will be held for consultation.
   - **e. Disposition of Carcasses -** Trapping mortalities will be processed as kept fish. The first 20 weir mortalities will be labeled, frozen, and provided to Fish Health for examination. Following Fish Health examination, carcasses will be disposed of in the landfill.
   - **f. Additional mortalities** collected on the weir through mid-August (prior to redd surveys) will be sampled by the Imnaha staff (length, sex, pre-spawn status, scales (natural fish), recapture (opercle punch), and origin). After mid-August, the redd survey crews will collect weir mortality data. Carcasses should be clearly identified as sampled (tails removed) and returned to the river below the weir. Biological data will be sent to ODFW Fish Research (Feldhaus).
6. **Broodstock Transportation Procedures –** ODFW will provide transportation of fish from the Imnaha weir to Lookingglass Hatchery. Broodstock will be hauled on Monday and Thursday.

Note: CTUIR does not agree with the current spring Chinook disposition plans at the Imnaha and Lostine River weirs.

E. Hatchery Broodstock Collection Guidelines

1. **Broodstock Needs**

a. Egg take- Need 512,200 green eggs at 95% survival of females, 82% survival from green egg to smolt, and estimated five-year fecundity average of 4,482 (4 year average of 4,703).

b. Adult Collection - Based on adult survival of 95%:

Males – 114 (spawn 108)

- 46 natural (spawn 43)
- 68 hatchery (spawn 65 adults or jack equivalent; 6 jacks equals one male)

Females – 114 (spawn 108)

- 46 natural (spawn 43)
- 68 hatchery (spawn 65)

2. **Brood collections guidelines**: The current projection for adult spring/summer Chinook returns to Imnaha River is 4,145 adults (2,978 Ad clipped and 1,167 unmarked). However, it is expected that only 65% of the run will be handled at the weir after harvest (800 Ad-clipped and 445 unmarked). Fish collected and released above the weir will be managed at 40% hatchery and 60% wild origin ratio (pass 3 wild:2 hatchery).

Estimated Totals:	**Estimate 65%**			**Release**
Escapement to mouth	**handled**	**Broodstock**	**OP**	**above the weir**
2,978 - Hatchery	800	136	300	235
1,167 - Wild	445	92	0	353

Estimate 1,000+ surplus hatchery adults (plus jacks) without harvest.

Collection guidelines for Imnaha spring Chinook in 2012.

	June 1-22	June 23–30	July 1-8	July 9-16	July 17-23
HOB-136	5	18	28	28	19
NOB-92	4	11	26	22	11

July24-31	Aug 1 - 8	Aug 9 - 16	Aug 17 – 23	Aug 24 - Sep	Sept 1 - 15
15	12	2	2	5	2
9	4	3	0	2	0

*Pass 2 hatchery adults per 3 wild adults above the weir

*Release all wild jacks

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

The intent is to collect broodstock in pairs or female and jack-male equivalent. Jacks and adults can be transferred to Wallowa Hatchery for M&E recovery of CWTs.

F. Spawning Guidelines

1. **Anesthetic Used** – MS222.
2. **Expected First Spawn** - Tuesday, August 14th.
3. **Spawning Frequency** – Once per week or as needed.
4. **Spawning Strategies** - All surviving broodstock collected will be spawned and eggs incubated at Lookingglass Hatchery. Sorting and spawning to take place the same day. Hatchery and co-manager staffs will determine fertilization matrices. A maximum of 10% of the eggs can be fertilized with three year old males and a minimum of 30% of the eggs will be spawned with assumed five year old males (>85cm). Large males may be spawned up to 3 times. Jack spawning will be conducted with 1 female to 6 jack matrix. Most adult spawning matrices will be

2 females x 2 males, but matrices of 1 x 1, 1 x 2, 2 x 1, or 3 x 2 can be used if necessary. Fecundity will be determined at eye-up.

5. **Natural Origin Surplus** – Natural origin fish collected but not spawned for broodstock will be returned to the Imnaha River.
6. **Adult Spawning -** The Nez Perce Tribe will provide fish culture support for spawning of the Imnaha River adults.

G. Incubation

1. **Imnaha eggs** will be incubated 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 and un-chilled well water and UV treated Lookingglass Creek. Possible use of Moist Air Incubators for BY12.
3. **Egg Picking and Fish Culture for Resulting Juveniles** – The Nez Perce Tribe will provide fish culture support for the resulting progeny of the Imnaha River program starting with egg care through the release.

H. Fish Health Monitoring plans

1. **Disinfection and Sanitation Guidelines** (Appendix C).
2. **Broodstock Monitoring and Treatment Plan** (Appendices J, K, L)

I. Monitoring and Evaluation

1. Spawning ground surveys
   - **a.** Carcasses – count, length, marks/tags, snout/scales, kidney sample, genetic sample
   - **b.** Live Fish – count
   - **c.** Redds – count, GPS
2. Hatchery spawning
   - **a.** Data collection – length (all fish), weight (females), marks/tags, eyed egg weights, individual fecundity
   - **b.** Tissue collection – snout/scales, kidney sample, genetic sample
3. Weir/trap morts
   - **a.** Data collection – count, length, marks/tags
   - **b.** Tissue collection – snout/scales, kidney sample, genetic sample
4. Monitor
   - **a.** Hatchery vs. Natural production, growth and survival (in collaboration with ODFW Early Life History Project)
   - **b.** PIT tag detections at dams and weir for run timing
5. Studies
   - **a.** CSS
   - **b.** Direct Release
   - **c.** Growth Modulation

J. Key Contacts

1. **Lookingglass** (Elmore, Deal) monthly reports to ODFW (Grande Ronde & Wallowa Fish Districts, Fagan, Hoffnagle, and Feldhaus), CTUIR (Zimmerman and McLean), NPT (B. Johnson, Hesse, Young, Harbeck, Zollman), LSRCP office.
2. **Fish Health** (Onjukka) monthly reports to ODFW (Grande Ronde & Wallowa Fish Districts, Fagan, and Research), CTUIR (Zimmerman and McLean), NPT (B. Johnson, Hesse, Harbeck, Young).
3. **Fish Research** (Feldhaus) monthly trap reports to ODFW (Grande Ronde & Wallowa Fish Districts, Fagan, and Hoffnagle), CTUIR (Boe, James, McLean), NPT (B. Johnson, Hesse, Vogel, Zollman).

XIII. Snake River – 2011 Brood Year - Fall Chinook

The production goal is 1.4 million sub-yearling smolts for the lower Grande Ronde and upper Snake rivers. This goal includes 1 million to the upper Snake (800,000 reared at Irrigon Hatchery) and 400,000 for the lower Grande Ronde River.

A. Allocation – Fall Chinook production at Irrigon hatchery is prioritized in the US v Oregon tables. Priorities 13 and 16 target a total production of 400,000 sub-yearlings scheduled for release in the Grande Ronde River around May 24 at 50 fpp. Marks include:

- 200,000 AdCWT
- 200,000 no marks

Priorities 15 and 17 target a total production of 1 million sub-yearlings, 800,000 reared at Irrigon Hatchery, scheduled for release in the Snake River at Hells Canyon Dam on May 24th and 26th at 50 fpp. Marks include:

- 200,000 AdCWT
- 600,000 Ad only

B. Adult collections and Spawning - See Lyons Ferry 2012 AOP.

C. Incubation/rearing

1. Fall Chinook incubation occurs at Lyons Ferry. After eye-up, inventory, and disease profiles, Lyons Ferry staff will combine eggs and ship to Irrigon Hatchery in December. Only eggs from females below BKD titers levels 0.2 are transferred.
2. Fish are reared and tagged at Irrigon Hatchery prior to release.
3. In late May or early June, ODFW will direct stream release 400,000 subyearlings at 50 fpp into the Grande Ronde River at Cougar Creek near the Washington border.
4. In late May, ODFW will direct release 800,000 at the Forest Service boat launch below Hells Canyon Dam at a release goal of 50 fpp.

D. Key Contact

1. **Lyons Ferry Hatchery** (Schuck, Mendel)
2. **ODFW** (Fagan, Garst)
3. **CTUIR** (Zimmerman, Johnson)

XIV. Snake River – 2012 Brood Year - Fall Chinook

The production goal is 1.4 million sub-yearling smolts for the lower Grande Ronde and upper Snake rivers. This goal includes 1 million to the upper Snake (800,000 reared at Irrigon Hatchery) and 400,000 for the lower Grande Ronde River.

A. Allocation – Fall Chinook production at Irrigon hatchery is prioritized in the US v Oregon tables. Priorities 13 and 16 target a total production of 400,000 sub-yearlings scheduled for release in the Grande Ronde River around May 24 at 50fpp. Marks include:

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- 600,000 Ad only

B. Adult collections and Spawning - See Lyons Ferry 2011 AOP.

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1. **Fall Chinook** incubation occurs at Lyons Ferry. After eye-up, inventory, and disease profiles, Lyons Ferry staff will combine eggs and ship to Irrigon Hatchery in December. Only eggs from females below BKD titers levels 0.2 are transferred.

D. Key Contact

1. **Lyons Ferry Hatchery** (Schuck, Mendel)
2. **ODFW** (Fagan, Garst)
3. **CTUIR** (Zimmerman, Johnson)

XV. Pacific Lamprey

The purpose of this stop gap effort by NPT Fisheries is to avoid local extirpation in the Snake River Basin and maintain a population of ammocoetes that serve as a source of pheromone attractants drawing adults upstream to spawn in the abundant habitat in this region, thereby continuing a presence in the Snake River Basin until upstream adult and downstream juvenile passage problems are identified and corrected, and healthy, harvestable populations are restored. The Nez Perce Tribe believes it is imperative to restore this important component of the ecosystem and retain cultural values.

NPT Program Nez Perce Tribal Hatchery - On December 7, 2011 NPT Fisheries staff collected 138 adult Pacific lamprey from the Yakama Indian Nation (YIN) Fisheries Hatchery site near Prosser, Washington, for transport back to the holding tanks at NPTH. These fish were actively trapped by YIN staff earlier in 2011 at the Bonneville, The Dalles, and John Day dams on the mainstem Columbia River during the summer lamprey runs. December 8, 2011 another 121 fish were transported from the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) holding site near Pendleton, Oregon to NPTH. These fish had been trapped by CTUIR Fisheries staff from mainstem Columbia River dams. All 259 lamprey were previously injected with oxytetracycline by CTUIR and YIN staff as a prophylaxis against furunculosis, and are held over the winter months. NPT plans to outplant these adults during May 2012 in Lolo, Orofino, and Newsome creeks in Idaho and Asotin Creek in Washington to spawn naturally. Due to the greater quantity of lamprey available this year, additional outplants are under consideration, including Big Canyon and South Fork Salmon in Idaho, and Wallowa/Imnaha in Oregon. Prior to release a subset of these fish may be tagged for telemetric tracking (in collaboration with USFWS). Genetic samples are collected by NPT staff for later analysis.

Fish Health – Fish Health recommends an examination (up to 5 grab-sampled) be conducted prior to lamprey being transferred to Oregon waters. At a minimum, all mortality should be examined during rearing to develop a pathogen history. If unable to lethally sample due to tribal policy, then develop a pathogen history as best as possible with mortalities.

Table 1 (02-16-12)
2012 Irrigon Summer Steelhead Transport Schedule
(11 brood)

Date	Stock	From Ponds	To	Number	Est. Pounds
Feb. 21-22	5611	7~,8,9*,10*,11*	Wallowa Lower Acc	193,000	42,900
Feb. 23-24	5611	7~,12*,13*,14*,26	Wallowa Upper Acc	193,000	42,900
Feb. 27	5611	19,23*	Big Cany. Lower Acc	85,000	18,955
Feb. 27-28	5611	18,20	Big Cany. Upper Acc	85,000	18,796
Feb. 29-Mar.1	2911	27,28,29*,30	Little Sheep Acc	173,000	34,660
Mar.2	2911	31	Little Sheep Acc (Big Sheep)	44,000	8,806
Apr. 10-11	5611	15*,16,17*	Wallowa Lower Acc	125,000	27,796
Apr. 17	5611	21,25*	Big Cany. Lower Acc	83,000	18,396
Apr. 17-18	5611	22,24	Big Cany. Upper Acc	85,000	18,923
				1,066,000	232,132

~ Denotes partial pond
*** Denotes CWT pond**

Table 2. Juvenile spring Chinook salmon and summer steelhead sampling schedule at LSRCP facilities, 2012. PS = Periodic sampling which includes length and weight. RS = Release sampling which includes length and weight by fin clip. CWT = retention sampling for CWT and associated fin clips. GS = Genetic monitoring using 50 fish samples. TBD = To Be Determined.

Sample Date	Stock	Location	Pond	Marks	Purpose
Spring Chinook					
Feb. 7-11	Catherine (10)	Lookingglass	1-3, C19		CWT, RS, GS
Feb. 7-11	Catherine (10)	Lookingglass	AHP A,B,C,D		CWT, RS, GS
Feb. 7-11	U. Grande Ronde (10)	Lookingglass	4-7		CWT, RS, GS
Feb. 7-11	Lostine (10)	Lookingglass	8-11		CWT, RS, GS
Feb. 7-11	Imnaha (10)	Lookingglass	12-18		CWT, RS, GS
June 4-5	All (10)	Lookingglass	1-18		PS
Summer Steelhead (brood 11)					
November 2011	Wallowa Fall Brood	Irrigon	9, 11, 13, 15		CWT
December 2011	Wallowa	Irrigon	10, 12, 14, 17, 23, 25		CWT
December 2011	Imnaha	Irrigon	29		CWT
March 27	Imnaha	Little Sheep	AP		RS, GS
April 06	Wallowa	Wallowa	LAP, UAP		RS
April 13	Wallowa	Big Canyon	LAP, UAP		RS, GS
April 20	Wallowa	Wallowa	LAP		RS, GS
April 23	Wallowa	Big Canyon	LAP, UAP		RS
April 24	Imnaha	Little Sheep	AP		sex ratio
May 07	Wallowa	Big Canyon	AP		sex ratio
Summer Steelhead (brood 12)					
November 2012	Wallowa	Irrigon	TBD		CWT
December 2012	Wallowa	Irrigon	TBD		CWT
December 2012	Imnaha	Irrigon	TBD		CWT

Table 3. Summer Steelhead run projections to LSRCP Facilities in 2012.

2012 PROJECTED Returns to Wallowa Hatchery

MARKED FISH

	Age	Males	Females	Total	95% C.I.
Marked	1:1	1,127	685	1,1812	
Marked	1:2	256	653	909	
Marked	2:1	9	8	17	
Marked	2:2	2	4	6	
Total		**1,394**	**1,350**	**2,744**	1,407-4,081

2012 PROJECTED Returns to Big Canyon Facility

MARKED AND UNMARKED FISH

	Age	Males	Females	Total	95% C.I.
Marked	1:1	659	577	1,236	
Marked	1:2	169	532	701	
Marked	2:1	4	5	9	
Marked	1:3	2	3	5	
Subtotal		**834**	**1,117**	**1,951**	702-2,806
Unmarked	2:1	12	14	26	
Unmarked	2:2	8	16	24	
Unmarked	3:1	15	11	26	
Unmarked	3:2 & 4:1	5	10	15	
Subtotal		**40**	**51**	**91**	38-144
Total		**874**	**1,168**	**2,042**	

2012 PROJECTED Returns to L. Sheep Cr. Facility

MARKED AND UNMARKED FISH

	Age	Males	Females	Total	95% C.I.
Marked	1:1	739	624	1,363	
Marked	1:2	96	365	461	
Marked	2:1	7	7	14	
Marked	3:1	0	3	3	
Subtotal		**842**	**999**	**1,841**	639-3,034
Unmarked	2:1	42	55	97	
Unmarked	2:2	10	33	43	
Unmarked	3:1	21	19	40	
Unmarked	3:2 & 4:1	4	10	14	
Subtotal		**77**	**117**	**194**	95-285
Total		**919**	**1,116**	**2,035**	

Table 4. Estimated numbers of tagged fish to be released in 2013, from 2012 brood summer steelhead and 2011 brood spring Chinook salmon.

Species, Stock	Raceway	Number Marked	Type of Mark	Marking Period	Marking Location
Summer Steelhead 2012 Brood Year (Ad clipped in September)					
Little Sheep		25,000	Ad-LV+CWT	November	Irrigon
Wallowa		100,000	Ad-LV+CWT	November	Irrigon
Wallowa		100,000	Ad-RV+CWT	November	Irrigon
Big Canyon		50,000	Ad-LV+CWT	November	Irrigon
Spring Chinook Salmon 2011 Brood Year					
Imnaha River		270,500	Ad+CWT	August	Lookingglass
Imnaha River		200,000	Ad only	August	Lookingglass
Catherine		101,100	Ad+CWT	August	Lookingglass
Catherine		50,500	Ad only	August	Lookingglass
Lostine		137,500	Ad+CWT	August	Lookingglass
Lostine		137,500	Ad only	August	Lookingglass
U. Grande Ronde		140,000	Ad+CWT	August	Lookingglass
U. Grande Ronde		140,000	CWT only	August	Lookingglass
Lookingglass		122,500	Ad+CWT	August	Irrigon
Lookingglass		122,500	Ad only	August	Irrigon

Table 5. PIT-tagging schedule for 2012 brood summer steelhead at Irrigon Hatchery scheduled for December 2012. Raceways need to be off feed 2 days prior to PIT-tagging to reduce tag loss. Comparative Survival Study (CSS) will provide 141,000 tags to supplement the LSRCP tagging and achieve a 70% LSRCP and 30% CSS split. The tagging trailer, modified for PIT tagging, will be used and it should take 7 or 8 days to complete. The trailer will be set-up Monday and tagging will begin Tuesday. A long-handled magnet will be used in raceways to recover shed tags. WAP indicates Wallowa Acclimation Ponds at Wallowa Hatchery, BC is Big Canyon Facility.

Stock, group	Raceway	LSRCP tags	CSS tags	Total tags[A]
Wallowa stock				
WAP, forced April	10, 12, 14	4,500	2,100	6,600
WAP, volitional May	17	1,400	700	2,100
WAP, early brood April	9, 11	1,800	800	2,600
WAP, early brood April	13	900	300	1,200
WAP, early brood, volitional May	15	900	300	1,200
BC, forced April	23	3,000	1,400	4,400
BC, forced May	25	3,000	1,400	4,400
Subtotal		15,500	7,000	22,500
Imnaha stock				
Little Sheep, volitional April	27, 29	12,000	5,600	16,400
Big Sheep, volitional April	31	3,000	1,400	5,600
Subtotal		15,000	7,000	22,000
Grand total		30,500	14,000	44,500

[A] PIT-tag a random sample by crowding each raceway to obtain target number. When tagging, note whether the fish is Ad, AdLV, or AdRV.

Table 6. Fish PIT-tagging numbers for spring Chinook salmon at Lookingglass Fish Hatchery, October 2012 (BY 2011). 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	46,000	7,000
Catherine Conventional	2	46,000	7,000
Catherine Conventional	3	46,000	7,000
Lookingglass Creek	AHP A	62,500	750
Lookingglass Creek	AHP B	62,500	750
Lookingglass Creek	AHP C	62,500	750
Lookingglass Creek	AHP D	62,500	750
U. Grande Ronde Conventional	4	62,500	500
U. Grande Ronde Conventional	5	62,500	500
U. Grande Ronde Conventional	6	62,500	500
U. Grande Ronde Conventional	7	62,500	500
Lostine Conventional	8	68,000	1,500
Lostine Conventional	9	68,000	1,500
Lostine Conventional	10	68,000	1,500
Lostine Conventional	11	68,000	1,500
Imnaha	12	58,429	3,000
Imnaha	13	58,429	3,000
Imnaha	14	58,429	3,000
Imnaha	15	58,429	3,000
Imnaha	16	58,429	3,000
Imnaha	17	58,429	3,000
Imnaha	18	58,429	3,000
Grand Total		**1,319,003**	**53,000**

Table 7. ODFW Projected spring Chinook salmon returns to Catherine Creek in 2012.

Origin	Estimated Total Return to the River	Confidence Interval (+/-)	Estimated % Trapped at the Weir	Estimated Trapped at the Weir
Hatchery age 3	374	93	0.9	336
Hatchery age 4	1,372	48	0.9	1235
Hatchery age 5	32	14	0.9	29
Total Hatchery Return	**1,778**			**1,600**
Total Hatchery Adults	**1,404**			**1,264**
Natural age 3	121	15	0.9	109
Natural age 4	1,013	60	0.9	102
Natural age 5	121	43	0.9	109
Total Natural Return	**1,255**			**320**
Total Natural Adults	**1,134**			**211**

Table 8. ODFW Projected spring Chinook salmon returns to the Upper Grande Ronde River in 2012.

Origin	Estimated Total Return to the River	Confidence Interval (+/-)	Estimated % Trapped at the Weir	Estimated Trapped at the Weir
Hatchery age 3	619	69	0.7	433
Hatchery adults	**876**	115	0.5	**438**
Total hatchery return	**1,495**			**871**
Natural age 3	32	4	0.7	22
Natural adults	**66**	26	0.5	**33**
Total natural return	**98**			**55**

Table 9. ODFW and NPT projected spring Chinook salmon returns to the Lostine River in 2012. The regression model utilized ocean rank and is influenced by guessing at the 2011 ocean rank.

Origin	Estimated Total Return to the River	Confidence Interval (+/-)	Estimated % Trapped at the Weir	Estimated Trapped at the Weir
Hatchery age 3	400	260	0.9	360
Hatchery adults	**3,820**	178	0.9	**3,438**
Total hatchery return	**4,220**			**3,798**
Natural age 3	291	19	0.9	262
Natural adults	**1,155**	71	0.9	**1,040**
Total natural return	**1,446**			**1,302**

Table 10. ODFW Projected spring Chinook salmon returns to Lookingglass Fish Hatchery in 2012 using the Catherine Creek regression models.

Origin	Estimated Total Return to the River	Confidence Interval (+/-)	Estimated % Trapped at the Weir	Estimated Trapped at the Weir
Hatchery age 3	290	67	0.9	261
Hatchery adults	**1,335**	68	0.9	**1,202**
Total hatchery return	**1,625**			**1,463**
Natural age 3	60	10	0.9	54
Total natural adults	**395**	80	0.9	**355**
Total natural return	**455**			**409**

Table 11. ODFW Projected spring Chinook salmon returns to the Imnaha River in 2012.

Origin	Estimated Total Return to the River	Confidence Interval (+/-)	Estimated % Trapped at the Weir	Estimated Trapped at the Weir
Hatchery age 3	1,668	295	0.70	1,168
Hatchery age 4	2,667	193	0.50	1,334
Hatchery age 5	311	83	0.50	156
Total Hatchery Return	**4,646**			**2,658**
Total Hatchery Adults	**2,978**			**1,490**
Natural age 3	191	24	0.70	134
Natural age 4	743	116	0.50	372
Natural age 5	424	70	0.50	212
Total Natural Return	**1,358**			**718**
Total Natural Adults	**1,167**			**584**

Appendices

APPENDIX A. PROPOSED JUVENILE SALMONID RELEASES IN THE GRANDE RONDE (GR) AND IMNAHA (IM) BASINS IN 2012

Basin	Species	Stock	Hatchery	Number [(/1)]	Lbs	fpp	Location	In Facility	In River	Pond # [(/2)]	Release Method [(/3)]	Marks
GR	STS	5611	IR	193,000	42,900	4.5	Wallowa Lower Acc	Feb 21-22	Apr 7,8	7, 8,9*,10*,11*	Forced	55K AdRV; 75K AdRVCWT; 75K AdLVCWT; 181K Ad
GR	STS	5611	IR	193,000	42,900	4.5	Wallowa Upper Acc	Feb 23-24	Apr 8,9	7,12,*13*,14*,26	Forced	
GR	STS	5611	IR	85,000	18,900	4.5	Big Canyon Lower	Feb 27-28	Apr 14-15	19,23*	Forced	25K AdLVCWT; 60K Ad
GR	STS	5611	IR	85,000	18,800	4.5	Big Canyon Upper	Feb 28-29	Apr 15-16	18,20	Forced	85K Ad
IM	STS	2911	IR	173,000	34,700	5.0	Little Sheep Acc	Feb 29-Mar 2	Mar 27-Apr 2	27,28,29*,30	Volitional	25K AdLVCWT; 148K Ad
IM	STS	2911	IR	44,000	8,800	5.0	Little Sheep Acc	Feb 29-Mar 2	Mar 27-Apr 2	31	Volitional	44K Ad
GR	STS	5611	IR	125,000	27,800	4.5	Wallowa Lower Acc	April 10-11	Apr 21-May 3	15*,16,17*	Volitional	19K AdRV; 25K AdRVCWT; 25AdLVCWT; 56K Ad only
GR	STS	5611	IR	83,000	18,400	4.5	Big Canyon Lower Acc	Apr 17-18	Apr 24-May 7	21,25*	Volitional	25K AdLVCWT; 58K Ad
GR	STS	5611	IR	85,000	18,900	4.5	Big Canyon Upper Acc	Apr 18	Apr 25-May 7	22,24	Volitional	85K Ad
				1,066,000	232,100	4.6						
GR	CHS	8010	LG	71,280	2,742	26.0	Grande Ronde Acc	Mar. 19	Mar 21-Apr 2	4	Volitional	71K AdCWT
GR	CHS	8010	LG	76,480	3,059	25.0	Grande Ronde Acc	Mar. 19	Mar 21-Apr 2	7	Volitional	76K CWT
GR	CHS	8010	LG	74,825	2,993	25.0	Grande Ronde Acc	Apr. 4	Apr. 6-16	5	Volitional	74K AdCWT
GR	CHS	8010	LG	72,310	3,013	24.0	Grande Ronde Acc	Apr. 4	Apr. 6-16	6	Volitional	72K CWT
GR	CHS	20010	LG	72,340	3,286	22.0	Lostine Acc	Mar. 12	Mar. 22	8	Volitional	72K AdCWT
GR	CHS	20010	LG	62,509	2,403	26.0	Lostine Acc	Mar. 12	Mar. 22	10	Volitional	62K Ad
GR	CHS	20010	LG	71,144	2,844	25.0	Lostine Acc	Apr. 3	Apr. 13	9	Volitional	71K AdCWT
GR	CHS	20010	LG	62,087	2,386	26.0	Lostine Acc	Apr. 3	Apr. 13	11	Volitional	62K Ad
GR	CHS	20110	LG	54,180	2,258	24.0	Catherine Creek Acc	Mar. 20	Mar. 22	1	Volitional	54K AdCWT
GR	CHS	20110	LG	52,775	2,201	24.0	Catherine Cr Acc	Mar 20	Mar. 22	2	Volitional	52K AdCWT
GR	CHS	20110	LG	55,500	2,144	26.0	Catherine Cr Acc	Mar. 20	Mar. 22	3	Volitional	55 K Ad
GR	CHS	8110	LG	228,650	8,645	27.0	Lookingglass Creek	NA	Apr. 2-13	A,B,C,D	Volitional	122K AdCWT; 106K Ad only
IM	CHS	2910	LG	471,000	20,139	23.0	Imnaha Acc	March 21-22	Mar.30-Apr 13	12-18	Volitional	270.5K AdCWT; 200K Ad only
				1,425,370	58,113							

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

(/2) * Indicates CWT groups, Brood evaluation groups include: AdLVCWT (12,13,14,16) or AdRVCWT (7,8,9,10,11)

(/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	BY	Sp.	Stock	Examination Category	Protocol	Comment
Irrigon Hatchery	2011 & 2012	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 CWD with Florfenicol under a Veterinary Feed Directive (VFD). Recommend trying new starter feed BIOPRO that mayhelp with CWD management.
Irrigon Hatchery	2011	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	2011	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	Need to rear and test 60 Rb brought in as eyed eggs on spring water. In addition, legal rainbow will be sampled for Mc before release.	Must be on water supply for 6 months
Wallowa & Little Sheep	2012	StS	56 & 29	Adult Spawners	Minimum of 60 per stock for culturable viruses (up to 30 from returning early brood) using ovarian fluid and caeca/kidney/spleen sample pools not to exceed 5 fish per pool. . Sub-sample LI adults for Mc if used for nutrient enrich.	A weekly sample (N=24) of ovarian or milt fluid may be sampled.
Wallowa & Little Sheep	2012	StS	56 & 29	Adult Mortality	-kidney smears on TYE-S agar -A minimum of 20 or all mortality less than 20 will be examined	
Lookingglass Creek	2012	StS or Sp		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): Disinfection and Sanitation Guidelines for all LSRCP Hatcheries

Goal: To bring everyone 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 Health Services Laboratory, formerly called 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 intake 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 Synospsis 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.

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
Hatchery Crew	Do not go from adult handling operations to juvenile operations activities unless all bib gear is thoroughly disinfected.	-As per attached iodophor protocol -it would be preferable to have bib gear designated for either adult or juvenile use.
Hatchery Crew	Pick mortality on a daily basis	-This is consistent with ODFW's statewide Fish Hatchery and Fish Health Management Policy.
All	Disinfect equipment when moving from raceway to raceway or tank to tank for any fish handling or pond cleaning activities	-As 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 & Fish Health 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 -store snouts only in adult mortality freezer -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
Safety Net 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_2O 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	Minimum 15 minutes	This is the statewide general practice
	Egg transfers - disinfection at receiving station	100 ppm	10 minutes	
Virkon Aquatic	Footbaths, nets, boots & gear			As per label
Chlorine or Aqueous solution as sodium hypochlorite (Household Bleach)	Lib truck tanks Raceway disinfection	10 ppm 100 ppm	10 min.	Organic matter binds and neutralizes Left to dry and breakdown in sun. Need to assure that no bleach goes to effluent.

***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. Imnaha/Little Sheep steelhead program draft guidelines

Steelhead smolts production will range from 215,000 to 330,000 smolts to provide a return of 2,000 adults to/above Ice Harbor Dam for harvest, broodstock, and natural escapement.
Escapement goals:

- Big Sheep - 500 adults
- Little Sheep - 250 adults

The base production program consists:

- Little Sheep - 165,000 Ad clipped smolts, 25,000 LVCWT and 9,300 PIT
- Big Sheep - 50,000 Ad clipped smolts, 3,500 PIT

Sliding scale production levels:

- Increase production to meet adult return goal up to 330,000 smolts
- If broodstock and escapement goals are not attained at full production (330,000 smolts), unclipped smolts can be released

Weir Management guidelines
Big Sheep- Big Sheep escapement would be estimated from PIT tagged adults crossing Lower Granite Dam. Goal is 500 fish escapement
Little Sheep-Goal of 250 fish escapement

- < 100 natural adults, no management of the proportion of hatchery/natural fraction (PNI) to meet 250 fish natural escapement.
- 101-150 natural adults, mange the PNI between 36-48% natural fish escapement.
- 151-200 natural adults, mange the PNI between 48-60% natural fish escapement. Total release up to 250.
- 201-250 natural adults, mange the PNI at 60-72% or less hatchery to wild. Total release up to 250
- > 251 natural adults, manage the PNI at >72% wild adults, no limit of wild fish above the weir.

Broodstock Management guidelines
Approximately 126-137 adults are required to produce the base program of 215,000 smolts. The guideline for the proportion of natural fish in the broodstock is as follows:

- At less than or equal to 100 natural returns, use 10% of natural run for broodstock
- At greater than 100 natural returns, use 10 natural fish plus 40% of the natural run greater than 100 for broodstock (examples below).
    - Examples:
        - 100 wild - 10 natural adults for broodstock
        - 150 wild - 30 natural adults
        - 200 wild – 50 natural adults
        - 250 wild - 70 naturals adults
        - 300 wild – 90 naturals adults

Surplus Adults: Adult returns to Little Sheep can be transferred to Big Sheep to meet escapement goal, given to the Tribes for C/S, used for nutrient enhancement, given to local food banks, or placed in the landfill.

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

Location	Brood year	Stock	Examination Category	Protocol	Comment/Disease Treatment
Lookingglass Hatchery	2011	200 201 80 29 81	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).	One Aquamycin feeding will be implemented for all fish in July. 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, PIT tagging, VIE tagging, coded wire tagging and after transfer back from IFH for 8110 fish for two consecutive days. Formalin is used under a local veterinarian prescription. Coldwater disease – Treat with florfenicol under a Veterinary Feed Directive (VFD).
Irrigon Hatchery	2011	81	Monthly Pre-transfer	-10 mort/moribund and wet mounts for parasites as per Lookingglass Hatchery -Monthly plus 30 grab-sampled for BKD ELISA and culturable viruses	-One Aquamycin medicated feeding at Irrigon Hatchery in June.
Lookingglass Hatchery	2010	200 201 80W 81 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 on water supply for 6 months (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	2010		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 F. Production plan for 2012 at Lookingglass Hatchery

Group	Strategy Treatment	BKD	Fry/Eggs (Nov. 30 2011)	Initial Ponding (fry)	Initial Raceway#			Smolts marked	Final Pond #	Smolt Numbers	Mark	Release Site
Catherine Creek	Conventional	Low	137,200	45,733	1		From rcy 1 into 1	45,733	1	45,733	AdCWT	CC
Catherine Creek				45,733	2		From rcy 2 into 2	45,733	2	45,733	AdCWT	CC
Catherine Creek				45,733	3		From rcy 3 into 3	45,733	3	45,733	Ad	CC
								137,199				
Lookingglass	Conventional	Low	286,175	286,175	Irrigon		From Irrigon to Adult A,B,C,D, raceways	286,175	Adult A,B,C,D	143,087 143,087	AdCWT Ad	Look
								286,175				
U. Grande Ronde	Conventional	Low	138,193	69,096	4		From rcy 4 into 4	69,096	4	69,096	CWT	UGR
U. Grande Ronde				69,096	5		From rcy 5 into 5	69,096	5	69,096	CWT	UGR
U. Grande Ronde	Captive (SNP)	Low	162,941	81,470	6		From rcy 6 into 6	81,470	6	81,470	AdCWT	UGR
U. Grande Ronde				81,470	7		From rcy7 into 7	81,470	7	81,470	AdCWT	UGR
								301,134				
Lostine River	Conventional	Low	260,825	65,206	8		From rcy 8 to 8	65,206	8	65,206	AdCWT	LR
Lostine River				65,206	9		From rcy 9 to 9	65,206	9	65,206	AdCWT	LR
Lostine River				65,206	10		From rcy 10 to 10	65,206	10	65,206	Ad	LR
Lostine River				65,206	11		From rcy 11into 11	69,250	11	65,206	Ad	LR
								260,825				
Imnaha River	Conventional	Low	408,771	58,395	12		From 12 into 12	58,395	12	58,395	AdCWT	IM
Imnaha River				58,395	13		From 13 into 13	58,395	13	58,395	AdCWT	IM
Imnaha River				58,395	14		From 14 into 14	58,395	14	58,395	AdCWT	IM
Imnaha River				58,395	15		From 15 into 15	58,395	15	58,395	AdCWT	IM
Imnaha River				58,395	16		From 16 into 16	58,395	16	58,395	Ad	IM
Imnaha River				58,395	17		From 17 into 17	58,395	17	58,395	Ad	IM
Imnaha River				58,395	18	51	From 18 into 18	58,395	18	58,395	Ad	IM
								408,771		**Total 1,394,673**		

APPENDIX G. 2012 Wallowa River Spring Chinook Sport Fishery Proposal

Introduction

The Grande Ronde River spring Chinook hatchery program is part of the Lower Snake River Compensation Plan (LSRCP) developed to mitigate for fish production after construction of the four lower Snake River dams. Hatchery Chinook salmon are produced at LSRCP hatcheries in Washington, Idaho and Oregon. Subsequent adult returns are intended to provide tribal and recreational fisheries and, in some cases, to enhance natural-origin (N-O) spawner numbers. Components of the Grande Ronde River spring Chinook hatchery program operate within the Lostine River, Catherine Creek, upper Grande Ronde River and Lookingglass Creek. This 2012 fishery proposal focuses on hatchery returns to the Lostine River component of the program.

Management of the Lostine hatchery program is guided by a Hatchery Genetic Management Plan (HGMP) that incorporates an adult sliding scale which uses hatchery fish to boost N-O spawner numbers during low N-O returns and manages against negative impacts of the hatchery program by limiting; 1) the number of hatchery fish spawning naturally and 2) the number of hatchery fish in the broodstock and as N-O runs increase. The sport fishery's ability to selectively remove hatchery fish from the system supports the direction provided in the HGMP and acts as an integral part of program management.

Consistent with the Grande Ronde spring Chinook Fishery Management and Evaluation Plan (FMEP) submitted to NOAA in June 2011, and other management agreements, the following proposal details a proposed sport fishery plan including; 1) 2012 run projections, 2) a description of the proposed fishery, 3) an analysis of the allowable harvest impacts as it relates to FMEP guidelines, 4) fishery expectations and resulting adult distribution and 5) fishery monitoring and enforcement plans.

Run Projections

Run projections are not available for the Wallowa River and tributaries outside the Lostine River. Therefore, we utilized relationships between redds counted in the Lostine River, Minam River, upper Wallowa River, Bear Creek and Hurricane Creek to estimate adult returns for: 1) the upper Wallowa basin excluding the Lostine River and 2) the Minam River. Those data suggest, on average, the Lostine River accounts for 40% of the spawning in the Wallowa basin, the Minam River accounted for another 40% and other Wallowa River tributaries accounted for the remaining 20%. Assuming this relationship is consistent in 2012, we estimate 1,607 and 1,071 unmarked, N-O Chinook salmon will return to the Wallowa-Lostine and Minam rivers, respectively (Table 1).

Allowable Sport Fishery Impact

The Grande Ronde Spring Chinook FMEP establishes criteria for implementation of sport fisheries based on the expected N-O adult run relative to critical and viable levels for each population in the basin. Run projections suggest that the Wallowa–Lostine, Catherine Creek, and Lookingglass populations will achieve N-O and hatchery adult numbers large enough to consider a fishery (Table 1).

Table 1. 2012 preseason spring Chinook (age 4 and 5 only) projections by population.

Population	*Projected Run Size*		
	Natural	**Hatchery**	**Total**
Catherine Creek	1,060	1,337	2,397
Lookingglass Creek	265	1,335	1,600
Upper Grande Ronde River	66	876	942
Wallowa/Lostine River	1,607	3,502	5,109
Minam River	1,071	N/A	1,071

At the projected run size, and as described by the FMEP, we expect a N-O fish impact of approximately 39 (2.4%) fish from the Wallowa-Lostine population, and 11 (1.0%) fish from the Minam River population (Table 2). Given: 1) the relationship between N-O and hatchery run components, 2) an assumption that natural and hatchery fish will be caught at comparable rates, 3) the 10% handling mortality for natural fish handled in the fishery (per FMEP), the sport fishery could harvest up to 850 hatchery fish without exceeding the designated N-O impact level (Table 2). The proposed harvest allowance provides the potential to substantially reduce surplus hatchery fish numbers. Reduction in hatchery fish escapement through harvest complements HGMP guidelines that reduces the use of hatchery fish for broodstock and limits the number of hatchery fish spawning naturally at projected escapement levels.

Inclusion of a two mile reach of the Wallowa River below the Minam River confluence in the proposed fishery increases sport harvest opportunity and potential to reduce hatchery fish surplus numbers. However, it also creates a mixed stock fishery and potential for impact to the Minam River population. According to FMEP criteria, un-supplemented populations in mixed stock fisheries will be managed for a 1% impact rate when expected returns are below the designated Minimum Abundance Threshold (MAT). Although Minam returns are expected to return at 1.4 times MAT, using more conservative criteria of 1.0% allows for an allowable N-O fish impact of 11 fish for the Minam population's projected 1,071 natural fish return (Table 2). With an assumed handling mortality of 10% (per FMEP), anglers would have to handle more than 110 Minam Chinook to exceed allowable impacts. Although we do not believe impacts to the Minam River population will be limiting, we may select to use a higher impact rate than 1.0% if needed to sustain harvest opportunity on Lostine-origin hatchery fish.

Description of Past Fisheries

Catch estimates from the 1960's and 1970's, when spring Chinook harvest in the Wallowa River was last allowed, do not partition Grande Ronde River catch to tributaries. As a result, estimates of harvest from those earlier fisheries provide little insight into potential sport fishery impacts for the proposed fishery. A brief fishery in 2008 resulted in no catch (based on estimates generated from creel data) due to high stream flows during the season. The 2009 fishery opened on June 13, and was extended to July 12. Anglers reported harvesting 10 hatchery-origin Chinook, and handling 11 N-O Chinook during the season. The 2010 fishery opened on May 22 and was extended to July 25. High flows early in the fishery hindered angler success. We estimated that anglers harvested 45 adult hatchery Chinook, and handled 47 N-O Chinook during the 2010 season. The 2011 season opened May 28th and was extended until August 7, as high flows reduced early catch rates. In 2011, we estimated that anglers harvested 25 adult hatchery Chinook, and handled 28 N-O Chinook.

Proposed 2012 Fishery

Consistent with hatchery program goals, FMEP criteria, and existing management agreements, ODFW proposes a 2012 Wallowa River spring Chinook sport fishery.

Open season: ***May 19 through July 21 (may be extended if impact limit and water conditions allow)***
Bag limit: ***Two adipose fin-clipped adult Chinook, five adipose fin-clipped jacks per day (consistent with statewide Oregon salmon bag limit).***
Open area: ***Wallowa River from a deadline at the lower end of Minam State Park upstream to the confluence with the Lostine River (Figure 1)***
Gear: ***Statewide salmon gear restrictions apply (2012 Oregon Sport Fishing Regulations. www.dfw.state.or.us)***

Expected Outcomes

FMEP guidelines provide for a hatchery fish sport harvest. However it is unlikely, given normal run-off patterns, in the Wallowa River that harvest will approach the allowable limits. Recent experience for Imnaha River spring Chinook sport fisheries suggest angler success is inversely proportional to flow during spring run-off. We expect a similar relationship for the proposed Wallowa fishery, although creel surveys provide the necessary means to track cumulative impact during the fishery. Data from creel surveys outlined below will be utilized to determine fishery impact on a weekly basis. The season will be closed if projected impact is expected to exceed allowable natural or hatchery fish impact during the following week.

As a result of flow and access issues, we expect a hatchery fish harvest of less than 850 adult Chinook and an incidental impact of less than 39 wild Chinook from the Wallowa-Lostine population. Our expectation is that fewer than 110 adult Minam River Chinook will be handled in the proposed fishery (resulting 11 fish impact, Table 2).

Following recently modified draft HGMP guidelines we plan to allow hatchery fish above the Lostine weir at a one to nine ratio with N-O fish (90% natural; Table 2). Based on run projections, expected sport harvest, management strategies and estimated trapping efficiency, implementation of this fishery proposal will result in the following distribution of adults:

- 695 or 51% wild adult fish spawning in the Lostine River,
- 678 or 49% hatchery adults spawning in the Lostine River,
- 142 natural and 0 hatchery adults utilized for hatchery broodstock (100% wild),
- An expected recreational harvest of 850 hatchery adults,
- An expected incidental handling mortality of 39 and 11 naturally-produced adults for the Wallowa–Lostine and Minam populations, respectively.

These estimates do not account for tribal harvest of wild and hatchery fish. Decisions regarding outplant numbers are generally made in a co-management forum and will likely affect composition of natural spawners in spawning areas outside the Lostine River. At the proposed run level, the intent of Lostine River hatchery program is to maintain broodstock and natural spawner composition in the Lostine River above the weir as identified in lines 21 and 24 in Table 2, respectively. This fishery plan

is an integral component of hatchery program management and is intended to provide an alternate outlet for hatchery fish identified as surplus to broodstock and natural spawning. Hatchery fish indicated in line 25 in Table 2 as "available for outplanting or other use" includes fish likely to be allocated by co-managers for tribal distribution.

The proposed fishery location in the upper portion of the Wallowa River watershed avoids impact to Chinook populations outside the Wallowa system (Figure 1). In addition to incidental hooking and handling of N-O spring Chinook, we expect ESA-listed Snake River summer steelhead kelts and ESA-listed adult bull trout may also be handled in the fishery. However, we expect angler effort and success will be restricted by high stream flow until after mid-June. As a result, most steelhead and bull trout will have moved from the fishery area prior to peak angler activity. Incidental catch and impact to these species is expected to be low, limited to a few individuals, but will be monitored.

Table 2. Distribution of Wallowa–Lostine 2012 adult spring Chinook run indicating, harvest, broodstock, fish available for outplant and other uses and resulting expected spawner compositions.

	2012 Lostine - Wallowa Spring Chinook Run Projections and Distribution **REVISED 2-14-12**			
	Projections, Allocations and Predicted Results	**Wild**	**Hatchery**	**Total**
	Run Projections and Expected Harvest Impacts			
1	Projected adult run to Lostine	1,071	3,502	4,573
2	Projected run to Wallowa – Lostine	1,607	3,502	5,109
3	Projected composition (Wallowa - Lostine)	31.5%	68.5%	100.0%
4	Allowable Wild Impact from FMEP (Wallowa-Lostine)	39		
5	Allowable Wild Impact Rate (Wallowa - Lostine)	2.43%		
6	Allowable Wild Fish Handle @ 10% Hooking Mortality	390		
7	Resulting maximum hatchery fish sport harvest		850	
8	Alternative maximum impact & harvest @ 50% of defined surplus	79	1,716	
9	Proposed sport harvest impact and harvest (lesser of row 7 and 8)	39	850	889
10	Anticipated Treaty Harvest (estimated here as 50% harvest share for our purposes)	208	681	889
11	Projected Minam River Return	1,071	0	1,071
12	Allowable Wild Impact from FMEP (Minam)	11		
13	Allowable Wild Impact Rate (Minam)	1.03%		
14	Allowable Wild Fish Handle @ 10% Hooking Mortality	110		
	Post Harvest Allocations and Predicted Results			
15	Post Sport Harvest Adult Escapement (Wallowa - Lostine)	1,360	1,971	3,331
16	Post Sport Harvest Adult Escapement (Lostine)	837	1,971	2,808
17	Escapement to Weir (0.85)	711	1,675	2,386
18	Escapement above Weir Before Weir in Place (0.2)	142	335	477
19	Fish Expected to Be Handled at Weir	569	1,340	1,909
20	Broodstock Composition Target	100%	0%	100%
21	Broodstock (per AOP)	142	0	142
22	Post Broodstock Escapement Handled At Weir	427	1,340	1,767
23	Target Percentage Passed above weir	90%	10%	
24	Target Passed Above the Weir	427	47	474
25	Available for Outplanting and Other Use	na	1,293	1,293
	Spawner Composition – Lostine			
26	Spawning Upstream of Weir	569	382	951
27	Composition of Natural Spawners above Weir	60%	40%	100%

28	Spawning Downstream of Weir (.15 of line 16)	126	296	422
29	Composition of Natural Spawners Downstream of Weir	30%	70%	100%
30	Lostine River Natural Spawners	695	678	1,373
31	Composition of Lostine River Natural Spawners	51%	49%	100%
	Spawner Composition - Wallowa/Lostine			
32	Natural Spawners w/ sport harvest w/o outplants & tribal harvest	890	2,652	3,542
33	Comp. of Natural Spawners w/sport harvest w/o outplants & tribal harvest	25%	75%	100%
34	Natural Spawners w/o sport harvest, outplants and tribal harvest	929	3,502	4,431
35	Comp. of Natural Spawners w/o sport harvest, outplants and tribal harvest	21%	79%	100%

Required inputs identified in blue cells

[1] Based on the lesser of FMEP calculated hatchery harvest or hatchery projection minus broodstock and natural spawners

Monitoring and Enforcement Plan

We will conduct a statistical creel survey designed to quantify: 1) angler effort, 2) harvest of marked Chinook and 3) catch and release of unmarked Chinook, bull trout and steelhead. Creel surveys will be conducted during three to four randomly-selected days per week. Sample days will be stratified to emphasize sample collection on weekends and survey start times (early or late) will be varied randomly to insure coverage of dawn and dusk periods. Harvest and catch data will be analyzed on a weekly basis to inform decisions regarding fishery. Weekly updates and a post-season fishery report will be produced and provided to NOAA staff and co-managers.

We will coordinate with local Oregon State Police (OSP) game enforcement staff during our annual Coordinated Enforcement Program meeting. Enforcement of angling regulations during the proposed sport fishery will be designated a "high" priority activity for that time period and OSP will develop patrol strategies to address expected enforcement needs.

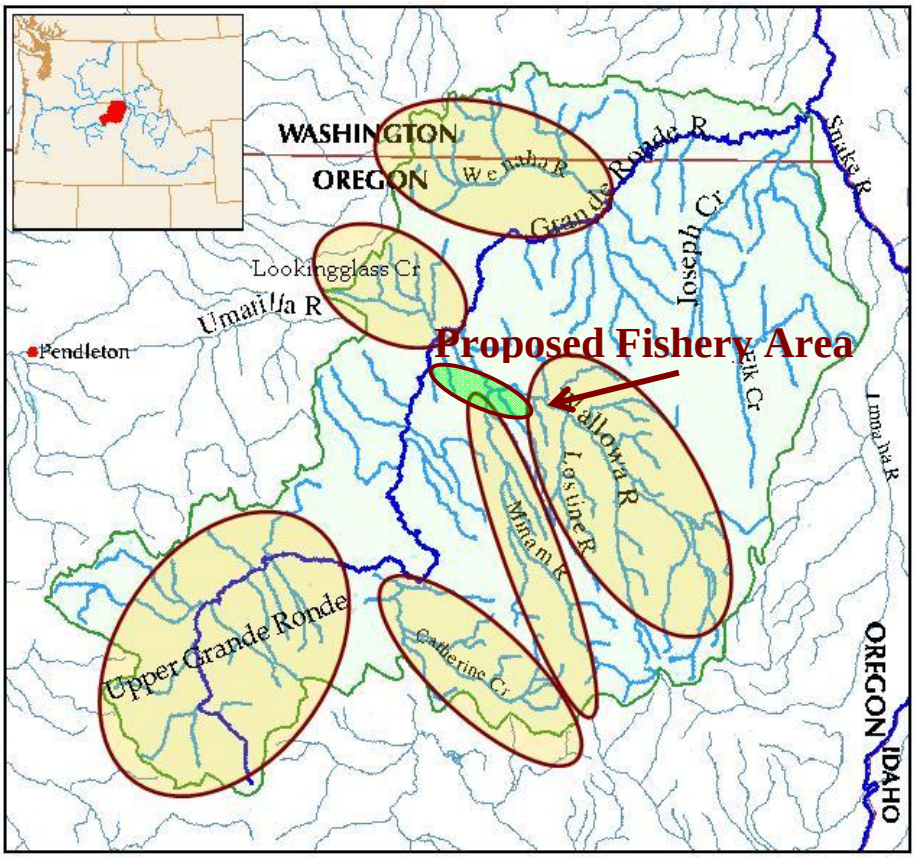

Figure 1. Map of The Grande Ronde sub-basin indicating proposed spring Chinook fishery area (green) and spring Chinook population areas (yellow).

References

Oregon Department of Fish and Wildlife (ODFW). 2011. Fisheries Management and Evaluation Plan for Snake River Spring/Summer Chinook – Grande Ronde Subbasin (draft submitted to NOAA Fisheries, June 2011).

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

Catherine Creek spring/summer Chinook salmon spawning data for the 2001-2011.

Brood Year	Marked Females Spawned	Unmarked Females Spawned	% Un-marked	Spawning Ratio F/M	Average Fecundity	Egg Take	Fry Ponded	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	47.1%	1.42:1	3,149	53,533	49,222	49,696
2006	28	8	22.2%	1.24:1	3,642	131,139	121,868	116,882
2007	30	15	33.3%	1.45:1	3,801	171,065	146,207	138,854
2008	21	11	31.3%	1.6:1	3,885	124,317	117,605	**111,800**
2009	30	13	30.2%	0.93:1	3,843	165,263	154,481	**159,237**
2010	32	10	23.8%	0.95:1	4,200	176,409	**158,289**	
2011	**20**	**19**	**48.7**	**0.90:1**	**3,852**	**150,225**		
Total	**170**	**153**	**47.4**		**3,788**	**1253,782**	**993,707**	**815,879**

*Inventory correction; Since 2004, eggs have been electronically counted
Numbers in blue current inventory
2001-07 brood, estimate survival from green egg to smolt at 85.4%

Upper Grande Ronde River spring/summer Chinook salmon spawning data 2001-2011.

Brood Year	Marked Females Spawned	Unmarked Females Spawned	% Un-marked	Spawning Ratio F/M	Average Fecundity	Egg Take	Fry Ponded	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	7.5%	1.54:1	3,877	155,080	119,963	118,803
2006	71	13	15.5%	1.45:1	3,539	297,244	269,439	259,932
2007	25	6	19.4%	1.14:1	3,960	122,750	99,136	94,148
2008	8	4	33.3%	1:1	3,950	47,402	42,458	42,400
2009	52	9	14.7%	0.97:1	4,281	261,136	226,773	**243,064**
2010	68	14	17.0%	0.94:1	3,890	318,953	**290,379**	
2011	**37**	**2**	**5.1**	**0.90:1**	**4,257**	**166,042**		
Total	**298**	**114**	**27.6%**		**3,986**	**1,631,905**	**1,242,829**	**936,558**

*Inventory correction; In 2004, eggs have been electronically counted
Numbers in blue current inventory
2001-07 brood, estimate survival from green egg to smolt at 82.3%.

Lostine River spring/summer Chinook salmon spawning data, 1997-2011

Brood Year	Marked Females Spawned	Unmarked Females Spawned	% Un-marked	Spawning Ratio F/M	Average Fecundity	Egg Take	Fry Ponded	Smolt releases
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	194,861
2007	41	20	32.8%	1.13:1	4,290	261,719	227,838	**185,750
2008	37	19	33.9%	0.95:1	4,783	267,834	247,274	**185,410
2009	32	25	43.8%	0.98:1	4,639	255,139	245,394	**62,941**
2010	58	18	23.7%	1.08:1	4,368	331,956	**300,705**	
2011	**40**	**24**	**37.5%**	**1.01:1**	**4,725**	**302,422**		
	333	**242**	**42.0%**		**4,527**	**2,569,265**	**1,777,842**	**1,025,818**

*Inventory correction due to large losses with egg shipment;
**Does not include 41,997 parr released in the Lostine River Km 21 June 25, 2008, and 54,166 released June 5, 2009
In 2004, eggs have been electronically counted
Numbers in blue current inventory
2001-07 brood, estimate survival from green egg to smolt at 84.3%

Imnaha River spring/summer Chinook salmon spawning data, 1990-2011.

Brood Year	Marked Males Spawned	Marked Females Spawned	Unmarked Males Spawned	Unmarked Females Spawned	% Un-marked	Spawning Ratio F/M	Average Fecundity	Egg Take (1,000's)	Fry Ponded (1,000's)	Smolts releases (1,000's)
1990	35	49	39	25	43.2%	1.00	4,414	327	270	263
1991	11	24	27	15	54.5%	1.03	4,954	193	163	158
1992	46	86	69	28	42.4%	0.99	4,754	542	465	439
1993	134	139	58	54	29.1%	1.01	5,425	1,047	1,010	873
1994	15	13	6	9	34.9%	1.05	5,082	112	96	91
1995	16	9	30	6	59.0%	0.33	4,541	68	51	51
1996	15	7	37	17	71.1%	0.46	4,276	103	102	93
1997	54	50	8	7	12.6%	0.92	4,962	283	206	195
1998	53	33	31	28	40.7%	0.59	5,059	309	183	180
1999	183	31	14	6	8.5%	*0.16	4,566	169	126	123
2000	240	58	46	10	15.8%	*0.19	5,048	334	311	304
2001	114	56	54	49	37.8%	*0.38	4,371	459	275	268
2002	117	83	14	14	12.3%	0.62	4,695	455	397	398
2003	125	72	24	26	20.2%	0.65	5,081	498	434	435
2004	74	79	32	25	27.1%	0.98	4,652	488	447	442
2005	108	88	21	29	20.3%	0.90	4,545	532	437	433
2006	85	74	28	24	24.6%	0.86	4,138	406	363	349
2007	82	72	23	21	21.6%	0.88	4,391	408	300	294
2008	123	82	82	22	33.6%	0.50	4,627	472	409	390
2009	73	75	33	34	31.2	1.02	4,710	513	437	253
2010	61	80	38	29	26.6%	1.10	4,756	518	467	
2011	68	79	35	26	24.7%	1.02	4,719	495		

Appendix I. Coded Wire Tag (CWT) Sampling Guidelines for the 2012 Northeast Oregon Annual Operation Plan

Recovery of coded-wire tags is an integral part of evaluating the effectiveness of our hatchery programs. Each tag provides us with the brood year and age of the fish and the raceway in which it was reared at Lookingglass Fish Hatchery (which also provides us with the stock to monitor straying). Knowing which raceway an adult return originated from allows us to determine the hatchery program (captive or conventional broodstock) of the adult return. Likewise, the absence of a coded wire tag in combination with an adipose fin clip signifies that the returning adult was from hatchery parr releases and should not be attributed to either the captive or conventional broodstock hatchery programs. When fish are recovered with a coded wire tag, we measure the length of each fish and, with that known age, we can infer the age of untagged or fish not sampled. This provides us with the age composition of the run. CWT data can also point out whether one raceway is performing particularly well or poorly. If that happens, it will allow us to examine our fish culture practices.

Minimum sample size is a tricky thing to determine; generally a minimum of 35 CWT fish sample from each 65K treatment group/raceway is targeted (Hesse et al. 2006). With multiple (typically four) treatment groups per hatchery release, a minimum sample of 140 CWT per hatchery cohort (35 x 4 raceways = 140) is minimally needed. Our desire is to collect as many tags as possible, given the logistic constraints. As a rule of thumb we try to collect at least 50 tags per tag group per year so that a single recovered tag does not exert too much influence over the estimates that we calculate. In 2012, we are planning to sample 100% of the Captive Broodstock returns designated for distribution because of the small number of fish that are expected. A sampling rate of 20% of the tagged fish from the Conventional hatchery program available for distribution is expected to provide us with a sufficient number of tags, given the uncertainty of estimating the number of fish that will return to each river and the proportion of those fish that we will capture.

Tags from ages 4 and 5 adults are commonly collected from carcasses recovered on spawning ground surveys and from fish retained for broodstock at Lookingglass Fish Hatchery. Tags from age 3 adults (jacks) are more difficult to recover because few jack carcasses are found on the spawning grounds and we collect few hatchery jacks for use in broodstock. Other potential recovery sources are the sport and tribal harvest, but the sport harvest is of very short duration, with few fish being harvested and the tribal harvest is not sampled. The best source of tag recoveries for jacks is the distribution collections.

Distribution of hatchery origin spring Chinook salmon to the tribe and food banks programs provides an opportunity for efficient CWT recovery sampling. Wallowa Hatchery has served as live holding location for distribution fish in recent years. The following bullets are meant to help facilitate CWT sampling of fish destined for distribution.

1) ODFW and NPT intend to alternate distribution fish pick up weeks for both Lostine and Imnaha river fish in 2012. The rotation will begin with ODFW picking up any available fish during the week of May 14. NPT will pick up any available fish during the following week of May 23. The rotation will continue with ODFW, and then NPT, picking up fish during subsequent weeks until one or both parties no longer desire available fish, or operation of the weir is discontinued for 2012.

a. Wallowa Fish Hatchery will report how distribution fish were allocated (i.e. ODFW food bank, picked up by NPT, or out-planted for nutrients) on a weekly basis.

2) ODFW research staff will conduct sampling. Joseph Feldhaus will coordinate sampling dates, times, and locations with Ron Harrod and Roger Elmore.

3) NPT production (Bruce McLeod/Nancy McAllaster) will communicate NPT distribution pickup dates and times with Ron Harrod and Roger Elmore. Current plan is for Tuesday pick-up.

4) Imnaha River - 20% sampling rate of all CWT fish destined for distribution.
   a. If possible, tagged fish to be sampled for CWT will be transported to Wallowa Fish Hatchery for CWT collection. Otherwise, ODFW Research will conduct collections at Imnaha Weir.
   b. The preferred approach is to transport 20% of all CWT fish destined for distribution to Wallowa Hatchery weekly and sample all of those fish for CWTs.
   c. Alternatively to 4b. above, 40% of CWT fish may be sampled over a four week period (during an ODFW week) if 20% sampling was not accomplished during the previous week that ODFW scheduled for sampling. ODFW may collect additional CWT samples at Imnaha weir on NPT distribution weeks, as long as it doesn't interfere with loading fish for NPT distribution.
   d. Post-sampled carcasses will be sent to a food bank OR provided for tribal distribution.

5) Lostine River – 20% sampling rate of conventional production adults destined for distribution.
   a. Sampling 40% every other ODFW week is not ideal but acceptable.
   b. Post-sampled carcasses will be sent to a food bank OR provided for tribal distribution.

6) Lostine River – 100% sampling rate of captive broodstock adults destined for distribution.
   a. Post-sampled carcasses will be sent to a food bank OR provided for tribal distribution.

Appendix J. Adult Chinook Fish Health Monitoring Plan & Disease Treatments at Lookingglass Hatchery in 2012

Stock	Examination Category	Protocol	Comment
200 201 80 29 81	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)
200 201 80 29 81	Adult HP Mortality	All mortality up to 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
81 LG-CK	Spawning Ground Survey	-Collect a minimum sub-sample of 30 kidney samples from adult Chinook above the weir (hatchery intake)	Fish Health Request

Disease Treatments and other Drugs for Adult Chinook Broodstock

Location	Brood Year	Stock	Treatment for	Chemical/Drug	Protocol	Comment
Lookingglass	2012	200 201 80 29 81	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	2012	200 201 80 29 81	BKD Furunculosis-Enteric Redmouth	Erythromycin Oxytetracycline	Injection 20 mg/kg (Veterinary Prescription) Injection 10 mg/kg (Veterinary Prescription)	Erythromycin 100. Product is available New charts will be provided, if needed. Injected fish are not for human consumption

Appendix K. Adult Collection Fish Health Injection Protocols for Grande Ronde and Imnaha Chinook

	Injection				
Arrival Dates	Erythro-100 @20mg/Kg	Oxytetracycline @ 10mg/Kg	When	Which Fish	Comment
Whole season up to spawning	Yes	Yes	Upon Collection	broodstock	Only fish kept for broodstock Re-injection will be done only if deemed necessary based on mortality rate and pathogens detected in mortality. Do not inject fish that are fully ripe or are going to be spawned by the next day

Injection Route Plan for 2012

Stock/Group	Erythromycin	Oxytetracycline	Comment
Imnaha & Lostine	IP	IP	
CC & GR Conventional	DS	DS	
LG-CR production fish	DS	DS	Swim-ins or fish trucked require 21 detox period if released or no injection. All brood stock will be injected

Appendix L. Imnaha and Grande Ronde Broodstock Antibiotic Injection Protocols

Modified by Sam Onjukka for 2012

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 veterinarians Dr. Collin Gillin or Dr. Julia Burco via ODFW Fish Health staff. These prescriptions and protocols apply to the injection of the antibiotics erythromycin and oxytetracycline. Note: Erythromycin-100 is available for purchase from a variety of vendors, see below.

http://www.calvinsequine.com/bmd001525201.html - $14.99/100 ml bottle
http://www.twincitypoultrysupplies.com/store/index.php?
main_page=product_info&cPath=46&products_id=771 - $20.95/100 ml bottle
http://www.jefferslivestock.com/gallimycin-100/camid/LIV/cp/A2-GL/cn/
1101454/ - $8/100 ml bottle
http://www.pbsanimalhealth.com/details/Gallimycin-100/37-50.html - $11.09/100 ml
bottle

3) At collection sites

Injection schedule: All broodstock are to be injected upon collection. The goal is to inject all broodstock, however, do not inject fish that are going to be spawned by the next day (Appendix K)
Methods:
1) Use erythromycin or gallimycin 100 and oxytetracycline 200 (200 mg/mL).
2) For Intraperitoneal (IP) injections use 1 inch 20 gauge needle. For Dorsal Sinus (DS) use a 1inch 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. Use of injector guns is another option. If injector guns are used, needles should be changes between each fish or sanitized between fish. A word of caution regarding injector guns: there is an increased risk of drug toxicity when administering this route or any method that administers a volume of drug based on bracketed size ranges.

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 2012, if needed.

At Lookingglass Hatchery
Re-injection will be done only if deemed necessary based on mortality rate and pathogens detected in mortality. Do not inject fish that are fully ripe or are going to be spawned by the next day. Dispose of all needles in sharps containers and all will be properly disposed of at Waste Pro 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 M. Lookingglass Creek Management Guidelines

Management Guidelines

The goal of the Lookingglass Creek spring Chinook hatchery program is to reintroduce spring Chinook into Lookingglass Creek using Catherine Creek stock to support tributary harvest, natural population restoration, and maintenance of a gene bank for the Catherine Creek stock.

Current production targets for Catherine Creek and Lookingglass production, per the *2008-2017 United States v. Oregon* Management Agreement is outlined in Table 1.

Table 1. Lookingglass Creek and Catherine Creek production outlined in Table B1 of the *2008-2017 United States v. Oregon* Management Agreement.

Release Site	Rearing Facility	Stock	Life Stage	Target Release Number	Primary Program Purpose	Funding
Lookingglass Creek	Lookingglass/Captive Brood	Catherine Creek	Smolt	250,000	Fishery/ Reintroduction	LSRCP/BPA
Catherine Creek	Lookingglass/Captive Brood	Catherine Creek	Smolt	150,000	Supplementation/ Fishery	LSRCP/BPA

All Lookingglass Creek adults arriving at the Lookingglass Hatchery intake weir prior to July 4 will be ponded into the adult holding ponds. Disposition of these adults will occur in early July according to the guidelines in Table 2, and adults designated to be passed upstream will be outplanted at that time. Disposition of Lookingglass Creek adults arriving after July 4 will be based on the percentages outlined in Table 2. All adults passed upstream will have genetic samples taken.

Table 2. Disposition of Lookingglass Creek adult spring Chinook salmon arriving at the Lookingglass Hatchery intake weir.

Escapement Level	% Pass Above	% Keep for Brood
150	67	33
200	60	40
250	55	45
300	50	50
>300 – adjustments will be made based on brood needs. If brood need has been met, remainder to be released upstream.		

An estimated 158 adults (47 natural origin and 111 hatchery origin) required to meet 250,000 smolt production level. Broodstock for the program will be collected from returns to either the Lookingglass Hatchery weir or the Catherine Creek weir. Either conventional or captive hatchery adults may be used for brood. The goal for broodstock composition will be to incorporate 30% natural origin adults, with no more than 25% of the returning natural origin steelhead retained for brood. If a shortage of natural origin adults occurs, then additional hatchery adults will be collected to meet the brood target.

Appendix N. 2012 Imnaha River Spring Chinook Sport Fishery Proposal

Introduction

The Imnaha River spring Chinook hatchery program is part of the Lower Snake River Compensation Plan (LSRCP) program developed to mitigate for fish production lost after construction of the four lower Snake River dams. Hatchery Chinook and steelhead smolts are produced at LSRCP hatcheries in Washington, Idaho and Oregon. Subsequent adult returns are intended to provide tribal and recreational fisheries and, in some cases, enhance natural-origin (N-O) spawner numbers.

From 2001-2005, Imnaha River spring Chinook sport fisheries were authorized by NOAA Fisheries through a Nez Perce Tribal Resource Management Plan (TRMP) and harvest sharing agreements outlined in a U.S. vs. Oregon stipulated order. Since that time Oregon Department of Fish and Wildlife (ODFW) developed Fishery Management and Evaluation Plans (FMEP) for Imnaha River spring Chinook and have submitted versions to NOAA Fisheries, most recently in July 2011. Current in-season projections suggest that the 2012 spring Chinook escapement to the Imnaha River will exceed 4,000 adult fish. The projected N-O and hatchery run size will provide opportunity for both tribal and sport harvest under TRMP and FMEP guidelines, respectively. This recreational fishery proposal is developed from criteria outlined in the FMEP and is intended to be authorized under that process.

Management of the Imnaha spring Chinook hatchery program is guided by a Hatchery Genetic Management Plan (HGMP) incorporating an adult sliding scale that uses hatchery fish to boost natural spawner numbers during low N-O return years and manages against negative impacts of the hatchery program by limiting: 1) the number of hatchery fish spawning naturally and 2) the number of hatchery fish in the hatchery broodstock as N-O runs increase. The sport fishery's ability to selectively remove hatchery fish from the system supports the direction provided in the HGMP and acts as an integral part of program management.

Consistent with the Imnaha Spring Chinook Fishery Management and Evaluation Plan (FMEP) submitted to NOAA in July 2011 and other management agreements, the following proposal details a 2012 Imnaha River spring Chinook sport fishery plan including: 1) 2012 run projections, 2) a description of the proposed fishery, 3) an analysis of the allowable harvest impacts as it relates to FMEP guidelines, 4) fishery expectations and resulting fish distribution and 5) fishery monitoring and enforcement plans.

Article II. Run Projections

ODFW expects a relatively large return of ESA-listed spring/summer Chinook salmon to the Imnaha River in 2012. Initial projections suggest a run heavily weighted toward hatchery fish, including 2,978 marked hatchery adults. Unmarked, N-O adults are expected to number 1,167 (Table 2). We will update run projections based on detections of PIT-tagged hatchery Chinook salmon, in conjunction with historic migration timing, at Lower Granite Dam. Since adequate PIT tag information is not available for the N-O component of the run, we will update projections for the N-O component proportional to the hatchery component. During the fishery, updated run projections from PIT tag detections will be compared with sport harvest creel on a weekly basis to assess sport harvest impacts.

Updated run projections and sport harvest impacts will be communicated to NOAA fisheries and co-managers on a weekly basis in a multi-agency harvest forum.

Allowable Sport Fishery Impact

Using the current in-season projections, FMEP guidelines provide for an allowable sport fishery impact of 30 natural fish or 3.0% of the run. Given: (1) the relationship between N-O and hatchery run components, (2) an assumption that N-O and hatchery fish will be caught at comparable rates, and (3) the 10% handling mortality for N-O handled in the fishery (FMEP), the sport fishery could harvest up to 766 hatchery fish without exceeding the designated N-O impact level (Table 1).

Table 1. Imnaha River adult Spring Chinook run projections, proposed allocations (indicating maximum expected sport harvest rate on hatchery fish) and expected outcomes for 2012.

Imnaha River Spring Chinook Run Projections and Distribution, 2012 REVISED 2-14-12

	Projections, Allocations and Predicted Results	Wild	Hatchery	Total
	Run Projections and Expected Harvest Impacts			
1	Projected adult run	1,167	2,978	4,145
2	Projected composition	28.2%	71.8%	100.0%
3	Allowable Wild Impact from FMEP	30		30
4	Allowable Wild Fish Handle @ 10% hooking mortality	300		300
5	Allowable Wild Impact Rate	3.00%		
6	Resulting maximum hatchery fish harvest		766	
7	Maximum hatchery fish harvest as 50% of defined surplus		1,107	
8	Proposed sport harvest impact (lesser of row 6 and 7)	30	766	796
9	Anticipated Tribal Harvest (estimated here as 50% harvest share for our purposes)	224	572	796
	Post-Harvest Allocations			
10	Post Harvest Adult Escapement	913	1,641	2,554
11	Escapement to Weir (.75 of line 10)	685	1,231	1,916
12	Escapement above Weir Before Weir in Place (.35 of line 11)	240	431	671
13	Fish Expected to Be Handled at Weir (.65 of line 11)	445	800	1,245
14	Broodstock Composition Target	40%	60%	100%
15	Broodstock (per AOP)	91	137	228
16	Post Broodstock Escapement At Weir	354	663	1,017
17	Target Wild Percentage Passed above weir	60%	40%	
18	Passed Above the Weir	354	236	590
19	Available for Outplant or Other Use	na	427	427
20	To Big Sheep Creek (≤ 300 fish)	na	300	300
21	Available for Alternative Use	na	127	127
	Spawner Composition w/ Tribal and Sport Harvest			
22	Spawning Upstream of Weir	594	667	1,261
23	Composition of Natural Spawners above Weir	47.1%	52.9%	100.0%
24	Spawning Downstream of Weir (.273 of line 11)	228	410	638
25	Composition of Natural Spawners Downstream of Weir	35.7%	64.3%	100.0%
26	Imnaha River Natural Spawners (w/o B. Sheep)	822	1,077	1,899
27	Composition of Imnaha River Natural Spawners (w/o B. Sheep)	43.3%	56.7%	100.0%

Required inputs identified in blue cells

[1] Based on the lesser of FMEP calculated hatchery harvest or hatchery projection minus tribal harvest and broodstock

Article III. Description of Past Fisheries

Prior to 2001, the Imnaha basin was closed to sport harvest of salmon since 1979. Before then, a modest fishery occurred during the late-spring and early-summer. Estimates of harvest from punch card returns (adjusted for non-response bias and reports of catch outside of the spring season) ranged from 0 to 201 Chinook from 1957 through 1978 (Beamesderfer et al. 1997). Creel surveys estimate between 15 and 433 unmarked N-O Chinook salmon were handled in sport fisheries from 2001 to 2011, resulting in a mean handle rate of 10.9% (range: 1.7-19.5%, Table 2). With an assumed handling mortality of 10%, impacts for N-O fish from 2001-2011 ranged from 0.2% to 1.9% with a mean of 1.1% (Table 2).

The relatively higher handle rate observed in 2001 (19.5%) likely resulted from low-flow conditions that are associated with higher catch rates, coupled with the relatively large return of unmarked Chinook salmon (Table 2). As a result, the season was closed early on 6/21/01. On average, the Imnaha River sustains high flows during the month of June and stream flows above 1200 cfs generally produce difficult angling conditions with low catch rates. Estimated harvest of marked hatchery Chinook ranged from 22 to 519 fish during 2001-2011 fisheries (impact range: 2.0-21.3%, Table 2).

Table 2. Imnaha River spring Chinook sport fisheries impact for years 2001 through 2011. Adult abundance did not support sport harvest in 2006 and 2007.

Year	Sport Season	Escapement to River[1] (H/W)[2]	Est. Harvest (H)	Est. Released (H)	Est. Released (W)	Impact[3] N (W)	Impact[3] % (H/W)
2001	6/2-6/21	2,665/2,215	302	21	433	43	11.3/1.9
2002	6/1-6/30	3,211/858	152	9	15	2	4.7/0.2
2003	6/7-7/1	2,326/1,445	125	22	83	8	5.4/0.6
2004	6/19-7/5	1,355/366	192	21	29	3	14.2/0.8
2005	6/25-7/4	1,084/301	22	54	22	2	2.0/0.7
2008	7/4-7/15	2,540/234	64	0	17	2	4.7/0.8
2009	6/13-7/12	1,565/268	197	0	50	5	12.6/1.9
2010	5/22-7/25	3,663/785	336	48	108	11	9.2/1.4
2011	5/28-7/23	2,438/972	519	0	153	15	21.3/1.5

[1] Adult Only, J. Feldhaus, ODFW, personal communication 2/1/12
[2] (H) = Hatchery fish, (W) = Wild fish
[3] Sport impact includes an 10% fishery mortality for both hatchery and wild fish caught and released

Proposed 2012 Fishery

Consistent with hatchery program goals, FMEP criteria, and existing management agreements, ODFW proposes a 2012 Imnaha River spring Chinook sport fishery.

Open season: ***May 19 – July 21 (may be extended if impact limit and water conditions allow)***
Bag limit: ***Two adipose fin-clipped adult Chinook, five adipose fin-clipped jacks per day (consistent with statewide salmon bag limit).***
Open area: ***Imnaha River from mouth upstream to Summit Cr. Bridge (Figure 1)***
Gear: ***Statewide salmon gear restrictions apply*** *(2012 Oregon Sport Fishing Regulations. www.dfw.state.or.us)*

Expected Outcomes

We expect a hatchery fish harvest of less than 766 marked hatchery-origin Chinook salmon and an incidental impact of less than 30 unmarked Chinook salmon from the Imnaha population.

Following draft HGMP guidelines, we plan to allow hatchery fish above the Gumboot weir at a rate of 40% to 60% N-O fish ratio, and may out plant up to 300 hatchery adults into Big Sheep Creek (Table 1).

Without consideration of natural and hatchery fish harvest in tribal fisheries and based on run projections, harvest expectations, management strategies and estimated trapping efficiency, implementation of this fishery proposal will result in the following distribution of adults:

- 822 or 35.7% natural-origin fish spawning in the Imnaha River,
- 1,077 or 56.7% hatchery-origin fish spawning in the Imnaha River,
- 300 hatchery spawners outplanted to Big Sheep Creek,
- 91 N-O and 137 hatchery adults utilized for hatchery broodstock (30% wild),
- a recreational harvest of less than 766 hatchery adults,
- an incidental handling mortality of less than 30 N-O adults

To give us an indication of potential (but unlikely provided normal flow conditions) maximum fishery impacts, we reviewed weekly catch data from the 2001-2011 fisheries. Maximum one-week harvest rate observed in those fisheries was 18.0% in 2011 (with a 4 adult daily bag limit in place). At 18.0% we estimate at most, 536 adult hatchery Chinook would be harvested and 210 naturally-produced Chinook would be handled in one week. With an assumed 10% handling mortality (per FMEP) we estimate a maximum one-week fishery impact of 21 unmarked fish. With the projected return of N-O adults the fishery could persist for more than one week with maximum harvest rates previously observed in the 2011 fishery.

In addition to incidental hooking and handling of naturally-produced Chinook, fluvial adult bull trout and summer steelhead kelts may also be intercepted in the fishery. Incidental impact to fluvial bull

trout is expected to be similar to the 2001-2011 fisheries when between 23 to 321 bull trout were caught and released. During the past 8 fisheries from 2001-2011, steelhead kelts were only intercepted in 2005 when 11 were caught and released.

We believe that levels of incidental take associated with the proposed recreational fishery will not rise to a level that will operate to the disadvantage of listed spring/summer Chinook salmon, summer steelhead or bull trout in the Imnaha basin. Furthermore, removal of hatchery fish as proposed will benefit natural spawning population by reducing the number of hatchery fish relative to natural fish.

HGMP and FMEP guidelines attempt to manage risk related to hatchery programs by limiting the use of hatchery fish in broodstock and natural spawning in years when naturally produced adults exceed critical levels as projected for 2012. Given the large numbers of hatchery Chinook expected in 2012, the proposed sport fishery should improve our ability to manage within the guidelines of the HGMP by removing hatchery fish prior to their arrival at the Imnaha weir.

Monitoring and Enforcement Plan

We will conduct a statistical creel survey similar to that done in 2002-2005, and 2008-2011 designed to quantify: 1) angler effort, 2) harvest of marked Chinook and 3) catch and release of unmarked Chinook, bull trout and steelhead. Creel surveys will be conducted during three to four randomly selected days per week. Sample days will be stratified to emphasize sample collection on weekends and survey start times (early or late) will be varied randomly to insure coverage of dawn and dusk periods. Harvest and catch data will be analyzed weekly to track hook and release of N-O Chinook. Estimates of effort, harvest, and incidental catch and release will be developed for the season and presented in a post season fishery report.

We will coordinate with local Oregon State Police (OSP) game enforcement staff during our annual Coordinated Enforcement Program meeting. Enforcement of angling regulations during the proposed sport fishery will be designated a “high” priority activity for that time period and OSP will develop patrol strategies to address expected enforcement needs.

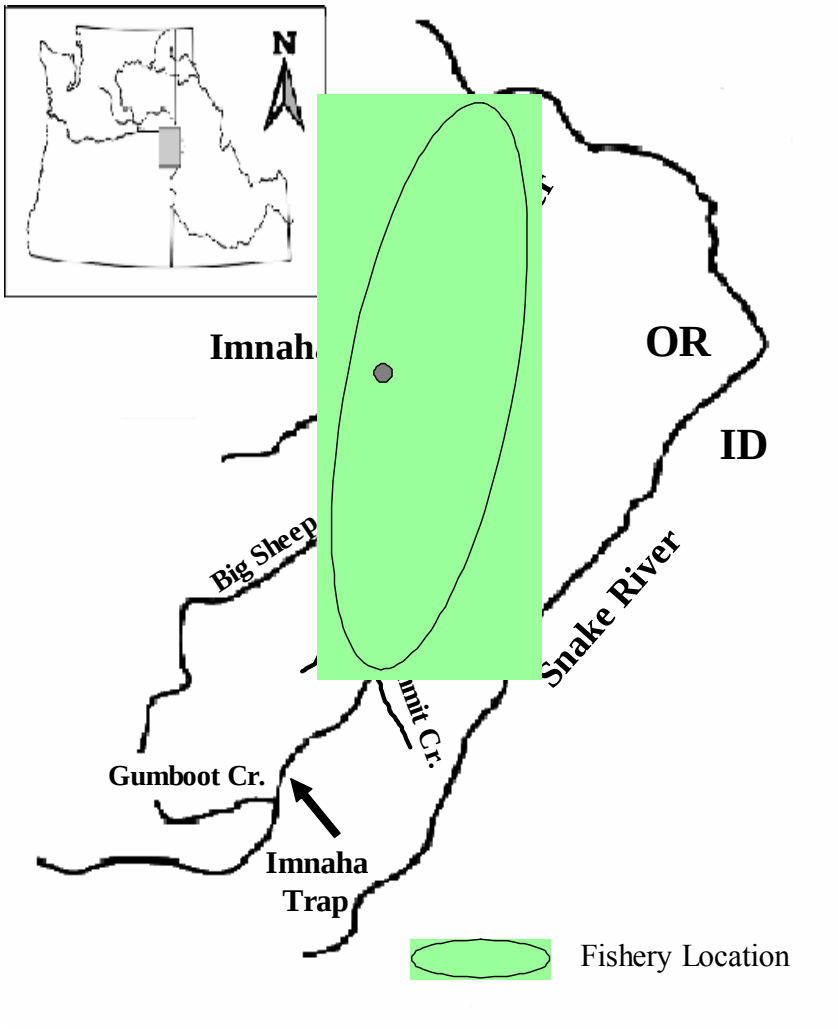

Figure 1. Map of the Imnaha River indicating boundaries of the proposed 2008 spring Chinook sport fishery.

Article IV. References

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Appendix O. Preliminary CTUIR data from Catherine Creek releases between 1998 and 2011 summarized by ODFW.

Origin (program)	Brood Year	Smolts Released	Returns			Total Return	SAR Percent
			Age 3	Age 4	Age 5		
Hatchery	1998	38,149	157	205	57	419	1.10%
(conventional)	1999	136,833	19	204	19	242	0.18%
	2000	180,343	78	570	25	673	0.37%
	2001	105,292	35	75	2	112	0.11%
	2002	91,797	8	56	5	69	0.07%
	2003	68,827	2	37	2	41	0.06%
	2004	45,604	27	79	3	109	0.24%
	2005	21,572	9	27	0	36	0.17%
	2006	0					
	2007	0					
	2008	34,111					
Hatchery	1998	0					
(captive)	1999	0					
	2000	0					
	2001	24,392	29	47	1	77	0.32%
	2002	70,071	25	160	15	200	0.29%
	2003	120,753	5	109	7	121	0.10%
	2004	23,216	8	73	2	83	0.36%
	2005	49,696	100	127	0	227	0.46%
	2006	116,882	431	935	35	1,401	1.20%
	2007	138,843	93	935		1,028	
	2008	110,242				0	
		Redd Counts					
Natural	1998	34	46	190	192	428	
Returns	1999	38	17	60	8	85	
	2000	26	2	45	6	53	
	2001	131	2	40	4	46	
	2002	156	3	109	32	144	
	2003	165	12	42	12	66	
	2004	94	6	77	27	110	
	2005	72	5	98	3	106	
	2006	115	42	474	34	550	
	2007	57	27	474		501	
	2008	99	140			140	

Appendix P. Preliminary CTUIR data from Upper Grande Ronde releases between 1998 and 2011summarized by ODFW.

Origin (program)	Brood Year	Smolts Released	Returns			Total Return	SAR Percent
			Age 3	Age 4	Age 5		
Hatchery	1998	1,508	0	3	4	7	0.46%
(conventional)	1999	2,560	0	6	6	12	0.47%
	20001	228,385	59	545	26	630	0.28%
	2001	210,113	72	233	7	312	0.15%
	2002	75,063	0	3	0	3	0.00%
	2003[1]	1,019	0	0	0	0	0.00%
	2004	76	0	0	0	0	0.00%
	2005	20,620	95	28	0	123	0.60%
	2006	0					
	2007	52,404	39	0	0	39	
	2008	190,531				0	
Hatchery	1998	0					
(captive)	1999	0					
	2000[2,3]	0					
	2001[4]	26,923	15	136	0	151	0.56%
	2002	69,856	9	144	13	166	0.24%
	2003	104,350	2	36	3	41	0.04%
	2004	18,901	30	56	40	126	0.67%
	2005	118,803	376	373	13	762	0.64%
	2006	259,932	397	2,428	103	2,928	1.13%
	2007	94,148	15	0	0	15	
	2008	41,819				0	
Natural		Redd Counts					
Returns	1998	42	0	78	220	298	
	1999	0	1	10	0	11	
	2000[2,3]	20	3	43	10	56	
	2001[4]	15	6	12	3	21	
	2002	23	0	51	13	64	
	2003	40	4	23	11	38	
	2004	186	0	53	27	80	
	2005	91	15	63	8	86	
	2006	28	12	121	47	180	
	2007	1	14	79		93	
	2008	31	34			34	

[1] 11,800 smolts were lost in downstream trap accident
[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

Appendix P1. Preliminary CTUIR data from Lookingglass Creek releases between 1998 and 2011.

Origin (program)	Brood Year	Smolts Released	Returns			Total Return	SAR Percent
			Age 3	Age 4	Age 5		
Hatchery	2000[1]	51,864	3	37	2	42	0.08%
(conventional)	2001[1]	17,880	11	24	1	36	0.20%
	2002	53,333	11	42	10	63	0.12%
	2003	98,023	22	97	21	140	0.14%
	2004	149,857	57	253	17	327	0.22%
	2005	0					
	2006	43,218	185	350	34	569	1.32%
	2007	150,477	116	448			
	2008	262,911	639				
Natural		Redd Counts					
Returns	1998	5	1	15	7	23	
	1999	3	2	16	1	19	
	2000	86	8	72	1	81	
	2001	86	2	23	2	27	
	2002	18	1	10	3	14	
	2003	10	4	10	7	21	
	2004	103	7	42	13	62	
	2005	39	4	65	10	79	
	2006	56	66	123	17	206	
	2007	53	17	116			
	2008	143	29				

[1] Fish released as Parr from the hatchery.

Appendix Q1. Preliminary smolt-to-adult return (SAR) rates for Lostine River hatchery origin Chinook salmon produced by the conventional (Conv.) and captive broodstock programs, brood years 1997-2006. Brood year escapement used in estimates was estimated jointly by ODFW and the NPT and age-at-return data for run reconstruction was provided by ODFW.

Origin (program)	Brood Year	Migration Year	Smolts Released[1]	Returns			Total Return	SAR Percent
				Age 3	Age 4	Age 5		
Hatchery (conventional)	1997	1999	11,870	64	148	14	226	1.91
	1998	2000	0	0	0	0	0	0
	1999	2001	**0**	0	0	0	0	0
	2000	2002	31,464	105	293	13	412	1.31
	2001	2003	100,882	251	353	28	633	0.63
	2002	2004	116,307	32	251	25	308	0.26
	2003	2005	102,556	72	169	14	255	0.25
	2004	2006	197,950	185	883	142	1,210	0.61
	2005	2007	205,406	541	1,214	78	1,833	0.89
	2006	2008	164,594	1,424	3,455	0[2]	4,879	2.51
Hatchery (captive)	1997	1999	0	0	0	0	0	NA
	1998	2000	35,100	56	416	103	575	1.64
	1999	2001	133,880	82	205	34	321	0.24
	2000	2002	77,312	58	506	61	626	0.81
	2001	2003	141,867	153	265	6	424	0.30
	2002	2004	133,729	62	111	7	180	0.13
	2003	2005	62,149	33	71	8	112	0.18
	2004	2006	40,982	4	101	1	106	0.26
	2005	2007	24,604	53	91	53	197	0.80
	2006	2008	10,470	53	149	0[2]	202	1.93

[1] The number of smolts released as reported by ODFW to HMIS.
[2] The estimated number of age 5 returns for brood year 2006 has not yet been completed.
[3] The SAR for brood year 2006 is incomplete.

Appendix Q2. Preliminary smolt-to-adult return (SAR) rates for Lostine River natural origin Chinook salmon, brood years 1997-2006. The number of smolts released and adult returns is shown for incomplete brood years 2007-2009. Brood year escapement used in estimates was estimated jointly by ODFW and the NPT and age-at-return data for run reconstruction was provided by ODFW.

				Estimated Returns				
Origin (Program	**Brood Year**	**Migration Year**	**Natural Smolts[1]**	**Age3**	**Age 4**	**Age 5**	**Total Return**	**SAR Percent**
Natural	1997	1999	25,554	24	425	48	497	1.94
	1998	2000	7,900	13	310	216	539	6.82
	1999	2001	8,183	37	152	34	223	2.73
	2000	2002	10,112	32	163	17	212	2.10
	2001	2003	20,935	41	129	23	193	0.92
	2002	2004	NA[2]	30	159	45	234	NA
	2003	2005	33,349	42	103	139	284	0.85
	2004	2006	30,202	3	243	79	325	1.08
	2005	2007	24,900	60	442	64	566	2.27
	2006	2008	16,720	117	669	0[3]	786	4.7[4]

[1] Natural smolts per brood year represent juveniles that migrated from Lostine River and survived to the smolt life stage as estimated by ODFW"s "Investigations into the Early Life History of Naturally Produced Spring Chinook Salmon and Summer Steelhead in the Grande Ronde River Subbasin" program (BPA project #1992-026-04).
[2] ODFW did not obtain a complete juvenile abundance estimate for migration year 2004.
[3] The estimated number of age 5 returns for brood year 2006 has not yet been completed.
[4] The SAR for brood year 2006 is incomplete.

Appendix Q3. Escapement, as estimated by the NPT and ODFW, of natural and hatchery Chinook salmon returning to the Lostine River, Oregon from 1997-2011 shown with the total number of redds and estimated weir efficiency per year.

Return Year	Total Redd Count	Estimated Weir Efficiency (%)	Age 3 Natural Escapement	Age 3 Hatchery Escapement	Age 4-5 Natural Escapement	Age 4-5 Hatchery Escapement
1997	49	10.9	18	0	130	11
1998	35	10.7	1	0	156	0
1999	57	1536	4	5	68	7
2000	64	15.4	24	64	223	4
2001	131	81.9	13	56	484	165
2002	209	66.7	37	82	358	442
2003	194	59.8	32	164	368	316
2004	189	78.0	41	405	197	837
2005	148	94.0	30	93	146	692
2006	111	82.3	42	105	182	395
2007	104	100.0	3	189	150	272
2008	293	48.0	60	594	382	1,005
2009	258	82.9	123	1,478	522	1,449
2010	696	3.3	64	913	733	3,741
2011	691	1.4	261	1,589	625	2,447

Appendix R. Preliminary data from Imnaha River releases between 1982 and 2011.

Origin (program)	Brood Year	Smolts Released	Returns Age 3	Returns Age 4	Returns Age 5	Total Return	SAR Percent
Hatchery	1982	29,184	156	48	4	208	0.713
(conventional)	1983[1]	59,578	24	18	38	80	0.134
	1984	35,014	55	40	16	111	0.317
	1985	123,530	101	96	9	206	0.167
	1986	199,066	183	269	47	499	0.251
	1987	142,320	69	243	72	384	0.270
	1988[2]	249,793	261	917	700	1,878	0.752
	1989	398,909	98	438	94	630	0.158
	1990	262,586	32	59	12	103	0.039
	1991	157,659	6	62	8	76	0.048
	1992	271,353	82	87	9	178	0.066
	1993[3]	590,069	64	446	225	735	0.125
	1994	91,240	9	66	15	90	0.099
	1995	50,911	79	424	16	519	1.019
	1996	93,108	259	453	145	857	0.921
	1997	194,967	810	2,435	249	3,493	1.792
	1998	179,797	808	2,611	969	4,387	2.440
	1999	123,014	227	869	77	1,173	0.953
	2000	303,737	716	1,394	107	2,217	0.730
	2001	268,426	912	986	45	1,943	0.724
	2002	398,469	241	941	105	1,287	0.323
	2003	435,186	97	935	252	1,284	0.295
	2004	441,680	586	2,489	199	3,274	0.741
	2005	432,530	1,477	1,618	91	3,186	0.737
	2006	348,910	4,234	3,568	330	8,132	2.331
	2007	293,802	1,253	2,107			
	2008	390,064	2,078				
Natural Returns		Redd Counts					
	1982	129	358	704	147	1,209	
	1983[1]	95	77	406	580	1,063	
	1984	113	14	129	154	297	
	1985	462	40	189	81	310	
	1986	284	59	184	113	356	
	1987	183	15	151	100	266	
	1988[2]	237	24	180	386	590	
	1989	116	15	147	95	257	
	1990	115	15	87	65	167	
	1991	178	1	89	41	131	
	1992	240	112	317	51	480	
	1993[3]	468	18	134	162	314	
	1994	154	7	105	97	209	
	1995	60	15	331	54	400	

Appendix R continued

Origin (program)	Brood Year	Smolts Released	Returns			Total return	SAR Percent
			Age 3	Age 4	Age 5		
	1996	136	42	388	324	754	
	1997	224	243	2,097	577	2,917	
	1998	146	87	828	886	1,801	
	1999	190	39	708	137	884	
	2000	261	94	420	88	602	
	2001	635	122	243	32	397	
	2002	1,111	27	262	91	380	
	2003	727	9	109	45	163	
	2004	495	36	229	102	367	
	2005	349	139	419	76	633	
	2006	235	302	713	198	1,213	
	2007	252	163	776		939	
	2008	536	168			168	

[1] Does not include 56,211 Parr released with no marks.
[2] Includes only Ad marked hatchery releases and returns.
[3] Does not include 195,814 smolts released with LV mark.

Appendix S. 2012 Lookingglass Creek Spring Chinook Sport Fishery Proposal

Introduction

The Grande Ronde River spring Chinook hatchery program is part of the Lower Snake River Compensation Plan (LSRCP) developed to mitigate for fish production after construction of the four lower Snake River dams. Hatchery Chinook salmon are produced at LSRCP hatcheries in Washington, Idaho and Oregon. Subsequent adult returns are intended to provide tribal and recreational fisheries and, in some cases, to enhance natural-origin (N-O) spawner numbers. Components of the Grande Ronde River spring Chinook hatchery program operate within the Lostine River, Catherine Creek, upper Grande Ronde River and Lookingglass Creek. This 2012 fishery proposal focuses on hatchery returns to the Lookingglass Creek component of the program.

Management of the Lookingglass Creek spring Chinook hatchery program is guided by the recently developed Lookingglass Creek Spring Chinook Management Plan (Management Plan) (ODFW, CTUIR and NPT 2011) and draft Hatchery and Genetic Management Plan (ODFW 2012). The Program goal as stated in the Management Plan is to "reintroduce spring Chinook into Lookingglass Creek using the Catherine Creek stock to support tributary harvest, natural population restoration, and maintenance of a gene bank for the Catherine Creek stock." An emphasis of this Program, as evidenced by the goal, is to provide tributary harvest to make use of abundant hatchery returns to both Lookingglass Creek and Catherine Creek.

Consistent with the Grande Ronde spring Chinook Fishery Management and Evaluation Plan (FMEP) (ODFW 2011), and other management agreements, the following proposal details a proposed sport fishery plan including; 1) 2012 run projections, 2) a description of the proposed fishery, 3) an analysis of the allowable harvest impacts as it relates to FMEP guidelines, 4) fishery expectations and resulting adult distribution and 5) fishery monitoring and enforcement plans.

Run Projections

ODFW expects a relatively large return of ESA-listed spring/summer Chinook salmon to Lookingglass Creek in 2012. Initial projections suggest a run heavily weighted toward hatchery-origin (H-0) fish, including 1,409 marked hatchery adults. Unmarked, N-O adults are expected to number 265 which is the mean of ODFW and CTUIR estimates (Table 1). We will update run projections based on detections of PIT-tagged hatchery Chinook salmon, in conjunction with historic migration timing, at Lower Granite Dam. Since adequate PIT tag information is not available for the N-O component of the run, we will update projections for the N-O component proportional to the hatchery component. During the fishery, updated run projections from PIT tag detections will be compared with sport harvest creel on a weekly basis to assess sport harvest impacts. Updated run projections and sport harvest impacts will be communicated to NOAA fisheries and co-managers on a weekly basis in a multi-agency harvest forum.

Allowable Sport Fishery Impact

The Grande Ronde Spring Chinook FMEP establishes criteria for implementation of sport fisheries based on expected N-O adult run relative to critical and viable levels for each population in the basin.

Run projections suggest that the Wallowa–Lostine, Lookingglass Creek and Catherine Creek populations will achieve N-O and H-O numbers large enough to consider a fishery (Table 1).

Table 1. 2012 preseason spring Chinook (age 4 and 5 only) projections by population.

Population	*Projected Run Size*		
	Natural	**Hatchery**	**Total**
Catherine Creek	1,060	1,453	2,513
Lookingglass Creek	265	1,409	1,674
Upper Grande Ronde River	66	1378	1,444
Wallowa/Lostine River	1,607	3,820	5,427

Using the current in-season projections, FMEP guidelines provide for an allowable sport fishery impact of 8 natural fish or 3.0% of the run. Given: (1) the hatchery fish harvest scale agreed upon by the fishery co-managers, 336 hatchery fish can be harvested without exceeding the designated N-O impact level (Table 2).

Table 2. Lookingglass Creek adult spring Chinook run projections, proposed allocations (indicating maximum expected sport harvest rate on hatchery fish) and expected outcomes for 2012.

Lookingglass Creek Spring Chinook Run Projections and Distribution, 2012 DRAFT
01-30-12

	Projections, Allocations and Predicted Results	Wild	Hatchery	Total
	Run Projections and Expected Harvest Impacts			
1	Projected adult run	265	1,409	1,674
2	Projected composition	15.8%	84.2%	100.0%
3	Allowable Wild Impact from FMEP	8		8
4	Allowable Wild Fish Handle @ 7.5% hooking mortality	107		107
5	Allowable Wild Impact Rate	3.00%		
6	Maximum sport hatchery fish harvest		336	336
7	Anticipated Tribal Harvest (estimated here as 50% harvest share for our purposes)	26	336	362
	Post-Harvest Allocations			
8	Post Harvest Adult Escapement	231	737	2,190
9	Broodstock Composition Target	30%	70%	100%
10	Broodstock (per AOP)	47	111	158
11	Post Broodstock Escapement	184	626	810

Description of Past Fisheries

Prior to 2001, available records indicate that a season had not been open for salmon in Lookingglass Creek since the late 1930's or early 1940's. No data is available for fisheries at this time, nor would data of this era be relevant today.

In both 2001 and 2002, fisheries were opened to harvest H-O fish of the Rapid River stock, which were being phased out of the hatchery program at that time. The fishery that occurred in 2002 was of relatively small scale, limited to juvenile anglers. A substantial fishery occurred in 2001.

The 2001 season was open May 26 – July 1 with a bag limit 2 adipose/RV clipped salmon per day. Based on statistical creel survey, an estimated 575 fish were harvested with an estimated 34% harvest rate. An estimated 83 marked Chinook were caught and released as were 84 unmarked Chinook.

During 2001, a total of 647 marked and 54 unmarked Chinook were trapped at the Lookingglass Hatchery trap. Of these, 459 marked and 54 unmarked Chinook were released below the hatchery to be recycled through the fishery. It is estimated that approximately 30% of the fish harvested were fish that had been recycled through the fishery.

In 2011, a sport fishery was implemented, made possible by the recently adopted Lookingglass Spring Chinook Management Plan (ODFW, CTUIR and NPT 2011) and the Grande Ronde Spring Chinook FMEP. Results of this fishery are shown in Table 3.

Table 3. Lookingglass Creek spring Chinook sport fishery adult impact for 2011.

Year	Sport Season	Escapement to River[1] (H/W)[2]	Harvest (H)	Released (H)	Released (W)	Impact[3] N (W)	Impact[3] % (H/W)
2011	5/28-7/15	1,014/80	141	4	38	3	13.9/3.8

[1] Draft Lookingglass Creek HGMP 1-18-2012
[2] (H) = Hatchery fish, (W) = Wild fish
[3] Sport impact includes an 7.5% fishery mortality for both hatchery and wild fish caught and released

Proposed 2012 Fishery

Consistent with hatchery program goals, FMEP criteria, and existing management agreements, ODFW proposes a 2012 Lookingglass Creek spring Chinook sport fishery.

Open season: ***May 26 through July 15***
Bag limit: ***Two adipose fin-clipped adult Chinook per day. Five adipose fin-clipped jacks per day, two daily bag limits in possession. (consistent with statewide Oregon salmon bag limit)***
Open area: ***Lookingglass Creek from the Moses Creek Lane Bridge upstream to the confluence of Jarboe Creek (approximately 2 miles)***
Gear: ***Restricted to artificial flies and lures only, otherwise statewide salmon gear restrictions apply (2012 Oregon Sport Fishing Regulations. www.dfw.state.or.us)***

Expected Outcomes

FMEP guidelines provide for a hatchery fish sport harvest. Based on expected average stream flows we estimate that the 2012 fishery could achieve the desired hatchery-origin harvest rate based on results achieved in 2001 and 2011. Flows during much of the 2011 fishery were relatively high. Anglers reported hooking many more H-O adults than were harvested. Many fish hooked were not landed, due to the high water velocities experienced during the high flows. Lookingglass Creek within the fishery areas is relatively steep with few pools for hooking and playing fish. Due to high jack returns in 2011, combined with low percentage of adults landed, the jack harvest was nearly twice that of adults.

Recent experience for Imnaha River spring Chinook sport fisheries suggest angler success is inversely proportional to flow during spring run-off. We expect a similar relationship for the proposed Lookingglass Creek fishery, although creel surveys provide the necessary means to track cumulative impact during the fishery. Data from creel surveys outlined below will be utilized to determine fishery impact on a weekly basis. The season will be closed if projected impact is expected to exceed allowable natural or hatchery fish impact during the following week.

We expect a H-O fish harvest of 336 with an incidental N-O impact of 8 (assumed 7.5% catch and release mortality). These estimates do not account for tribal harvest of N-O and H-O fish. There is the also the potential for outplanting of surplus adult hatchery-origin fish from Catherine Creek, but it is unlikely based on the pre-season run estimates for Catherine Creek. Decisions regarding outplant numbers are generally made in a co-management forum that will determine the actual number of Catherine Creek origin adults released into Lookingglass Creek. Should actual returns to Catherine Creek result in the need to outplant adults in Catherine Creek, these fish will be allocated to harvest with a 50:50 share between sport and tribal fishers. Outplanted Catherine Creek H-O fish not harvested will be passed upstream and the hatchery weir.

In addition to incidental hooking and handling of N-O spring Chinook, we expect ESA-listed Snake River summer steelhead kelts and ESA-listed adult bull trout may also be handled in the fishery. Statistical Creel implemented for the 2001 Lookingglass Creek spring Chinook fishery led to estimates of bull trout and summer steelhead caught. It was estimated that 134 bull trout and 8 summer steelhead were handled by spring Chinook anglers during this fishery. Based on data from the 2011 creel, we estimate that 60 bull trout were caught and released. The potential impact of the proposed fishery on steelhead is well within the impacts described in the Grande Ronde/Imnaha Steelhead FMEP (ODFW 2009). Impacts to both steelhead and bull trout should be reduced due to the gear restriction of artificial flies and lures.

Monitoring and Enforcement Plan

We will conduct a statistical creel survey designed to quantify: 1) angler effort, 2) harvest of marked Chinook and 3) catch and release of unmarked Chinook, bull trout and steelhead. Creel surveys will be conducted during three to four randomly-selected days per week. Sample days will be stratified to emphasize sample collection on weekends and survey start times (early or late) will be varied randomly to insure coverage of dawn and dusk periods. Harvest and catch data will be analyzed on a weekly basis to inform decisions regarding fishery. Weekly updates and a post-season fishery report will be produced and provided to NOAA staff and co-managers.

We will coordinate with local Oregon State Police (OSP) game enforcement staff during our annual Coordinated Enforcement Program meeting. Enforcement of angling regulations during the proposed sport fishery will be designated a “high” priority activity for that time period and OSP will develop patrol strategies to address expected enforcement needs.

References

Oregon Department of Fish and Wildlife (ODFW). 2011. Fisheries Management and Evaluation Plan for Snake River Spring/Summer Chinook – Grande Ronde Subbasin (draft submitted to NOAA Fisheries, June 2011).

Oregon Department of Fish and Wildlife (ODFW). 2012. Lookingglass Creek Spring Chinook Program, Hatchery and Genetic Management Plan (draft submitted to NOAA Fisheries, January 2012).

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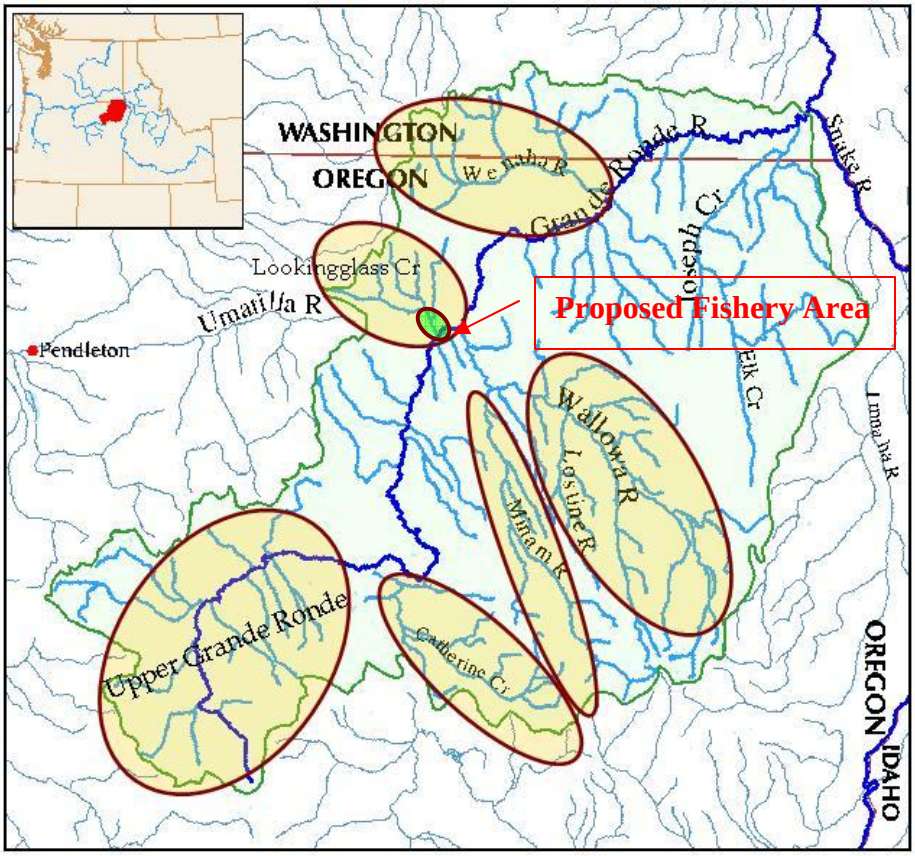

Figure 1. Map of The Grande Ronde sub-basin indicating proposed spring Chinook fishery area (green) and spring Chinook population areas (yellow)

References

Confederated Tribes of the Umatilla Indian Reservation (CTUIR). 2010. Tribal Resource Management Plan. Grand Ronde and Imnaha River Subbasins Spring/Summer Chinook Salmon Treaty Fisheries.

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Appendix T. 2012 Catherine Creek Spring Chinook Sport Fishery Proposal

Introduction

The Grande Ronde River spring Chinook hatchery program is part of the Lower Snake River Compensation Plan (LSRCP) developed to mitigate for fish production after construction of the four lower Snake River dams. Hatchery Chinook salmon are produced at LSRCP hatcheries in Washington, Idaho and Oregon. Subsequent adult returns are intended to provide tribal and recreational fisheries and, in some cases, to enhance natural-origin (N-O) spawner numbers. Components of the Grande Ronde River spring Chinook hatchery program operate within the Lostine River, Catherine Creek, upper Grande Ronde River and Lookingglass Creek. This 2012 fishery proposal focuses on hatchery returns to the Catherine Creek component of the program.

Management of the Catherine Creek program is guided by a Hatchery Genetic Management Plan (HGMP) (ODFW 2011a) that incorporates an adult sliding scale which uses hatchery fish to boost N-O spawner numbers during low N-O returns and manages against negative impacts of the hatchery program by limiting; 1) the number of hatchery fish spawning naturally and 2) the number of hatchery fish in the broodstock. The sport fishery's ability to selectively remove hatchery fish from the system supports the direction provided in the HGMP and acts as an integral part of program management.

Consistent with the Grande Ronde Spring Chinook Fishery Management and Evaluation Plan (FMEP)(ODFW 2011b), and other management agreements, the following proposal details a proposed sport fishery plan including; 1) 2012 run projections, 2) a description of the proposed fishery, 3) an analysis of the allowable harvest impacts as it relates to FMEP guidelines, 4) fishery expectations and resulting adult distribution and 5) fishery monitoring and enforcement plans.

Run Projections

ODFW expects a relatively large return of ESA-listed spring/summer Chinook salmon to Catherine Creek in 2012. Initial projections suggest a run heavily weighted toward hatchery-origin (H-O) fish, including 1,453 marked hatchery adults. Unmarked, N-O adults are expected to number 1,060 (Table 1). We will update run projections based on detections of PIT-tagged hatchery Chinook salmon, in conjunction with historic migration timing, at Lower Granite Dam. Since adequate PIT tag information is not available for the N-O component of the run, we will update projections for the N-O component proportional to the hatchery component. During the fishery, updated run projections from PIT tag detections will be compared with sport harvest creel on a weekly basis to assess sport harvest impacts. Updated run projections and sport harvest impacts will be communicated to NOAA fisheries and co-managers on a weekly basis in a multi-agency harvest forum.

Allowable Sport Fishery Impact

The Grande Ronde Spring Chinook FMEP establishes criteria for implementation of sport fisheries based on expected N-O adult run relative to critical and viable levels for each population in the basin. Run projections suggest that the Catherine Creek, Lookingglass Creek and Wallowa–Lostine populations will achieve N-O and H-O adult numbers large enough to consider a fishery (Table 1).

Table 1. 2012 preseason spring Chinook (age 4 and 5 only) projections by population.

Population	*Projected Run Size*		
	Natural	**Hatchery**	**Total**
Catherine Creek	1,060	1,453	2,513
Lookingglass Creek	265	1,409	1,674
Upper Grande Ronde River	66	1378	1,444
Wallowa/Lostine River	1,607	3,820	5,427

At the projected run size, and as described by the FMEP, we expect a N-O fish impact of approximately 24 (2.26%) fish from the Catherine Creek population (Table 2). Given: 1) the relationship between N-O and H-O run components, 2) an assumption that natural and hatchery fish will be caught at comparable rates, 3) the 10% handling mortality for natural fish handled in the fishery (per FMEP), the sport fishery could harvest up to 329 hatchery fish without exceeding the designated N-O impact level (Table 2). The proposed harvest allowance provides the potential to substantially reduce surplus hatchery fish numbers. Reduction in hatchery fish escapement through harvest complements HGMP guidelines that reduces the use of hatchery fish for broodstock and limits the number of hatchery fish spawning naturally at projected escapement levels.

Table 2. 2012 Catherine Spring Chinook Run Projections and Distribution Draft 1-30-12

	Projections, allocations and Predicted Results	Wild	Hatchery	Total
	Run Projections and Expected Harvest Impacts			
1	Projected adult run to Catherine	1060	1453	2513
2	Projected Composition	42.18%	57.82%	100.00%
3	Allowable Wild Impact from FMEP	24		
4	Allowable Wild Impact Rate	2.26%		
5	Allowable Wild Handle @ 10% Hooking Mortality	240		
6	Resulting proposed sport harvest/impact	24	329	353
7	Resulting tribal harvest	67	329	396
8	Total sport and tribal harvest	91	658	749
	Post Harvest Allocations and Predicted Results			
9	Post Harvest Total Adult Escapement	969	795	1764
10	Post harvest/broodstock total adult escapement	918	756	1674
11	Natural escapement to weir @ 0.9311of total return and assuming 50% of sport and 25% tribal harvest below weir	960	1106	2066
12	Handled at weir @ .908 trap efficiency	872	1004	1876
13	Broodstock Composition Target	56%	44%	100%
14	Broodstock per AOP	51	39	90
15	Available at weir after broodstock	821	965	1786
16	Number naturally passing weir @ .908 trap efficiency	88	102	190
17	Total upstream of weir for harvest/impact	62	411	473
18	Total passed upstream of weir for harvest/impact	0	411	
19	Total upstream of weir for natural production	898	656	1554
20	Total passed upstream of weir for natural production	872	554	1426
21	Available for outplanting		0	
22	Total Passed upstream	872	965	1837

Description of Past Fisheries

There have been no spring Chinook sport fisheries on Catherine Creek since 1978. Annual Catch estimates of Catherine Creek spring Chinook from punch card returns,1969 through 1978, average 30 (Range 0-124). However, there are no available abundance data by which to calculate harvest rates. As a result, estimates of harvest from those earlier fisheries provide little insight into potential sport fishery impacts for the proposed fishery. One factor that will be considerably different from past fisheries is angler access. There is very little public land along Catherine Creek, which today will be a significant factor limiting this fishery. Historic fisheries would have had much better access available for anglers as private lands were much more open to public use.

Proposed 2011 Fishery

Consistent with hatchery program goals, FMEP criteria, and existing management agreements, ODFW proposes a 2012 Catherine Creek spring Chinook sport fishery.

Open season: ***May 26 through July 15***
Bag limit: ***Two adipose fin-clipped adult Chinook per day. Five adipose fin-clipped jacks per day, two daily bag limits in possession. (consistent with statewide Oregon salmon bag limit)***
Open area: ***Catherine Creek from the Miller Lane Bridge (downstream from Union), upstream to the Hwy 203 bridge, upstream from Catherine Creek State Park (Figure 1)***
Gear: ***Statewide salmon gear restrictions apply (2011 Oregon Sport Fishing Regulations. www.dfw.state.or.us)***

Expected Outcomes

FMEP guidelines provide for a hatchery fish sport harvest. Recent experience for Imnaha River spring Chinook sport fisheries suggest angler success is inversely proportional to flow during spring run-off. We expect a similar relationship for the proposed Catherine Creek fishery, although creel surveys provide the necessary means to track cumulative impact during the fishery. Due to limited publicly accessible fishing areas, we do not expect to achieve the harvest described in this plan. The Proposed fishery should prove very useful in understanding the sport harvest potential on Catherine Creek. Data from creel surveys outlined below will be utilized to determine fishery impact on a weekly basis. The season will be closed if projected impact is expected to exceed allowable natural or hatchery fish impact during the following week.

The proposed sport fishery will occur both above and below the CTUIR operated weir which is used for enumeration, broodstock collection and to adjust escapement of hatchery adults upstream to meet weir management guidelines (ODFW 201a; Zimmerman 2002). Because sport harvest is planned upstream of the weir and we assume tribal harvest will occur above the weir as well, the number of hatchery fish released above the weir will include the number for natural escapement as described in the Annual Operating Plan, HGMP (ODFW 2011a) and Zimmerman (2002), and hatchery fish intended for harvest. For the sport fishery we have made the assumption that 50% of the sport harvest will occur upstream of the weir. Therefore, 50% of the allocated sport harvest will be passed upstream of the weir. We assume that 75% of tribal harvest will occur above the weir, so these fish will be passed

upstream as well. Based on run projections, expected sport and tribal harvest, management strategies and estimated trapping efficiency, implementation of this fishery proposal will result in the following distribution of adults:

- 918 or 87% wild adult fish spawning in Catherine Creek;
- 756 or 52% hatchery adults spawning in Catherine Creek;
- 51 natural and 39 hatchery adults utilized for hatchery broodstock (56% wild);
- An estimated recreational harvest of 329 hatchery adults;
- An expected incidental handling mortality of 24 naturally-produced Catherine Creek adults.

These estimates assume sport and tribal harvest as described in Table 2. Failure of sport and tribal fisheries to perform as specified could lead to the need for removal of hatchery adults to meet weir management guidelines. Current co-manager agreements allow for outplanting of Catherine Creek adults for natural production in Indian Creek and in Lookingglass Creek for fisheries and natural production. At the proposed run level, the intent of the Catherine Creek hatchery program is to maintain broodstock and natural spawner composition in Catherine Creek above the weir as identified in lines 17 and 19 in Table 2, respectively. This fishery plan is an integral component of hatchery program management and is intended to provide an alternate outlet for hatchery fish identified as surplus to broodstock and natural spawning.

Monitoring and Enforcement Plan

We will conduct a statistical creel survey designed to quantify: 1) angler effort, 2) harvest of marked Chinook and 3) catch and release of unmarked Chinook, bull trout and steelhead. Creel surveys will be conducted during three to four randomly-selected days per week. Sample days will be stratified to emphasize sample collection on weekends and survey start times (early or late) will be varied randomly to insure coverage of dawn and dusk periods. Harvest and catch data will be analyzed on a weekly basis to inform decisions regarding fishery. Weekly updates and a post-season fishery report will be produced and provided to NOAA staff and co-managers.

We will coordinate with local Oregon State Police (OSP) game enforcement staff during our annual Coordinated Enforcement Program meeting. Enforcement of angling regulations during the proposed sport fishery will be designated a "high" priority activity for that time period and OSP will develop patrol strategies to address expected enforcement needs.

References

Oregon Department of Fish and Wildlife (ODFW). 2011a. Catherine Creek Spring Chinook Program, Hatchery and Genetic Management Plan (draft submitted to NOAA Fisheries, May 2011).
Zimmerman, B. 2002. Grande Ronde Basin Spring Chinook Hatchery Management Plan.

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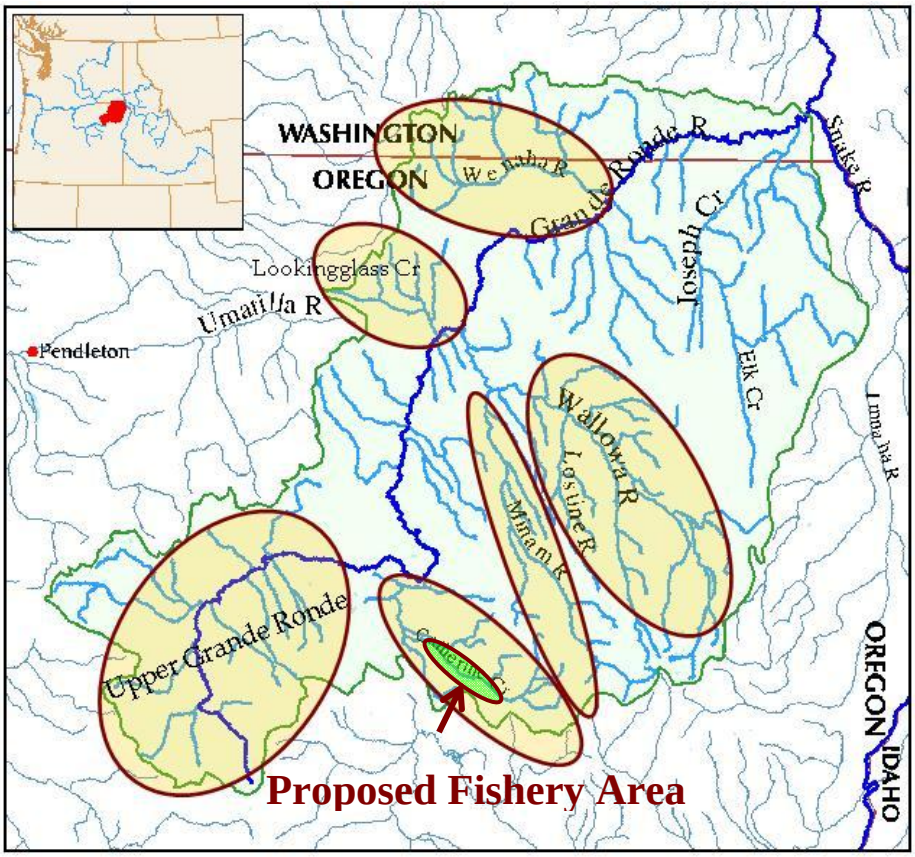

Figure 1. Map of The Grande Ronde sub-basin indicating proposed spring Chinook fishery area (green) and spring Chinook population areas (yellow).

Appendix U. Wallowa Fall Broodstock Experiment Background and Objectives

The Grande Ronde steelhead hatchery program was initiated in the late 1970s as part of the Lower Snake River Compensation Plan (LSRCP) to mitigate for Oregon harvest opportunity lost by construction of the four lower Snake River dams. The founding parents for the Wallowa program were endemic to the Snake basin and the resulting stock is a proven, productive hatchery population that has reestablished a fishery with effort, catch rates, and harvest levels similar to historic, pre-dam levels (Flesher et al. 2011). The LSCRP program goal of returning 9,184 adults to the compensation area was met in 1997-98 and every year since 2001-02 (Warren et al. 2011).

Prior to closure of the native steelhead fishery in 1974, the majority of harvest opportunity occurred in the lower Grande Ronde River during fall (Carmichael et al. 1990), whereas with the current hatchery stock peak harvest typically occurs in the spring (Flesher et al. 2011). This apparent shift in timing of harvest opportunities may be associated with selection of the founding parents. The Wallowa stock was sourced from collections of Snake River steelhead during spring at Ice Harbor and Little Goose dams, and incorporated embryos from Pahsimeroi Fish Hatchery, Idaho. Since 1979, Wallowa stock adults returning to Wallowa Hatchery, Big Canyon, and Cottonwood traps (WA) have been utilized as broodstock.

Most Wallowa stock steelhead migrate through the Columbia River corridor in mid-summer, when water temperatures are warmest; a behavior that may encourage migrants to use relatively cooler mid-Columbia tributaries, particularly the Deschutes River, as thermal refuge. Once they enter the mouth of the Deschutes River, Wallowa stock steelhead are apparently more likely to stray far upriver than are other hatchery stocks. Managers hypothesized that the earliest returning portion of the Wallowa stock run—those adults that traveled through the Columbia River mainstem quickly and arrived in the Grande Ronde River in the fall—would produce progeny that would be less likely to stray. Therefore, in response to straying concerns, co-managers agreed to modify the Wallowa program to reduce impacts of hatchery releases on out-of-basin native stocks.

The desire to increase fall harvest opportunities in the lower Grande Ronde River, combined with efforts to reduce straying of Wallowa stock steelhead in the Deschutes basin, provided impetus for the Wallowa fall broodstock experiment. By creating an alternate brood line of Wallowa stock steelhead collected from the lower Grande Ronde River in fall, the progeny were expected to contribute to the following objectives:

1. Modify run-timing to emphasize fall-entry to the Grande Ronde River
2. Reduce recoveries of Wallowa stock steelhead in the Deschutes River
3. Enhance fishing opportunities in the lower Grande Ronde River in fall
4. Maintain successful stock performance measures exhibited by the standard Wallowa stock

Volunteers collected 109, 109, 115, and 77 hatchery steelhead via hook-and-line during Octobers of 2003 through 2006. Collections occurred in the Grande Ronde River mostly between the Oregon-Washington state lines upstream to Wildcat Bridge. After capture, fish were placed in a PVC tube and held in-river. Within 24 h of capture, fish were transported to Wallowa Hatchery and held until spawning the following spring.

Fall broodstock (hereafter, fall brood) fish were spawned separately from standard Wallowa production fish (hereafter, production). All fall brood progeny were marked with an adipose and right ventral (RV) fin clip to distinguish them from production fish when they return as adults. To evaluate the objectives of the experiment four groups of fall brood progeny, and four groups of standard production were PIT and coded-wire tagged to

monitor migration timing into the Columbia River and its tributaries, and determine smolt to adult survival and straying rates (Gee et al. 2008).

Experiment Summary

During the course of this experiment, two generations of the fall brood line have been released. The first (or F1) generation consisted of direct progeny from angler-collected adults, and were released from spring 2005-2008. The two-salt component of the 2008 release returned in 2010; therefore, data for the first generation is nearly complete, pending some coded wire tag recoveries. The second (or F2) generation consists of progeny of the fall brood line that returned as adults, and were released as smolts in 2009-2011 (the fourth year of the F2 generation is now being raised at the hatchery). Currently, straying data based on coded-wire tag recoveries is not available for this generation, and PIT tag derived data only consists of one complete brood year (2008), and the 1-salt component of the 2009 brood year.

Using data collected from four brood years of the F1 generation, and one-and-a-half brood years of the F2 generation, the following summarizes the experiment to date within the context of the aforementioned objectives:

Modify run timing to emphasize fall-entry into the Grande Ronde: At Lower Granite Dam (the nearest PIT tag monitoring site to the Grande Ronde River), the F1 generation of fall brood returned, on average, three weeks (25 d) earlier than production returns. Average median run timing dates where 11-Sept and 6-Oct for the fall brood and production lines, respectively. The preliminary data collected suggests that run timing remains earlier for the F2 generation of fall brood, although the difference is approximately one week (9 d; 25-Sept and 4-Oct for fall brood and production, respectively).

Reduce recoveries of Wallowa stock steelhead in the Deschutes River: Stray rate indexes (coded-wire tag recoveries not adjusted for temporary use by steelhead) were not appreciably different between fall brood and production lines, and were actually higher for brood years 2004 and 2006. Data also indicates that stray rate indexes for both fall brood and standard production have declined during the experiment, and declines may be correlated with reduced barging rates of Snake River steelhead.

Enhance angling opportunities in the lower Grande Ronde River in fall: Data collected from the 2006-07 to 2008-09 run years (F1 generation of fall brood only) suggest that 51% of fall brood harvest occurred during the fall (from September to November), whereas only 23% of the production line were harvested during the same period. Similarly, the calculation of a harvest index (fish harvested / fish available in the fishery) also indicated that the fall brood fish were harvested at higher rates than the production line during the fall lower Grande Ronde River fishery (e.g., 10X higher in October). Although both groups contributed at similar rates across the LSRCP compensation area, the fall brood line appeared to contribute at higher rates within Oregon tributaries, whereas the production line contributed at a slightly higher rate within the Snake River and associated tributaries (excluding the Grande Ronde River).

Maintain stock performance to meet program objectives: For brood years 2004-2009 length-at-release; survival, and travel times from release to Lower Granite Dam were similar between fall brood and production groups. Smolt-to-adult survival to Bonneville Dam was consistently higher for the F1 generation fall brood line than for the production line (mean difference of 32%). Preliminary data from the F2 generation indicate that survival remained higher for the brood year 2008 fall brood release, but the 1-salt component of the BY 2009 release did not appear to survive to adulthood at a higher rate than the production line. Age-at-return for the fall brood line was skewed towards 1-salt fish compared with the production line. The composition of 1-salt

returns in the F1 generation of fall brood averaged 80.5% (range 67.7-89.7%) compared to 70.8% (range 61.7-77.0%) for the production line.

Migration timing for the F1 generation of fall brood was successfully shifted three weeks earlier at lower Granite Dam. However, the earlier migration timing exhibited by fall brood line did not appear to reduce utilization (temporary or permanent straying) by Wallowa steelhead in the Deschutes. Other factors such as transportation rates may prove to have a greater causal effect on stray rate indexes than stock migration timing. In addition, the opportunity to remove stray steelhead has increased greatly within the Deschutes basin provided the recent increase in research infrastructure (i.e. weirs). Together, changes in transportation rates and active removal may be a more effective means of reducing stray rates in the Deschutes than broodstock management.

Earlier migration timing of the fall brood line does, however, show promise in enhancing fishing opportunities in the lower Grande Ronde River fishery in fall. Relatively higher harvest indexes during the fall, and in Oregon tributaries, support that earlier run timing at Lower Granite Dam was associated with fall entry to the Grande Ronde River. In addition, the fall brood line may provide well-balanced angler opportunity throughout the run year, as contributions to spring fisheries in Oregon compensation areas were also substantial. That said the higher harvest rates observed in the fall brood line may also be due to attributes other than run timing.

The harvest benefits provided by the fall brood line may be, in part, due to a higher proportion of 1-salt fish in the returns. As noted, the first generation of fall brood releases exhibited higher smolt-to-adult survival rates, which is likely related to a higher proportion of the return suffering one less year of ocean mortality. Although higher survival rates would result in more adults in the fishery area, younger and smaller-sized adults may not be desirable for anglers. In addition, if the fall brood smolt-to-adult survival advantage does not continue through later generations, the harvest contribution advantage may also not continue.

In summary, we recommend gradually increasing the production of the fall brood line within the Wallowa steelhead program from current target releases of 160,000 to 400,000 by 2014. With increased production the fishery benefits seen during the experiment can be better realized for the angler; as smaller, experimental groups (~20% of total production) have constituted the fall brood releases to date. Gradually increasing production (by 24 females or 40,000 smolts) will better allow broodstock goals (numbers, spawn timing) to be met at Wallowa Hatchery. In addition, maintaining the production line will continue to provide harvest benefits and, pending long-term efficacy of the fall brood line (see *Information Needs* below), will be available should managers choose to revert back to the production line.

Recommendations for BY 2012

Brood take / Production: Spawn 72 females to create 240,000 smolts from the fall brood (30% of total production). Reduce production releases accordingly to maintain total release levels at 800,000 smolts.

Rearing: Continue releasing fall brood production from Wallowa Hatchery to consolidate spawning.

Marking: Maintain current tagging and marking to assess whether the F3 generation performs similarly to the F1 generation.

Recommendations for BY 2013 and beyond

Brood take / Production: For brood year 2013, spawn 96 females to create 320,000 smolts from the fall brood line (40% of total production). For brood year 2014, spawn 120 females to produce 400,000 smolts from the fall brood line (50% of total production). Reduce production releases accordingly to maintain total release levels at 800,000 smolts.

Increasing production beyond BY 2014 will depend on our ability to manage the fall brood line in a fashion that: maintains the run timing, stock performance, and harvest benefits consistent with results of the F1 generation; while offering a size-at-return similar to the production line, and harvest opportunity during both fall and spring periods. In addition, final production goals will need to consider rearing space allocations at both Irrigon Hatchery and acclimation facilities, and feasible broodstock collection protocols for hatchery staff.

Long-term management of the fall brood line will likely include occasional 'refreshing' of the broodstock with adults collected via angling in the fall Grande Ronde fishery. We expect refreshing the fall brood line will act to sustain run timing differences observed in the F1 generation, and diversify the genetic makeup of the broodstock. Tentatively, we will plan to refresh the fall brood line during the fall of 2013. Long term strategies may employ a focused one to two-week effort as occurred in 2003-2006, or a dedicated group of volunteer anglers that collect fish throughout the fall period.

Rearing: Long term rearing strategies will ultimately depend on desired production goals for the fall brood line, our ability to differentially mark the fall brood and production lines, and brood take needs.

Marking: Long term tagging and marking strategies will largely be determined when data from the F2 generation is complete. However, to maintain two steelhead lines will require differential marking, which is currently accomplished using left and right ventral clips.

Coordination with Washington: The state of Washington currently uses Wallowa-stock steelhead in the Cottonwood program (lower Grande Ronde River) releases. Currently, Washington is considering utilizing the Wallowa fall brood line for the cottonwood program, depending on results of the current experiment. We will continue to coordinate with the state of Washington, understanding that any desire to use fall brood Wallowa steelhead in Washington programs will affect brood take goals at Wallowa Hatchery.

Information Needs

As production is increased over the next few brood years, information gaps need to be resolved in order to fully utilize the fall brood line in the long-term. The younger age-at-return of the fall brood line is not necessarily a desirable trait, and may also be confounding the harvest benefits observed in the F1 generation. Going forward, we will require information on whether age-at-return can be better aligned with the production line, and if the harvest benefits persist with older fish.

Preliminary data from the F2 generation, although incomplete, may suggest that the desirable traits selected for in the F1 generation may be reduced in subsequent generations (e.g., run-timing, smolt-to-adult survival). It may be necessary to regularly infuse the fall brood line with fall-collected adults; the rate and amount of which may determine the cost-effectiveness of this strategy in the long-term.

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