

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

**FOR THE PERIOD OF  
JANUARY 1 – DECEMBER 31, 2014**

**PREPARED BY:  
OREGON DEPARTMENT OF FISH AND WILDLIFE  
CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION  
NEZ PERCE TRIBE**

**FOR  
LOWER SNAKE RIVER COMPENSATION PLAN  
U.S. FWS ADMINISTRATION**

**and  
BONNEVILLE POWER ADMINISTRATION**

**March 5, 2014**

In Attendance November 25, 2013 pre-AOP: CTUIR (McLean, Boe), ODFW (Aschenbrenner, Bailey, Blessing, Bratcher, Deal, Elmore, Flesher, Garst, Gaston, Harrod, Herold, Hoffnagle, Jonasson, Myatt, Woods, Yanke), NPT (Johnson, Vogel, Zollman).

In Attendance January 14, 2014 AOP: CTUIR (Boe, McLean, Crump), ODFW (Aschenbrenner, Bailey, Blessing, Clarke, Deal, Feldhaus, Flesher, Garst, Harrod, Helwick, Hoffnagle, Lauman, Myatt, Onjukka, Skendzel, White, Woods, Yanke), LSRCP (Starr, Yundt), NPT (Cleary, Edwards, Espinosa, Johnson, Vogel, Zollman).

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# Steelhead (Oncorhynchus mykiss)

## I. Summer Steelhead - 2013 Brood Year (Grande Ronde & Innaha basins)

*This is the sixth year for releasing smolts from adults returned from fall collected brood stock evaluation. Fall component is 320,000 smolts with 75,000 AdRV + CWT, and 165,000 AdRV only, being released at Wallowa Fish Hatchery and 25,000 Ad + CWT and 55,000 Ad only being released at Big Canyon. A portion (~8,800 smolts) of the fall collected brood smolts are implanted with a PIT tag. There is one, paired release from spring-collected brood with 25,000 AdLV + CWT and PIT tags. The identifying external difference is the ventral fin clip.*

**A. Allocations** –The estimated number of smolts from Irrigon is 1,095,000 fish weighing 224,091 pounds. A total of 840,000 are Wallowa stock. The early group that consists of 336,000 will be transferred at 5.5 fish per pound (fpp). The remaining 504,000 will be transferred at 4.5 (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 255,000 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

### I. Schedule

- a. Wallowa Acclimation:** Approximately 504,000 smolts will be transferred from Irrigon Hatchery to Wallowa Hatchery acclimation ponds in 2014.

Early Group: Approximately 336,000 smolts will be released after 10 weeks of acclimation			
Location	Transfer in date	Release dates	Comments
Lower Acclimation Pond	Jan. 21-22	April 6-Sun	The screens in the lower sections will be pulled on April 6 allowing fish to leave for 1 day. On April 7, the remaining fish will be forced out of the lower pond.
		April 7-Mon	
Upper Acclimation Pond	Jan 23-24	April 7-Mon	The screens in the upper sections will be pulled on April 7. On April 8, the remaining fish will be forced out.
		April 8-Tues	
Note: Approximately 50,000 smolts released will be used for fall brood evaluations.			
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 8-9	April 20-Sun	The screens in the lower section will be pulled on April 20 allowing fish to leave for 12 days. On May 2, the remaining fish will be forced out.
		May 2-Fri	
Note: Approximately 25,000 smolts released will be used for fall collected brood evaluations.			

- b. Big Canyon Acclimation:** Approximately 336,000 smolts will be transferred from Irrigon Hatchery to the Big Canyon acclimation ponds, 168,000 in the early group and 168,000 in the late group.

Early Group: Approximately 168,000 smolts will be released after 5 to 7 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
Lower Acclimation Pond	Feb 24 Mon	April 15-Tues	The screens in the lower sections will be pulled on April 15 allowing fish to leave for 24 hours. On April 16, the remaining fish will be forced out of the lower pond.
		April 16-Wed	
Upper Acclimation	Feb 25 Tue	April 16-Wed	The screens in the upper sections will be pulled

Pond		April 17-Thur	on April 16 allowing fish to leave for 24 hours. On April 17, the remaining fish will be forced out of the lower pond.
Note: Approximately 25,000 smolts released will be used for fall collected brood evaluations.			

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	April 24 - Thur	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.
		May 7 - Wed	
Upper Acclimation Pond	April 18	April 25-Fri	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.
		May 7-Wed	
Note: On May 7, ODFW Fish Research will sample smolts in the acclimation pond. If >70% of the sample contains <i>males</i> , 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 255,000 smolts will be transferred to the Little Sheep Acclimation facility for release in Little Sheep.

Acclimation. Approximately 255,000 smolts will be released after 4 to 8 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
Acclimation Pond	Feb 26-Feb 28	March 26- Wed	Screens will be pulled on March 26 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 22 release date.
	March 3	April 22 - Tues	
Note: Prior to forced release, ODFW Fish Research will sample smolts in the acclimation pond. If >70% of the sample contains <i>males</i> , remaining fish will be estimated and up to 7,500 fish released in Kinney Lake.			

- d. Big Sheep Direct Release:** Beginning in 2011, smolts targeted for direct release into Big Sheep will instead be transferred to Little Sheep Acclimation facilities, because of safety concerns with the bridge to access the release location in Big Sheep. Planning goal for 50,000 smolts.

### **C. Monitoring and Evaluation**

#### **1. Summary of marked steelhead for release in 2014**

Comparative survival studies (CSS) continue for the sixth consecutive year for steelhead with 14,000 PIT tagged fish released in 2014 (Table 5). PIT tagged released fish are a representative sample of the marked population.

##### **a. Wallowa**

- 177,000 AdRV
- 75,000 AdRVCWT
- 25,000 AdLVCWT
- 152,000 Ad
- 75,000 Ad CWT

##### **b. Big Canyon**

- 50,000 Ad CWT
- 202,000 Ad only
- 25,000 FB Ad CWT

- 59,000 FB Ad
- c. **Little Sheep**
  - 187,500 Ad
  - 25,000 AdCWT
- d. **Big Sheep** (volitional release into Little Sheep)
  - 42,500 Ad

**2. Pit Tagging** Pit tagging is scheduled for December 2013 (Table 5).

- a. Wallowa - 13,700
- b. Big Canyon - 8,800
- c. Little Sheep – 17,000
- d. Big Sheep – 5,000

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

**4. Irrigon Hatchery** –Irrigon staff do not need to measure fish lengths for the Big Sheep release in 2014.

**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, Jonasson and P. Keniry (ODFW), Harbeck and Young (NPT), and Putnam (IDFG) of steelhead releases.

**II. Summer Steelhead - 2014 Brood Year - Wallowa Stock**

*The LSRCP mitigation goal is 9,184 adults above the project area.<sup>1</sup>*

**A. Smolt Goal** – Produce 800,000 smolts at 4.0 fpp for release in 2015. Target production includes:

1. 400,000 Production
2. 400,000 Fall Brood

**B. Egg Take Goal** – Collect 1,165,500 green eggs to produce 1,025,600 eyed eggs (88% survival green to eyed eggs). Transfer 1,025,600 eyed eggs to Irrigon Hatchery to produce 800,000 smolts (78% survival eyed eggs to smolt).

**C. 2014 Adult Collection**

**1. Predicted Run** (Table 3)

- Marked – 2,634 (3,389 based on PIT tags)
- Unmarked – 48
- Total – 2,682
- a. **Wallowa Hatchery**
  - Marked – 1,580 (491-2,667 95% CI); 2,112 based on PIT tags
- b. **Big Canyon Satellite**
  - Marked – 1,054 (247-1,861 95% CI); 1,277 based on PIT tags
  - Unmarked – 48 (6-89 95% CI)
  - Total – 1,102

## **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 ~2,000 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 ODFW Wallowa District has requested 100 fish in Marr Pond and 70 fish in Wallowa wildlife pond. Stocking should occur by April 3<sup>rd</sup>. 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 (Ad) adults will be released, but will be sampled for CWT recovery. Surplus hatchery fish will be provided to local food banks or landfill.

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).

4) *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 50% Production Brood and 50% Fall Brood. Some Fall Brood production may be collected from angler-caught fish in the Lower Grande Ronde steelhead fishery during the previous fall (October). Upon capture, fish will be briefly held in tubes, transferred to Wallowa Hatchery, and held until spawn. Collection activities will be led by the Wallowa District and will be dependent on fish returns and volunteer resources.

- a. **Broodstock Needs** –A total of 468 adults should be spawned to meet production goals.
  - Males – 234 (117 Ad or AdLV and 117 RV)



- Females – spawn 234 (117 Ad or AdLV and 117 RV).  
The five-year average fecundity is 5,000 eggs per female.

## **2. Wallowa Hatchery Spawning Guidelines**

- a. **Expected 1st Spawn** – Wednesday, March 5.
- b. **Spawning Dates** – Wednesday.
  - March 5 – RV's from holding pond/trap
  - March 12 – 17 females (Ad or AdLV); RVs as needed
  - March 19 - 22 females (Ad or AdLV); RVs as needed
  - March 26 - 26 females (Ad or AdLV); RVs as needed
  - April 2 - 23 females (Ad or AdLV); RVs as needed
  - April 9 - 18 females (Ad or AdLV); RVs as needed
  - April 16 – 11 females (Ad or AdLV); RVs as needed
- c. Brood needs for the fall brood production are 234 pairs (50% of total production). We expect that 21 angler-caught adults will be available for spawning from captures in October 2013. Therefore, the first 213 RV clipped fish trapped will be held. After 213 adults have been collected, all remaining fall brood fish (RV) captured will be killed and not spawned. Additional mortality of angler-caught fish currently held at Wallowa Hatchery may occur. In this case, the balance will be collected from Wallowa Hatchery returns. In-season adult collection adjustments will be made depending on mortality and spawning success. Ripe fish will be spawned weekly. A total of 234 (117 males and 117 females) will be spawned (Appendix J).
- 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.

1. **Standing Transfer Goal** - Will be transferred to Wallowa Hatchery in January at 5.5 fpp. Standing goal is 4.5 fpp for April and May releases, but water shortage requires January transfer.
  - a. **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 Oxbow Reservoir. Co-managers are looking for other water body options should there be a large excess of fish. Excess smolts will not be marked.
  - b. **Progeny** from fall brood will be segregated.
2. **No Wallowa stock will be graded.**

## **H. Fish Health**

### **1. Broodstock Monitoring Plan** (Appendix B).

- a. Treatment plan: Formalin bath treatments for hook and line caught fall brood as needed to control fungus under a veterinary prescription

### **b. Disinfection and Sanitation Guidelines** (Appendix C).

## **I. Monitoring & Evaluation**

1. **Proposed marking includes:**

- a. **Wallowa** (480,000 total; 320,000 first acclimation and 160,000 second acclimation)
  - 240,000 total production (75,000 AdCWT; 25,000 AdLVCWT; 140,000 Ad only)
    - 50,000 AdCWT first acclimation
    - 25,000 AdLVCWT first acclimation
    - 25,000 AdCWT second acclimation
    - 140,000 Ad
  - 240,000 total Fall Brood (50,000 AdRVCWT, 190,000 AdRV)
    - 25,000 AdRVCWT first acclimation
    - 25,000 AdRVCWT second acclimation
    - 190,000 AdRV
  - 40,000 total production transferred to Cottonwood Facility, WA\* (contingent on funding)
    - 25,000 AdCWT
    - 15,000 Ad only
  - 40,000 Ad only transferred from Lyons Ferry Hatchery (contingent on funding)
  
- b. **Big Canyon** (320,000 total; 160,000 in the each period)
  - 160,000 total production (50,000 AdCWT, 110,000 Ad only)
    - 25,000 AdCWT first acclimation
    - 25,000 AdCWT second acclimation
    - 110,000 Ad only
  - 160,000 total fall brood (50,000 AdCWT, 110,000 Ad only)
    - 25,000 AdCWT first acclimation
    - 25,000 AdCWT second acclimation
    - 110,000 Ad only (Fall Brood)

2. **Tagged groups** are summarized in Table 4.

3. **PIT-tagging** in each release group.

**a. Wallowa**

- Total production 13,700
  - Transferred to Cottonwood Facility 4,000
  - Transferred to Lyons Ferry Hatchery 4,000
- Fall brood 6,600

**b. Big Canyon**

- Total production 2,200
- Fall brood 2,200

4. **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.

**III. Summer Steelhead - 2014 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.<sup>1</sup>*

**A. Smolt Goal** — Produce 215,000 smolts at 4.5 fpp for release in 2015.

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).

- a. Marked – 817 (0-1,754 95% CI; (381 males and 436 females); 917 based on PIT tags
- b. Unmarked – 136 (60-226 95% CI); (55 males and 81 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 – 132 (18.2% wild) Males – 66
- Females – 66
- Broodstock numbers were determined based on a fecundity of 4,800.
  - a. **Wild** broodstock – 12 males and 12 females needed for brood. Release remainder above the weir. Approximately 112 wild fish (82%) will be released above Little Sheep weir.
  - b. **Hatchery** broodstock – 54 males and 54 females are needed for brood. Approximately 138 hatchery adults will be released above the Little Sheep weir.

<u>Week Ending</u>	<b>Wild – keep 24</b>		<b>Hatchery – keep 108 (+4 males)*</b>	
	<u>Avg. % by Week</u>	<u>Number Kept</u>	<u>Avg. % by Week</u>	<u>Number Kept</u>
March 19	5.4	1	6.9	7
March 26	9.7	2	8.6	9
April 2	8.6	2	12.6	14
April 9	16.0	4	18.8	20 (+1 male)
April 16	16.5	4	19.2	21 (+1 male)
April 23	15.2	4	13.9	15 (+1 male)
April 30	14.8	4	11.6	13 (+1 male)
May 7	9.2	2	5.7	6
May 14	2.6	1	1.8	2
May 21	1.3	0	0.7	1
May 28+	0.7	0	0.2	0
Totals		24		108+4=112

- \* Keep one extra hatchery male per full week in April
- \* Pass five hatchery fish for every four wild fish passed, match sex ratios
- \* Last spawn can include the last fish in the Table and added to the May 14 egg take
- \* If short for a particular week, make up the difference at the first opportunity

**3. Disposition of Trapped Fish**

- a. **Wild** – Keep 24 wild fish (total wild fish collected is estimated at 55 males and 81 females). Wild composition in hatchery brood is estimated at 18.2%. 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 112 fish with a wild composition of 44.8% for natural spawning.

- b. **Hatchery** – Keep 108 hatchery fish plus one additional male each time the trap is operated in April. Five hatchery fish should be released above the weir for every four wild fish released above the weir. 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.
- 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. NPT will provide staff and vehicle for Big Sheep adult outplants.
- h. **Surplus fish** may be used for distribution (food bank).
- 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. If IHNV prevalence  $\geq 30\%$  then nutrient enrichment would have to stop.
- 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.

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

<b>Mark</b>	<b>Disposition</b>
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.

## **F. Spawning Guidelines**

1. **Little Sheep Satellite**
  - **First Spawn** - March 18.
  - **Expected Spawning Frequency** – Weekly on Tuesdays.
2. **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.

### **G. Incubation Strategies**

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

### **H. Rearing Program**

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

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

### **I. Fish Health** - Monitoring Plans

1. **Broodstock Monitoring Plan** (Appendix B)
2. **Disinfection and Sanitation Guidelines** (Appendix C).

### **J. Monitoring & Evaluation**

1. **Proposed marking includes:**
  - a. **Little Sheep:**
    - 25,000 AdCWT
    - 154,000 Ad only
  - b. **Big Sheep**
    - 36,000 Ad
2. **Tagged groups** are summarized in Table 4.
3. **PIT tagging** in each release group (Table 5).
  - a. Little Sheep – 17,000
  - b. Big Sheep – 5,000
4. **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.
5. **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 broodstock are sampled.

### **K. Key contacts**

1. **ODFW** (Flesher, Clarke) will provide ODFW (Yanke), NPT (B. Johnson, Hesse, Vogel, Harbeck, Young) and CTUIR (Zimmerman, 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 - 2014**

*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**
  - **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.

- **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

- **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.
- **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).
- **Live, clipped captures or clipped mortalities** - Enumerate, fork length, maturity, migration status, sex, marks/tags, condition. At CC, UGRR, and LGCR weir 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. At LGCR, steelhead will be euthanized. If staff from both ODFW and CTUIR are present when the trap is checked, ODFW will euthanize them. If only CTUIR staff are present, any hatchery-origin fish will be put in a holding pen in the trap, ODFW hatchery staff notified, and ODFW will euthanize. AT CC and UGRR, 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).
- **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.*

- **Adult Escapement** – Population estimate using mark-recapture methodology.
- **Live unclipped first time captures** - LR unclipped steelhead will have the following noted: number captured, direction of capture (upstream or downstream), fork length, 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).
- **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.

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

- **Adult Escapement** - Enumeration using floating weirs with standoff structures going to the bank and a PIT tag array.
- **Wild/Hatchery** – No broodstock collection. Trap, collect data, and release only.
- **Kelts** – No broodstock collection. Trap, collect data, and release only.
- **Period of Trap Operation** – January through June, or until 10 days after last capture. Trap is operated on a daily basis. If fish numbers warrant, then trap will be emptied multiple times per day to ensure the safety of the fish.
- **Trapping Strategies** - Traps checked every day.
- **Disposition of Steelhead** – Steelhead in the upstream movement box will be 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 tagged and given a 1 ROP. 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.
- **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).
- **Disposition of other non-target species** – Enumerate, subsample for length and release.
- **Adult Mortalities** – Natural mortalities will be sampled for biological information and their heads retained for otolith extraction.

## **B. Remote PIT Tag Array Monitoring Section**

The Nez Perce Tribe operates remote in-stream detection systems in the Grande Ronde 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.ptocentral.org/dbaccess/InStrmDtctn/InStrmDtctn\\_query.html](http://www.ptocentral.org/dbaccess/InStrmDtctn/InStrmDtctn_query.html)”. Grande Ronde Basin PIT Arrays, Site code, and GPS locations include:

1. *Site Code (JOC) – Joseph Creek at rkm 3 - N 46.030016, W 117.016042 – installed 10/15/2010.*
2. *Site Code (UGR) - Upper Grande Ronde at rkm 155 - N 45.593338, W 117.903124- installed 10/18/12.*
3. *Site Code (WR1) - Wallowa River at rkm 14 - N 45.633769, W 117.73369- installed 8/16/2013.*

### **C. Key Contacts**

1. CTUIR (McLean). Distribute bull trout and steelhead data collected to ODFW District offices (Bailey, Yanke).
2. NPT (Vogel, Cleary, Kucera). Distribute bull trout and steelhead data collected to ODFW District offices.

## **V. Summer Steelhead - Imnaha Tributaries (Cow, Camp, Big Sheep, Freezeout, Dry, and Gumboot 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 and picket weirs with standoff structures going to the bank. Population estimates will be determined by mark recapture methodology.
  - a. *Weir locations* – Freezeout, Dry and Gumboot creeks.
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*
    - 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 a single right opercle punch (1 ROP) will be taken for genetic analysis in Freezeout, Dry 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.
    - 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).
    - 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 remote in-stream detection systems in the Imnaha 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.ptocentral.org/dbaccess/InStrmDtctn/InStrmDtctn\\_query.html](http://www.ptocentral.org/dbaccess/InStrmDtctn/InStrmDtctn_query.html)". Imnaha Basin PIT Arrays, Site code, and GPS locations include:

1. *Site Code (IR1) – Lower Imnaha River at rkm 7 - N 45.761162, W 116.750658- installed 12/3/2010.*
2. *Site Code (IR2) - Lower Imnaha River at rkm 10 - N 45.742839, W 116.764563- installed 11/13/2010.*
3. *Site Code (IR3) – Lower Imnaha River at rkm 41 - N 45.49004, W 116.80393 - installed 2/15/2011.*
4. *Site Code (COC) – Cow Creek at rkm 1 - N 45.76774, W 116.744037- installed 1/12/2011.*
5. *Site Code (BSC) – Big Sheep Creek at rkm 6 - N 45.50649, W -116.85067- installed 10/20/2010.*
6. *Site Code (CMP) – Camp Creek at rkm 2 - N 45.552014, W 116.86688 - installed 2/21/2013.*
7. *Site Code (being applied for) – Crazyman Creek at rkm 0.6 - N 45.22930, W 116.84478 - installed 11/8/2013.*

### **C. Key Contacts**

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 – 4 for conventional
- Catherine Creek; 3 raceways
- Lookingglass Creek; AHP's
- Imnaha; 7 raceways

**VI. Grande Ronde Basin - 2012 Brood Year Spring/Summer Chinook – Catherine Creek, Lookingglass Creek, U. Grande Ronde & Lostine River**

Smolts target size was 25 fpp (actual~ 28.5 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 2014 release is 863,000 fish weighing 39,250 pounds (Appendix A). Release target breakdown by tributary is as follows:

1. Catherine Creek (CC) – 138,000
  - a. Conv - 138,000
2. Lostine River (LR) – 233,000
  - a. Conv - 233,000
3. U. Grande Ronde (UGR) – 241,000
  - a. Conv – 241,000
4. Lookingglass (LGCR) – 251,000
  - a. Conv - 251,000

**B. Liberations**

1. **Schedule**—All facilities will be set-up and operational at least 2 days prior to scheduled delivery of smolts. 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 116,000smolts 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 W	March 21 F	March 31 M	The screens will be pulled on March 21 allowing fish to leave for 10 days. On March 31, the remaining fish will be forced out
LGH ½ R8 to pond B				
LGH ½ R9 to pond C				
LHG ½ R9to pond D				
Approximately 116,000 smolts will be released after 1.5 weeks of acclimation.				
Location	Transfer in date	Release dates	Force Release Date	Comments
LGH ½ R10 to pond A	April 1 T	April 12 Sa	April 22 T	The screens will be pulled on April 12 allowing fish to leave for 10 days. On April 22 the

LGH ½ RW 10 to pond B				remaining fish will be forced out.
LGH ½ RW 11 to pond C				
LGH ½ RW11 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 19 W	Mar 21 F	Apr 15 T	Conventional
LGH R1, 2 to pond B	Mar 19 W	Mar 21 F	Apr 15 T	Conventional
LGH R2,3 to pond C	Mar 19 W	Mar 21 F	Apr 15 T	Conventional
LGH R3, to pond D	Mar 19 W	Mar 21 F	Apr 15 T	Conventional
Approximately 138,000 smolts @ 25 fpp will be released after 29 days of acclimation. The fish will be split equally into the acclimation raceways.				

**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 20 Th	Mar 22 S	Mar 31 M	Conventional
LGH R4 to pond B	Mar 20 Th	Mar 22 S	Mar 31 M	Conventional
LGH R7 to pond C	Mar 20 Th	Mar 22 S	Mar 31 M	Conventional
LGH R7 to pond D	Mar 20 Th	Mar 22 S	Mar 31 M	Conventional
Approximately 122,000 smolts @ 25 fpp will be released after 15 days of acclimation. The fish will be split equally into the acclimation raceways.				
Late Group				
LGH R5 to pond A	Apr 4 F	Apr 6 Th	Apr 15 T	Conventional
LGH R5 to pond B	Apr 4 F	Apr 6 Th	Apr 15 T	Conventional
LGH R6 to pond C	Apr 4 F	Apr 6 Th	Apr 15 T	Conventional
LGH R6 to pond D	Apr 4 F	Apr 6 Th	Apr 15 T	Conventional
Approximately 119,700 smolts @ 25 fpp will be released after 15 days of acclimation. The fish will be split evenly into the acclimation raceways.				

**d. Lookingglass Creek Release Schedule**

Approximately 251,000 smolts will be released into Lookingglass Creek			
Location		Release dates	Comments
LGH AHPs A, B, C, D, RW 18	NA	April 1 - through April 14	The screens will be pulled on April 1 allowing fish to leave for 14 days. On April 15, 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: Brian Jonasson, 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 (Keniry). 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.**

1. Catherine Creek
  - a. 46,336 Ad
  - b. 93,895 AdCWT
2. Lostine River
  - a. 117,130 AdCWT Ad only 50:50 (raceways 8 and 9)
  - b. 117,858 AdCWT, Ad only 50:50 (raceways 10 and 11)
3. Upper Grande Ronde
  - a. CV 118,200 CWT (raceways 4 and 5)
  - b. CV 123,100 AdCWT (raceways 6 and 7)
4. Lookingglass Creek-
  - a. CV 149,500 ADCWT
  - b. 102,300 Ad

**E. PIT Tags**

1. Catherine Creek – 20,932
2. Lostine River – 3,978
3. Upper Grande Ronde – 1,997
4. Lookingglass Creek – 2,988

**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 (Deal), NPT (Zollman).
2. **Fish Research:** CTUIR (Boe) ODFW (Hoffnagle, Feldhaus, Jonasson), and NPT (Hesse, Vogel, Cleary, Young).

**VII. Grande Ronde Basin - 2013 Brood Year Spring/Summer Chinook – Catherine, Lookingglass, Lostine & U. Grande Ronde**

*Smolt target size is 30 fpp by October 31 and 20-25 fpp at release for Catherine and Lostine and Upper Grande Ronde. The CTUIR would prefer a smolt target release size of 20 fpp. Expected transfer size is 22-26 fpp. Lookingglass Creek target release size is 20 fpp.*

**A. Allocation** – Scheduled for transfer target size of 26 fpp in mid-March 2015.

1. **Anticipated Grande Ronde basin production** is 838,939 smolts for release in 2015 produced from Lookingglass Hatchery.
  - a. **Estimated Conventional brood** numbers are:
    - Catherine Creek 155,649 – (3 raceways)
    - Lostine River 259,094 – (5 raceways)
    - U. Grande Ronde 230,290 – (4 raceways)
    - Lookingglass Creek 193,906 – (adult ponds A, B, C, D)

**B. Final Rearing** — Catherine Creek, Lostine River, and U. Grande Ronde fry will be transferred outside in late April or early May at 200 fpp. All Lookingglass fry will be transferred to Irrigon in April, using tempered well water for lib truck, and returned to Lookingglass in late September (Appendix F).

**C. Monitoring and Evaluation**

1. Monitor
  - a. PIT tag survival studies (CSS) for Catherine Creek and Lostine River
  - b. 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 2014.
  - a. **Catherine Creek**
    - 104,000 AdCWT
    - 52,000 Ad only
  - b. **Lostine River**
    - 130,000 AdCWT
    - 130,000 Ad only
  - c. **Lookingglass Creek**
    - 97,000 AdCWT
    - 97,000 Ad only
  - d. **Upper Grande Ronde**
    - 115,000 AdCWT (Conventional)
    - 115,000 CWT only (Conventional)

*Note: During marking, equipment will be disinfected between stocks. Within a stock, operations will start with the healthiest raceway of fish and progress to least healthy raceway of fish based on the latest Fish Health information. 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 2014 (Table 6). Numbers by stock include:
  - a. Catherine Creek - 21,000 CSS
  - b. U. Grande Ronde - 2,000

- c. Lostine (conventional) – 2,300
- d. Lookingglass Creek - 3,000

### **E. Fish Health**

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

### **F. Key contacts**

- 1. **Fish Marking:** ODFW (Haugen, Onjukka, Feldhaus, LaPoint, Hoffnagle and Keniry), NPT (Cleary, Vogel)

## **VIII. Grande Ronde Basin - Conventional - 2014 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:
  - a. Catherine Creek - 150,000 smolts
  - b. Lookingglass Creek - 250,000 smolts
  - c. Lostine - 250,000 smolts
  - d. 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 86% green egg to smolt survival. Safety Net component can be used to supplement production numbers for the Upper Grande Ronde River stock.

### **C. 2014 Adult Collection**

- 1. **Predicted Runs** (Tables 7, 8, 9, 10) female contribution estimated at 50% of adults.
  - a. **Catherine Creek**
    - **885 adults (265 jacks)**
      - Natural – 342 adults (plus 105 jacks)
      - Hatchery – 543 adults (plus 160 jacks)
  - b. **Lostine River**
    - **2,601 Adults (897 jacks)**
      - Natural – 572 adults (plus 120 jacks)
      - Hatchery – 2,029 Adults (plus 777 jacks)
  - c. **Upper Grande Ronde**
    - **1,143 adults (310 jacks)**
      - Natural - 324 adults (plus 24 jacks)
      - Hatchery - 819 adults (plus 286 jacks)
  - d. **Lookingglass Creek**
    - **1,250 adults (317 jacks)**
      - Natural - 303 adults (67 jacks)
      - Hatchery – 947 adults (250 jacks)
- 2. **Broodstock needs** are based on fecundity and green egg to smolt survival summarized in Appendix G.
  - a. **CC** - A target of 106 adult should be collected with 49 females spawned to produce 150,000 smolts. The estimate is based on an average of 3,056 (2005-2007, lowest years) smolts released/female spawned.

- b. **LGCR** - An estimated 85 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 80 adult pairs (64 natural and 96 hatchery origin adults), plus 6 hatchery jacks, should be collected (70 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 180 fish should be collected with 82 females spawned to produce 250,000 smolts. The estimate is based on an average of 3,034 (2005-2007, lowest years) smolts released/female spawned.

#### **D. Trap Operation**

1. **CC and UGR Trap Operation (CTUIR)** – Trapping will begin in March to monitor steelhead abundance. Overnight staffing will occur after April 16 and trapping will continue, if river conditions allow, through July 31. Electroanesthesia will be used at both weirs.
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 and Steve Boe will be notified.
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° F (20° C) 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 or pass 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.
  - e. With the exception of the Lostine River stock, fish retained for broodstock will be injected with erythromycin and oxytetracycline (Appendix H ). For the LR stock only 50% of the broodstock will be injected with both antibiotics to evaluate the effect of no injections.
5. **Weir Management Guidelines**
  - a. **Catherine Creek** - The projected adult run is 885, including 342 natural adults. 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% (59 of 106) broodstock from natural origin adults In-season PIT tag projections will used to reassess the run. 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. A surplus of 250 fish is expected. The first 50 should be outplanted to Indian Creek, then 100 to Lookingglass Creek, then 50 to Indian Creek.

- **Catherine Creek Spring Chinook broodstock/upstream passage management guidelines (Table 12)**
- **Catherine Creek Broodstock Collection Guidelines**

		Nat Female	Hat Female	Nat Male	Hat Male	Nat Jack	Hat Jack
Week		<b>27</b>	<b>21</b>	<b>30</b>	<b>24</b>	<b>2</b>	<b>2</b>
6-May	0.1	0	0	0	0	0	0
13-May	0.6	0	0	0	0	0	0
20-May	2.4	1	1	1	1	0	0
27-May	8	2	2	2	2	0	0
3-Jun	14.3	4	3	4	3	0	0
10-Jun	11.6	3	2	4	3	1	1
17-Jun	26.9	7	6	8	6	1	1
24-Jun	19.1	5	4	6	5	0	0
1-Jul	8.8	2	2	3	2	0	0
8-Jul	3.8	2	1	1	1	0	0
15-Jul	2.2	1	0	1	1	0	0
22-Jul	1.1	0	0	0	0	0	0
29-Jul	0.6	0	0	0	0	0	0
		27	21	30	24	2	2

- b. **Upper Grande Ronde** – The projected adult run estimates is 1,143, including 324 natural adults. The 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.

- **Grande Ronde Broodstock Collection Guidelines**

		Female	Male	Jack	Hi temp	Female	Male	Jack
Week		<b>86</b>	<b>86</b>	<b>8</b>		<b>86</b>	<b>86</b>	<b>8</b>
6-May	0	0	0	0		0	0	0
13-May	0	0	0	0		0	0	0
20-	0	0	0	0		0	0	0



May								
27-May	3.8	3	3	0		9	9	0
3-Jun	14.4	12	12	2		19	19	2
10-Jun	4.4	4	4	2		10	10	2
17-Jun	25	22	22	2		28	28	2
24-Jun	16.3	14	14	2		20	20	2
1-Jul	18.8	16	16	0		Run missed		
8-Jul	8.1	7	7	0				
15-Jul	4.4	4	4	0				
22-Jul	4.4	3	3	0				
29-Jul	0.6	1	1	0				
5-Aug	0	0	0	0				
		86	86	8		86	86	8

a. **Lostine River** - At the projected run level of 572 natural adult returns, NPT and ODFW agree to manage at the viable to 1.5x viable population level of the sliding scale where up to 40% of the fish passed upstream can be hatchery origin and a minimum of 40% of the fish taken for broodstock will be natural origin. Ten percent of the male fish passed upstream can be age 3 hatchery Chinook (< 63 cm). Observations of PIT tagged Lostine River hatchery Chinook salmon at mainstem hydroelectric dams will be monitored in-season by ODFW and the NPT. If in-season monitoring indicates that natural adult returns are not returning as projected, co-managers will discuss changes to management. Natural and hatchery origin fish may be radio tagged and released at the weir. Radio tagged hatchery origin fish will be included in the percent of hatchery origin fish above the weir for 2014. The basic collection guidelines are as follows:

- **Lostine Creek Spring Chinook broodstock/upstream passage management guidelines (Table 13).**
- **Lostine Broodstock Collection Guidelines**

Start of Week (Sun)	Natural	Hatchery	Weekly Goal
June 15	0	1	1
June 22	4	6	10
June 29	5	7	12
July 6	12	18	30
July 13	16	21	37
July 20	11	17	28
July 27	3	5	8
Aug 3	3	4	7
Aug 10	2	3	5
Aug 17	1	2	3

August 24	2	4	6
August 31	4	6	10
Sept 7	1	2	3
Sept 14	0	0	0
Total	64	96	160

Surplus hatchery origin fish are expected and they will be available for both distribution and out-planting as specified below.

- Hatchery origin fish will be out-planted to the Wallowa River below the McDaniel’s restoration project.
- Outplanted fish will be as representative as possible in 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.
- If outplants occur in new reaches, subsequent spawning success will be monitored in target reaches by NPT and/or ODFW staff.
- Surplus fish beyond those outplanted in Wallowa River will be outplanted in previously agreed to streams.
- Age 3- 5 hatchery origin fish may be transferred to Wallowa Hatchery for distribution. Fish held for distribution will be sampled according to Appendix G.

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

**c. 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

- 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.
- 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 and carcasses could be used for foodbank. 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.
- All Chinook passed upstream of the intake trap will have tissue collected (opercle punch; 1 ROP) for future genetic analysis (pedigree)
- 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 will be euthanized at LGCR. 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. Each fish trapped will be measured to the nearest mm fork length, and sex determined. 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 from the Lostine River trap 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 H.

**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° F or 5.6° C. Tempering may be necessary to reduce temperature difference.
- d. Fish Handling** - Fish will be netted from the transport tank and placed in holding tanks at Lookingglass Hatchery. Lookingglass Hatchery personnel will record all observations on data sheets and report to Fish Health at the end of the season.

## **8. Adult holding** - The adult holding plan includes:

- a. Catherine Creek** - Endemic building
- b. Lookingglass Creek** - One adult holding pond
- c. Lostine River** - One adult holding pond

- d. **Imnaha** - One adult holding pond. Outplants will be held at Imnaha facility
- e. **Upper Grande Ronde** - One adult holding pond
- f. **Safety Net** - Endemic Building

#### **E. Spawning Guidelines** (for each stock)

1. **Anesthetic** - MS222 or Electro-Anesthesia for Lostine and Imnaha stocks and Electro-Anesthesia for Lookingglass, Catherine Creek, and Upper Grande Ronde stocks.
2. **Sorting** – The first sort will occur the week of August 11<sup>th</sup>
3. **Expected First Spawn** – The week of August 11<sup>th</sup>
4. **Spawning Frequency** - Once per week or as required (deceased females will not be spawned). Tentative Schedule: Tuesday-IM, LR; Thursday-UGR, CC; Wednesday -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, LGC, 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. LGH is currently using Electro anesthesia. CC stock return will be dependent on percentages above CC weir. CC fish could be released into LGC.

#### **F. BKD Management**

Fish Health recommends only rearing progeny from parents with low (<.200 OD units) 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<sup>2</sup>/sec) creek water, Moist Air Incubator (Lookingglass Creek stock and U. Grande Ronde) and heath trays.

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. **Heath Trays and Moist Air Incubators** will be used for eggs from all Lookingglass Creek adults, U. Grande Ronde and Innaha adults.
3. **Heath Trays** will be used for eggs from all Catherine Creek and Lostine River adults.

#### 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, Lookingglass and Grande Ronde** smolts produced will be targeted for ~250 fpp April 30, 2014 and 30 fpp October 2014.

#### 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
  1. Data collection – length (all fish), weight (females), marks/tags, eyed egg weights, individual fecundity
  2. Tissue collection – snout/scales, kidney sample, genetic sample
3. Weir/trap morts
  1. Data collection – count, length, scan, marks/tags
  2. Tissue collection – snout/scales, kidney sample, genetic sample
4. Monitor
  1. Hatchery vs. Natural production, growth and survival (in collaboration with ODFW Early Life History Project)
  2. PIT tag detections at dams and weirs for run timing – Catherine Creek and Lostine River
5. Studies
  1. CSS
6. Fish Health Monitoring Plans
  - a. **Disinfection and Sanitation Guidelines** (Appendix C).
  - b. **Broodstock Monitoring and Treatment Plan** (Appendices I)
  - c. Within each tributary, collect 40 kidneys from natural spawning females (20 N and 20 H) above the weir (Appendix H).
7. Hatchery versus Natural egg weights at eyed egg stage

#### J. Key Contacts

1. **Transportation - Facility Operators (NPT and CTUIR)** will coordinate all hauling and notify LGH (Deal) 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).

**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 - 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.*

**A. Allocation** All Grande Ronde Captive brood adults will be transported to LGH from Bonneville Hatchery in mid to late June and held in circular tanks until possible spawning. If not needed in the production, they will be outplanted into Meadow and/or Sheep 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. The SNAP 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.

**B. Spawning** - See Section VII. E. Spawning Guidelines.

**C. BKD Management** – See Section VII. F BKD Management

**D. Incubation** - See Section VII. G Incubation Strategies.

**E. Fish Health** - If a decision is made to spawn SNP fish at Lookingglass Hatchery then these fish will be injected with erythromycin and oxytetracycline as soon as possible as per Appendix tables J, K & L. Either way, formalin will be administered for fungus control as per Appendix table J.

**F. Key Contact** - Safety Net/Captive Brood TOT project leader (Hoffnagle, McLean)

## **X. Imnaha - 2012 Brood Year - Spring/Summer Chinook**

**A. Anticipated smolt release** – A total of 347,000 smolts at 22 fpp (current size 28 fpp).

1. Acclimated: 231,000 (4 raceways)
2. Direct stream: 116,000 (2 raceways)

**B. Liberations** (See Appendix A)

1. **Transfer and Acclimation** – Approximately 231,000 smolts will be transferred to Imnaha Satellite between March 21 and held for acclimation. Satellite personnel will begin volitional release April 1. Any remaining fish will be forced out on April 14. Release number will be determined by transfer inventory minus mortality.
2. **Direct Stream Release** – Approximately 116,000 smolts will be direct released from 2 raceways (14 and 15) on April 14. Fish will be released directly above the weir.

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: Brian Jonasson, Scott Favrot, Brad Garner, Pat Keniry, Steve Boe, Steve Yundt.

**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 2014.
  - a. 233,000 AdCWT
  - b. 114,500 Ad only
  - c. 20,850 PIT
2. **Fish Research** staffs will coordinate efforts with hatchery staff for pre-release sampling efforts (Table 2).
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, Cleary, Young, Vogel), ODFW ( D. Eddy, Feldhaus, Hoffnagle), CTUIR (McClean, Zimmerman), LSRCP office and FPC (Tuomikoski (503-230-4287)) of date and numbers of fish released.

### **XI. Imnaha – 2013 Brood Year - Spring/Summer Chinook**

**A. Smolt Production** - An estimated 345,000 smolts will be produced at a target size of 20-25 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.
2. **Final Rearing** - After marking, fish will be divided into 6 raceways with approximately 59,167 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 2014. Approximately 237,000 fish will receive a CWT.
2. **PIT tag**- 21,000 fish will be PIT tagged in October 2014 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 – 237,000
2. AD – 118,000
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** (Deal)
2. **Fish Health** (Onjukka)
3. **Fish Research** (Feldhaus, Hoffnagle and Vogel)

### **XII. Imnaha – 2014 Brood Year - Spring/Summer Chinook**

*The production goal is 490,000 smolts for the Imnaha River reared in 7 raceways. Based on a 490,000 smolt production, the adult return goal above the project area is 2,340.<sup>1</sup>*

**A. Smolt goal** - 490,000 smolts at 20-25 fpp for release 2016.

#### **B. Adult Collection**

1. **Predicted Runs**- Total estimated return to river is 2,404 adults and 870 jacks. The breakdown includes 1,732 hatchery origin and 672 natural origin adults (Table 21).

#### **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 three staff people stationed at the Imnaha satellite facility Monday-Thursday and one Friday-Sunday, 24/7.
  - b. The NPT will provide one technician Monday through Friday and a transportation vehicle.
  - c. LSRCP will fund two 3 month seasonal technicians for ODFW 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 2014 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, or as needed to make broodstock. 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** – Pre-season run predictions estimate that 672 natural-origin adult Chinook will return to the Imnaha River mouth. At that level of the sliding scale (0.5 Viable – Viable), 50% of the fish released above the weir can be of hatchery origin and 30% of the broodstock should be natural origin. All natural-origin 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 (adult + jacks). Typically, natural jacks exceed 10% of the males. Co-managers acknowledge that these guidelines are based on pre-season estimates. Return estimates will likely change as the run materializes, and these guidelines will be adjusted accordingly.

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 (Kraaker).
- 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 (Kraaker). Wild fish collected in the trap will be released upstream and wild kelts downstream of the weir.
- c. **Chinook Adults and jacks** – Fish retained for broodstock will be injected, intra-peritoneally (IP), with erythromycin and oxytetracycline (Appendices I). 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 H.
  - 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 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 or NPT will provide transportation of fish from the Imnaha weir to Lookingglass Hatchery. Broodstock will be hauled on Monday and Thursday, or as needed to make broodstock.

**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. **Egg take** – To produce 490,000 smolts, 597,561 green eggs will be collected assuming 82% survival from green egg to smolt. We assume an estimated five-year fecundity average of 4,482.

- a. **Adult Collection** - Based on pre-season run estimates and adult survival of 95% from collection to spawn (Return estimates will likely change as the run materializes, and these guidelines will be adjusted accordingly):

- **Males – 141 (spawn 134)**
  - 42 natural (spawn 40)
  - 99 hatchery (spawn 94 adults)
- **Females – 141 (spawn 134)**
  - 42 natural (spawn 40)
  - 99 hatchery (spawn 94)

2. **Brood collections guidelines:** The current projection for adult spring/summer Chinook returns to Imnaha River is 2,404 adults (672 unmarked and 1,732 ad-clipped and). However; it is expected that only 31% of the unmarked and 17% of the marked fish will be handled at the weir accounting for harvest, fallout below the weir, and escapement past the weir (209 unmarked and 298 ad-clipped). Return estimates will likely change as the run materializes, and these guidelines will be adjusted accordingly. Using the pre-season run estimates, fish collected and released above the weir will be managed at 50% hatchery and 50% wild origin ratio (pass 1 unmarked: 1 marked).

<b>Estimated Totals:</b>	<b>Estimate</b>	<b>Release</b>	<b>Available</b>	
<b>Escapement to mouth</b>	<b>handled</b>	<b>Broodstock</b>	<b>above the weir</b>	
			<b>for outplant</b>	
672 - Wild	209	84	125	-
1,742 - Hatchery	298	198	100	0

**F. Spawning Guidelines**

1. **Anesthetic Used** – MS222 or Electroanesthesia.
2. **Expected First Spawn** - Tuesday, August 12<sup>th</sup>.
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 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. 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. Use of Heath Trays or Moist Air Incubators for BY14.
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 I)

### **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

### **J. Key Contacts**

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

### **XIII. Snake River – 2013 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 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 15 target a total production of 400,000 sub-yearlings scheduled for release in the Grande Ronde River around May 29 at 50 fpp. Marks include:

1. 200,000 AdCWT
2. 200,000 no marks

Priorities 14 and 16 target a total production of 1 million sub-yearlings, and scheduled for release in the Snake River at Hells Canyon Dam in late May at 50 fpp. Marks include:

1. 200,000 AdCWT
2. 800,000 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 1,000,000 at the Forest Service boat launch below Hells Canyon Dam at a release goal of 50 fpp.

### **D. Key Contact**

1. **Lyons Ferry Hatchery** (Bumgarner, Mendel)
2. **ODFW** ( Garst, Keniry)
3. **CTUIR** (Zimmerman)
4. **IDFG** (Putnam)
5. **NPT** (Johnson)

### **XIV. Snake River – 2014 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 (1,000,000 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 15 target a total production of 400,000 sub-yearlings scheduled for release in the Grande Ronde River around May 29 at 50fpp. Marks include:

1. 200,000 AdCWT
2. 200,000 no marks

Priorities 14 and 146 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 in early May at 50fpp. Marks include:

1. 200,000 AdCWT
2. 800,000 Ad only

**B. Adult collections and Spawning** - See Lyons Ferry 2013 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.

### **D. Key Contact**

1. **Lyons Ferry Hatchery** (Bumgarner, Mendel)
2. **ODFW** (Garst)
3. **CTUIR** (Zimmerman)
4. **NPT** (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** – During the summer of 2013, NPT Fisheries began a new phase of operations by actively trapping adult lamprey at Bonneville, The Dalles, and John Day dams and transporting them to Nez Perce Tribal Hatchery. In June/July 2013, 238 lamprey were collected at Bonneville Dam, and during July/August 54 lamprey were obtained from John Day Dam, and in August an additional 9 came from traps at The Dalles Dam. A total of 301 lamprey were collected from the trapping efforts, and all were injected with oxytetracycline by NPT staff as a prophylaxis against furunculosis. Unfortunately, the majority of these lamprey were lost when single individuals climbed into inflow pipes and cutoff water flow to two of three tanks, resulting in complete mortality in those tanks. After holding the remaining 51 adults through the winter months, NPT plans to outplant them during April/May 2014 in Lolo, Orofino, and Newsome creeks and the South Fork Salmon in Idaho, Asotin Creek in Washington, and the Wallowa/Imnaha in Oregon, to spawn naturally. 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 moribund and dead lamprey should be examined during rearing in Oregon and Idaho to develop a pathogen history. If unable to lethally sample due to tribal policy, then develop a pathogen history as best as possible with moribund and dead lamprey. For lamprey releases in Oregon, Fish Health recommends source lamprey for holding in Idaho come from the CTUIR holding site near Pendleton, OR rather than Yakima Indian Nation site near Prosser.

Table 1.  
Irrigon Hatchery Summer steelhead transport schedule, 2014.  
(13 brood)

<u>Date</u>	<u>Stock</u>	<u>From Ponds</u>	<u>To</u>	<u>Number</u>	<u>Est. Pounds</u>
Jan. 21-24	5613	9,11*,13,14*	Wallowa Lower Acc	168,179	30,578
Jan. 21-24	5613	7*,8*,10*,12	Wallowa Upper Acc	172,967	30,449
Feb. 24	5613	15*,17	Big Cany. Lower Acc	84,347	18,744
Feb. 26	5613	16,18*	Big Cany. Upper Acc	84,122	18,694
Feb. 26-28	2913	27,28*,29,31,32	Little Sheep Acc	211,997	42,400
Mar. 3	2913	30	Little Sheep Acc (Big Sheep)	42,418	8,484
Apr. 8-9	5613	19*,25*,21,22	Wallowa Lower Acc	168,931	37,540
Apr. 17	5613	23*,20	Big Cany. Lower Acc	84,244	18,721
Apr. 18	5613	24,26	Big Cany. Upper Acc	<u>84,553</u> 1,101,758	<u>18,790</u> 225,400

\* Denotes CWT pond

Note: Odd ponds 7-21 are Fall Brood all others are Production  
Pond 8 is the ADLVCWT Production group  
The January liberations will be at 5.5 fpp

Table 2. Juvenile spring Chinook salmon and summer steelhead sampling schedule at LSRCP facilities, 2014. 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. RVC=Right ventral clip quality. TBD = To Be Determined.

<b>Sample Date</b>	<b>Stock</b>	<b>Location</b>	<b>Pond</b>	<b>Mark s</b>	<b>Purpose</b>
<b><u>Spring Chinook</u></b>					
Feb. 10-14	Catherine (11)	Lookingglass	1-3		CWT, RS, GS
Feb. 10-14	Lookingglass (11)	Lookingglass	AHP A,B,C,D		CWT, RS, GS
Feb. 10-14	U. Grande Ronde (11)	Lookingglass	4-7		CWT, RS, GS
Feb. 10-14	Lostine (11)	Lookingglass	8-11		CWT, RS, GS
Feb. 10-14	Imnaha (11)	Lookingglass	12-18		CWT, RS, GS
June 4-5	All (11)	Lookingglass	1-18		PS
<b><u>Summer Steelhead (brood 14)</u></b>					
October 2013	Wallowa Fall Brood	Irrigon	7, 11, 15, 19		CWT
October 2013	Wallowa	Irrigon	10, 14, 18, 23, 25		CWT
December 2013	Wallowa	Irrigon	8		CWT
December 2013	Wallowa Fall Brood	Irrigon	7, 9, 11, 13, 19, 21		RVC
October 2013	Imnaha	Irrigon	28		CWT
March 25	Imnaha	Little Sheep	AP		RS, GS
April 04	Wallowa	Wallowa	LAP, UAP		RS
April 14	Wallowa	Big Canyon	LAP, UAP		RS, GS
April 18	Wallowa	Wallowa	LAP		RS, GS
April 24	Wallowa	Big Canyon	LAP, UAP		RS
April 22	Imnaha	Little Sheep	AP		sex ratio
May 07	Wallowa	Big Canyon	AP		sex ratio

Table 3 . Summer Steelhead run projections to LSRCF Facilities in 2014. Estimates of marked and unmarked returns (with 95% confidence intervals) are made using the best fitting linear regression model derived from an adult steelhead count at a Columbia or Snake river dam and the corresponding hatchery weir count for return years 1995-2013. PIT tag derived estimates are based on current year tag recoveries at Lower Granite Dam of hatchery adults and are expanded for the untagged portion of hatchery release groups.

<b>2014 PROJECTED Returns to Wallowa Hatchery</b>					
<b>MARKED FISH</b>					
	Age	Males	Females	Total	95% C.I.
Marked	1:1	646	400	1,046	
Marked	1:2	146	376	522	
Marked	2:1	5	4	9	
Marked	2:2	1	2	3	
<b>Total</b>		<b>798</b>	<b>782</b>	<b>1,580</b>	491 – 2,667
Mark Return Based on PIT TAGS –2,112					

<b>2014 PROJECTED Returns to Big Canyon Facility</b>					
<b>MARKED AND UNMARKED FISH</b>					
	Age	Males	Females	Total	95% C.I.
Marked	1:1	386	323	708	
Marked	1:2	84	256	339	
Marked	2:1	2	2	4	
Marked	1:3	1	2	3	
<b>Subtotal</b>		<b>473</b>	<b>583</b>	<b>1,054</b>	247 – 1,861
Unmarked	2:1	7	7	14	
Unmarked	2:2	4	9	13	
Unmarked	3:1	8	6	14	
Unmarked	3:2 & 4:1	2	5	7	
<b>Subtotal</b>		<b>21</b>	<b>27</b>	<b>48</b>	6-89
<b>Total</b>		<b>494</b>	<b>610</b>	<b>1,102</b>	
Mark Return Based on PIT TAGS – 1,277					

<b>2014 PROJECTED Returns to L. Sheep Cr. Facility</b>					
<b>MARKED AND UNMARKED FISH</b>					
	Age	Males	Females	Total	95% C.I.
Marked	1:1	338	279	617	
Marked	1:2	40	153	193	
Marked	2:1	3	3	6	
Marked	3:1	0	1	1	
<b>Subtotal</b>		<b>381</b>	<b>436</b>	<b>817</b>	0-1,754
Unmarked	2:1	30	38	68	
Unmarked	2:2	8	25	33	
Unmarked	3:1	14	12	26	
Unmarked	3:2 & 4:1	3	6	9	
<b>Subtotal</b>		<b>55</b>	<b>81</b>	<b>136</b>	60-226
<b>Total</b>		<b>436</b>	<b>517</b>	<b>953</b>	
Mark Return Based on PIT TAGS - 917					



Table 4. Estimated numbers of marked fish to be released in 2015, from 2014 brood summer steelhead and 2013 brood spring Chinook salmon.

<b>Species, Location, Group</b>	<b>Raceway</b>	<b>Number Marked</b>	<b>Type of Mark</b>	<b>Marking Period</b>	<b>Marking Location</b>
<b>Summer Steelhead</b>					
<u>2014 Brood Year</u>					
Little Sheep	TBD	25,000	Ad+CWT	September	Irrigon
Little Sheep	TBD	190,000	Ad	September	Irrigon
Wallowa	TBD	25,000	AdLV+CWT	September	Irrigon
Wallowa	TBD	75,000	Ad+CWT	September	Irrigon
Wallowa	TBD	140,000	Ad	September	Irrigon
Wallowa (Fall Brood)	TBD	50,000	AdRV+CWT	September	Irrigon
Wallowa (Fall Brood)	TBD	190,000	AdRV	September	Irrigon
Big Canyon	TBD	50,000	Ad+CWT	September	Irrigon
Big Canyon (Fall Brood)	TBD	50,000	Ad+CWT	September	Irrigon
Big Canyon	TBD	110,000	Ad	September	Irrigon
Big Canyon (Fall Brood)	TBD	110,000	Ad	September	Irrigon
<b>Spring Chinook Salmon</b>					
<u>2013 Brood Year</u>					
Imnaha River		237,000	Ad+CWT	August	Lookingglass
Imnaha River		118,000	Ad only	August	Lookingglass
Catherine		104,000	Ad+CWT	August	Lookingglass
Catherine		52,000	Ad only	August	Lookingglass
Lostine		130,000	Ad+CWT	August	Lookingglass
Lostine		130,000	Ad only	August	Lookingglass
U. Grande Ronde		115,000	Ad+CWT	August	Lookingglass
U. Grande Ronde		115,000	CWT only	August	Lookingglass
Lookingglass		97,000	Ad+CWT	August	Irrigon
Lookingglass		97,000	Ad only	August	Irrigon

Table 5. PIT-tagging schedule for 2013 brood summer steelhead at Irrigon Hatchery scheduled for December 2013. Raceways need to be off feed 2 days prior to PIT-tagging to reduce tag loss. Comparative Survival Study (CSS) will provide 14,000 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.

<b>Stock, group</b>	<b>Raceway</b>	<b>LSRCP tags</b>	<b>CSS tags</b>	<b>Total tags<sup>A</sup></b>
<b>Wallowa stock</b>				
WAP, forced April	8,10,14	3,500	1,400	4,900
WAP, volitional May	25	1,500	700	2,200
WAP, fall brood April	7,11	3,000	1,400	4,400
WAP, fall brood, volitional May	19	1,500	700	2,200
BC, forced April	18	1,500	700	2,200
BC, fall brood, forced April	15	1,500	700	2,200
BC, forced May	23	3,000	1,400	4,400
Subtotal		15,500	7,000	22,500
<b>Imnaha stock</b>				
Little Sheep, volitional April	28, 32	11,600	5,400	17,000
Big Sheep, volitional April	30	3,400	1,600	5,000
Subtotal		15,000	7,000	22,000
Grand total		30,500	14,000	44,500

<sup>A</sup> 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 2014 (BY 2013). Note: Fish must be off feed 2 days prior and 2 days after PIT tagging to reduce tag loss.

<b>Experimental group</b>	<b>Raceway</b>	<b>Estimated # per raceway</b>	<b>Number to PIT tag</b>
Catherine Conventional	1	51,000	7,000
Catherine Conventional	2	51,000	7,000
Catherine Conventional	3	51,000	7,000
Lookingglass Creek	AHP A	47,500	750
Lookingglass Creek	AHP B	47,500	750
Lookingglass Creek	AHP C	47,500	750
Lookingglass Creek	AHP D	47,500	750
U. Grande Ronde Conventional	4	57,500	500
U. Grande Ronde Conventional	5	57,500	500
U. Grande Ronde Conventional	6	57,500	500
U. Grande Ronde Conventional	7	57,500	500
Lostine Conventional	8	51,000	460
Lostine Conventional	9	51,000	460
Lostine Conventional	10	51,000	460
Lostine Conventional	11	51,000	460
Lostine Conventional	12	51,000	460
Imnaha	13	59,000	3,500
Imnaha	14	59,000	3,500
Imnaha	15	59,000	3,500
Imnaha	16	59,000	3,500
Imnaha	17	59,000	3,500
Imnaha	18	59,000	3,500
<b>Grand Total</b>			<b>51,000</b>

Table 7. The ODFW and CTUIR estimated preseason returns to the mouth of Catherine Creek, 2014. The ODFW draft 2013 total return to the river estimates and the minimum, median, mean, and maximum return estimates for each age class.

Origin	Age	2014 ODFW point est.	Summary statistics: ODFW estimated total return to the river mouth (BY 1998-present)				
			2013 draft return est.	Min.	Median	Mean	Max.
<u>Hatchery</u>	3	160	197	7	78	143	599
	4	520	249	122	210	359	934
	5	23	14	0	14	18	57
	Total (3-5)	703	460				
	<b>Adults (4-5)</b>	<b>543</b>	<b>263</b>				
<u>Natural</u>	3	105	97	2	17	32	143
	4	318	210	40	103	182	477
	5	24	56	4	23	36	192
	Total (3-5)	447	363				
	<b>Adults (4-5)</b>	<b>342</b>	<b>266</b>				

Table 8. ODFW and CTUIR estimated preseason returns to the mouth of the Upper Grande Ronde River, 2014. The ODFW draft 2013 total return to the river estimates and the minimum, median, mean, and maximum return estimates for each age class.

Origin	Age	2014 ODFW point est.	Summary statistics: ODFW estimated total return to the river mouth (BY 1998-present)				
			2013 draft return est..	Min.	Median	Mean	Max.
<u>Hatchery</u>	3	286	221	0	52	160	589
	4	795	450	3	409	500	2,400
	5	24	92	2	12	27	103
	Total (3-5)	1,105	793				
	<b>Adults (4-5)</b>	<b>819</b>	<b>542</b>				
<u>Natural</u>	3	24	27	0	6	10	34
	4	221	254	10	65	86	254
	5	103	97	0	11	40	220
	Total (3-5)	348	378				
	<b>Adults (4-5)</b>	<b>324</b>	<b>351</b>				

Table 9. ODFW estimated preseason returns to the mouth of the Lostine River, 2014. The ODFW draft 2013 total return to the river estimates and the minimum, median, mean, and maximum return estimates for each age class. NPT also did independent estimates that are within the bounds of the ODFW estimates and agree using their numbers for planning purposes.

		Summary statistics: ODFW estimated total return to the river mouth (BY 1998/hatchery and BY 1995 for natural-present)					
Origin	Age	2014 ODFW point est.	2013 draft return est.	Min.	Median	Mean	Max.
<u>Hatchery</u>	3	777	773	45	177	452	1,444
	4	2,014	142	142	617	929	3,611
	5	15	71	11	68	93	449
	Total (3-5)	2,806	986				
	<b>Adults (4-5)</b>	<b>2,029</b>	<b>213</b>				
<u>Natural</u>	3	120	86	1	35	50	231
	4	530	201	57	201	320	846
	5	42	132	27	50	86	222
	Total (3-5)	692	419				
	<b>Adults (4-5)</b>	<b>572</b>	<b>333</b>				

Table 10. ODFW estimated preseason returns to the mouth of Lookingglass Creek, 2014. The ODFW draft 2013 total return to the river estimates and the minimum, median, mean, and maximum return estimates for each age class. NPT also did independent estimates that are within the bounds of the ODFW estimates and agree using their numbers for planning purposes.

Summary statistics: ODFW estimated total return to the river mouth (BY 2002-present)							
Origin	Age	2014 ODFW point est.	2013 draft return est.	Min.	Median	Mean	Max.
<u>Hatchery</u>	3	250	606	18	133	319	1,060
	4	924	803	69	348	709	2,159
	5	23	37	3	17	18	37
	Total (3-5)	1,197	1,146				
<b>Adults (4-5)</b>		<b>947</b>	<b>840</b>				
<u>Natural</u>	3	67	60	1	13	29	69
	4	291	75	18	75	119	263
	5	12	17	2	8	9	17
	Total (3-5)	370	152				
<b>Adults (4-5)</b>		<b>303</b>	<b>92</b>				

Table 11. ODFW estimated preseason returns to the mouth of the Imnaha River, 2014. The ODFW draft 2013 total return to the river estimates and the minimum, median, mean, and maximum return estimates for each age class. NPT also did independent estimates that are within the bounds of the ODFW estimates and agree using their numbers for planning purposes.

Origin	Age	2014 ODFW point est.	Summary statistics: ODFW estimated total return to the river mouth (BY 1983-present)				
			2013 draft return est.	Min.	Median	Mean	Max.
<u>Hatchery</u>	3	753	780	6	231	569	4,361
	4	1,526	944	18	869	1,005	3,621
	5	206	273	8	86	162	969
	Total (3-5)	2,485	1,997				
	<b>Adults (4-5)</b>	<b>1,732</b>	<b>1,217</b>				
<u>Natural</u>	3	117	238	1	41	73	243
	4	554	209	87	243	390	2,097
	5	118	141	32	99	188	891
	Total (3-5)	789	588				
	<b>Adults (4-5)</b>	<b>672</b>	<b>350</b>				



Table 12. Catherine Creek Spring Chinook broodstock/upstream passage management guidelines

Estimated total adult escapement to the mouth (hatchery plus natural) <sup>a</sup>	Ratio of hatchery to natural adults at the mouth	Maximum % of natural adults to retain for broodstock	% of hatchery adults to retain for broodstock <sup>b</sup>	% of adults released above the weir can be of hatchery origin	Minimum % of broodstock of natural origin	% strays allowed above the weir <sup>c</sup>
<250	Any	40	40	d	d	≤5
251-500	Any	20 <sup>d</sup>	20	≤70	≥20	≤5
>500	Any	≤20	e	≤50	≥30	≤5
<ul style="list-style-type: none"> <li>• <sup>a</sup>Pre-season estimate of total escapement</li> <li>• <sup>b</sup> Conventional hatchery adults only, all captive brood adults released to spawn naturally or outplanted</li> <li>• <sup>c</sup> For hatchery adults originating from different gene conservation groups (Rapid River stock or strays from outside the Grande Ronde basin)</li> <li>• <sup>d</sup> Not to exceed 150,000 smolt production</li> <li>• <sup>e</sup> Not decision factor at this level of escapement, percentage determined by other criteria</li> </ul>						

Table 13. Lostine This assumes a program of 250,000 smolts - 168 adults for broodstock.

Estimated Natural Run of ADULTS to River Mouth as a Proportion of minimum Interior Columbia Technical Recovery Team recommended abundance threshold <sup>1</sup>	Number of ADULT Natural Fish to River Mouth	Max % Natural ADULTS for Broodstock	Number of ADULT Natural Fish Retained for Broodstock (Proportion of Natural Brood)	Max Proportion of ADULT Hatchery Fish Released Above Weir	Minimum % Natural ADULTS in Broodstock
> .05 of Critical	> 8	0	0	NA	NA
.05 - .5 of Critical	8 - 74	50%	04 - 37	NA	NA
.5 - Critical	75 - 149	40%	30 - 60	70%	20%
Critical - .5 of Viable	150 - 249	40%	60 - 100	60%	25%
.5 Viable - Viable	250 - 499	30%	75 - 150	50%	30%
Viable - 1.5 Viable	500 - 749	30%	150 - 225	40%	40%
1.5 - 2 Viable	750 - 999	25%	188 - 250	25%	50%
> 2 Times Viable	> 1000	25%	> 250	<10%	100%

<sup>1</sup> Lostine River contributes about 50% of production for Wallowa/Lostine Population - Viable level is 50% of TRT recommended minimum abundance threshold for Wallowa/Lostine population (1000) after broodstock collection and fishery.

Table 14. Imnaha River Adult Management Table for natural and hatchery origin fish. This scale assumes program of 490,000 smolts - 322 adults for broodstock.

Estimated Natural Run of ADULTS to River Mouth as a Proportion of minimum Interior Columbia Technical Recovery Team recommended abundance threshold	Number of ADULT Natural Fish to River Mouth	Expected Handle Rate at Weir of ADULT Natural Fish (50%)	Max % Natural ADULTS for Broodstock	Number of ADULT Natural Fish Retained for Broodstock (Proportion of Natural Brood)	Proportion of ADULT Hatchery Fish Released Above Weir	% Natural ADULTS in Broodstock
> .05 of Critical	> 15	> 8	0	0	NA	NA
.05 - .5 of Critical	15 - 149	8 - 74	50%	04 - 37	NA	NA
.5 - Critical	150 -299	75 -149	40%	30 - 60	70%	20%
Critical - .5 of Viable	300 - 499	150 -249	40%	60 - 100	60%	25%
.5 Viable - Viable	500 - 999	250 - 499	30% <b>40%</b>	75 - 150	50%	30%
Viable - 1.5 Viable	1000 - 1499	500 - 749	30% <b>40%</b>	150 - 225	40% <b>30%</b>	40%
1.5 - 2 Viable	1500 - 1999	750 - 999	25%	188 - 250	25%	50%
> 2 Times Viable	> 2000	> 1000	25%	> 250	<10%	100%

BOLD values would be used after 3 consecutive years (or 3 year mean) @ viable or greater.

APPENDIX A. PROPOSED JUVENILE SALMONID RELEASES IN THE GRANDE RONDE (GR) AND IMNAHA (IM) BASINS IN 2014.

Basin	Species	Stock	Hatchery	Number <sup>(1)</sup>	Lbs	fpp	Location	In Facility	In River	Pond # <sup>(2)</sup>	Release Method <sup>(3)</sup>	Marks
GR	STS	5613	IR	168,000	30,500	4.5	Wallowa Lower Acc	Jan 21-22	Apr 6-7	9,11*,13,14*	Forced	25K AdCWT; 101K AdRV; 25K AdRVCWT; 17K Ad
GR	STS	5613	IR	168,000	30,500	4.5	Wallowa Upper Acc	Jan 23-24	Apr 7-8	7*,8*,10*,12	Forced	
GR	STS	5613	IR	84,000	18,700	4.5	Big Canyon Lower	Feb 24	Apr 15-16	15*,17	Forced	59K Ad; 25K AdCWT
GR	STS	5613	IR	84,000	18,700	4.5	Big Canyon Upper	Feb 25	Apr 15	16,18*	Forced	25K AdCWT; 59K Ad
IM	STS	2913	IR	212,500	42,500	5.0	Little Sheep Acc	Feb 26-28	Mar 26-Apr 22	22,27,28*,29,31,32	Volitional	25K AdLVCWT; 187.5K Ad
IM	STS	2913	IR	42,500	8,500	5.0	Little Sheep Acc	Feb 26-28	Mar 26-Apr 22	30	Volitional	42.5K Ad
GR	STS	5613	IR	168,000	37,300	4.5	Wallowa Lower Acc	April 8-10	Apr 20-May 2	19*,25*,21,22	Volitional	25K AdRVCWT; 25K AdCWT; 59K AdRV; 59K Ad
GR	STS	5613	IR	84,000	18,700	4.5	Big Canyon Lower Acc	Apr 17	Apr 24-May 7	23*,26	Volitional	25K AdCWT; 59K Ad
GR	STS	5613	IR	84,000	18,700	4.5	Big Canyon Upper Acc	Apr 18	Apr 25-May 7	20,24	Volitional	84K Ad
				1,095,000	224,100	4.6						
GR	CHS	8012	LG	58,300	2,650	22.0	Grande Ronde Acc	Apr. 4	Apr. 4- 5	4	Volitional	100% CWT
GR	CHS	8012	LG	63,400	2,881	22.0	Grande Ronde Acc	Mar. 20	Mar 20-Apr. 1	7	Volitional	100% AdCWT
GR	CHS	8012	LG	59,900	2,722	22.0	Grande Ronde Acc	Apr. 4	Apr. 4-15	5	Volitional	100% CWT
GR	CHS	8012	LG	59,700	2,714	22.0	Grande Ronde Acc	Mar. 20	Mar 20-Apr. 1	6	Volitional	100% AdCWT
GR	CHS	20012	LG	58,700	2,668	22.0	Lostine Acc	Mar. 11	Mar. 21	8	Volitional	100% Ad, 51% CWT
GR	CHS	20012	LG	58,400	2,654	22.0	Lostine Acc	Mar. 11	Mar. 21	10	Volitional	100% Ad, 53% CWT
GR	CHS	20012	LG	57,500	2,614	22.0	Lostine Acc	Apr. 3	Apr. 12	9	Volitional	100% Ad, 65% CWT
GR	CHS	20012	LG	58,800	2,672	22.0	Lostine Acc	Apr. 3	Apr. 12	11	Volitional	100% Ad, 60% CWT
GR	CHS	20112	LG	46,400	2,109	22.0	Catherine Creek Acc	Mar. 19	Mar. 21	1	Volitional	100% AdCWT
GR	CHS	20112	LG	46,700	2,122	22.0	Catherine Cr Acc	Mar 19	Mar. 21	2	Volitional	100% AdCWT
GR	CHS	20112	LG	45,700	2,122	22.0	Catherine Cr Acc	Mar. 19	Mar. 21	3	Volitional	100% Ad
GR	CHS	8112	LG	252,000	11,455	22.0	Lookingglass Creek	NA	Apr. 1-14	A,B,C,D,18	Volitional	100% Ad, 59% CWT
IM	CHS	2912	LG	230,500	10,477	22.0	Imnaha Acc	March 20-21	Mar.30-Apr 14	12,13,16,17	Volitional	100% Ad, 50% CWT
IM	CHS	2912	LG	116,300	5,286	22.0	Imnaha Direct Release	N/A	Mar. 30	14,15	Direct	100% AdCWT
				1,211,900	55,086							

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

<sup>(2)</sup> \* Indicates CWT groups, Brood evaluation groups include: AdLVCWT (8), AdRVCWT (7,11,19), AdCWT (10,14,18,23,25,28), AdCWT-Fall Brood (15)

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

### Appendix B. Steelhead Fish Health Monitoring Plan & Disease Treatments

Location	BY	Sp.	Stock	Examination Category	Protocol	Comment
Irrigon Hatchery	2013 2014	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 using INAD #10-697 and a veterinarian authorization letter.
Irrigon Hatchery	2012	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	2012	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	2014	StS	56 & 29	Adult Spawners	Minimum of 60 per stock for culturable viruses (up to 30 from returning fall 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. Regarding Little Sheep Creek: -Must abide by ODFW DEQ Memorandum of Agreement for any nutrient enrichment program
Wallowa & Little Sheep	2014	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	2013	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 2): Disinfections and Sanitation Guidelines for all LSRCP Hatcheries**

**Specific Operational Recommendations**

**For background on the importance of these recommendations see page 1 of Appendix C (2013 AOP)**

<b>Applies to Who?</b>	<b>Prevention Control Measure or Sanitary Practice</b>	<b>Guideline Comment</b>
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 <u>any</u> 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 Spawning	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

**Appendix C (page 2 of 2): Disinfection and Sanitation Guidelines for all LSRCP hatcheries  
Summary of Recommended Disinfectants (Concentration and time) and for what Application**

<b>Disinfectant*</b>	<b>Application</b>	<b>Concentration</b>	<b>Time</b>	<b>Comment</b>
<b>Iodophor</b>	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 <sub>2</sub> O or 6.7 oz.=189ml	10 min.	-Equipment should be pre-rinsed to remove dirt, mucus or other organic material which reduces the efficacy of disinfection and sanitization  -Rinse equipment to remove harmful residue if equipment is going into standing water containing fish or fish are being placed into the equipment (tank or bucket). Remember that iodine at 1:20,000 is harmful to fish.  -Argentyne or other buffered iodophors such as Western Chemicals “PVP iodine” would be acceptable. <b>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</b>
	Water hardening eggs	100 ppm	Minimum 15 minutes	This is the statewide general practice
	Egg transfers - disinfection at receiving station	100 ppm	10 minutes	
<b>Virkon Aquatic</b>	Footbaths, nets, boots & gear			As per label
<b>Chlorine or Aqueous solution as sodium hypochlorite (Household Bleach)</b>	Lib truck tanks	10 ppm	10 min.	Organic matter binds and neutralizes
	Raceway disinfection	100 ppm		Left to dry and breakdown in sun. Need to assure that no bleach goes to effluent.

<sup>a</sup>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.

<sup>b</sup> 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 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 of:

- Little Sheep - 165,000 Ad clipped smolts, 25,000 CWT 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 to meet 250 fish natural escapement.
- 101-150 natural adults, range for between 36-48% natural fish escapement.
- 151-200 natural adults, range for between 48-60% natural fish escapement. Total release up to 250.
- 201-250 natural adults, range for 60-72% or more natural fish escapement. Total release up to 250
- > 251 natural adults, manage natural adult escapement for >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 natural adults
    - 300 wild – 90 natural 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	2013	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 2014. 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 8113 fish for two consecutive days. Formalin is used under a local veterinarian prescription. Treat CWD with Florfenicol using INAD #10-697 and a veterinarian authorization letter.
Irrigon Hatchery	2013	81	Monthly	-10 mort/moribund and wet mounts for parasites as per Lookingglass Hatchery monthly protocol	-One Aquamycin medicated feeding at Irrigon Hatchery in July/August 2014.
Lookingglass Hatchery	2012	200 201 80 29 81	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	2012		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 2014 at Lookingglass Hatchery

Group	Strategy Treatment	BKD	Fry/Eggs (12/26/13)	Initial Ponding (fry)	Initial Raceway#	Smolts marked	Final Pond #	Smolt Numbers	Mark	Release Site
Catherine Creek	Conventional	Low	155,649	50,000	1	50,000	1	51,883	AdCWT Ad	CC
Catherine Creek				50,000	2	50,000	2	51,883	AdCWT Ad	CC
Catherine Creek				50,000	3	50,000	3	51,883	AdCWT Ad	CC
Lookingglass	Conventional	Low	194,000	190,000	Irrigon	<b>150,000</b> 190,000	Adult A,B,C,D	97,000 97,000	AdCWT Ad	Look
U. Grande Ronde	Conventional	Low	228,900	56,000	4	56,000	4	57,573	AdCWT CWT	UGR
U. Grande Ronde				56,000	5	56,000	5	57,573	AdCWT CWT	UGR
U. Grande Ronde				56,000	6	56,000	6	57,573	AdCWT CWT	UGR
U. Grande Ronde				56,000	7	56,000	7	57,573	AdCWT CWT	UGR
						<b>224,000</b>				
Lostine River	Conventional	Low	259,100	50,500	8	50,500	8	51,819	AdCWT Ad	LR
Lostine River				50,500	9	50,500	9	51,819	AdCWT Ad	LR
Lostine River				50,500	10	50,500	10	51,819	AdCWT Ad	LR
Lostine River				50,500	11	50,500	11	51,819	AdCWT Ad	LR
Lostine River				50,500	12	50,500	12	51,819	AdCWT Ad	LR
Imnaha River	Conventional	Low	355,700	58,000	13	58,000	13	59,167	Ad Ad	IM
Imnaha River				58,000	14	58,000	14	59,167	Ad	IM
Imnaha River				58,000	15	58,000	15	59,167	AdCWT	IM
Imnaha River				58,000	16	58,000	16	59,167	AdCWT	IM
Imnaha River				58,000	17	58,000	17	59,167	AdCWT	IM
Imnaha River				58,000	18	58,000	18	59,167	AdCWT	IM
						<b>348,000</b>		<b>Total 1,164,500</b>		

## **Appendix G. Coded Wire Tag (CWT) Sampling Guidelines for the 2014 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). 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 stock 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. As an example, there were two treatments of conventional fish released in the past during early and late acclimation periods and two treatments of captive broodstock program fish released during early and late acclimation periods for the Lostine River for a total of four treatments. However, currently only the Conventional program produces hatchery smolts for the Lostine River. Therefore, depending on whether or not early and late acclimation periods are considered separate treatments, only one to two raceways of 65K CWT groups are needed. 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 2014. The rotation will begin with NPT picking up any available fish during the first week of distribution. ODFW will pick up any available fish during the following week. The rotation will continue with NPT, and then ODFW, picking up fish during subsequent weeks until one or both parties no longer desire available fish, or operation of the weir is discontinued for 2014.

- 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. NPT research staff may assist ODFW research staff, or conduct sampling for ODFW research staff, when requested by ODFW research staff.
- 3) NPT production (Bruce McLeod/Nancy McAllaster) will communicate NPT distribution pickup dates and times with Ron Harrod. Current plan is for Tuesday pick-up.
- 4) Innaha 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 Innaha 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, 50% 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 Innaha 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 destined for distribution.
  - a. Sampling 50% 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.

**Appendix H. Adult Chinook Fish Health Monitoring Plan & Disease Treatments at Lookingglass Hatchery in 2014.**

Stock	Examination Category	Protocol	Comment
200 (LR) 201 (CC) 80 (GR) 29 (IM) 81 (LGC)	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 (if available) of ovarian fluid.
200 201 80 29 81	Prespawning 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 or 201 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	2014	200 201 80 80Z (SNP) 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 weirs	2014	200 201 80 80Z (SNP) 29 81	BKD  Furunculosis-Enteric Redmouth & other gram negative bacterial infections	Erythromycin  Oxytetracycline	Injection 20 mg/kg (Veterinary Prescription) Injection 10 mg/kg (Veterinary Prescription)  Inject fish kept for broodstock and reinjection only if deemed necessary Note: For the Lostine River stock only 50% of the broodstock will be injected with both antibiotics to evaluate the effect of no injections.	Fish Health will provide injection charts and vendor for erythromycin-100 upon request (still not sure on availability for 2014 season). Injected fish are not to be used for human consumption or legal harvest.  If a decision is made to spawn GR 80Z SNP fish transferred from Bonneville Hatchery then these fish will be injected with erythromycin and oxytetracycline as soon as possible after this decision is made (on or about July 1 <sup>st</sup> at the latest)

## Appendix I. 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 2.

Table 2. Lookingglass Creek and Catherine Creek production outlined in Table B1 of the *2008-2017 United States v. Oregon* Management Agreement.

<b>Release Site</b>	<b>Rearing Facility</b>	<b>Stock</b>	<b>Life Stage</b>	<b>Target Release Number</b>	<b>Primary Program Purpose</b>	<b>Funding</b>
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 3, 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 3. All adults passed upstream will have genetic samples taken.

Table 3. Disposition of Lookingglass Creek adult spring Chinook salmon arriving at the Lookingglass Hatchery intake weir.

<b>Escapement Level</b>	<b>% Pass Above</b>	<b>% Keep for Brood</b>
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 Chinook retained for brood. If a shortage of natural origin adults occurs, then additional hatchery adults will be collected to meet the brood target.

## **Appendix J. 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 LSCRCP 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 were 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 LSRCPC 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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