

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

PART 1 - Steelhead

**FOR THE PERIOD OF
JANUARY 1 – DECEMBER 31, 2016**

**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**

December 16, 2015

In Attendance November 12, 2015 Steelhead AOP: CTUIR (McLean, Naylor), ODFW (Blessing, Clarke, Flesher, Garst, Gaston, Harrod, Myatt, Onjukka, Requa, Schmidt, Stanton, Traxler, Woods, Yanke), NPT (Harbeck, Zollman), LSRCP (Engle, Starr).

TABLE OF CONTENTS

Table of Contents.....	ii
List of Tables.....	ii
List of Appendices.....	ii
Directory.....	iii

Steelhead (*Oncorhynchus mykiss*)

I. Summer Steelhead 2015 Brood Year (Grande Ronde & Imnaha basins).....	1
II. Summer Steelhead 2016 Brood Year - Wallowa Stock.....	7
III. Summer Steelhead 2016 Brood Year - Little Sheep Stock.....	10
IV. Summer Steelhead Monitoring: Catherine Creek/Grande Ronde River/Lookingglass Creek/Lostine River/Joseph Creek in 2016.....	13
V. Summer Steelhead – Imnaha River and Tributaries (Cow, Big Sheep, Horse, Mahogany, Gumboot, Camp, and Crazyman Creeks.....	15

List of Tables

Table 1. Irrigon Hatchery Summer steelhead transport schedule, 2016.	19
Table 2. Juvenile summer steelhead sampling schedule at LSRCP facilities, 2016.....	20
Table 3. Summer Steelhead run projections to LSRCP Facilities in 2016.....	21
Table 4. Estimated numbers of tagged fish to be released in 2017 from 2016 brood summer steelhead...	22
Table 5. PIT-tagging schedule for 2015 BY summer steelhead at Irrigon Hatchery scheduled for December 2015/January 2016.....	23
Table 6. Proposed 2016 juvenile salmonid releases in the Grand Ronde and Imnaha basins.....	24

List of Appendices

Appendix A. Steelhead Fish Health Monitoring Plan & Disease Treatments.....	25
Appendix B. Disinfection and Sanitation Guidelines for all LSRCP Hatcheries.....	26
Appendix C. Imnaha/Little Sheep steelhead program guidelines.....	28

Directory

Name	Agency	Phone	E-mail
Operation and Maintenance			
Brian Zimmerman	CTUIR	541-429-7286	brianzimmerman@ctuir.org
Mike McLean	CTUIR	541-429-7960	MikeMcLean@ctuir.org
Becky Johnson	NPT	208-843-7320	beckyj@nezperce.org
Rick Zollman	NPT	541-886-6300	rickz@nezperce.org
Jack Yearout	NPT	208-621-4638	jacky@nezperce.org
Brett Requa	ODFW	541-296-1349	brett.requa@state.or.us
Ron Harrod	ODFW	541-426-4467	ron.l.harrod@state.or.us
Jack Woods	ODFW	541-963-8296	jack.d.woods@state.or.us
Gary Gaston	ODFW	541-962-1839	gary.a.gaston@state.or.us
Marc Garst	ODFW	541-922-5732	marc.garst@state.or.us
Sam Onjukka (Fish Health)	ODFW	541-962-3823	sam.t.onjukka@state.or.us
Monitoring & Evaluation			
Andy Vansickle	CTUIR	541-429-7946	AndyVanSickle@ctuir.org
Carrie Crump	CTUIR	541-429-7945	carriecrump@ctuir.org
Les Naylor	CTUIR	541-429-7942	lesnaylor@ctuir.org
Lance Clarke	ODFW	541-962-3755	lance.r.clarke@state.or.us
Mike Flesher	ODFW	541-962-3764	mike.flesher@state.or.us
Debbie Eddy	ODFW	541-962-3283	deb.eddy@state.or.us
Holly Stanton	ODFW	541-962-3764	holly.m.stanton@state.or.us
Brad Garner	ODFW	541-426-6057	alan.b.garner@state.or.us
Brian Jonasson	ODFW	541-962-3763	brian.c.jonasson@state.or.us
Pat Keniry	ODFW	541-962-3026	patrick.j.keniry@state.or.us
Devin Olsen	NPT	541-432-2514	devino@nezperce.org
Shane Vatland	NPT	541-432-2508	shanev@nezperce.org
Jim Harbeck	NPT	541-432-2501	jimh@nezperce.org
Jason Vogel	NPT	208-621-3602	jasonv@nezperce.org
Bill Young	NPT	208-834-5290	billy@nezperce.org
Stuart Rosenberger	IPC	208-388-6121	srosenberger@idahopower.com
Fisheries Management			
Nick Myatt	ODFW	541-962-1824	Nick.a.myatt@state.or.us
Tim Bailey	ODFW	541-962-1829	timothy.d.bailey@state.or.us
Jeff Yanke	ODFW	541-426-3279	jeff.yanke@state.or.us
Kyle Bratcher	ODFW	541-426-3279	kyle.w.bratcher@state.or.us
Federal			
Julie Collins	LSRCP	208-378-5668	julie_collins@fws.gov
Chris Starr	LSRCP	208-378-5329	chris_starr@fws.gov
Rod Engle	LSRCP	208-278-5298	rod_engle@fws.gov
Brett Farman	NOAA	503-231-6222	brett.farman@noaa.gov

Steelhead (*Oncorhynchus mykiss*)

I. Summer Steelhead - 2015 Brood Year (Grande Ronde & Imnaha basins)

The fall brood component remains half (400,000) of the total Wallowa production goal. This is the second year that ~44,000 smolts from Irrigon Hatchery will be released at Cottonwood Acclimation on the lower Grande Ronde and an equal number of Wallowa stock smolts will be transferred from Lyons Ferry to the Wallowa Hatchery Acclimation ponds. Wallowa stock fin marking and tagging has been adapted to meet changed production goals. Marking and tagging is summarized in Table 5.

A. Allocations –The estimated number of smolts from Irrigon is 1,055,870 fish weighing 229,550 pounds. A total of 843,550 are Wallowa stock. The early group that consists of 253,800 will be transferred at 5 fish per pound (fpp). The remaining 589,750 will be transferred at 4.5 fpp. Wallowa fish will be acclimated at the Wallowa, Big Canyon, and Cottonwood Creek 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 212,320 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 7.

B. Liberations

I. Schedule

- a. **Wallowa Acclimation:** Approximately 505,100 smolts will be transferred from Irrigon Hatchery to Wallowa Hatchery and Cottonwood Creek acclimation ponds in 2016.

Early Group: Approximately 337,900 smolts will be released after 10 weeks of acclimation			
Location	Transfer in date	Release dates	Comments
Lower Acclimation Pond	Jan. 19-20	April 2	The screens in the lower sections will be pulled on April 2 allowing fish to leave for 2 days. On April 4, the remaining fish will be forced out of the lower pond.
		April 4	
Upper Acclimation Pond	Jan 20-21	April 3	The screens in the upper sections will be pulled on April 3. On April 4, the remaining fish will be forced out.
		April 4	
Note: In early-Feb. 41,900 smolts will be transferred to Cottonwood and 42,000 will be transferred from Lyons Ferry Hatchery to Wallowa Hatchery acclimation as part of a reciprocal study (see Table 5 for details)			
Note: One raceway (~ 44,000 smolts) will be transferred to Wallowa Hatchery on Feb. 20 to compare the effect of a long and short acclimation on survival and straying .			
Late Group: Approximately 167,200 smolts will be released after 1 to 3 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
Lower Acclimation Pond	April 4-6	April 19	The screens in the lower section will be pulled on April 19 allowing fish to leave for 10 days. On April 29, the remaining fish will be forced out.
		April 29	

- b. **Big Canyon Acclimation:** Approximately 338,450 smolts will be transferred from Irrigon Hatchery to the Big Canyon acclimation ponds, 167,650 in the early group and 170,800 in the late group.

Early Group: Approximately 167,650 smolts will be released after 5 to 7 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
Lower Acclimation	Feb 22	April 13	The screens in the lower sections will be pulled

Pond		April 15	on April 13 allowing fish to leave for 24 hours. On April 15, the remaining fish will be forced out of the lower pond.
Upper Acclimation Pond	Feb 23	April 14	The screens in the upper sections will be pulled on April 14 allowing fish to leave for 24 hours. On April 15, the remaining fish will be forced out of the lower pond.
		April 15	

Late Group: Approximately 170,800 smolts will be released after 1 to 3 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
Lower Acclimation Pond	April 18	May 2	The screens in the lower section will be pulled on May 2 allowing fish to leave for 12 days. On May 13, the remaining fish will be forced out.
		May 13	
Upper Acclimation Pond	April 19	May 3	The screens in the upper section will be pulled on May 3 allowing fish to leave for 11 days. On May 13, the remaining fish may be forced out.
		May 13	
Note: On May 13, 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 212,320 smolts will be transferred to the Little Sheep Acclimation facility for release in Little Sheep.

Acclimation. Approximately 212,320 smolts will be released after 4 to 8 weeks of acclimation.			
Location	Transfer in date	Release dates	Comments
Acclimation Pond	Feb 24 - 26	April 1	Screens will be pulled on April 1 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 28 release date.
		April 28	
Note: Prior to forced release, ODFW Fish Research will conduct a 24 h pilot study to determine whether residuals can be trapped from acclimation ponds. Concurrently, 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. If outplanted, Fish Research will scan for PIT tags.			

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

We will determine and compare rearing performance, smolt condition, juvenile migration performance, and smolt-to-adult survival of steelhead released from the Wallowa Hatchery, Big Canyon, Little Sheep and Cottonwood Creek facilities. For the Imnaha supplementation program we will also evaluate the effects of hatchery releases on natural origin abundance. Fish will be sampled prior to transfer and release from acclimation facilities for lengths (100), weights (50), and smolt condition. PIT tags will be used to determine juvenile migration performance to Lower Granite Dam, evaluate the ODFW-WDFW reciprocal release experiment, evaluate run timing performance of the fall broodstock, provide in season run forecasts, and to support the Comparative Survival Study (CSS). PIT tags were supplied by LSRCP and CSS and to meet the M&E objectives. To determine smolt-to-adult survival and straying we will CWT 25,000 fish from each

release group. All fish will be AD clipped. Ventral clips will not be used for purposes of CWT recovery.

Specific Objectives

- 1. Hatchery Spawning**
 1. Data collection – origin, length, age, marks/tags, return timing
 2. Tissue collection – snout/scales, genetic sample
- 2. Weir/trap Mortalities**
 1. Data collection – count, origin, length, marks/tags, gender
 2. Tissue collection – snout/scales, genetic sample, otoliths
- 3. Monitor**
 1. CWT vs. PIT run reconstruction, Grande Ronde basin harvest
 2. PIT tag detections at dams and weirs for in season run forecasts, run timing – detections at Bonneville and Lower Granite dam, Wallowa River, Wallowa Hatchery
- 4. Studies**
 1. Fall brood return timing
 2. ODFW-WDFW reciprocal release study
 3. Comparative survival study (CSS)
 4. Effect of no. of days of acclimation on survival, straying
- 5. 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.
- 6. Imnaha Reproductive Success genetic analysis** – Relative reproductive success of hatchery and wild Imnaha adults is evaluated using genetics. All fish released above the weir and used for broodstock are sampled.
- 7. Marking and tagging**

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

Fish Marking (numbers were at the time of Fish Marking)

- a. Wallowa Hatchery**
 - 202,000 AdRV
 - 50,000 AdRVCWT
 - 25,000 AdLVCWT
 - 110,000 Ad
 - 75,000 Ad CWT
- b. Cottonwood**
 - 25,000 Ad CWT
 - 17,000 Ad
- c. Big Canyon**
 - 25,000 Ad CWT
 - 143,000 Ad only
 - 50,000 FB Ad CWT
 - 118,000 FB Ad
- a. Little Sheep**
 - 168,000 Ad
 - 50,000 Ad (Big Sheep group)
 - 25,000 AdCWT

Pit Tagging: Scheduled for Dec. 2015 (31,000 tags) and Jan. 2016 (4,000 tags) (Table 5).

- a. Wallowa Hatchery – 9,200
- b. Cottonwood – 4,000
- c. Big Canyon – 6,800
- d. Little Sheep – 11,900
- e. Big Sheep – 3,100

D. Fish Health—Fish Health will coordinate with hatchery staff to conduct a pre-release health examination (Appendix A). Standard disinfection and sanitation guidelines will apply (Appendix B).

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 Olsen (NPT), and Putnam (IDFG) of steelhead releases.

II. Summer Steelhead - 2016 Brood Year - Wallowa Stock

The LSRCP mitigation goal is 9,184 adults above the project area.¹

A. Smolt Goal – Produce 800,000 smolts at 4.0 fpp for release in 2017. Target production includes:

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

B. Egg Take Goal – Collect 1,111,100 green eggs to produce 1,000,000 eyed eggs (90% survival green to eyed eggs). Transfer 1,000,000 eyed eggs to Irrigon Hatchery to produce 800,000 smolts (80% survival eyed eggs to smolt).

C. 2016 Adult Collection

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

- Marked – 3,414
- Unmarked – 57
- Total – 3,471
- a. **Wallowa Hatchery**
 - Marked – 2,346 (1,131-3,560 95% CI)
 - Marked PIT tag estimate – 2,392
- b. **Big Canyon Satellite**
 - Marked – 1,068 (299-1,838 95% CI)
 - Unmarked – 57 (14-97 95% CI)
 - Total – 1,125
 - Marked PIT tag estimates – 1,888

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 ~3,000 adults. The majority of surplus fish will be distributed to food banks. ODFW Grande Ronde Fish District will stock 50 fish in Roulet pond; and ODFW Wallowa District will stock 100 fish in Marr Pond and 70 fish in Wallowa Wildlife (Weaver) pond. Stocking should occur by April 3rd. Stocked fish will be identified by a missing adipose

fin and 2-left opercle punches (2-LOP). Fish not outplanted or given to food banks will be buried at Wallowa Hatchery.

- 1) *Unmarked*—Transport unmarked fish to the Fish Hatchery Lane Bridge and release. Sampling shall include genetic (from opercle punch), sex, and length.
- 2) *Residual Steelhead* – Count and sample all residuals weekly, take snouts from all AdLV’s and AdRV’s, and euthanize all fish marked Ad only. After smolts have been released from acclimation pond, discontinue residual sampling.
- 3) *Bull Trout* – Record date, number trapped, and estimated fork length (minimizing handling effects and avoid anesthetics). 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 (Engle).

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 30, 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 May 1, 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 buried at Wallowa Hatchery.
 - 2) *Bull Trout* – Record date, number trapped, and estimated fork length (minimizing handling effects and avoid anesthetics). Report take to US Fish and Wildlife Service Under Section 6 (4d limitation) Bull Trout Permit #TE001598-1 with copy of data to ODFW (Yanke) and LSRCP (Engle)..
 - 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, scales from both live and dead fish 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 Broodstock may be from angler-caught fish in the Lower Grande Ronde steelhead fishery during the previous October. Upon capture, these fish will be transferred to Wallowa Hatchery and held until spawn. Fall broodstock collection at Lower Granite Dam is also being discussed with the ACOE. Angler and dam 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 472 adults should be spawned to meet production goals.
 - Males – 236 (114 Ad or AdLV and 122 RV)
 - Females – spawn 236 (114 Ad or AdLV and 122 RV).The five-year average fecundity is 5,000 eggs per female.

2. Wallowa Hatchery Spawning Guidelines

- a. **Expected 1st Spawn** – Wednesday, March 2.
- b. **Spawning Dates** – Wednesday.

- March 2 – RV's only as needed
 - March 9 – 17 females (Ad or AdLV); RVs as needed
 - March 16 - 21 females (Ad or AdLV); RVs as needed
 - March 23 - 26 females (Ad or AdLV); RVs as needed
 - March 30 - 22 females (Ad or AdLV); RVs as needed
 - April 6 - 18 females (Ad or AdLV); RVs as needed
 - April 13 – 11 females (Ad or AdLV); RVs as needed
- c. The first 244 RV clipped fish trapped will be held at a 50:50 Male / Female ratio. In-season adult collection adjustments will be made depending on mortality and spawning success. Ripe fish will be spawned weekly. A total of 244 (122 males and 122 females) will be spawned.
- 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 six or 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** – First group will be transferred to Wallowa Hatchery in January at 5.0 fpp and second group will be transferred at 4.3 fpp.
 - a. **Excess** – No excess is expected. However, if survival is greater than expected, eggs can be culled, 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 A).

- a. Treatment plan: Formalin bath treatments for fall brood hook and line caught or any transfer from Lower Granite Dam as needed to control fungus under a veterinary prescription.
- b. Disinfection and Sanitation Guidelines (Appendix B).

I. Monitoring & Evaluation

M&E activities for brood year 2016 are anticipated to be similar to those for 2015 (see page 2) with one exception; this year we will conduct physiological assessments (Gill ATPase, body lipids, etc.) to determine the smolting profile of fish in the ODFW-WDFW reciprocal experiment. We will sample approximately 50 fish from each release group monthly from November-January, and prior to release in April. Our sampling will result in a total of 500 smolts (from Irrigon and Lyons Ferry Hatcheries combined) that will be sacrificed. A physiologist with AFTC will do the laboratory work on sampled fish.

Table 4 shows the anticipated CWTs and marks for fish from brood year 2016. Table 5 shows the planned LSRC PIT tag allocations.

III. Summer Steelhead - 2016 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.¹

A. Smolt Goal — Produce 215,000 smolts at 4.5 fpp for release in 2017.

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

B. Egg Take Goal – A total 317,000 green eggs will be taken to produce 282,200 eyed eggs (89%) and 215,000 smolts (76.2% eyed eggs to smolts).

C. Adult Collection

1. Predicted Run – (Table 3).

- a. Marked – 1,169 (243-2,106 95% CI; (542 males and 627 females)
- b. Unmarked – 119 (42-196 95% CI); (48 males and 71 females)
- c. Total – 1,288
- d. Marked PIT tag estimate – 1,319

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 (28% wild)
- Males – 66
- Females – 66
- Broodstock numbers were determined based on a fecundity of 4,800.
 - a. **Wild** broodstock –9 males and 9 females needed for brood. Release remainder above the weir (expected 101).
 - b. **Hatchery** broodstock – 57 males and 57 females are needed for brood. Approximately 149 (13%) hatchery adults will be released above the Little Sheep weir.

	Wild – keep 18		Hatchery – keep 114 (+4 males)*	
<u>Week Ending</u>	<u>Avg. % by Week</u>	<u>Number Kept</u>	<u>Avg. % by Week</u>	<u>Number Kept</u>
March 18	5.4	0	6.9	8
March 25	9.7	2	8.6	10
April 1	8.6	2	12.6	14
April 8	16.0	4	18.8	22 (+1 male)
April 15	16.5	4	19.2	22 (+1 male)
April 22	15.2	2	13.9	16 (+1 male)
April 29	14.8	2	11.6	14 (+1 male)
May 6	9.2	2	5.7	6
May 13	2.6	0	1.8	2
May 20	1.3	0	0.7	0
May 27+	0.7	0	0.2	0
Totals		18		114+4=118

* 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 15 egg take
- * If short for a particular week, make up the difference at the first opportunity

3. Disposition of Trapped Fish

- a. **Wild** – Wild adults collected and not retained for broodstock will be marked with a 1-LOP and placed above the weir. Number of wild fish released above the weir is estimated at 101 fish with a wild composition of 40% for natural spawning.
- b. **Hatchery** – Approximately 149 hatchery fish should be released above the weir for a prescribed spawner composition of 60%. 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.
- a. **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 LSRCF (Engle).
- d. **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.
- e. **Genetics tissue samples** - Tissue sample all wild and hatchery fish passed above the weir for genetic analysis by ODFW (for NOAA Fisheries).
- f. **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.
- g. **Surplus fish** may be used for distribution (food bank).
- h. **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.
- i. **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. Contact Jim Harbeck (NPT) for carcass availability.
- j. **Strays** - All unidentified marked fish (e.g. RV only, maxillary clip) will be sacrificed.
- k. **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:

Mark	Disposition
Ad	Subsistence, carcass, outplant or pass above the weir
AdLV+CWT	Subsistence, carcass, outplant, pass above weir, or spawn
AD + CWT (2016-first year)	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 22.
 - **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. Plan to administer iodophor flush treatment for CWD prevention trial to approximately 50% of the females (the last ~33 females).

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 A)
- 2. Disinfection and Sanitation Guidelines** (Appendix B).

J. Monitoring & Evaluation

Monitoring and evaluation activities for brood year 2016 are anticipated to be similar to those for 2015 (described on page 2) with one exception. During acclimation we will implement a small-scale pilot experiment to investigate whether sexually maturing residual males in the acclimation pond can be lured into a fish trap baited with diluted ovarian fluid from females spawned for broodstock for the hatchery program. Ovarian fluid will be pre-screened by Fish Health to insure that it is IHNV free. The trap will be operated for approximately 24 hours, on or near April 27 (end of the volitional release). If fish are trapped, a maximum of 25 individuals will be sacrificed and dissected to determine gender and testes development. Any remaining fish in the trap will be released back into the acclimation pond.

Table 4 shows the anticipated CWTs and marks for fish from brood year 2016. Table 5 shows the planned LSRCP PIT tag allocations.

K. Key contacts

- 1. ODFW** (Yanke) will provide NPT (B. Johnson, Hesse, Vogel, Harbeck, Young), CTUIR (Zimmerman, McLean) and USFWS (Engle) 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 - 2015

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 and collect snouts if CWT present. 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.

3. Disposition of bull trout and other non-target species

- a. **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 (Engle).

- b. **Disposition of other non-target species** – Enumerate, subsample for length and release.
- c. **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”. 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 (WRI) - Wallowa River at rkm 14 - N 45.633769, W 117.73369- installed 8/16/2013.*

C. Key Contacts

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

V. Summer Steelhead - Imnaha River and 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. Tributary 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 be 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 LSRC (Engle).
 - Other non-target species – Enumerated, subsampled for length and released.
- f. **Adult Mortalities** – Natural mortalities will be sampled for biological information.

B. Imnaha Weir Monitoring

Note: The below italicized guidelines should be considered “draft” at the time this AOP is finalized. Co-managers will be meeting between the time this document is finalized and the time weir operation begins to develop all protocols associated with operation of the Imnaha Weir. Any changes to operations related to steelhead will be captured in the 2016 Chinook AOP.

When the Imnaha weir is operating during the time that steelhead may be present, NPT staff are available to assist. The following protocols will be used:

- ***New Upstream Steelhead*** – *If adult steelhead are observed in the Imnaha trap box they will be handled, processed and passed upstream. ODFW staff will operate the crowder system and make the fish available for processing. NPT staff will provide all the tools, instruments, scale and genetic tissue envelopes PIT tags, etc. needed to process the fish. NPT staff will record data and handle the fish until recovery. ODFW staff will then place the fish into the operating return tube.*

If Chinook salmon and/or bull trout and steelhead are present in the trap at the same time, then Chinook salmon and/or bull trout will take priority. ODFW will process the Chinook salmon and bull trout exclusively. NPT staff will either wait or leave and return at an agreed upon time when the steelhead can be processed without interfering with the Chinook operations.

Protocols to process upstream bound steelhead will be based upon those used at the tributary weirs. Steelhead removed from the trap will be placed in an anesthetic vessel provided by NPT containing a buffered solution of tricaine methanesulfonate (MS-222) at a concentration of 80 mg/L. After anesthetization, each fish will be examined for fin-clips, marks and/or tags, measured for fork length (cm), categorized by gender using secondary sexual characteristics, and origin determined (hatchery or natural). Scales will be collected from the preferred area of the fish and a IROP opercle punch given to each steelhead. The resulting tissue will be retained for future genetic analysis. Prior to release, steelhead without a preexisting PIT tag, will receive a tag for future detections on passover PIT tag arrays and downstream dams (kelts). These fish will be tagged in the cartilage of the pelvic girdle to facilitate tag

retention during spawning. After tagging the steelhead will recover in a NPT provided vessel with fresh river water. ODFW staff will then release the recovered fish down the return tube.

- ***Live Kelts*** – NPT staff will make daily kelt observations at the weir when turbidity levels allow. If kelts are present, every effort within reason will be made to safely pass kelts downstream. Panels will be raised temporarily in specific sections of the weir to accommodate their downstream movement. If flows allow, seine or dip nets may be used to encourage kelts to seek the temporary exit through the weir. If kelts are netted they will be immediately released below the weir. No live kelts will be examined or processed.
- ***Dead Kelts*** – Steelhead kelts that have died on the weir or floated down as carcasses will be retained for processing (if flows allow for recovery). NPT will provide a steelhead carcass tote to hold carcasses until NPT staff can examine the fish. NPT will process the carcasses similar to methods used for live upstream steelhead. After examination carcasses will be passed downstream.
- ***Timeframe*** – NPT staff will be at the Imnaha weir to assist on a daily basis until June 20 or until it can be determined that adult steelhead will no longer be present at the weir site. In an emergency situation, NPT can also be reached at the College Creek facility via telephone (541-577-3254).

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 (CZY) – Crazyman Creek at rkm 0.6 - N 45.22930, W 116.84478 - installed 11/8/2013.*

C. Key Contacts

NPT (Vogel, Hesse, Young, Harbeck)

Table 1. 2016 Irrigon Summer Steelhead Transport Schedule

<u>Date</u>	<u>Stock</u>	<u>From Ponds</u>	<u>To</u>	<u>Number</u>	<u>Est. Pounds</u>
Jan. 19-20	5615	7*,9,11,12	Wallowa Lower Acc	168,000	33,600
Jan. 19-20	5615	8*,10*	Wallowa Upper Acc	84,000	16,800
Feb. 2	5615	14*	Cotton Wood	41,900	9,300
Feb. 19	5615	16*	Wallowa Upper Acc	42,200	9,380
Feb. 22-23	5615	15,17*	Big Cany. Lower Acc	82,900	18,400
Feb. 22-23	5615	13,18*	Big Cany. Upper Acc	84,750	18,800
Feb. 23-25	2915	27,28*,29,31,30	Little Sheep Acc	178,100	35,600
Feb. 25	2915	32	Little Sheep Acc (Big Sheep)	34,220	6,850
Apr. 4-5	5615	19,21*,20*22	Wallowa Lower Acc	167,200	39,800
Apr. 18	5615	23*,25	Big Cany. Lower Acc	85,600	20,380
Apr. 19	5615	24,26	Big Cany. Upper Acc	<u>85,200</u> 1,055,870	<u>20,280</u> 229,550

*Denotes CWT
Pond

Table 2. Juvenile summer steelhead sampling schedule at LSRCF facilities, 2016. 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. SPS = Smolt physiology sampling. CC = Cottonwood Creek. TBD = To Be Determined.

Sample Date	Stock	Location	Pond	Purpose
October 2015	Wallowa Fall Brood	Irrigon	7, 11, 15, 19	CWT
October 2015	Wallowa	Irrigon	10, 14, 18, 23, 25	CWT
October 2015	Imnaha	Irrigon	28	CWT
December 2015	Wallowa	Irrigon	8	CWT
December 2015	Wallowa Fall Brood	Irrigon	7, 9, 11, 13, 19, 21	RVC
January 30	Wallowa	Wallowa	UAP	PS
February 2	Wallowa	Irrigon	14	PS
February 20	Wallowa	Wallowa	UAP	PS
March 31	Imnaha	Little Sheep	AP	RS, GS
April 01	Wallowa	Wallowa	LAP, UAP	RS
April 12	Wallowa	Big Canyon	LAP, UAP	RS, GS
April 18	Wallowa	Wallowa	LAP	RS
May 2	Wallowa	Big Canyon	LAP, UAP	RS
April 28	Imnaha	Little Sheep	AP	sex ratio
May 13	Wallowa	Big Canyon	AP	sex ratio
Nov., Dec.	Wallowa	Irrigon	Pond to CC	SPS

Table 3 . Summer Steelhead run projections to LSRCF Facilities in 2016. 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 1995-2015. 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.

2016 PROJECTED Returns to Wallowa Hatchery					
MARKED FISH					
	Age	Males	Females	Total	95% C.I.
Marked	1:1	952	585	1,537	
Marked	1:2	222	570	792	
Marked	2:1	7	6	13	
Marked	2:2	1	3	4	
Total		1,182	1,164	2,346	1,131 – 3,560
Mark Return Based on PIT TAGS – 2,392					

2016 PROJECTED Returns to Big Canyon Facility					
MARKED AND UNMARKED FISH					
	Age	Males	Females	Total	95% C.I.
Marked	1:1	365	299	664	
Marked	1:2	99	299	398	
Marked	2:1	2	2	4	
Marked	1:3	1	1	2	
Subtotal		467	601	1,068	299 – 1,838
Unmarked	2:1	8	9	17	
Unmarked	2:2	5	10	15	
Unmarked	3:1	10	7	17	
Unmarked	3:2 & 4:1	3	5	8	
Subtotal		26	31	57	14 – 97
Total		493	632	1,125	
Mark Return Based on PIT TAGS – 1,888					

2016 PROJECTED Returns to L. Sheep Cr. Facility					
MARKED AND UNMARKED FISH					
	Age	Males	Females	Total	95% C.I.
Marked	1:1	482	401	883	
Marked	1:2	57	220	277	
Marked	2:1	4	4	8	
Marked	3:1	0	1	1	
Subtotal		542	627	1,169	243-2,106
Unmarked	2:1	27	34	60	
Unmarked	2:2	8	23	31	
Unmarked	3:1	11	10	21	
Unmarked	3:2 & 4:1	2	5	7	
Subtotal		48	71	119	42-196
Total		590	690	1,288	
Mark Return Based on PIT TAGS – 1,319					

Table 4. Estimated numbers of marked fish to be released in 2017, from 2016 brood summer steelhead. Cottonwood is the WDFW Cottonwood Creek Facility.

Species, Location, Group,	Month of transfer/release	Number Marked	Type of Mark	Marking Period	Marking Location
Summer Steelhead 2016 Brood Year					
Wallowa, production	Jan/Apr	25,000	AdLV+CWT	Sept.	Irrigon
Wallowa, fallbrood	Jan/Apr	25,000	AdRV+CWT	Sept.	Irrigon
Wallowa, production	Jan/Apr	25,000	Ad+CWT	Sept.	Irrigon
Wallowa, production	Feb/Apr	25,000	Ad+CWT	Sept.	Irrigon
Wallowa, fall brood	Apr/May	25,000	AdRV+CWT	Sept.	Irrigon
Wallowa, production	Feb/May	25,000	Ad+CWT	Sept.	Irrigon
Wallowa, fall brood	Apr/May	190,000	AdRV	Sept.	Irrigon
Wallowa, production	Apr/May	100,000	Ad	Sept.	Irrigon
Lyons Ferry to Wallowa	Feb/Apr	40,000	Ad	Sept.	Lyons Ferry
Wallowa to Cottonwood	Feb/Apr	40,000	25K AdCWT+ 15K Ad	Sept.	Irrigon
Big Canyon, Production	Feb/Apr	25,000	Ad+CWT	Sept.	Irrigon
Big Canyon, Fallbrood	Feb/Apr	25,000	Ad+CWT	Sept.	Irrigon
Big Canyon, Fallbrood	Feb/May	25,000	Ad+CWT	Sept.	Irrigon
Big Canyon, Production	Apr/May	135,000	Ad	Sept.	Irrigon
Big Canyon, Fallbrood	Apr/May	110,000	Ad	Sept.	Irrigon
Little Sheep, production	Feb/Apr	25,000	Ad+CWT	Sept.	Irrigon
Little Sheep, production	Feb/Apr	190,000	Ad	Sept.	Irrigon

Table 5. Planned PIT tagging for 2015 brood year steelhead at Irrigon Hatchery in December 2015 and January 2016. Brood year 2016 PIT tagging is anticipated to be similar. Not shown are 4,000 WDFW PIT tags implanted into Lyons Ferry smolts for release at Wallowa Hatchery. Comparative Survival Study (CSS) provides 14,000 tags to supplement the LSRCP tagging. CC = WDFW Cottonwood Creek Facility, AP = Acclimation pond, U = upper pond, L = lower pond, S = single pond.

Stock, Release Group	Month of Transfer/Release	Irrigon Raceway	AP	Fin Clip	PIT tags		
					LSRCP	CSS	Total
<u>Wallowa stock</u>							
Wallowa, Production	Jan/Apr	10	U	Ad/AdCWT	1,000	700	1,700
Wallowa, Fallbrood	Jan/Apr	7	L	AdRV/AdRVCWT	1,000	1,000	2,000
Wallowa, Production	Jan/Apr	8	U	Ad/AdLVCWT	1,000	1,100	2,100
Wallowa, Production	Feb/Apr	16	U	Ad/AdCWT	1,000	700	1,700
Wallowa, Fallbrood	Apr/May	21	L	AdRV/AdRVCWT	1,000	700	1,700
Lyons Ferry to Wallowa	Feb/Apr		U	Ad	NS	NS	NS
Wallowa to Cottonwood	Feb/Apr	14	CC	Ad/AdCWT	4,000	0	4,000
Big Canyon, Production	Feb/Apr	18	U	Ad/AdCWT	1,000	700	1,700
Big Canyon, Fallbrood	Feb/Apr	15	L	Ad/AdCWT	1,000	700	1,700
Big Canyon, Production	Apr/May	24	U	Ad/AdCWT	1,000	700	1,700
Big Canyon, Fallbrood	Apr/May	23	L	Ad/AdCWT	<u>1,000</u>	<u>700</u>	<u>1,700</u>
Subtotal					13,000	7,000	20,000
<u>Imnaha stock</u>							
Little Sheep, Production	April	28	S	Ad/AdCWT	3,200	2,800	6,000
Little Sheep, Production	April	30	S	Ad	3,100	2,800	5,900
Big Sheep, Production	April	32	S	Ad	<u>1,700</u>	<u>1,400</u>	<u>3,100</u>
Subtotal					8,000	7,000	15,000
Grande Total					21,000	14,000	35,000

Notes: The tagging trailer will be used. December tagging should take 7 days to complete, January tagging 1 day to complete. Trailer set-up is on Monday, tagging begins Tuesday. A long-handled magnet will be used in raceways to recover shed tags. Fish should be off feed 2 days prior to tagging to reduce tag loss. Crowd fish in raceways to obtain a random sample. When tagging, note whether the fish is Ad, AdLV, or AdRV.

Table 6. PROPOSED JUVENILE STEELHEAD RELEASES IN THE GRANDE RONDE (GR) AND IMNAHA (IM) BASINS IN 2016.

Basin	Species	Stock	Hatchery	Number ⁽¹⁾	Lbs	fpp	Location	In Facility	In River	Pond # ⁽²⁾	Release Method ⁽³⁾	Marks
GR	STS	5614	IR	168,000	33,600	5.0	Wallowa Lower Acc	Jan 19-20	Apr 2-4	7*, 9, 11, 12	Forced	25K AdRVCWT; 143K AdRV
GR	STS	5614	IR	84,000	16,800	5.0	Wallowa Upper Acc	Jan 20-21	Apr 2-4	8*, 10*	Forced	25K AdLVCWT; 25K AdCWT; 34K Ad only
GR	STS	5614	IR	41,900	9,300	4.5	CottonWood	Feb 1	Apr 13-14	14*	Forced	25K AdCWT; 17K Ad only
GR	STS	5614	IR	42,200	9,380	4.5	Wallowa Upper Acc	Feb 19	Apr 2-4	16*	Forced	25K AdCWT; 17K Ad only
IM	STS	2914	IR	178,100	35,600	5.0	Little Sheep Acc	Feb 24-26	Apr 1-28	27,28*,29,30,31	Volitional	25K AdCWT; 177.5K Ad only
IM	STS	2914	IR	34,220	6,850	5.0	Little Sheep Acc	Feb 24-26	Apr 1-28	32	Volitional	40.5K Ad
GR	STS	5614	IR	168,000	37,334	4.5	Wallowa Lower Acc	April 4-6	Apr 19-29	19,21*,22*,20	Volitional	25K AdRVCWT; 25K AdCWT; 59K AdRV; 59K Ad
GR	STS	5614	IR	84,000	18,667	4.5	Big Canyon Lower Acc	Feb 22	Apr 13-15	15*, 17	Forced	25K AdCWT; 59K Ad
GR	STS	5614	IR	84,000	18,667	4.5	Big Canyon Upper Acc	Feb 23	Apr 13-15	13, 18*	Forced	25K AdCWT; 59K Ad
GR	STS	5614	IR	84,000	18,667	4.5	Big Canyon Lower Acc	Apr 18	May 2-13	23*, 25	Volitional	25K AdCWT; 59K Ad only
GR	STS	5614	IR	84,000	18,667	4.5	Big Canyon Upper Acc	Apr 19	May 3-13	24, 26	Volitional	84K Ad Only
				1,082,500	229,570							

(1) Total release does not include 42,000 steelhead coming from Lyons Ferry to Wallowa Upper Acclimation pond in early February. However, note that the 42,000 "CottonWood" are released from WDFW's Cottonwood Creek Facility on the lower Grande Ronde River in Washington, so the total release is correct for the Grande Ronde Basin.

(2) * indicates ponds with Coded Wire Tags.

(3) Forced indicates a forced release within a 3 day period, whereas volitional indicates a release whereby fish have the ability to leave the acclimation pond over a minimum of 1 week prior to being forced out.

Appendix A. Steelhead Fish Health Monitoring Plan & Disease Treatments

Location	BY	Sp.	Stock	Examination Category	Protocol	Comment
Irrigon Hatchery	2015 2015	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 a veterinary feed directive (VFD).
Irrigon Hatchery	2015	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	2015	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	2016	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. Note: Little Sheep ovarian fluid (OF) samples will be tracked by number to ensure only IHNV negative OF is used as bait for pilot study.	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	2016	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	2016	StS or Sp		Adults	-mortalities examined for culturable viruses, bacteria, <i>R. salmoninarum</i> 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 B (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)

Applies to Who?	Prevention Control Measure or Sanitary Practice	Guideline Comment
All	Disinfect all gear/equipment prior to entering or leaving hatchery grounds	-As per attached iodophor protocol -Hatchery crew responsible for providing tub of 100 ppm iodophor
Hatchery Crew	Do not go from adult handling operations to juvenile operations activities unless all bib gear is thoroughly disinfected.	-As per attached iodophor protocol -it would be preferable to have bib gear designated for either adult or juvenile use.
Hatchery Crew	Pick mortality on a daily basis	-This is consistent with ODFW's statewide Fish Hatchery and Fish Health Management Policy.
All	Disinfect equipment when moving from raceway to raceway or tank to tank for <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 ^a .
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

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

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

^a Within a stock, operations will start with 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.

^b 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 C. 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 6,100 PIT
- Big Sheep - 50,000 Ad clipped smolts, 1,900 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, manage for between 36-48% natural fish escapement.
- 151-200 natural adults, manage for between 48-60% natural fish escapement. Total release up to 250.
- 201-250 natural adults, manage 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 naturals adults
 - 300 wild – 90 naturals adults

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