

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

PART 2 – Chinook, Coho, and Lamprey

**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**

March 14, 2016

In Attendance January 19, 2016 AOP: CTUIR (Crump, McLean, Naylor), ODFW (Bailey, Bratcher, Capps, Feldhaus, Gee, Gibbs, Hoffnagle, Myatt, Onjukka, Requa, Yanke), LSRCP (Collins, Engle, Starr), NPT (Johnson, Vatland, Vogel, Young, Zollman).

TABLE OF CONTENTS

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

Chinook (*O. tshawytscha*)

I.	Grande Ronde Basin - 2014 Brood Year Spring/Summer Chinook – Catherine Creek, Lookingglass Creek, U. Grande Ronde & Lostine River.....	4
II.	Grande Ronde Basin - 2015 Brood Year Spring/Summer Chinook – Catherine, Lookingglass, Lostine, & U. Grande Ronde.....	7
III.	Grande Ronde Basin - Conventional 2016 Brood Year - Spring/Summer Chinook – Catherine, Lookingglass, Lostine, and Upper Grande Ronde.....	8
IV.	Innaha Basin – 2014 Brood Year - Spring/Summer Chinook.....	16
V.	Innaha Basin – 2015 Brood Year - Spring/Summer Chinook.....	17
VI.	Innaha Basin – 2016 Brood Year - Spring/Summer Chinook.....	17
VII.	Snake River - 2015 Brood Year - Fall Chinook.....	22
VIII.	Snake River - 2016 Brood Year - Fall Chinook.....	22

Coho (*O. kisutch*)

IX.	Grande Ronde Basin – Wallowa River.....	23
-----	---	----

Pacific Lamprey (*Entosphenus tridentatus*)

X.	Pacific Lamprey.....	23
----	----------------------	----

List of Tables

Table 1. Production plan for BY2015 at Lookingglass Hatchery	25
Table 2. Proposed juvenile chinook releases in the Grande Ronde and Innaha basins 2016.....	26
Table 3. Estimated numbers of tagged fish to be released in 2017 from 2015 brood spring Chinook	27
Table 4. Fish PIT-tagging numbers for spring Chinook salmon at Lookingglass Fish Hatchery, October 2016 (BY2015)	28
Table 5. Preseason return estimates and estimated conversion rates for 2016 spring/summer Chinook Salmon returns to Bonneville Dam (BON), Lower Granite Dam (LGD), and the tributaries.....	29
Table 6. Catherine Creek Spring Chinook broodstock/upstream passage management guideline.....	30
Table 7. Lostine Creek Spring Chinook broodstock/upstream passage management guidelines	31
Table 8. Innaha River Spring Chinook broodstock/upstream passage management guidelines.....	32
Table 9. Wallowa-Lostine harvest and weir management expectations based on pre-season estimates and sliding scale agreements.....	33
Table 10. Innaha River harvest and weir management expectations based on pre-season estimates and sliding scale agreements.....	34

List of Appendices

Appendix A. Disinfection and Sanitation Guidelines for all LSRCP Hatcheries.....	35
Appendix B. Juvenile Chinook Fish Health Monitoring Plan & Disease Treatments.....	37
Appendix C. Coded Wire Tag (CWT) Sampling Guidelines for the 2015 Northeast Oregon Annual Operation Plan.....	38
Appendix D. Adult Chinook Fish Health Monitoring Plan & Disease Treatments at Lookingglass Hatchery in 2015.....	41

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
Nick Myatt	ODFW	541-962-1824	nick.a.myatt@state.or.us
Andrew Gibbs	ODFW	541-437-9723	andrew.j.gibbs@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
Debbie Eddy	ODFW	541-962-3784	deb.eddy@state.or.us
Holly Stanton	ODFW	541-962-3764	holly.m.stanton@state.or.us
Tim Hoffnagle	ODFW	541-962-3884	timothy.l.hoffnagle@state.or.us
Joseph Feldhaus	ODFW	541-962-3724	joseph.feldhaus@state.or.us
Brad Garner	ODFW	541-519-7184	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	208-378-5298	rod_engle@fws.gov
Mark Robertson	LSRCP	208-378-5323	mark_robertson@fws.gov
Brett Farman	NOAA	503-231-6222	brett.farman@noaa.gov

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
- Catherine Creek; 2 raceways
- Lookingglass Creek; 4 adult holding ponds, 1 raceway,
- Imnaha; 7 raceways

I. Grande Ronde Basin -2014 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 2016 release is 976,000 fish weighing 44,363 pounds (Table 2). Release target breakdown by tributary is as follows: All production is conventional.

1. Catherine Creek (CC) – 166,000
2. Lostine River (LR) – 258,000
3. U. Grande Ronde (UGR) – 240,000
4. Lookingglass (LGCR) – 312,000

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 129,000 smolts will be released after 1.5 weeks of acclimation.				
Location	Transfer in date	Release dates	Force Release Date	Comments
LGH 32K R12 to pond A	March 11	March 21	March 31	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 32K R12 to pond B				
LGH 22K R12 and 10K RW11 to pond C				
LGH 32K R11 to pond D				
Approximately 129,000 smolts will be released after 1.5 weeks of acclimation.				
Location	Transfer in date	Release dates	Force Release Date	Comments
LGH 32K R11 to pond A	April 1	April 12	April 22	The screens will be pulled on April 12 allowing fish to leave for 10 days. On April 22 the remaining fish will be forced out.
LGH 12K RW 11 20K RW13 to pond B				

LGH 32K RW 13 to pond C				
LGH 32K RW13 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 21	Mar 23	Apr 14	Conventional
LGH R1 to pond B	Mar 21	Mar 23	Apr 14	Conventional
LGH R2 to pond C	Mar 21	Mar 23	Apr 14	Conventional
LGH R2 to pond D	Mar 21	Mar 23	Apr 14	Conventional
Approximately 166,000smolts @ 25 fpp will be released after 25 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 R15 to pond A	Mar 18	Mar 21	April 5	Conventional
LGH R15 to pond B	Mar 18	Mar 21	April 5	Conventional
LGH R18 to pond C	Mar 18	Mar 21	April 5	Conventional
LGH R18 to pond D	Mar 18	Mar 21	April 5	Conventional
Approximately 120,000 smolts @ 25 fpp will be released after 16 days of acclimation. The fish will be split equally into the acclimation raceways.				
Late Group				
LGH R16 to pond A	Apr 6	Apr 8	Apr 18	Conventional
LGH R16 to pond B	Apr 6	Apr 8	Apr 18	Conventional
LGH R17 to pond C	Apr 6	Apr 8	Apr 18	Conventional
LGH R17 to pond D	Apr 6	Apr 8	Apr 18	Conventional
Approximately 120,000 smolts @ 25 fpp will be released after 13 days of acclimation. The fish will be split evenly into the acclimation raceways.				

d. Lookingglass Creek Release Schedule

Approximately 312,000 smolts will be released into Lookingglass Creek			
Location		Release dates	Comments
LGH R3,10, 14	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, Mike McLean, Julie Collins, Les Naylor, Carrie Crump.

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

C. Monitoring and Evaluation— A variety of M&E efforts are ongoing. Target date for genetic tissue, pre-liberation, and CWT retention sampling is Feb 8-12.

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
 - 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. 50,359Ad
 - b. 114,845AdCWT
2. Lostine River
 - a. 87,491 Ad only (raceways 11)
 - b. 86,408 AdCWT (raceway 12)
 - c. 85,891 AdCWT (raceway 13)
3. Upper Grande Ronde
 - a. 119,843 CWT (raceways 16 and 18)
 - b. 122,039 AdCWT (raceways 15 and 17)
4. Lookingglass Creek-
 - a. 142,654 AdCWT
 - b. 162,683 Ad

E. PIT Tags

1. Catherine Creek – 20,947
2. Lostine River – 2,403
3. Upper Grande Ronde – 1,997
4. Lookingglass Creek- 4,999

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

G. Key contacts

1. **Hatcheries:** CTUIR (McLean), ODFW (Gibbs), NPT (Zollman).
2. **Fish Research:** CTUIR (Naylor, Crump) ODFW (Hoffnagle, Feldhaus, Jonasson), and NPT (Hesse, Vogel, Vatland, Young).

II. Grande Ronde Basin 2015 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 2017

1. **Anticipated Grande Ronde basin production** is 927,000 smolts for release in 2017 produced from Lookingglass Hatchery.
 - a. **Estimated Conventional brood** numbers are:
 - Catherine Creek 157,000 (2 raceways)
 - Lostine River 270,000 (4 raceways)
 - U. Grande Ronde 259,000 (4 raceways)
 - Lookingglass Creek 241,000 (4 AHPS, 1 raceway)

B. Final Rearing — Catherine Creek, Lostine River, Lookingglass Creek and U. Grande Ronde fry will be transferred outside in late April or early May at 200 fpp (Table 2).

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 2016
 - a. **Catherine Creek**
 - 100,000 AdCWT
 - 57,000 Ad only
 - b. **Lostine River**
 - 126,000 AdCWT
 - 146,000 Ad only
 - c. **Lookingglass Creek**
 - 126,000 AdCWT
 - 115,00 Ad only
 - d. **Upper Grande Ronde**
 - 125,00 AdCWT
 - 125,000 CWT only
 - 9,000 Ad only

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 2016. Numbers by stock include:
 - a. Catherine Creek - 21,000 CSS
 - b. U. Grande Ronde - 5,000
 - c. Lostine (conventional) – 2,400
 - d. Lookingglass Creek - 5,000

E. Fish Health

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

F. Key contacts

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

III. Grande Ronde Basin - Conventional – 2016 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. 2016 Adult Collection

1. **Predicted Runs** (See Table 5) female contribution estimated at 50% of adults.
2. **Broodstock needs** are based on fecundity and green egg to smolt survival summarized in Appendix C.
 - a. **CC** - A target of 96 (48 females, 44 males, 4 jacks) fish should be collected with 44 females spawned to produce 150,000 smolts. The estimate is based on an average of 3,425 (2010-2014) smolts released/female spawned and a prespawn mortality of 9%.
 - b. **LGCR** - A target of 172 (86 females, 78 males, 8 jacks) fish should be collected with 78 females spawned to produce 250,000 smolts. The estimate is based on an average of 3,210 (2010-2014) smolts released/female spawned and a prespawn mortality of 10%.
 - c. **LR** - A target of 83 adult pairs (83 natural and 83 hatchery origin adults), plus 6 hatchery jacks, should be collected (73 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 (Table 9).

- d. **UGR** - A target of 166 (83 females, 75 males, 8 jacks) fish should be collected with 73 females spawned to produce 250,000 smolts. The estimate is based on an average of 3,429 (2010-2014) smolts released/female spawned and a prespawn mortality of 14%.

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 CC weirs. Fish will be handled without anesthesia at UGR weir.
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 monitoring and continue through Chinook broodstock collection.
3. **Lookingglass (ODFW)** — The intake trap at Lookingglass Hatchery will be operated from March (as environmental conditions allow) through mid-September. If pickets are removed due to debris and high water, notes will be made on the trap sheet.
4. **General Guidelines**
 - a. Trapping facilities will be checked daily.
 - b. Water temperature data will be collected. It is expected that as water temperatures increase, facility operators will adjust their schedule to best coincide their work with the coolest water temperatures. Water temperatures can be monitored with Onset temperature loggers. When the daily maximum 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 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 tulathromycin and oxytetracycline (Appendix D). 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 461, including 174 natural adults. The adult sliding scale for broodstock collection with a projected run 251-500 adults is a maximum of 20% of the wild return. Hatchery-origin adults released above the weir should be $\leq 70\%$ of the total. Ten percent of the males above the weir may be age-3 hatchery males. The pNOB goal for CC at this return level is $>30\%$. Based taking the maximum number of wild adults allowed under the sliding scale, the pNOB target for 2016 is 35.4%. In-season PIT tag projections will be 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. However, no surplus is expected based on preseason projections. If surplus occurs, 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 6)**

- **Catherine Creek Broodstock Collection Guidelines**

Brood collection		Nat	Hat	Nat	Hat	Nat	Hat
	Nat	Female	Female	Male	Male	Jack	Jack
Week	timing	17	31	16	28	1	3
6-May	0.0	0	0	0	0	0	0
13-May	0.8	0	0	0	0	0	0
20-May	1.6	0	0	0	0	0	0
27-May	6.5	1	2	1	2	0	0
3-Jun	14.6	3	5	3	4	0	0
10-Jun	14.6	3	5	3	5	0	0
17-Jun	27.6	5	9	4	8	1	2
24-Jun	17.9	3	6	3	5	0	1
1-Jul	8.1	1	2	1	2	0	0
8-Jul	4.1	1	1	1	1	0	0
15-Jul	2.4	0	1	0	1	0	0
22-Jul	0.8	0	0	0	0	0	0
29-Jul	0.8	0	0	0	0	0	0

- 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	Female	Male	Jack
Week	Nat	83	75	8	83	75	8
6-May	0.0	0	0	0	0	0	0
13-May	0.0	0	0	0	0	0	0
20-May	0.0	0	0	0	0	0	0
27-May	0.0	0	0	0	2	2	0
3-Jun	3.7	3	3	2	5	4	2
10-Jun	28.0	23	21	2	25	23	2
17-Jun	40.2	34	30	2	35	32	2
24-Jun	17.1	14	13	2	16	14	2
1-Jul	7.3	6	5	0	Run missed		
8-Jul	0.0	0	0	0			

15-Jul	2.4	2	2	0			
22-Jul	1.2	1	1	0			
29-Jul	0.0	0	0	0			

c. **Lostine River** – Natural-origin adult returns to the Lostine River in 2016 are projected at 279. Given the combination of forecasting uncertainty and closeness of the forecast to the 250 threshold between sliding scale categories, NPT and ODFW agree to manage at the “critical - 0.5 viable” population level of the sliding scale. A maximum of 60% of adults passed upstream of the weir can be hatchery-origin. A minimum of 25% of adults taken for broodstock will be natural-origin. Adults are defined as fish >630 mm fork length, and jacks are fish ≤ 630 mm fork length. All natural-origin jacks will be passed upstream. Ten percent of the total male hatchery fish passed upstream can be jacks. Observations of PIT-tagged Lostine River hatchery Chinook salmon at mainstem hydroelectric dams will be monitored in-season by ODFW and NPT. If in-season monitoring indicates that natural-origin 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 fish will be included in estimates of the hatchery/natural composition of fish passed above the weir. The basic collection guidelines are as follows:

- **Lostine River Spring Chinook broodstock/upstream passage management guidelines (Table 7)**
- **Lostine Broodstock Collection Guidelines**

Start of Week (Sun)	Natural	Hatchery	Weekly Goal
06/05/16	1	1	2
06/12/16	3	8	11
06/19/16	2	7	9
06/26/16	4	11	15
07/03/16	3	9	12
07/10/16	7	21	28
07/17/16	5	16	21
07/24/16	2	7	9
07/31/16	1	2	3
08/07/16	1	4	5
08/14/16	1	4	5
08/21/16	4	12	16
08/28/16	6	18	24
09/04/16	2	4	6
Total	42	124	166

If surplus hatchery-origin fish exist, they will be available for both distribution and out-planting as specified below.

- Hatchery-origin fish will be outplanted 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.
- 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 to the Wallowa River will be outplanted to previously agreed to streams.
- Age 3-5 hatchery-origin fish may be transferred to Wallowa Hatchery for distribution or recycled. Fish held for distribution will be sampled according to Appendix A.

d. **Lookingglass Creek**

Lookingglass Creek Broodstock Collection Guidelines.

		Nat Female	Hat Female	Nat Male	Hat Male	Nat Jack	Hat Jack
Week	Nat	26	60	23	55	2	6
6-May	0.0	0	0	0	0	0	0
13-May	0.0	0	0	0	0	0	0
20-May	0.0	0	0	0	0	0	0
27-May	1.6	0	1	0	1	0	0
3-Jun	11.5	3	7	3	6	0	1
10-Jun	16.4	4	10	4	9	0	1
17-Jun	21.3	8	12	5	11	1	1
24-Jun	13.1	3	8	3	7	1	1
1-Jul	11.5	3	7	3	6	0	1
8-Jul	4.9	1	3	1	3	0	1
15-Jul	3.3	1	2	1	2	0	0
22-Jul	1.6	0	1	0	1	0	0
29-Jul	1.6	0	1	0	1	0	0
5-Aug	1.6	0	1	0	1	0	0
12-Aug	0.0	0	0	0	0	0	0
19-Aug	3.3	1	2	1	2	0	0
26-Aug	4.9	1	3	1	3	0	0
2-Sep	3.3	1	2	1	2	0	0

- 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

- Bull Trout** – Enumerate and estimate length (minimize handling). Data and reports sent to ODFW (ODFW District and Regional offices), and LSRCP (Robertson).
- Steelhead** -- Enumerate and determine hatchery or wild origin. Ad clipped fish will be euthanized at Lookingglass Creek only. Data and reports sent to ODFW (ODFW District and Regional offices), and LSRCP (Robertson).
- 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, LGC=1ROP) for population estimates. 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.
- Hatchery Chinook** trapped on Lookingglass Creek, and identified as CC or UGR, will be disposed of as follows: UGR returned to UGR or taken for broodstock, CC released below the weir or added to CC or LG broodstock if needed.
- 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 (Feldhaus) and CTUIR (Naylor, Crump). Following examination, the carcasses may be disposed of in the landfill.

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

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

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

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 11th
 3. **Expected First Spawn** – The week of August 16th
 4. **Spawning Frequency** - Once per week or as required (deceased females will not be spawned). Tentative Schedule: Tuesday-IM, LR; Wednesday – LG CR; Thursday-UGR, CC. 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 ILOP 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. Fish injected with antibiotics will not be used for human consumption or released where legal harvest is possible. 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/cm²/sec) creek water 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** will be used for eggs from all Lookingglass Creek, U. Grande Ronde, Catherine Creek and Lostine 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
 - a. CSS
6. Fish Health Monitoring Plans
 - a. **Disinfection and Sanitation Guidelines** (Appendix A).
 - b. **Broodstock Monitoring and Treatment Plan** (Appendix D)
 - c. Within each tributary, collect 40 kidneys from natural spawning females (20 N and 20 H) above the weir (Appendix D).
7. Hatchery versus Natural egg weights at eyed egg stage

J. Key Contacts

- a. **Transportation - Facility Operators (NPT and CTUIR)** will coordinate all hauling and notify LGH (Gibbs) of the stock, number being hauled and estimated arrival time.
- b. **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.

IV. Imnaha – 2014 Brood Year - Spring/Summer Chinook

A. Anticipated smolt release – A total of 519,000 smolts at 22 fpp (current size 28 fpp).

1. Acclimated: 348,000(4 raceways)
2. Direct stream: 174,000(2 raceways)

B. Liberations (See Table 1)

1. **Transfer and Acclimation** – Smolts will be transferred to Imnaha Satellite March 25 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** – Smolts will be direct released from raceways on April 15. 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, Julie Collins, Jim Harbeck, Jason Vogel, Devin Olsen.

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 2016.
 - a. 341,000AdCWT
 - b. 179,000Ad only
 - c. 20,953 PIT
2. **Fish Research** staffs will coordinate efforts with hatchery staff for pre-release sampling efforts.
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 A).

F. Key Contacts

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

V. Imnaha – 2015 Brood Year - Spring/Summer Chinook

A. Smolt Production - An estimated 500,000 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 7 raceways with approximately 71,400 fish per raceway (Table 2).

B. Monitoring and Evaluation

1. **Fish marking**- All fish will be Ad clipped August-September 2016. Approximately 240,000 fish will receive a CWT.
2. **PIT tag**- 21,000 fish will be PIT tagged in October 2016 for CSS (Table 4).
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** – 240,000
2. **AD** – 260,000
3. **PIT** – 21,000 CSS

D. Fish Health

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

E. Key Contacts

1. **Lookingglass** (Gibbs)
2. **Fish Health** (Onjukka)
3. **Fish Research** (Feldhaus, Hoffnagle and Vogel)

VI. Imnaha 2016 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.

A. Smolt goal - 490,000 smolts at 20-25 fpp for release 2018 .

B. Adult Collection

1. **Predicted Runs**- See Table 5.

D. Trap Operations

1. **Period of Trap Operation** – The trap will be installed near May 16th, or 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. **Weekdays:** ODFW will provide two staff each day, one LGH staff will stay at the weir and another WFH (Herold) staff will travel on site. NPT will provide one staff (vacant) that will travel on site each day. LGH pick-up equipped with a slip tank will transport bull trout to intake pool for release.
 - b. **Weekends:** ODFW will provide two staff each day. One LGH staff will be staying on-site, another LGH staff will travel on-site on Friday to stay the weekend. NPT will provide one staff (vacant) that will travel on-site each day. During weekend, the NPT truck will haul recycles and/or outplants, and additional fish will be passed. Any surplus fish beyond the capacity of the NPT tanker will be placed in a holding pen. Alternatively, one LGH staff may haul fish in the LGH pick up after bull trout are released.
 - c. ODFW staff will be responsible for determining fish disposition on-site. Priorities for hatchery fish will be: 1) broodstock 2) natural spawning above the weir, 3) recycle to fishery, 4) transport to Wallowa Hatchery for CWT recovery, subsistence and/or foodbank use, and 5) outplants. Priorities for natural fish will be 1) broodstock, and 2) natural spawning above the weir.
 - d. 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.
3. **General Guidelines**
 - a. The Imnaha satellite facility will be staffed 24 hours per day, 7 days per week, while operational.
 - b. After the first Chinook is captured, trap catch will be checked and fish processed daily through June.
 - c. From July until the end of weir operations, fish will be removed and processed daily from Monday-Friday.
 - d. After June; if 10 or more natural Chinook salmon, or 100 or more total fish, are estimated in the trap are in the trap on Friday or Saturday, the trap will be worked on the next day. Generally, distribution of fish trapped on the weekend will generally be as for Tuesday, Wednesday, and Friday (see item f below); unless broodstock collection is required and resources are available.
 - e. 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 collection target for the following week.
 - f. Tuesday, Wednesday, and Friday and fish collected above broodstock needs on Monday and Thursday will be passed, recycled for harvest, transported to Wallowa Hatchery for CWT recovery, distributed for subsistence or food bank use, or outplanted.
4. **Weir Management Guidelines** – Pre-season adult projections are listed in Table 5. Based on these projections and sliding scale agreements, 50% of the fish released above the weir can be of hatchery origin. All natural-origin jacks will be released above the weir and hatchery jacks may be released above the weir to meet a jack composite of 10% of the total males (adult + jacks). Co-managers acknowledge that these guidelines are based on pre-season estimates and will be adjusted accordingly as the run materializes.
5. **Disposition of Trapped Fish**

- a. **Bull Trout** - Bull trout captured at the Imnaha weir may be incorporated into an ongoing Idaho Power Company (IPC) research project to evaluate abundance and life history of fluvial bull trout in the Snake and Imnaha Rivers.
 - Upon capture, bull trout will be enumerated and scanned for existing PIT tags.
 - When conditions allow, unmarked bull trout will be anesthetized and implanted with a PIT tag using standard procedures.
 - When water temperatures exceed 61°F (16°C), PIT tags will not be applied and expedited handling procedures will be followed.
 - Expedited handling procedures will include enumeration, scan for existing tags, and estimating length (within 2-inch size class).
 - PIT tags and tagging procedures will be provided by IPC (Wilkeson).
 - Regarding bull trout handling, mortality reporting and health assessments, the Imnaha River Weir SOP and Terms of Conditions of the USFWS Biological Opinion of the Imnaha River Facility will be followed. Bull trout mortalities will be stored frozen for further analysis. A summary of fish health analysis will be sent to LSRCP (Robertson).
 - Data, tag codes, and reports will be sent to ODFW (Yanke), LSRCP (Robertson), and IPC (Wilkeson)
 - All PIT tagged bull trout will be reported under ODFW Section 6 permit.
- b. **Steelhead** - Enumerate, estimate length and determine hatchery or wild origin. Ad clipped fish will be euthanized. Data and reports sent to ODFW (ODFW District and Regional offices), and LSRCP (Krakker). Wild fish collected in the trap will be released upstream and wild kelts downstream of the weir.
- c. **Chinook adults and jacks** – Fish retained for broodstock will be injected with tulathromycin and oxytetracycline (Appendix D). After broodstock and natural spawning, surplus hatchery jacks and adults are expected. Use for hatchery origin surplus fish includes:
 - Recycling adults and jacks (early in season) for fisheries. Fish will be released downstream at agreed to locations and dates.
 - Adults and jacks can be used for Tribal and non-tribal distribution/foodbank. These fish may be held at, Wallowa Hatchery prior to distribution. 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 A.
 - 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. **Marking** – Fish captured at the Imnaha weir, and not retained for broodstock, will receive an opercle punch that indicates their intended disposition:
 - Pass above weir = 1 ROP
 - Outplant = 1 LOP
 - Recycle = 2 LOP
 - Double recycle = 3 LOP (previously recycled fish will have another LOP applied)
- e. **Tumors** - Chinook will be inspected for tumors along the gum line. If a tumor is suspected, fish will be held for consultation.
- f. **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.
- g. **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.

E. Hatchery Broodstock Collection Guidelines

1. **Adult Collection** - Collection guidelines are based on pre-season run estimates. These estimates will likely change as the run materializes, and these guidelines will be adjusted accordingly:
 - Males – 141 (spawn 130)
 - 43 natural (spawn 39)
 - 98 hatchery (spawn 91 adults)
 - Females – 141 (spawn 130)
 - 43 natural (spawn 39)
 - 98 hatchery (spawn 91)
2. **Broodstock collection guidelines:** Pre-season adult projections are listed Table 5. Based on these projections and sliding scale agreements, we will target a broodstock composition of at least 30% natural-origin and 70% hatchery-origin salmon. Weekly broodstock collection guidelines are outlined below. Return estimates will likely change as the run materializes, and these guidelines will be adjusted accordingly.

	N-O	H-O	Total	
Broodstock Goal	85	197	282	
Pre-Season Adult Estimate	557	882		

Collection Week (Sat-Fri)	% of Collection Goal		No. Adults	
	N-O	H-O	N-O	H-O
May 28-Jun 17	0.04	0.04	4	7
Jun 18-Jun 24	0.12	0.13	10	26
Jun 25-Jul 1	0.28	0.21	23	41
Jul 2-Jul 8	0.24	0.21	20	41
Jul 9-Jul 15	0.12	0.14	10	28
Jul 16-Jul 22	0.10	0.11	9	22
Jul 23-Jul 29	0.04	0.09	4	17
Jul 30-Aug 5	0.03	0.01	2	2
Aug 6-Aug 12	0.00	0.01	0	2
Aug 13-Aug 19	0.03	0.04	2	7
Aug 20-Aug 26	0.00	0.01	0	2
Total	1.0	1.0	84	197

F. Spawning Guidelines

1. **Anesthetic Used** – MS222 or Electroanesthesia.
2. **Expected First Spawn** - Tuesday, August 16th
3. **Spawning Frequency** – Once per week or as needed.

4. **Spawning Strategies** - Surviving broodstock collected will be spawned up to the brood goal and the remainder will be released. 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. **Surplus** – All natural origin fish collected will be spawned for broodstock to meet and/or exceed sliding scale minimums. Hatchery-origin surplus can be returned to Big Sheep Creek or Lick Creek. Fish injected with antibiotics will not be used for human consumption or released where legal harvest is possible.
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. If possible, only BKD lows will be reared (<0.200 OD units).
2. **Water Sources** – Lookingglass-chilled and un-chilled well water and UV treated Lookingglass Creek. Use of Heath Trays.
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 A).
2. **Broodstock Monitoring and Treatment Plan** (Appendices H)

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, egg size, 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

J. Key Contacts

1. **Lookingglass** (Gibbs) monthly reports to ODFW (Grande Ronde & Wallowa Fish Districts, Hoffnagle, and Feldhaus), CTUIR (Zimmerman, McLean), NPT (B. Johnson, Hesse, Young, Harbeck, Zollman), LSRCF office.
2. **Fish Health** (Onjukka) monthly reports to ODFW (Grande Ronde & Wallowa Fish Districts, and Research), CTUIR (Zimmerman and McLean), NPT (B. Johnson, Hesse, Vatland, Young).
3. **Fish Research** (Feldhaus) monthly trap reports to ODFW (Grande Ronde & Wallowa Fish Districts, and Hoffnagle), CTUIR (Crump, Naylor), NPT (B. Johnson, Hesse, Vogel, Zollman).

VII. Snake River – 2015 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 2015 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)
2. **ODFW** (Garst, Keniry)
3. **CTUIR** (Zimmerman)
4. **IDFG** (Putnam)
5. **NPT** (Johnson)
6. **IPC** (Rosenberger)

VIII. Snake River – 2016 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 2016 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)
2. ODFW (Garst, Keniry)
3. CTUIR (Zimmerman)
4. IDFG (Putnam)
5. NPT (Johnson)
6. IPC (Rosenburger)

IX. COHO (*O. kiscutch*) Grande Ronde Basin – Wallowa River

The production goal is 500,000 smolts for release in the Wallowa River if funding is available. Co-managers will work to update the reintroduction plan and determine facility constraints/opportunities, marking plan, and monitoring/evaluation plan. Coordination with local governments will take place early in the planning process. No release is planned during the period of this plan.

X. Pacific Lamprey

The purpose of this stop gap effort 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~~ Tribes believes it is imperative to restore this important component of the ecosystem and retain cultural values.

A. CTUIR Lamprey Program – Up to 700 adult lamprey are currently being held at Minthorn Springs in the Umatilla Basin for outplanting into the Grande Ronde Basin in 2016. All have been injected with oxytetracycline for furunculosis and treated with formalin to control fungus. After holding these adults through the winter/spring, CTUIR plans to outplant them in May/June. Up to 400 will be outplanted to spawn naturally in the upper Grande Ronde at River Campground (~RM 163) and up to 150 each into Catherine Creek at Catherine Creek State Park (~RM 49) and Lookingglass Creek upstream of river mile 5.

B. NPT Lamprey Program – During the summer of 2015, NPT Fisheries again conducted trapping operations for adult lamprey at Bonneville, The Dalles, and John Day dams and transported them to Nez Perce Tribal Hatchery

- June 12 to July 6, 2015, a total of 289 lamprey were collected at Bonneville Dam,
- July 23 to August 20 an additional 210 lamprey were obtained from John Day Dam, and
- July 23 to August 13 an additional 217 lamprey were collected from traps at The Dalles Dam.

A total of 716 lamprey were collected from these trapping efforts, and all were injected with oxytetracycline by NPT staff for furunculosis. Unfortunately we experienced a water supply problem in one of the holding tanks during holding and suffered the loss of 114 fish as a result. There were 11 other mortalities in addition to this loss from other causes. A total of 591 lamprey were on station as of November, 2015. After holding these adults through the winter months, NPT plans to outplant them during April/May 2016 in Lolo Creek, Orofino Creek, and Newsome Creek, Big Canyon Creek, and the South Fork Salmon in Idaho, Asotin Creek in Washington, and the Wallowa River in Oregon, to spawn naturally. Genetic samples are collected by NPT staff for analysis by CRITFC in the lab at Hagerman NFH. Any plans to outplant into Joseph Creek will be discussed with ODFW prior to implementation.

C. 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 direct transfer from the dam collection site or the CTUIR holding site near Pendleton, OR rather than Yakima Indian Nation site near Prosser.

Table 1. Production plan for BY 2015 at Lookingglass Hatchery

Group	Fry 3/1/16	Initial ponding	Initial Raceways	Smolts AD marked	Final Pond #	Smolt #	Mark	CWT %	Release site	Release timing
LGC	241K	80.3K	3	79.5K	14	70K	ADCWT/AD	60%	LGC	ACC
LGC		80.3K	10	79.5K	AHP 1,2	83K	ADCWT/AD	50.6%	LGC	ACC
LGC		80.3K	14	79.5K	AHP 3,4	83K	ADCWT/AD	50.6%	LGC	ACC
	Total LGC	240.9K		238.5K		236K		53.4%	LGC	
Catherine	157K	78.5K	1	77.7K	1	76.9K	ADCWT/AD	65%	CC	ACC
Catherine		78.5K	2	77.7K	2	76.9K	ADCWT/AD	65%	CC	ACC
	Total CC	157K		155.K		153.8K		65%	CC	
Imnaha	500K	83.3K	4	82.5K	3	71.4K	ADCWT/AD	84%	IM	DR
Imnaha		83.3K	5	82.5K	4	71.4K	ADCWT/AD	84%	IM	DR
Imnaha		83.3K	6	82.5K	5	71.4K	ADCWT/AD	84%	IM	ACC
Imnaha		83.3K	7	82.5K	6	71.4K	AD	0%	IM	DR
Imnaha		83.3K	8	82.5K	7	71.4K	AD	0%	IM	ACC
Imnaha		83.3K	9	82.5K	8	71.4K	AD/CWT	84%	IM	ACC
Imnaha					9	71.4K	AD/CWT	Mixed	IM	ACC
	Total IM	500K		495K		500K		48%	IM	
Lostine	270K	90K	11	89.2K	10	66.2K	AD/CWT	47.6%	LR	1 ACC
Lostine		90K	12	89.2K	11	66.2K	AD/CWT	47.6%	LR	2 ACC
Lostine		90K	13	89.2K	12	66.2K	AD/CWT	47.6%	LR	1 ACC
Lostine					13	66.2K	AD/CWT	47.6%	LR	2 ACC
	Total LR	270K		267.6K		264.8K		47.6%	LR	
UGR	259K	64.7K	15	64.1K		63.4K	CWT	100%	UGR	1 ACC
UGR		64.7K	16	64.1K		63.4K	CWT	100%	UGR	2 ACC
UGR		64.7K	17	64.1K		63.4K	AD/CWT	100%	UGR	1 ACC
UGR		64.7K	18	64.1K		63.4K	Ad/CWT	100%	UGR	2 ACC
	Total UGR	259K		256.4K		63.4K				

*initial numbers are after fry reduction

*assuming 2% eyed egg to smolt mortality

Table 2. PROPOSED JUVENILE CHINOOK 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	CHS	8014	LG	59,000	2,681	22.0	Grande Ronde Acc	Apr. 6	Apr. 8	16	Volitional	100% CWT
GR	CHS	8014	LG	61,000	2,772	22.0	Grande Ronde Acc	Mar. 18	Mar 21	15	Volitional	100% AdCWT
GR	CHS	8014	LG	60,000	2,727	22.0	Grande Ronde Acc	Apr. 6	Apr. 8	17	Volitional	100% CWT
GR	CHS	8014	LG	60,000	2,727	22.0	Grande Ronde Acc	Mar. 18	Mar 21	18	Volitional	100% AdCWT
GR	CHS	20014	LG	86,000	3909	22.0	Lostine Acc	Apr. 1	Apr. 12	13	Volitional	100% Ad, 81% CWT
GR	CHS	20014	LG	86,000	3909	22.0	Lostine Acc	Mar. 11	Mar. 21	12	Volitional	100% Ad, 81% CWT
GR	CHS	20014	LG	43,000	1954	22.0	Lostine Acc	Mar. 11	Mar. 21	11	Volitional	100% Ad,
GR	CHS	20014	LG	43,000	1954	22.0	Lostine Acc	Apr. 1	Apr. 12	11	Volitional	100% Ad,
GR	CHS	20114	LG	82000	3727	22.0	Catherine Creek Acc	Mar. 21	Mar. 23	1	Volitional	100% Ad 69% CWT
GR	CHS	20114	LG	84000	3818	22.0	Catherine Cr Acc	Mar 21	Mar. 23	2	Volitional	100% Ad 68% CWT
GR	CHS	8114	LG	312,000	14,181	22.0	Lookingglass Creek	NA	Apr. 1-14	3,10,14	Volitional	100% Ad, 45 % CWT
IM	CHS	2914	LG	257,000	11,681	22.0	Imnaha Acc	March 25	Apr. 1-Apr 15	4,5,8,9	Volitional	100% Ad, 65 % CWT
IM	CHS	2914	LG	262,000	11,909	22.0	Imnaha Direct Release	Apr. 15	Apr. 15	6, 7,	Direct	100% Ad 65% CWT
				1,495,000	67,954							

Table 3. Estimated numbers of marked fish to be released in 2017, from 2015 brood spring Chinook salmon.

Species, Location, Group	Number Marked	Type of Mark	Marking Period	Marking Location
Spring Chinook Salmon <u>2015 Brood Year</u>				
Imnaha River	240,000	Ad+CWT	AUG	Lookingglass
Imnaha River	160,000	Ad only	AUG	Lookingglass
Catherine	100,000	Ad+CWT	AUG	Lookingglass
Catherine	57,000	Ad only	AUG	Lookingglass
Lostine	126,000	Ad+CWT	AUG	Lookingglass
Lostine	146,000	Ad only	AUG	Lookingglass
U. Grande Ronde	130,000	Ad+CWT	AUG	Lookingglass
U. Grande Ronde	130,000	CWT only	AUG	Lookingglass
Lookingglass	126,000	Ad+CWT	AUG	Lookingglass
Lookingglass	115,000	Ad only	AUG	Lookingglass

Table 4. Fish PIT-tagging numbers for spring Chinook salmon at Lookingglass Fish Hatchery, October 2016 (BY 2015). Note: Fish must be off feed 2 days prior and 2 days after PIT tagging to reduce tag loss.

Experimental group	Raceway	Estimated # per raceway	Number to PIT tag
Catherine	1	78,500	10,500
Catherine	2	78,500	10,500
Lookingglass Creek	3	75,000	1,550
Innaha River	4	73,500	3,000
Innaha River	5	73,500	3,000
Innaha River	6	73,500	3,000
Innaha River	7	73,500	3,000
Innaha River	8	73,500	3,000
Innaha River	9	73,500	3,000
Innaha River	10	73,500	3,000
Lostine	11	67,500	600
Lostine	12	67,500	600
Lostine	13	67,500	600
Lostine	14	67,500	600
U. Grande Ronde River	15	64,750	1,250
U. Grande Ronde River	16	64,750	1,250
U. Grande Ronde River	17	64,750	1,250
U. Grande Ronde River	18	64,750	1,250
Lookingglass Creek	AHP-A	41,250	775
Lookingglass Creek	AHP-B	41,250	775
Lookingglass Creek	AHP-C	41,250	775
Lookingglass Creek	AHP-D	41,250	775
Grand Total		1,499,000	
fish numbers are after any planned reductions in 2016			

Table 5. Preseason return estimates and estimated conversion rates for 2016 spring/summer Chinook Salmon returns to Bonneville Dam (BON), Lower Granite Dam (LGD), and the tributaries. The Lostine River estimate was developed jointly by the ODFW and NPT.

Stock	Bonneville Dam			Estimated Conversion Rate: BON-LGD	Lower Granite Dam			Estimated Conversion Rate: LGD to Tributary	Estimated Tributary Return			Overall Conversion Rate: Bon to LGD
	Age 4	Age 5	Total		Age 4	Age 5	Total		Age 4	Age 5	Total	
<i>Catherine Creek</i>												
Hatchery	358	24	382	80%	286	19	305	94%	269	18	287	75%
Natural	164	41	205	90%	148	37	185	94%	139	35	174	85%
<i>Upper Grande Ronde River</i>												
Hatchery	1,030	56	1,086	80%	824	45	869	94%	775	42	817	75%
Natural	125	56	181	90%	113	50	163	94%	106	47	153	85%
<i>Lookingglass Creek</i>												
Hatchery	608	48	656	80%	486	38	524	94%	456	36	492	75%
Natural	319	20	339	90%	287	18	305	94%	270	17	287	85%
<i>Imnaha River</i>												
Hatchery	1,312	331	1,643	55%	722	182	904	90%	650	164	814	50%
Natural	691	166	857	72%	498	120	618	90%	449	108	557	65%
<i>Lostine River</i>												
Hatchery	270	174	444	55%	149	96	245	90%	134	86	220	50%
Natural	330	98	428	72%	239	71	310	90%	215	64	279	65%

Table 6. Catherine Creek Spring Chinook broodstock/upstream passage management guidelines

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

Table 7. 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 ¹	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%

¹ 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 8. 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% 40%	75 - 150	50%	30%
Viable - 1.5 Viable	1000 - 1499	500 - 749	30% 40%	150 - 225	40% 30%	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.

Table 9. Wallowa-Lostine harvest and weir management expectations based on pre-season estimates and sliding scale agreements.

2016 Wallowa-Lostine Spring Chinook Run Projections and Distribution				
<i>Revised pre-season projections for AOP (1/7/16)</i>				
Projections, Allocations and Predicted Results		Wild	Hatchery	Total
<u>Run Projections and Expected Harvest Impacts</u>				
1	Projected adult run to Lostine	279	220	499
2	Projected run to Wallowa - Lostine	391	220	611
3	Projected composition (Wallowa - Lostine)	64.0%	36.0%	100.0%
4	Allowable Wild Impact from FMEP (Wallowa-Lostine)	3		
5	Allowable Wild Impact Rate (Wallowa - Lostine)	0.77%		
6	Allowable Wild Fish Handle @ 10% Hooking Mortality	30		
7	Resulting maximum hatchery fish sport harvest		17	
8	Alternative maximum impact & harvest @ 50% of defined surplus	0	0	
9	Proposed sport harvest impact and harvest (lesser of row 7 and 8)	3	17	20
10	Anticipated Treaty Harvest (estimated here as 50% harvest share for our purposes)	10	10	20
11	Projected Minam River Return	570	0	570
12	Allowable Wild Impact from FMEP (Minam)	6		
13	Allowable Wild Impact Rate (Minam)	1.05%		
14	Allowable Wild Fish Handle @ 10% Hooking Mortality	60		
<u>Post Harvest Allocations and Predicted Results</u>				
15	Post Sport Harvest Adult Escapement (Wallowa - Lostine)	378	193	571
16	Post Sport Harvest Adult Escapement (Lostine)	267	193	460
17	Escapement to Weir (0.85)	227	164	391
18	Escapement above Weir Before Weir in Place (0.2)	45	33	78
19	Fish Expected to Be Handled at Weir	182	131	313
20	Broodstock Composition Target	30%	70%	100%
21	Broodstock (per AOP)	50	116	166
22	Post Broodstock Escapement Handled At Weir	132	15	147
23	Target Percentage Passed above weir	50%	50%	
24	Target Passed Above the Weir	132	15	147
25	Available for Outplanting and Other Use	na	0	0
<u>Spawner Composition - Lostine</u>				
26	Spawning Upstream of Weir	177	48	225
27	Composition of Natural Spawners above Weir	79%	21%	100%
28	Spawning Downstream of Weir (.15 of line 16)	40	29	69
29	Composition of Natural Spawners Downstream of Weir	58%	42%	100%
30	Lostine River Natural Spawners	217	77	294
31	Composition of Lostine River Natural Spawners	74%	26%	100%
<u>Spawner Composition - Wallowa/Lostine</u>				
32	Natural Spawners w/ sport harvest w/o outplants & tribal harvest	226	87	313
33	Comp. of Natural Spawners w/sport harvest w/o outplants & tribal harvest	72%	28%	100%
34	Natural Spawners w/o sport harvest, outplants and tribal harvest	229	104	333
35	Comp. of Natural Spawners w/o sport harvest, outplants and tribal harvest	69%	31%	100%

Table 10. Imnaha River harvest and weir management expectations based on pre-season estimates and sliding scale agreements.

Imnaha River Spring Chinook Run Projections and Distribution, 2016				
<i>Revised pre-season projections for AOP (1/7/16)</i>				
Projections, Allocations and Predicted Results		Wild	Hatchery	Total
<u>Run Projections and Expected Harvest Impacts</u>				
1	Projected adult run	557	814	1,371
2	Projected composition	40.6%	59.4%	100.0%
3	Allowable Wild Impact from FMEP	8		8
4	Allowable Wild Fish Handle @ 10% hooking mortality	80		80
5	Allowable Wild Impact Rate	1.44%		
6	Resulting maximum hatchery fish harvest		117	
7	Maximum hatchery fish harvest as 50% of defined surplus		71	
8	Proposed sport harvest impact (lesser of row 6 and 7)	8	117	125
9	Anticipated Tribal Harvest (estimated here as 50% harvest share for our purposes)	24	101	125
<u>Post-Harvest Allocations</u>				
10	Post Harvest Adult Escapement	525	596	1,121
11	Escapement to Weir (.74 W and .61 H of line 10)	389	363	752
12	Escapement above Weir Before Weir in Place (.10 W and .10 H of line 11)	39	36	75
13	Fish Expected to Be Handled at Weir (Line 11 - Line 12)	350	327	677
14	Broodstock Composition Target	30%	70%	100%
15	Broodstock (per AOP)	85	197	282
16	Post Broodstock Escapement At Weir	265	130	395
17	Target Wild Percentage Passed above weir	50%	50%	
18	Passed Above the Weir	265	130	395
19	Available for Outplant or Other Use	na	0	0
20	To Big Sheep Creek (\leq 300 fish)	na	0	0
21	Available for Alternative Use	na	0	0
<u>Spawner Composition w/ Tribal and Sport Harvest</u>				
22	Spawning Upstream of Weir	304	166	470
23	Composition of Natural Spawners above Weir	64.7%	35.3%	100.0%
24	Spawning Downstream of Weir (Line 10 - Line 11)	136	233	369
25	Composition of Natural Spawners Downstream of Weir	37.0%	63.0%	100.0%
26	Imnaha River Natural Spawners (w/o B. Sheep)	441	399	840
27	Composition of Imnaha River Natural Spawners (w/o B. Sheep)	52.5%	47.5%	100.0%

Appendix A (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 CWTagging, fin clipping and PIT tag operations. See footnote for marking.
All	Use footbaths upon entering or leaving the work area for a given program	-Use larger tub of disinfectant if involved in a spawning
All	Use a new disposable apron or disinfected personal rain gear while working with fish	
CTUIR Personnel operations at Lookingglass Hatchery	Disinfect all gear/equipment prior to entering or leaving hatchery grounds, Lookingglass Creek, or the intake building and when done with operations at intake	-CTUIR personnel responsible to maintain and use a tub of 100 ppm iodophor at intake building workstation
Hatchery Crew	Assure that individual raceway and tank mortality "picker equipment" is in place at each raceway and tank	-All use these for the specifically designated Raceway
Hatchery Crew	Sanitize each raceway prior to use for the next brood year. (see page 3 for recommendation)	-dry for a minimum of three days
Hatchery Crew	Keep footbaths located at strategic locations refreshed with disinfectant	-As per iodophor label, refreshed as needed
People at Spawnings	Disinfect the spawning table and spawning work area between stocks and at the end of the day	-As per attached iodophor protocol
Research, Hatchery Crew & Fish Health Personnel	Handle and necropsy dead fish only in designated areas	-Adult morts: use concrete pad outside spawn area or concrete pad in endemic building at LGH -store snouts only in adult mortality freezer -Juvenile morts: store in freezer in designated area for this purpose.
PIT taggers	-PIT tagging supervisors maintain and keep footbaths by each door of PIT tagging trailer for use during operations -Assure that PIT tagging needles are new or clean and sharp -Disinfect in 70% Isopropyl alcohol -No re-use of PIT tag needles until air dried	-if PIT tag needles are re-used disinfect as per isopropyl protocol attached
Lib Truck Operators	Assure proper disinfection of tank and equipment prior to collection or transfer	-As per attached disinfectant application Summary

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

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

^aWithin 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 B. Juvenile Chinook Fish Health Monitoring Plan & Disease Treatments

Location	Brood year	Stock	Examination Category	Protocol	Comment/Disease Treatment
Lookingglass Hatchery	2015	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) if suspect disease or starting monthly sampling by October 2015, 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).	A 21-day Aquamycin 2.25% feed will be implemented for all fish in July 2016. 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 and coded wire tagging for two consecutive days. Formalin is used under a veterinarian prescription. Treat CWD with Florfenicol using a Veterinary Feed Directive (VFD) INAD..
Lookingglass Hatchery	2014	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 <i>Myxobolus cerebralis</i>	Pre-transfer grab-sample numbers may vary depending on disease history and number of fish for a given brood year. For future years a small group rainbow/steelhead should be reared at Lookingglass Hatchery for annual <i>M. cerebralis</i> testing 181 days after ponding.
Chinook acclimation IM, LR, CC & UGR	2014		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 C. Coded Wire Tag (CWT) Sampling Guidelines for the 2015 Northeast Oregon Annual Operation Plan

In order to accurately evaluate the success of our hatchery programs, we must be able to correctly identify all recaptured salmon from each treatment/evaluation group. Recovery of coded-wire tags is an integral part of identifying these salmon. Each tag provides us with the population (to monitor straying and out-of-basin harvest), brood year, and age of each tagged salmon that is recovered, as well as the raceway in which it was reared (for any treatments that are being evaluated or association with known disease histories). These data can also point out whether one stock, treatment group, or raceway is performing particularly well or poorly, allowing us to examine our fish culture practices. Additionally, when salmon are recovered with a CWT, we measure the length of each salmon and, with that known age, we can infer the age of untagged salmon of similar length and expand to those not sampled, providing us with the age composition of the entire run. These tags provide us with the means to adaptively manage our hatchery programs.

Tagging Rates

Each recovered tag represents a portion of the entire group of salmon (including untagged and unrecovered salmon) that was tagged with that particular code, so each recovered tag must be expanded in order to derive estimates for the entire run. The lower the number of recoveries, the greater influence each individual recovered tag has on the final estimate. Therefore, a minimum number of recoveries is needed.

We have used a minimum of 35 CWT recoveries as that needed to calculate accurate estimates (de Libero 1986; Hesse et al. 2006). In order to obtain at least 35 tag recoveries, a larger number of salmon must be tagged. In order to determine that number of salmon that must be tagged in order to recover 35 tags, we need to know the likely recovery rate for tags. We estimate the recovery rate using known smolt-to-adult survival (SAS) rates and sampling rates. For Imnaha River Chinook Salmon (1982-2009 brood years), our median SAS rate has been 0.645% and our mean sampling rate (mostly from spawning ground surveys) is 21.5%, resulting in a mean tag recovery rate of 0.139%. If we use this recovery rate to calculate the number of salmon to be tagged, it will allow us to recover a sufficient number of tags for only half of the years, which is not sufficient for our purposes.

Tagging at the rate required for the 25th percentile of the SAS rates will allow us to recover at least 35 tags per tag group for approximately three out of every four years. Multiplying the 25th percentile of the SAS rate (0.230%) by the mean sampling rate (21.5%) gives us a lower tag recovery rate of 0.049%. Finally, we determine the required number of tags by dividing 35 recoveries by 0.049%, which results in 71,429 salmon that must be tagged per evaluation group (replicate). Tagging 90,000 salmon will allow us to recover a sufficient number of tags for 83% of the years.

Evaluation groups may be specific or broad. When conducting experimental evaluations of specific hatchery rearing practices, we use individual raceways as experimental units (evaluation groups) and try to have at least two replicate raceways for each treatment. Since we want ~70,000 tags in each replicate, each raceway should be 100% tagged with codes that identify specific raceways. Less rigorous monitoring evaluation groups may include more than one raceway and the required number of tags (70,000) can be spread across all raceways within an experimental unit, such as an acclimation group (early vs. late). Even more broadly, production salmon may be tagged as a single evaluation group across all raceways. Note that when tagging across raceways, it is always beneficial

(and no more expensive) to use individual codes for each raceway. This will allow us to calculate variances for each raceway and rough estimates of survival for each raceway without increasing the number of tags and may show us problems with individual raceways that would not otherwise become evident. However, for experimental evaluations, tags should not be spread across raceways in order to calculate the most rigorous variances.

Tag Recoveries

Tags are recovered from many locations, both within and outside the basin to which the salmon return. Outside the Grande Ronde and Imnaha basins, we obtain CWT recovery data from the RMIS database, providing us with ocean, Columbia River, and Snake River harvests and strays. Within the basins, we recover tags from salmon handled at weirs and hatcheries, from sport fisheries (tribal harvest is not sampled, but should be), and on spawning ground surveys. Tags from ages 4 and 5 adults are the most commonly recovered, while 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 jacks for use in broodstock. The best source of tag recoveries for jacks is from salmon collected for distribution to food banks, tribal subsistence, and/or nutrient enhancement.

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

- 1) ODFW and NPT intend to alternate distribution salmon pick up weeks for both Lostine and Imnaha river salmon. The rotation will begin with NPT picking up any available salmon during the first week of distribution. ODFW will pick up any available salmon during the following week, alternating during subsequent weeks until one or both parties no longer desire available salmon or operation of the weir is discontinued.
 - a. Wallowa Fish Hatchery will report how distribution salmon were allocated (i.e., food bank, picked up by NPT or out-planted for nutrients) on a weekly basis.
- 2) ODFW Fish Research staff will conduct sampling of these salmon for CWTs. Joseph Feldhaus and Deb Eddy will coordinate sampling dates, times, and locations with Ron Harrod and Andrew Gibbs. NPT Fisheries Research staff may assist with or conduct sampling for ODFW Fish Research staff, when requested by ODFW Fish Research staff.
- 3) NPT production (Bruce McLeod/Nancy McAllaster) will communicate NPT distribution pickup dates and times with Ron Harrod and Andrew Gibbs. Current plan is for Tuesday pick-up.
- 4) Imnaha River: 20% sampling rate of all CWT salmon destined for distribution.
 - a. If possible, tagged salmon to be sampled for CWT will be transported to Wallowa Fish Hatchery for CWT collection. Otherwise, Lookingglass Hatchery staff will conduct collections at Imnaha Weir.
 - b. The preferred approach is to transport 20% of all CWT salmon destined for distribution to Wallowa Hatchery weekly and sample all of those salmon for CWTs.

- c. Alternatively to 4b. above, 40% of CWT salmon may be sampled over a four week period (during an ODFW week) if 20% sampling was not accomplished during the previous week that ODFW scheduled for sampling. ODFW may collect additional CWT samples at Imnaha weir on NPT distribution weeks, as long as it does not interfere with loading salmon 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 40% every other ODFW week is not ideal but acceptable.
 - b. Post-sampled carcasses will be sent to a food bank or provided for tribal distribution.

Citations

- de Libero, F. E. 1986. A statistical assessment of the use of the coded wire tag for Chinook (*Oncorhynchus tshawytscha*) and coho (*Oncorhynchus kisutch*) studies. Doctoral dissertation. University of Washington, Seattle.
- Hesse, J. A., J. R. Harbeck and R. W. Carmichael. 2006. Monitoring and evaluation plan for Northeast Oregon hatchery Imnaha and Grande Ronde subbasin spring Chinook Salmon. Prepared for Bonneville Power Administration, Portland, OR.

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

Appendix D. Adult Chinook Fish Health Monitoring Plan & Disease Treatments at Lookingglass Hatchery in 2015.

Stock	Examination Category	Protocol	Comment
200 (LR) 201 (CC) 80 (GR) 29 (IM) 81 (LGC)	Adult Spawners (Broodstock)	-A minimum of 60 females will be sampled for virus from each stock (or all females if <60). Samples will be individual ovarian fluid and 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.
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	2016	200 201 80 29 81	Fungus Control	Formalin Hydrogen Peroxide	Formalin administered a minimum of 3 days per week at 167 ppm for 1 hr. (Veterinary prescription) Hydrogen peroxide 3 days per week at 100 ppm	If formalin cannot be used then use hydrogen peroxide (second choice) Continue treatments throughout the entire spawning season.
Lookingglass, Catherine Creek, Upper Grande Ronde and weirs	2016	200 201 80 29 81	BKD Furunculosis-Enteric Redmouth & other gram negative bacterial infections	Tulathromycin DRAXXIN-25 Oxytetracycline	Injection 5 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 efficacy of injections.	Erythromycin will not be available for the 2015 season DRAXXIN (tulathromycin) will be used instead. Injected fish will not be used for human consumption or released where legal harvest is possible.

