

Steelhead Annual Operation Plan

For

Lower Snake River Fish and Wildlife Compensation Plan

Grande Ronde and Imnaha Basin

For the Period of

January 1 – December 31, 2021

Prepared by:

Oregon Department of Fish and Wildlife

Confederated Tribes of the Umatilla Indian Reservation

Nez Perce Tribe

For

Lower Snake River Compensation Plan

USFWS

and

Bonneville Power Administration

Final

12/23/2020

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Northeastern Oregon Steelhead

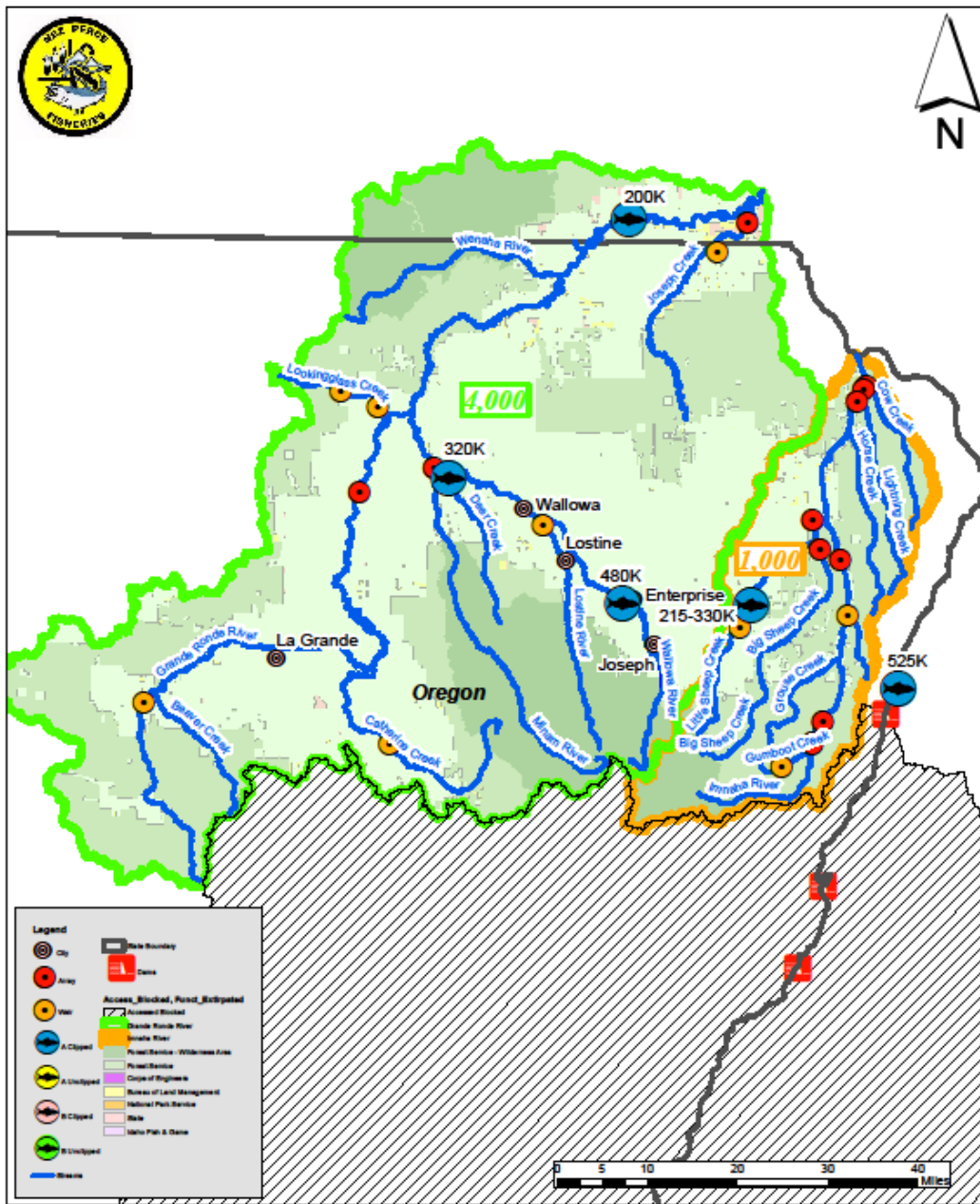


Figure 1. Steelhead hatchery facilities and release locations in Northeast Oregon.

Table 1. Steelhead smolt release goals by release location.

Smolt Release Program	Rearing Facility	Release Site	Parent Stock	Annual Smolt Release Goal
LSRCP / ODFW	WAL/IRR	Wallowa Acclimation Pond Early	Wallowa	400,000
	WAL/IRR	Wallowa Acclimation Pond Late	Wallowa	160,000
	Total			560,000
	WAL/IRR	Big Canyon Acclimation Early	Wallowa	240,000
	Total			240,000
	WAL/IRR	Little Sheep Acclimation	Imnaha	215,000
	Total			215,000
Grand Total			1,015,000	

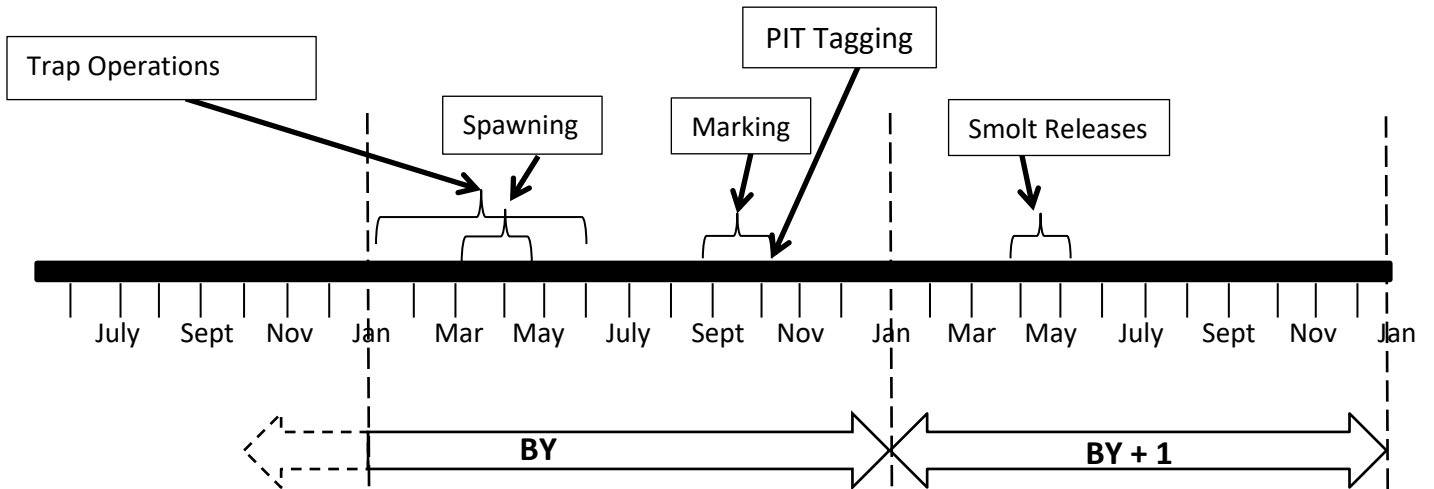


Figure 2. Steelhead production timeline

Table 2. BY2020 steelhead rearing goals by mark type.

Hatchery	Release Site	Stock	Rearing Goals by Mark Type				PIT Tags		
			Date	Total ^a	Mark Type		Total ^b	Funding Source	
					AD	AD CWT		CSS	LSRCP
Irrigon	Wallowa Acc. 1st Release	Wallowa	Nov. 2020	400,000	275,000	125,000	8,500	3,500	5,000
Irrigon	Wallowa Acc. 2nd Release	Wallowa	Nov. 2020	160,000	110,000	50,000	3,800	1,400	2,400
Irrigon	Big Canyon Acc. Release	Wallowa	Nov. 2020	240,000	165,000	75,000	5,300	2,100	3,200
Grande Ronde Basin Totals				800,000	550,000	250,000	17,600	7,000	10,600
Irrigon	Little Sheep Accl. Pond	Imnaha	Nov. 2020	215,000	190,000	25,000	15,000	7,000	8,000
Imnaha Basin Totals				215,000	190,000	25,000	15,000	7,000	8,000
Grand Total				1,015,000	740,000	275,000	32,600	14,000	18,600

^a Numbers in the "Total" column may not equal the current inventory shown in Table 3.

^b PIT tag numbers will not be finalized until June 2021, tag release numbers by release group will be available at: http://www.cbr.washington.edu/dart/query/pit_releases

Table 3. BY2020 steelhead rearing and releases.

Hatchery	Release Site	Stock	Inventory AFTER Marking			Release Goals		Projected Smolt Releases			% of goal
			Date	Number	Size (FPP)	Number	Size (FPP)	Start Date	Number	Transfer Size (FPP)	
Irr/Wal	Wallowa Accl. Pond - 1st Release	Wallowa	10/01/2020	419,987	40.0	400,000	5.0	4/1/2021	418,000	5.5	104%
Irr/Wal	Wallowa Accl. Pond - 2nd Release	Wallowa	10/01/2020	167,536	50.0	160,000	5.0	4/17/2021	166,000	5.5	104%
Irr/Wal	Big Canyon Accl. Pond - Release	Wallowa	10/01/2020	250,575	45.0	240,000	5.0	4/8/2021	249,000	5.5	104%
Totals				838,098		800,000					
Irr/Wal	Little Sheep Accl. Pond	L. Sheep	10/01/2020	235,865	60.0	215,000	4.5	4/1/2021	234,000	5.0	109%
Grand Total				1,037,963		1,015,000			1,066,000		

Table 4. BY2020 steelhead transport, M&E sampling and release schedule.

Transfer Date (Tentative)	M&E Sampling^a	Release Date (2021)	Stock	From Ponds	To	Number	Est. Pounds
Nov. 16-18	Mar. 30 ^b	April 1-5	5620	7,9,11*,13*,15*	Wallowa Lower Acc.	209,000	20,900
Nov. 16-18	Mar. 30 ^b	April 2-5	5620	8*,10*,12*,14,16	Wallowa Upper Acc.	209,000	20,900
Feb. 17-18	April 1 April 30 ^c	April 1-30	2920	27,28,29,30,31*,32	Little Sheep Acc.	234,000	46,800
March 17-18	Apr. 8	April 8-9	5620	21,23,25	Big Canyon Lower Acc.	124,500	22,636
March 17-18	Apr. 8	April 8-9	5620	22*,26	Big Canyon Upper Acc.	83,000	15,091
March 17-18	Apr. 8	April 8-9	5620	24*	Big Canyon Chinook Pd.	41,500	7,545
Apr. 6-7	Apr. 16	April 17-29	5620	17,18*,19,20*	Wallowa Lower Acc.	166,000	30,182
Total						1,067,000	164,054

* Denotes Coded Wire Tag (CWT) Pond

^a Sampling is for pre-release unless otherwise footnoted.

^b Periodic length/weight sampling to monitor the November transfer growth rates.

^c Sex ratio determination.

Table 5. BY2021 steelhead spawning.

Trap Site	Egg Destination	Stock	Spawning Dates	Predicted Return Natural	Predicted Return Hatchery	Wild Fish Needed for Spawning		Hatchery Fish Needed for Spawning		
				Total	Total	Males	Females	Males	Females	Total
Wallowa	Irrigon	Wallowa - Production	March 3 -RV's only (Wednesdays) March 10 - 25 Females; RV's as needed March 17 - 14 Females; RV's as needed March 24 - 17 Females; RV's as needed March 31 -16 Females; RV's as needed April 7 - 15 Females; RV's as needed April 14 - 27 Females; RV's as needed	N/A	1,027 ^a	None – Hatchery Only		140	140	280
Wallowa	Irrigon	Wallowa - Fall Brood		None – Hatchery Only	70	70	140			
Big Canyon	Irrigon	Wallowa - Production	N/A	18	414	Broodstock not collected at Big Canyon				
Little Sheep	Irrigon	Little Sheep	Estimated first spawn (Tues) March 16. Spawn each Tuesday for six weeks or until goals is met.	53	659	2	3	53	52	110

^a This estimate includes Wallowa Fall Brood

Trap Site	Egg Destination	Stock	Fecundity	Egg Take Goal	Egg Transfer Goal
				Green Eggs	Eyed Eggs
Wallowa	Irrigon	Wallowa - Production	5,000	700,000	630,000
Wallowa	Irrigon	Wallowa - Fall Brood	4,400	308,000	277,000
Little Sheep	Irrigon	Little Sheep	5,000	275,000	247,500

Table 6. BY2021 Little Sheep steelhead broodstock collection targets.

Week Ending (Fri)	Natural				Hatchery			
	Average % by Week	Males	Females	Total	Average % by Week	Males	Females	Total
12-Mar	5.4%	0	0	0	6.9%	4	4	8
19-Mar	9.7%	0	0	0	8.6%	5	5	10
26-Mar	8.6%	0	0	0	12.6%	7	7	14
2-Apr	16.0%	1	1	2	18.8%	10	9	19
9-Apr	16.5%	1	1	2	19.2%	10	10	20
16-Apr	15.2%	0	1	1	13.9%	7	7	14
23-Apr	14.8%	0	0	0	11.6%	6	6	12
30-Apr	9.2%	0	0	0	5.7%	3	3	6
7-May	2.6%	0	0	0	1.8%	1	1	2
14-May	1.3%	0	0	0	0.7%	0	0	0
21-May	0.7%	0	0	0	0.2%	0	0	0
Total		2	3	5		53	52	105

**No management of the proportion of hatchery/natural fraction at natural adult run sizes <100. Assuming a predicted natural return of 53 fish, pass four hatchery fish for every one natural, resulting in approx. 202 total adults of the 250 adult target above the weir to spawn naturally in Little Sheep Creek.*

Table 7. BY2021 production planning

Stock	HAT ¹	Pond	# Fish	LBS	F/LB ²	Transfer Location	Approx Transfer Date	Approx Release Date ³	Marks and Tags
5621-Prod	IR	7	42,000	4,200	10.0	Wallowa Lower	Mid-November	Early April	42K Ad Only
5621-Prod	IR	8	42,000	4,200	10.0	Wallowa Upper	Mid-November	Early April	25K ADCWT, 17K AD, 1000 PIT LSRCP, 700 PIT CSS
5621-Prod	IR	9	42,000	4,200	10.0	Wallowa Lower	Mid-November	Early April	42K Ad Only
5621-Prod	IR	10	42,000	4,200	10.0	Wallowa Upper	Mid-November	Early April	25K ADCWT, 17K AD, 1000 PIT LSRCP, 700 PIT CSS
5621-Prod	IR	11	42,000	4,200	10.0	Wallowa Lower	Mid-November	Early April	25K ADCWT, 17K AD, 1000 PIT LSRCP, 700 PIT CSS
5621-Prod	IR	12	42,000	4,200	10.0	Wallowa Upper	Mid-November	Early April	25K ADCWT, 17K AD, 1000 PIT LSRCP, 700 PIT CSS
5621-Prod	IR	13	42,000	4,200	10.0	Wallowa Lower	Mid-November	Early April	25K ADCWT, 17K AD, 1000 PIT LSRCP, 700 PIT CSS
5621-Prod	IR	14	42,000	4,200	10.0	Wallowa Upper	Mid-November	Early April	42K Ad Only
5621-Prod	IR	15	42,000	4,200	10.0	Wallowa Lower	Mid-November	Early April	42K Ad Only
5621-Prod	IR	16	42,000	4,200	10.0	Wallowa Upper	Mid-November	Early April	42K Ad Only
5621-Prod	IR	17	42,000	7,636	5.5	Wallowa Lower	Early April	Early May	42K Ad Only
5621-Prod	IR	18	42,000	7,636	5.5	Wallowa Lower	Early April	Early May	25K ADCWT, 17K AD, 1200 PIT LSRCP, 700 PIT CSS
5621-Prod	IR	19	42,000	7,636	5.5	Wallowa Lower	Early April	Early May	42K Ad Only
5621-Prod	IR	20	42,000	7,636	5.5	Wallowa Lower	Early April	Early May	25K ADCWT, 17K AD, 1200 PIT LSRCP, 700 PIT CSS
5621-FB	IR	21	42,000	7,636	5.5	Big Canyon Lower	Mid-March	Mid-April	42K Ad Only
5621-FB	IR	22	42,000	7,636	5.5	Big Canyon Upper	Mid-March	Mid-April	25K ADCWT, 17K AD, 1000 PIT LSRCP, 700 PIT CSS
5621-FB	IR	23	42,000	7,636	5.5	Big Canyon Lower	Mid-March	Mid-April	42K Ad Only
5621-FB	IR	24	42,000	7,636	5.5	Big Canyon Chinook	Mid-March	Mid-April	25K ADCWT, 17K AD, 1200 PIT LSRCP, 700 PIT CSS
5621-FB	IR	25	42,000	7,636	5.5	Big Canyon Lower	Mid-March	Mid-April	25K ADCWT, 17K AD, 1000 PIT LSRCP, 700 PIT CSS
5621-FB	IR	26	42,000	7,636	5.5	Big Canyon Upper	Mid-March	Mid-April	42K Ad Only

¹ Hatchery abbreviations: IR – Irrigon Hatchery

² F/LB is the number of fish per pound at time of transfer.

³ Release date is the approximate date of the first release.

Table 7 Continued. BY2021 production planning

Stock	HAT¹	Pond	# Fish	LBS	F/LB²	Transfer Location	Approx Transfer Date	Approx Release Date³	Marks and Tags
2921-IM	IR	27	36,000	7,200	5.0	Little Sheep Acc. Pond	Late Feb	Early April	36K AD
2921-IM	IR	28	36,000	7,200	5.0	Little Sheep Acc. Pond	Late Feb	Early April	36K AD
2921-IM	IR	29	36,000	7,200	5.0	Little Sheep Acc. Pond	Late Feb	Early April	36K AD, 2000 PIT LSRCP, 1700 PIT CSS
2921-IM	IR	30	36,000	7,200	5.0	Little Sheep Acc. Pond	Late Feb	Early April	36K AD, 2000 PIT LSRCP, 1700 PIT CSS
2921-IM	IR	31	36,000	7,200	5.0	Little Sheep Acc. Pond	Late Feb	Early April	25K ADCWT, 11K AD, 2000 PIT LSRCP, 1800 PIT CSS
2921-IM	IR	32	36,000	7,200	5.0	Little Sheep Acc. Pond	Late Feb	Early April	36K AD, 2000 PIT LSRCP, 1800 PIT CSS

¹ Hatchery abbreviations: IR – Irrigon Hatchery.

² F/LB is the number of fish per pound at time of transfer.

³ Release date is the approximate date of the first release.

Standard Operating Procedures

Steelhead (*Oncorhynchus mykiss*)

I. Summer Steelhead - Grande Ronde- Wallowa Stock

In 2019 the National Marine Fisheries Service issued a biological opinion that covers activities pursuant to operating and maintaining the steelhead programs in Northeast Oregon. The opinion can be found at:

https://www.fws.gov/lsnakecomplan/Reports/ESA%20Compliance/Biological%20Opinions/NMFS_Final%20NEOR-SEWA%20Steelhead%20BO_07-11-2017.pdf

A. Production goals

Wallowa stock smolt release is 800,000 fish consisting of 560,000 Production and 240,000 Fall Brood released at 5.0 fpp.

B. Allocations – Wallowa stock Production fish will be acclimated at Wallowa Acclimation in two acclimation periods. Wallowa stock Fall Brood fish will be acclimated at Big Canyon Acclimation in a single acclimation period.

C. Liberations

1. Wallowa Acclimation: Smolts are transferred from Irrigon to Wallowa Hatchery

a. First Acclimation – Transferred in November and released after 4 to 5 months of rearing and acclimation.

i. Lower Acclimation Pond – Screens are pulled on the release date. Remaining fish are forced out after 3 days.

ii. Upper Acclimation Pond – Screens are pulled on the release date. Remaining fish are forced out after 2 days.

b. Second Acclimation – Transferred in early April and released after 1-3 weeks of acclimation.

i. Lower Acclimation Pond – The screens are pulled on the release date. Remaining fish are forced out after 10 days.

2. Big Canyon Acclimation: Smolts are transferred from Irrigon Hatchery to the Big Canyon acclimation ponds.

a. Acclimation – Transferred in early March and released after 4 - 5 weeks of acclimation.

i. Lower Acclimation Pond – Screens are pulled on the release date. Remaining fish are forced out after 2 days.

ii. Upper Acclimation Pond – Screens are pulled on the release date. Remaining fish are forced out after 1 day.

iii. Residual removal – On the force out date, ODFW Fish Research samples smolts in the acclimation pond. If >70% of the sample contains males, fish are enumerated and released into a closed waterbody at the District Biologist's discretion. Fish Research will scan for PIT tags.

3. Liberation Notifications: ODFW (Harrod) will notify Yanke, Sedell, and Keniry and Feldhaus (ODFW), and Putnam (IDFG) of steelhead releases.

D. Trap Operations

1. Wallowa Trap

- a. Period of Trap Operation** - Wallowa trap is installed in late January. Collections will continue until no fish are caught for 10 consecutive days.
- b. Trap/sorting Frequency** - Work trap Wednesdays with ODFW staff.
- c. Disposition of Trapped Fish**
 - i. Marked** - Brood collection. Surplus fish are distributed to food banks, buried at Wallowa Hatchery and outplanted to Roulet Pond (50), Marr Pond (100) and Wallowa Wildlife Pond (70). Victor Pond may also be used at the discretion of the Wallowa District. Stocked fish will be marked with 2-left opercle punches.
 - ii. Unmarked** - Transport unmarked fish to the Wallowa River (Fish Hatchery Ln bridge) and release. Sampling shall include genetic punch (1 LOP), sex, and length.
 - iii. Residual Steelhead** - Count and sample all residuals, take snouts from all CWT fish, and euthanize all marked fish. After smolts have been released from acclimation pond, discontinue residual sampling.

2. Big Canyon Trap

- a. Period of Trap Operation** - The Big Canyon trap is installed in early-February or as winter conditions allow. Collections will continue until no fish are caught for 10 consecutive days. From initial start-up through April 30, the ladder is operated from Monday afternoon through Friday morning. After sorting on Fridays, the ladder remains closed through Monday afternoon to increase hatchery fish availability to anglers. Beginning May 1, the ladder remains open throughout the trapping operation.
- b. Trap/sorting/ Frequency** - Work trap weekly with a preference for Fridays.
- c. Disposition of Trapped Fish**
 - i. Marked** – Possible brood collection. Surplus fish are distributed to food banks, buried at Wallowa Hatchery and outplanted to Roulet Pond, Marr Pond, or Wallowa Wildlife Pond. Victor Pond may also be used at the discretion of the Wallowa District. Stocked fish are marked with 2-left opercle punches.
 - ii. Unmarked** - Pass all fish above the weir in Deer Creek. Measure all released fish and mark with 1 LOP. Research staff will save the punch for genetics.
 - iii. Residual Steelhead** - Count and sample weekly until first smolt release, take snouts from all CWT fish, and euthanize all marked fish. After smolts have been released from acclimation pond, discontinue residual sampling.
 - iv. Disposition of Fallback Fish** – Research staff will collect otoliths and scales from dead fish on the Deer Creek weir. On live fish, collect scales then pass live fish downstream.

E. Brood Collection

- 1. Program Summary** - Approximately 420 adults are required to produce the base program of 800,000 smolts. Adult steelhead are collected at two facilities, Wallowa Hatchery on Spring Creek (Wallowa R) and Big Canyon Satellite on Deer Creek (Wallowa R).
 - a. Broodstock Lines** – Two broodstock lines comprise the Wallowa Program, the ‘Production’ line and ‘Fall Brood’ line. Spawning consists of approximately 70% Production Brood and 30% Fall Brood. The Production line originated from adult collections during spring at mainstem Snake River dams from 1976-1978 and from embryos at Pahsimeroi Fish Hatchery (Idaho) in 1979. The Fall Brood line was developed from Production line steelhead that were collected via angling from the Grande Ronde River during early October 2003-2006, spawned separately and differentially marked for release. The Fall Brood line has been maintained by

spawning returning progeny of these collections, with occasional infusion of angler-caught adult steelhead in October that are captured and held at Wallowa Hatchery until spawning.

Prior to BY20, adult returns from the two brood lines were both spawned at Wallowa Hatchery, but segregated at the trap by distinct ventral clips (Production = Adipose fin (AD) clip or AD clip + left ventral (LV), Fall Brood = AD clip + right ventral (RV)). Starting with BY20, ventral clips were discontinued in both broodstock lines prior to release. In the future, the two broodstock lines will be spatially segregated with Production line collected, acclimated, and released at Wallowa Hatchery, and Fall Brood at Big Canyon Satellite.

- b. Wallowa Hatchery / Production Line** – Both broodstock lines will be spawned at Wallowa Hatchery, separated by ventral clips, until 2022. After 2022, only Production line broodstock will be collected at Wallowa Hatchery, and collection of the Fall Brood line will transition to Big Canyon. Adults are held at a 50:50 Male / Female ratio to meet spawning goals. In-season adult collection adjustments are made depending on mortality and spawning success.
- c. Big Canyon Satellite / Fall Brood Line** – Steelhead collected at Big Canyon will not be used for broodstock, unless there is a critical shortage, until 2022. After 2022, collection of the Fall Brood line will transition to Big Canyon. Adults will be spawned and gametes transferred to Wallowa Hatchery for fertilization. Angler-caught fish in the Lower Grande Ronde steelhead fishery during fall months may supplement collections when available. Upon capture, these angler-caught fish are transferred to Wallowa Hatchery and held until spawning.

F. Spawning Guidelines

- 1. Wallowa First Spawn** – Early March.
- 2. Expected Spawning Frequency** – Weekly on Wednesdays.
- 3. Spawning Strategies**
 - a.** Fish are spawned at a 1:1 ratio and loaded into incubation trays up to 2 females per tray. Fall Brood and Production eggs are segregated during incubation.
 - b.** Production eggs are represented from 6 egg takes (events). ODFW Fish District staff develops a number of fish to spawn related to Fish Research run estimates.
 - c.** Fall Brood spawning will occur weekly in March until the goal number of spawned fish is reached. Ripe fish are spawned as needed from on-hand collected brood.

G. Incubation and Rearing

- 1.** Green eggs are incubated at Wallowa Hatchery. Eyed eggs are transferred to Irrigon Hatchery and represent all egg takes.
- 2.** Eggs are hatched and ponded at Irrigon Hatchery.
- 3.** Fish are reared at Irrigon Hatchery until transfer to acclimation sites.
- 4.** Fall Brood and Production fish are segregated at Irrigon Hatchery.
- 5.** If excess occurs greater than expected, eggs can be culled and used for resident trout production, or ODFW will propose release location in a closed waterbody. Excess smolts will not be marked.

II. Summer Steelhead - Imnaha Stock

In 2017 the National Marine Fisheries Service issued a permit which covers activities related to the production, monitoring, and evaluation of the Little Sheep Creek Summer Steelhead Hatchery Program. The permit has additional details on these activities, and can be found at:

https://www.fws.gov/snakecomplan/Reports/ESA%20Compliance/Permits/NMFS_Final%20Permit%2018032%20Little%20Sheep%20STH_07-25-2017.pdf

- A. **Production goals** - Little Sheep smolt release is 215,000 fish at 4.5 fpp.
- B. **Allocations** - Little Sheep fish are acclimated at the Little Sheep Creek satellite facility. The releases will occur in one acclimation period.
- C. **Liberations - Little Sheep Acclimation:** Smolts are transferred from Irrigon Hatchery to Little Sheep Creek acclimation pond.
 - 1. Smolts are volitionally released after a 5-8 week acclimation. Beginning in the first part of April, the screens are pulled and the fish are allowed 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 are notified if changes are made to the release date.
 - 2. Fish Research samples smolts in the acclimation pond. If >70% of the sample contains *males*, remaining fish will be estimated and up to 7,500 fish released in Kinney Lake. If outplanted, Fish Research scans for PIT tags. Otherwise, remaining fish will be forced out.
 - 3. Liberation Notifications: ODFW (Harrod) will notify Yanke, Keniry, and Feldhaus (ODFW), Harbeck and Tenant (NPT), and Putnam (IDFG) of steelhead releases.

D. Trap Operations

1. Little Sheep Trap

a. Period of Trap Operation - The Little Sheep Creek trap is installed in late February.

Collections continue until no fish are caught for 10 consecutive days.

b. Trap/sorting Frequency - Work trap Monday and Thursday.

c. Disposition of Trapped Fish

- i. Marked** - Adults collected for broodstock, placed above the weir and marked with a 1-LOP, distributed to food banks, used for stream enrichment, or buried.
- ii. Unmarked** - Adults collected for broodstock or placed above the weir and marked with a 1-LOP.
- iii. Genetics tissue samples** - Tissue sample all wild and hatchery fish passed above the weir for genetic analysis by ODFW (for NOAA Fisheries).
- iv. Residual Steelhead** – Count weekly until first smolt release, take snouts from all CWT fish, and euthanize all marked fish. After smolts have been released from acclimation pond discontinue residual sampling.
- v. Surplus** – Steelhead in excess of production or natural production needs above the weir are considered surplus. These fish will be killed and: 1) distributed to tribes and/or local food banks, 2) placed in Little Sheep Creek for nutrient enrichment purposes, or 3) buried in a landfill. If IHNV prevalence $\geq 30\%$ then nutrient enrichment would have to stop. Contact Jim Harbeck (NPT) for carcass availability.
- vi. Disposition of fall back fish.** 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.

- vii. **Carcass Disposal** - Spawned fish not suitable for distribution can be placed in the stream for nutrient enhancement or buried in a landfill.
- viii. **Strays** - All unidentified marked fish (e.g. RV only, maxillary clip) will be sacrificed.

E. Brood Collection

1. Broodstock Management guidelines - Approximately 126-137 adults are required to produce the base program of 215,000 smolts.
2. The guideline for the proportion of natural fish in the broodstock is as follows:
 - a. At less than or equal to 100 natural returns, use 10% of natural run for broodstock
 - b. At greater than 100 natural returns, use 10 natural fish plus 40% of the natural run greater than 100 for broodstock.
3. Remaining broodstock needs are comprised of hatchery adults.
4. Wild and hatchery adults are collected based upon weekly estimated run timing to the facility. ODFW Fish District Staff (Yanke/Bratcher) will create a table to reflect all collections.
5. Little Sheep Creek – In season modification - The run size will be reviewed around April 1 and adjustment can be made for broodstock collections.

F. Spawning Guidelines

1. **Little Sheep Satellite First Spawn** – Mid March.
2. **Expected Spawning Frequency** – Weekly on Tuesdays.
3. **Spawning Strategies**
 - c. A 2 x 2 or 3 x 3 spawning matrix is utilized. A matrix includes at least one natural fish, whenever possible.
 - d. When eggs have been fertilized, the embryos are combined into groups of three females. These groups are tracked.
 - e. Note: Live spawn all wild males retained for broodstock, collect genetic tissue sample (1 LOP), and release above the weir.

G. Incubation and Rearing

1. Green eggs will be incubated at Wallowa Hatchery. Eyed eggs will be transferred to Irrigon Hatchery and represents all egg takes.
2. Eggs are hatched and ponded at Irrigon Hatchery.
3. Fish are reared at Irrigon Hatchery until transfer to acclimation sites.
4. Fish in excess of program needs will be reared to smolts and incorporated with the Little Sheep Creek release providing they total less than 236,500 (215,000 + 10%).

III. Monitoring and Evaluation

Summary: 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, and Little Sheep facilities. For the Imnaha supplementation program we will also evaluate the effects of hatchery releases on natural origin abundance. 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 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.

A. Current Studies

1. Fallbrood versus standard production, began with 2004 cohort (funded by LSRCP). For details, see Clarke et al. 2017 at: <https://www.fws.gov/lsnakecomplan/Reports/Miscreports.html>
2. Comparative Survival Study (for the Fish Passage Center, contact: Brandon Chockley), compares barging at Lower Granite vs. natural downstream migration (funded by BPA). For details, see: <http://www.fpc.org/documents/CSS.html>
3. ODFW-WDFW reciprocal release study, releases from 2015-2018, adults returns to freshwater through 2022 (funded by LSRCP). For details see Clarke 2018 at: <https://www.fws.gov/lsnakecomplan/Meetings/2018ProductionAnnualMeeting.html>
4. Monitor effects of fall (November) transfer from Irrigon to Wallowa Hatchery beginning with brood year 2020 (release year 2021). Objective to provide a period of extended acclimation and rearing at lower densities, reduce transfer stress, and provide safer hauling conditions. Performance will be evaluated using standard monitoring methods with groups of PIT and CWT tags. Co-managers are also investigating the use of PBT marking/tagging for future performance evaluation. Collect monthly weight and length samples for the months of December through March. Sample pond for maturity prior to release. **New for 2021.**
5. Relative Reproductive Success (RRS) of Imnaha stock – Reproductive success of hatchery and wild Imnaha adults passed above the weir to spawn naturally is evaluated using genetics run by NOAA Fisheries (contact: Ewann Bernston). All fish released above the weir and used for broodstock are sampled for genetics (funded by BPA). For details see Bernston et al. 2012 at: <https://www.fws.gov/lsnakecomplan/Meetings/2012SteelheadProgramReviewSymposium.html>

B. Work Conducted at Facilities

1. Irrigon Hatchery

- a. PIT tagging

- i. October tagging – 18,600 LSRCP tags (10.6k Wallowa stock and 8k Imnaha stock), 14,000 CSS tags (7k Wallowa and 7k Imnaha stock).

2. Wallowa Hatchery

- a. Spawning
 - i. Wallowa stock – sample all adults. Measure FL, record fin clip, opercle punch, collect snouts on CWT'd fish, collect genetic tissue samples from all brood used in production for Matt Campbell's (Eagle Genetics Lab, ID) parental based tagging study.
 - ii. Imnaha stock – sample adults that were spawned at Little Sheep Facility by hatchery staff the previous day – same sampling protocol as Wallowa stock except collect two genetic samples, one for the Eagle Genetics Lab and one for NOAA Fisheries (contact: Ewann Bernston)
- b. Install 2 PIT tag antennas in adult ladder for duration of trapping.
- c. Monthly length/weight samples to monitor growth.
- d. Pre-release sampling – for each unique release group, measure 100 FL (mm), 50 weights (g), and 300 Ad-clip quality in each acclimation pond.

3. Big Canyon Facility

- a. Trapping – assist hatchery staff with running adult trap (weekly), record number, fork length, fin clip of adults by sex, collect snouts on CWT adults and residuals, and save opercle punches (1LOP) on all wild fish passed above weir.
- b. Fallbacks at weir – Assist with capture of fallbacks. Record sex, fin clip, FL (mm), opercle punch, and collect scales on fallbacks. Pass live fish downstream.
- c. Pre-release sampling – Same procedure as at Wallowa Hatchery, except collect 50 genetic tissue samples (Wallowa stock) for NOAA Fisheries (contact: Ewann Bernston)
- d. Sampling to enumerate residuals in Deer Creek – Mid to late July, using block seines and a backpack electrofisher, do multiple pass/removal of all salmonids at two sites. Count and measure (FL) by species, record origin (hatchery or wild) keeping each pass separate. Estimate number of age zero *O. mykiss*, Chinook salmon, and other non-salmonids.
- e. Install 2 PIT tag antennas in adult ladder for duration of trapping.

4. Little Sheep Creek Facility

- a. Trapping – Hatchery staff scans all hatchery fish (Ad clip) for CWT and collect snouts on distribution days (Mondays).
- b. Install 2 PIT tag antennas in adult ladder for duration of trapping.
- c. Pre-release sampling – same procedures as Wallowa Hatchery, except collect 50 genetic tissue samples (Imnaha stock).
- d. Sex ratio at end of volitional release – estimate number left in pond, measure FL, sacrifice 100 fish and determine gender – note if ripe. If > 70% male, outplant to farm ponds (up to 7,500), otherwise force out.
- e. Sampling to enumerate residuals in Little Sheep Creek – Procedures similar to Big Canyon.
- f. Genetic sampling for the Relative Reproductive Success study (contact: Ewann Bernston NOAA Fisheries) – in mid-August, collect fin clip samples from *O. mykiss* as follows: 20 age-0, 20 age 1+, all wild fish >150 mm FL (considered

rainbow trout), and all hatchery (ad-clipped) residuals at 8 sites above the Little Sheep Creek Facility. Sites on Little Sheep Creek include Devils Gulch, Lightning Cr, Hayden Cr, Threebuck Cr, Rail Canyon, Corcoran property, McCully Cr, and Ferguson Cr.

C. Creel Surveys

1. Lower Grande Ronde (GR) River (ODFW: 1 Sept – 31 Dec, WDFW: 1 Feb - 30 March) – One creel surveyor conducts pressure counts, and interviews anglers between counts, recording angler hours fished, angler origin, number of steelhead adults kept, hatchery fish released, and wild fish released. Creeler samples harvested fish, scans for PIT tags and CWT, records fin clip, FL (mm), sex, and collects snouts on all CWT fish.
2. Wallowa River (1 Feb to 15 April) – same sampling protocol as Lower GR, except no pressure counts.
3. Imnaha River (1 Feb to 15 April) – One creel surveyor runs a check station at Fence Creek, interviewing all anglers leaving lower river. During scheduled times, the surveyor closes the check station and drives upriver to the town of Imnaha and up Big Sheep Creek to the mouth of Little Sheep Creek, count and interview all anglers then return to the check station, recording time away from the check station. During the second day of a two-day sampling block, surveyor drives downstream to Cow Creek, counting and interviewing all anglers. Creeler collects the same sampling information as on the Lower GR and Wallowa surveys.

D. Adult Return and Juvenile Release Monitoring

1. CWT vs. PIT tag reconstruction of abundance, mortality, and life history traits throughout the run; Grande Ronde and Imnaha basin harvest.
2. Download PIT tag detections at dams and weirs for in-season run forecasts and run timing – detections at Bonneville and Lower Granite dams, Wallowa and Imnaha Rivers, Wallowa Hatchery, Big Canyon and Little Sheep Creek acclimation facilities.

E. Marking and Tagging

1. Ad-clip – August at Irrigon Hatchery in conjunction with CWT.
2. CWT - August at Irrigon Hatchery. Eleven 25k tag groups are represented.
 - a. Production - November transfer – Wallowa Hatchery upper acclimation pond – April release.
 - b. Production - November transfer – Wallowa Hatchery lower acclimation pond – April release.
 - c. Production – Wallowa Hatchery lower acclimation pond – May release.
 - d. Fallbrood – Big Canyon upper acclimation pond – April release.
 - e. Fallbrood – Big Canyon lower acclimation pond – April release.
 - f. Fallbrood – Big Canyon Chinook pond – April release.
 - g. Little Sheep production – Little Sheep acclimation pond – April volitional release.
3. CWT Recovery – Adult fish are scanned for CWTs using a tube detector or wand. If a tag is present, the snout is removed and placed in a bag with snout identification number. Snouts are sent to the ODFW Fish ID Lab in Clackamas for processing, typically in June.
4. PIT tag – All fish will be PIT tagged in October at Irrigon Hatchery.

IV. Fish Health

Location	Sp.	Stock	Examination Category	Protocol	Comment
Irrigon Hatchery	StS	Wallowa (56) and Little Sheep (29)	Monthly & Preliberation	- Examine subset of morts for disease using appropriate diagnostic methods - Monitor health status of healthy fish from each stock - Establish disease status at preliberation exam with appropriate testing methods	Utilize best management practices and judicious antibiotic use to manage disease outbreaks as recommended by Fish Health Services and Fish Pathologist
Irrigon Hatchery	StS	56 or 29	Annual Myxobolus cerebralis	60 smolts that have been on the water supply for at least 6 months >180 days	Prefer using saved mortalities
Steelhead acclimation sites – WA, BI & LI	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 n = 60 <i>O. mykiss</i> from each water supply to be sampled for Mc prior to release.	Must be on water supply >180 days
Wallowa & Little Sheep	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.	A weekly sample (N=24) of ovarian or milt fluid may be sampled. Discontinue out-planting if IHNV prevalence \geq 30%.
Wallowa & Little Sheep	StS	56 & 29	Adult Mortality as needed by Fish Pathologist	-kidney smears on TYE-S agar - A maximum of 10 mortality (29 stock) examined and no more than 20 of 56 stock will be examined	
Lookingglass Creek	StS or Sp		Adults	-mortalities examined by fish health staff, diagnostics employed per Fish Pathologist for culturable viruses, bacteria, <i>R. salmoninarum</i> by ELISA	The scope of what can be learned from these mortalities will depend on the degree of degradation.

**Disinfections and Sanitation Guidelines
Specific Operational Recommendations**

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

Disinfection and Sanitation Guidelines
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.

V. Grande Ronde Natural Population Monitoring

Summer Steelhead Monitoring: Catherine Creek/Grande Ronde River/Lookingglass Creek/Lostine River/Joseph Creek

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

A. Monitoring and Evaluations

1. Adult Enumeration/Weir Collections

- a. Weir locations** - Catherine Creek (CC), Lookingglass Creek (LGCR), and Lostine River (LR). The primary adult enumeration protocol for Joseph Creek (JC) will be through in-stream PIT array. A weir will be operated every 5 years or when PIT array becomes non-operational. CC weir is installed, operated, and maintained by CTUIR. LGCR weir installed and operated by ODFW and CTUIR. LR and JC weirs installed and operated by NPT. The upper Grande Ronde River weir site is not operated to capture steelhead.
- b. Period of Trap Operation** – CC 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 the last Chinook spawning survey, but no later than September 30, to collect steelhead and spring Chinook. Lookingglass Hatchery crew notifies CTUIR screw trap personnel when pickets are pulled. LR weir will begin operating mid-February but may be periodically lowered when debris or high flow threaten the structure. During the years it is operational, JC weir will begin operating in January.

2. Disposition of steelhead at weirs

a. Catherine Creek and Lookingglass Creek Weirs

- i. Live, unclipped, first-time captures** – Enumerate, fork length, maturity, migration status, scales, sex, marks/tags, condition, take one opercle punch and pass above the weir (or below if kelt). All CC and LGCR fish will have scales collected. All steelhead will be scanned for CWTs and PIT tags.
 - ii. Live, unclipped, previously punched captures** - Enumerate, fork length, maturity, migration status, sex, marks/tags, and pass above the weir (or below if kelt). Note the number and position of existing opercle punches and the direction of capture (upstream or downstream).
 - iii. Live, clipped captures or clipped mortalities** - Enumerate, fork length, maturity, migration status, sex, marks/tags, condition. At CC 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, 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).
- b. Weir/Trap Unclipped Mortalities - (First time captures at CC)** Enumerate, fork length, maturity, migration status, scales, sex, marks/tags, condition, take two opercle punches and take otolith. Return carcass to stream. **(Recaptures at CC)** – Enumerate, fork length, maturity, migration status, sex, marks/tags, condition, take ONE opercle punch and otolith. Return carcass to stream. **(First time capture or recapture at Lookingglass Creek)** Collect same data and tissues as for CC. **Retain mortalities in freezer in labeled bag.** Collaborate with Fish Health when working dead fish at any of the three streams.

- c. **Lostine River Weir** - Goal: to quantify natural and hatchery adult escapement and determine life history characteristics (NPT)—No Production goals.
- i. **Adult Escapement** – Population estimate using mark-recapture methodology.
 - ii. **Live unclipped first time captures** - LR unclipped steelhead will have the following noted: number captured, direction of capture (upstream or downstream), fork length, sex, fin clips/marks/tags, condition. A single left opercle punch (1 LOP) will be taken to mark the fish and the tissue will be stored in a uniquely labeled envelope for later genetic analysis. All steelhead will be scanned for CWTs and PIT tags. Steelhead will be released in the direction in which they were traveling (i.e. fish captured in the upstream trap box will be released upstream of the weir).
 - iii. **Live, unclipped, previously punched captures** – Spawned out kelts that wash downstream onto the weir will serve as recaptures for the mark-recapture estimate. Downstream captures of steelhead may also be obtained by seining or dip netting at the upstream face of the Lostine River weir. No attempt will be made to capture steelhead occupying a redd. Previously captured steelhead will be identified by the presence of a 1 LOP. In addition to the existing opercle punch, the following will be noted: number captured, direction of capture (upstream or downstream), fork length, maturity (green, ripe, or kelt), sex, fin clips/marks/tags, condition. All steelhead will be scanned for CWTs and PIT tags.
 - iv. **Live clipped first time captures** – LR fin clipped steelhead will be treated the same as unclipped steelhead.
 - v. **Live, clipped, previously punched captures** – Recaptured LR fin clipped steelhead will be treated the same as unclipped steelhead.
 - vi. **Weir/Trap Mortalities** - Note the location of all steelhead carcasses and mortalities as upstream of weir, in trap box, in pickets, or downstream of weir. Inspect all steelhead carcasses for fin clips/marks/tags and scan for coded wire and PIT tags. Collect fork length, sex, percent spawned (if female) and inspect the operculum plates for a punch. If no punch exists, take a 1 LOP 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.
3. **Disposition of bull trout and other non-target species**
- i. **Disposition of Bull trout** – Record date, number trapped, and estimated fork length (minimizing handling effects and avoid anesthetics). Report take to as per the US Fish and Wildlife Service 2016 Biological Opinion with copy of data to ODFW (Yanke) and LSRCP (Robertson).
 - ii. **Disposition of other non-target species** – Enumerate, subsample for length and release.
 - iii. **Adult Mortalities** – Natural mortalities will be sampled for biological information and their heads retained for otolith extraction.

B. Remote PIT Tag Array Monitoring

NPT and ODFW operate remote in-stream detection systems in the Grande Ronde basin year round as 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 (WR1) - Wallowa River at rkm 14 - N 45.633769, W 117.73369- installed 8/16/2013.*
4. *Site Code (UGS) - Upper Grande Ronde Weir - N 45.248966, W 118.388930- installed 11/05/17.*
5. *Site Code (WR2) - Wallowa River at rkm 32 - N 45.594472°, W 117.579237° - installed in 8/2/2018.*
6. *Site Code (WEN) - Wenaha River at rkm 1 - N 45.946202°, W 117.454189°- installed 9/27/2018.*
7. *Site Code (CCU) – Catherine Creek - N 45.215300°, W 117.900700°- installed 12/2018.*
8. *Site Code (MR1) – Minam River - N 45.619658°, W -117.726644°- installation in progress.*

Key Contacts

1. CTUIR (McLean, Naylor). Distribute bull trout and steelhead data collected to ODFW District offices (Yanke).
2. NPT (Vogel, Vatland, Orme). Distribute bull trout and steelhead data collected to ODFW District offices (Yanke).
3. ODFW (Sedell, Feldhaus, Faber). Distribute bull trout and steelhead data collected to ODFW District offices (Yanke)

VI. Imnaha Basin Natural Population Monitoring

Summer Steelhead - Imnaha River and Tributaries (Cow, Camp, Big Sheep, Grouse, and Crazyman 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* — Camp Creek.
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*
 - i. *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. 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.

- ii. 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

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:

1. **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 1ROP 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.

2. **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.
3. **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.
4. **Timeframe** – NPT staff will be at the Imnaha weir to assist on a daily basis until June 18 or until it can be determined that adult steelhead will no longer be present at the weir site.

5. **Notification** – ODFW personnel notifies immediate notification to NPT if any new upstream steelhead, live kelts, or dead kelts are observed in the trap or above the weir. NPT staff can process as needed.

B. Remote PIT Tag Array Monitoring

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". 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 2.3 - N 45.554842, W 116.872908 - installed reinstalled Jan/Feb 2021 (tentative).*
7. *Site Code (CZY) – Crazyman Creek at rkm 0.6 - N 45.22930, W 116.84478 - installed 11/8/2013.*
8. *Site Code (IR4) – Imnaha Weir Downstream Array N 45.19446, W 116.868774- installed 8/18/2016.*
9. *Site Code (IR5) – Imnaha Weir Upstream Array N 45.193188, W 116.868593- installed 8/18/2016.*
10. *Site Code (IML) – Imnaha Weir Adult Ladder N 45.19427639, W 116.8686635- installed 5/18/2015.*
11. *Site Code (GCM) – Grouse Creek at rkm 0.02 – N 45.328050, W 116.806617 – installed 3/18/2020.*

C. Key Contacts

NPT (Vogel, Orme, Young, Harbeck)