Annual Operating Plan

for

Lower Snake River Fish and Wildlife Compensation Programs

Grande Ronde and Imnaha Basins, Oregon

Spring Chinook Salmon

Fall Chinook Salmon

Coho Salmon

Pacific Lamprey

For the Period of

January 1 – December 31, 2022

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

2/17/2022

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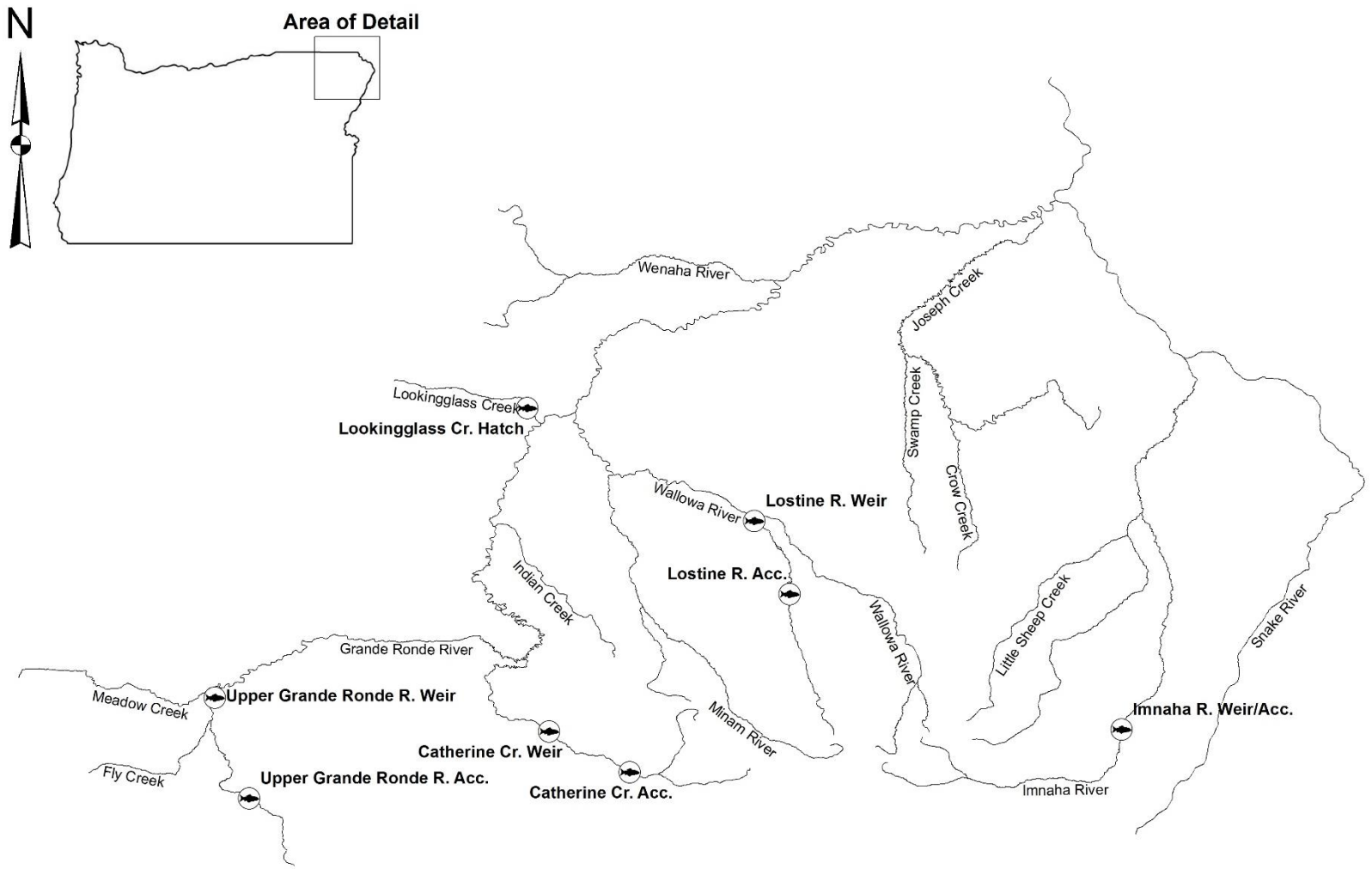

Figure 1. Grande Ronde and Imnaha basin Chinook salmon hatchery facilities and release locations.

Table 1. Grande Ronde and Imnaha basin Chinook salmon smolt release goals, including marking strategy. Source = funding source for allocation of PIT tags: LSRCP (Lower Snake River Compensation Plan), CSS (Comparative Survival Study – Fish Passage Center).

Stock	Smolt release goal	Acclimation Period		Direct Release	Ad clipped (%)	CWT (N)	CWT (%)	PIT Tags	
		First	Second					N	Source
Upper Grande Ronde R.	250,000	125,000	125,000		50	250,000	100	2,000	LSRCP
Catherine Crk.	150,000	150,000			100	100,000	67	21,000	CSS
Lookingglass Crk.	250,000	250,000			100	120,000	48	5,000	LSRCP
Lostine R.	250,000	125,000	125,000		100	126,000	50	6,000	LSRCP
Grande Ronde Basin	**900,000**					**596,000**		**34,000**	
Imnaha R.	**490,000**	280,000		210,000	100	245,000	50	21,000	CSS
Oregon Snake Basin	**1,390,000**	**930,000**	**250,000**	**210,000**		**841,000**		**55,000**	

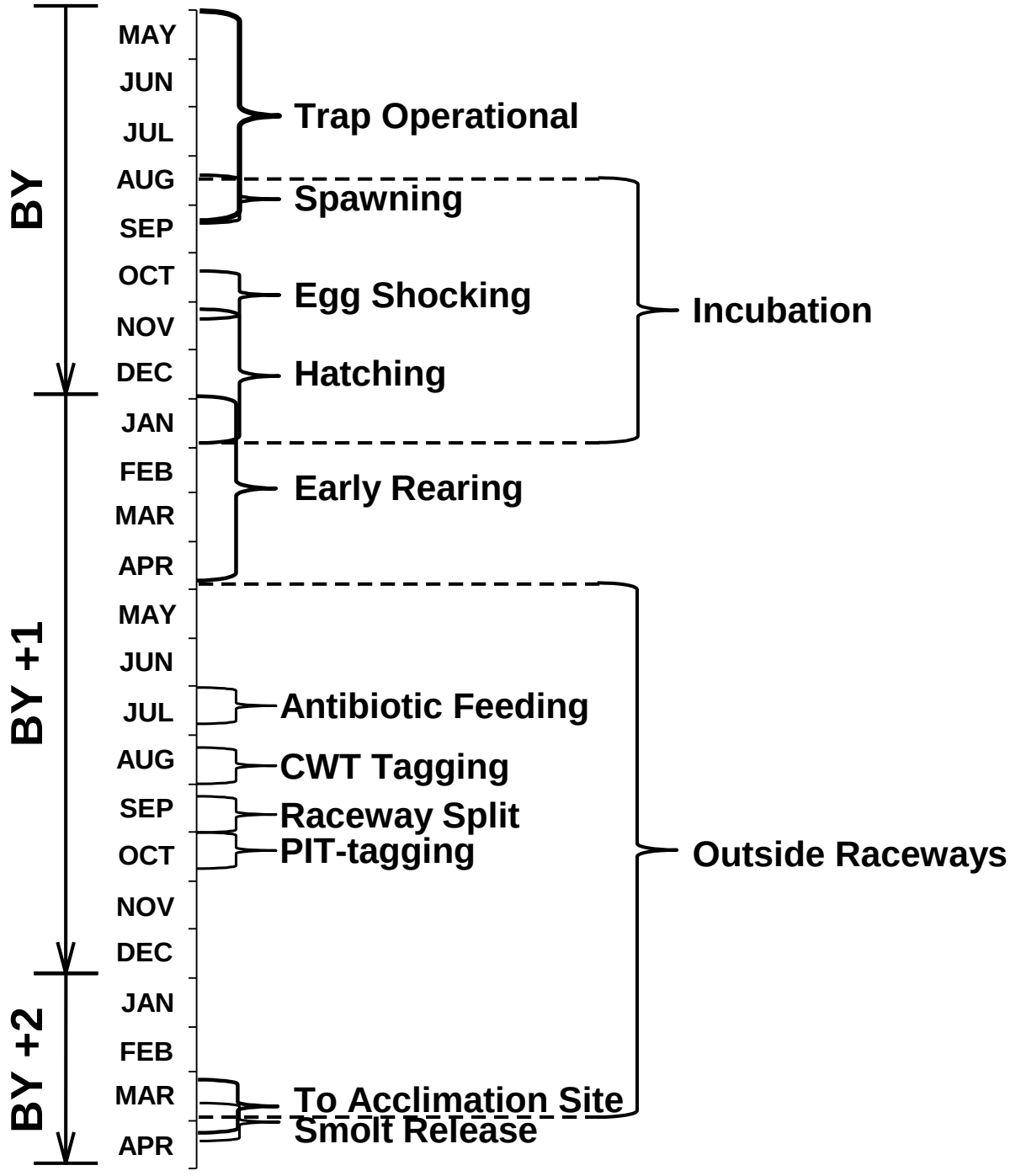

Figure 2. Grande Ronde and Imnaha basin Chinook salmon production timeline.

Table 2. Grande Ronde and Imnaha basin Chinook salmon brood year (BY) 2020 inventory, current as of 1/27/2022. Marks (CWT, PIT Tag, and AD) represent percentage or number of fish marked but does not account for tag loss and/or mortality.

	Pre-Split	Current Inventory					
Release Site	**Container**	**Container**	**N**	**% CWT**	**CWT Codes**	**PIT Tag (N)**	**AD (%)**
Upper Grande Ronde R. (GQ)	RW15	RW15	74,260	81	091686	500	100
	RW16	RW16	64,870	92	091687	500	100
	RW17	RW17	65,785	100	091684	500	0
	RW18	RW18	64,782	100	091685	500	0
Upper Grande Ronde Total			**269,697**			**2,000**	
Catherine Crk. (CQ)	RW13	RW13	90,172	55	091682	10,500	100
	RW14	RW14	89,426	56	091683	10,500	100
Catherine Crk. Total			**179,598[a]**			**21,000**	
Lookingglass Crk. (LG)	RW1	RW1	80,784	0	-	1,600	100
	RW2	AHPA	49,401	61	091690	900	100
		AHPB	49,100	61	091690	800	100
	RW6	AHPC	49,252	63	091691	900	100
		AHPD	45,744	66	091691	800	100
Lookingglass Crk. Total			**274,281**			**5,000**	
Lostine River (LQ)	RW3	RW2	67,259	25	091688	1,500	100
	RW4	RW3	67,068	75	091688	1,500	100
	RW5	RW4	67,141	25	091689	1,500	100
		RW5	67,119	75	091689	1,500	100
Lostine River Total			**268,587**			**6,000**	

Table 2 Continued. Grande Ronde and Imnaha basin Chinook salmon brood year (BY) 2020 inventory, current as of 1/27/2022. Marks (CWT, PIT Tag, and AD) represent percentage or number of fish marked, but does not account for tag loss and/or mortality.

	Pre-Split	Post-Split					
Release Site	**Container**	**Container**	**N**	**% CWT**	**CWT Codes**	**PIT Tag (N)**	**AD (%)**
Imnaha River (IM)		RW6	67,712	0	–	3,000	100
	RW7	RW7	67,405	0	–	3,000	100
	RW8	RW8	67,925	0	–	3,000	100
	RW9	RW9	75,728	82	091692	3,000	100
	RW10	RW10	77,254	79	091693	3,000	100
	RW11	RW11	75,038	83	091694	3,000	100
	RW12	RW12	74,983	67	091695	3,000	100
Imnaha River Total			**506,045**			**21,000**	

[a] *Current inventory for BY20 Catherine Creek exceeds smolt release goals by 19.7%. Marking has already occurred; therefore, all production will be released into Catherine Creek.*

Table 3. Grande Ronde and Imnaha basin Chinook salmon brood year (BY) 2020 transport and release schedule in 2022. Inventory current as of 1/27/2022.

Stock	Transfer Date	Release Type	Container	To	N	Estimated Pounds	Release Date
Grande Ronde R.	28-Mar	1st Acclimation	RW 15,18	UGR Acc.	139,042	6,320	7-Apr
Grande Ronde R.	8-Apr	2nd Acclimation	RW 16,17	UGR Acc.	130,655	5,939	27-Apr
Grande Ronde Total					**269,697**		
Catherine Creek	29-Mar	Acclimated	RW 13,14	Catherine Acc.	179,598	8,164	27-Apr
Catherine Total					**179,598**		
Lookingglass Creek		Acclimated	RW1, A, B, C, D	Lookingglass Crk.	274,281	12,467	22-Apr
Lookingglass Total					**274,281**		
Lostine River	7-Mar	1st Acclimation	RW 2,3	Lostine R. Acc.	134,327	6,106	10-Apr
Lostine River	11-Apr	2nd Acclimation	RW 4,5	Lostine R. Acc.	134,260	6,103	23-Apr
Lostine Total					**268,587**		
Imnaha River	17-18 Mar	Acclimated	RW 6, 7, 11, 12	Imnaha R. Acc.	285,138	12,961	17-Apr
Imnaha River	15-Apr	Direct	RW 8, 9,10	Imnaha R.	220,907	10,041	15-Apr
Imnaha Total					**506,045**		

Table 4. Brood year (BY) 2021 fry inventory with release goals and marking plan, current as of 1/28/2021.

Stock	Stock-BY ID	Estimated Fry	Release Goal	% Ad Clip	% CWT	PIT Tag (N)
Upper Grande Ronde	GQ 80-21	278,570	250,000	50	100	2,000
Catherine Creek	CQ 201-21	174,237	150,000	100	68	21,000
Lookingglass Creek	LG 81-21	292,792	250,000	100	48	5,000
Lostine River	LQ 200-21	291,464	250,000	100	45	6,000
Imnaha River	IM 29-21	564,183	490,000	100	61	21,000
Total Fry to Pond		**1,599,853**	**1,390,000**			**55,000**

Table 5. Pre-season return estimates for adult (age 4-5) Chinook salmon returning to Oregon Snake Basin tributaries in 2022.

Stock	Origin	BON	Conversion to LGD	LGD	Conversion to Tributary	Tributary Mouth	Conversion from BON to Tributary
Upper Grande Ronde	Hatchery	568	65%	369	90%	**332**	59%
	Natural	134	70%	94	90%	**85**	63%
Catherine Creek	Hatchery	783	65%	509	90%	**458**	59%
	Natural	258	70%	180	90%	**162**	63%
Lookingglass Creek	Hatchery	921	65%	598	90%	**538**	59%
	Natural	153	70%	107	90%	**96**	63%
Lostine River	Hatchery	1,067	75%	800	90%	**720**	68%
	Natural	373	80%	299	90%	**269**	72%
Grande Ronde Total	Hatchery	**3,339**		**2,276**		**2,048**	
	Natural	**918**		**680**		**612**	
Imnaha River	Hatchery	1,611	75%	1,208	90%	**1,088**	68%
	Natural	474	85%	403	90%	**363**	77%
Oregon Snake Basin	Hatchery	**4,950**		**3,484**		**3,136**	
	Natural	**1,392**		**1,083**		**975**	

Table 6. Grande Ronde and Imnaha basin Chinook salmon brood year (BY) 2022 brood stock collection goals.

Stock	Goals[a]			Fecundity Estimate (eggs per female)	% Planned Survival (green egg to smolt)
	Female Collection	Females Spawned	Green Eggs Collected		
Upper Grande Ronde (GQ)	89	79	281,442	3,572	89
Catherine Creek (CQ)	52	50	175,187	3,526	86
Lookingglass Creek (LG)	87	79	292,634	3,705	85
Lostine River (LQ)	82	73	305,640	4,245	80
Grande Ronde Total	**310**	**281**	**1,054,903**		
Imnaha (IM)[b]	141	134	576,471	4,075	85
Oregon Snake Basin Tributaries	**451**	**415**	**1,631,374**		

[a] *Subject to change based on in-season run projections.*

[b] *Fecundity, planned survival, and green egg collection goals reflect most recent 3-year estimates, but will not match females spawned. ODFW may collect more females if broodstock collection indicates smaller females.*

Table 7. BY 2022 Upper Grande Ronde River weekly brood stock collection strategy, by sex, during years when 'normal' water temperatures are observed and when 'high' temperatures require early removal of the weir and trapping facilities.

Week	Est. NOR Timing (%)	Females		Males		Jack	
		Normal Temp	High Temp	Normal Temp	High Temp	Normal Temp	High Temp
2-May	0.0	0	0	0	0	0	0
9-May	1.1	1	3	1	2	0	0
16-May	4.3	4	6	4	6	0	0
23-May	8.6	8	8	7	7	1	1
30-May	31.2	28	28	26	26	2	2
6-Jun	24.7	22	22	21	21	2	2
13-Jun	17.2	16	16	14	14	2	2
20-Jun	8.6	8	8	7	7	1	1
27-Jun	3.2	3		2		0	
4-Jul	0.0	0		0		0	
11-Jul	1.1	1		1		0	
18-Jul	0.0	0		0		0	
25-Jul	0.0	0		0		0	
1-Aug	0.0	0		0		0	
Total Goal		**91**	**91**	**83**	**83**	**8**	**8**

Table 8. BY 2022 Catherine Creek weekly brood stock collection strategy, by sex, and origin (natural-origin, NOR, and hatchery-origin, HOR) for Chinook salmon based on 50% natural in brood. Returns that are lower than anticipated in 2021 may necessitate a shift to collect fish based on the maximum allowable under the sliding scale (40% of total natural and hatchery returns).

Week	Est. NOR Timing (%)	Females		Males		Jack	
		NOR	HOR	NOR	HOR	NOR	HOR
2-May	0.0	0	0	0	0	0	0
9-May	0.0	0	0	0	0	0	0
16-May	2.6	1	1	1	1	0	0
23-May	6.6	2	2	2	2	0	0
30-May	19.9	5	5	5	5	0	0
6-Jun	23.2	6	6	6	6	2	2
13-Jun	21.2	6	6	5	5	0	0
20-Jun	14.6	3	3	3	3	0	0
27-Jun	6.0	2	2	1	1	0	0
4-Jul	3.3	1	1	1	1	0	0
11-Jul	1.3	0	0	0	0	0	0
18-Jul	0.7	0	0	0	0	0	0
25-Jul	0.7	0	0	0	0	0	0
1-Aug	0.0	0	0	0	0	0	0
Total Goal		**26**	**26**	**24**	**24**	**2**	**2**

Table 9. BY 2022 Lookingglass Creek weekly brood stock collection strategy, by sex and origin (natural-origin, NOR, and hatchery-origin, HOR) for Chinook salmon.

Week	Est. NOR Timing (%)	Females		Males		Jack	
		NOR	HOR	NOR	HOR	NOR	HOR
2-May	0.0	0	0	0	0	0	0
9-May	0.0	0	0	0	0	0	0
16-May	0.0	0	0	0	0	0	0
23-May	0.0	0	0	0	0	0	0
30-May	10.4	3	6	2	6	0	1
6-Jun	22.9	6	14	5	13	0	2
13-Jun	11.5	3	7	3	6	0	1
20-Jun	12.5	3	8	3	7	0	1
27-Jun	12.5	3	8	3	7	0	1
4-Jul	7.3	2	4	2	4	0	1
11-Jul	6.3	2	4	1	3	0	1
18-Jul	3.1	1	2	1	2	0	0
25-Jul	2.1	1	1	0	1	0	0
1-Aug	1.0	0	1	0	1	0	0
8-Aug	1.0	0	1	0	1	0	0
15-Aug	1.0	0	1	0	1	0	0
22-Aug	1.0	0	1	1	1	0	0
29-Aug	2.1	1	1	1	1	0	0
5-Sept	3.1	1	2	2	1	0	0
12-Sept	2.1	0	0	0	0	0	0
	Total Goal	**26**	**61**	**24**	**55**	**0**	**8**

Table 10. BY 2022 Lostine River weekly adult brood stock collection strategy, by sex and origin (natural-origin, NOR, and hatchery-origin, HOR) for Chinook salmon.

Week	Est. NOR Timing (%)	Females		Males		Jacks	
		NOR	HOR	NOR	HOR	NOR	HOR
<12-Jun	0.3	0	0	0	0	0	0
12-Jun	0.4	0	0	0	0	0	0
19-Jun	6.4	2	4	1	4	0	0
26-Jun	9.0	2	5	2	5	0	1
3-Jul	20.8	5	12	5	11	0	1
10-Jul	20.1	5	11	5	11	0	1
17-Jul	10.9	3	6	3	6	0	1
24-Jul	5.5	2	3	2	3	0	0
31-Jul	2.2	1	1	1	1	0	0
7-Aug	1.6	0	1	0	1	0	0
14-Aug	1.4	0	1	0	1	0	0
21-Aug	4.9	1	3	1	3	0	1
28-Aug	10.1	3	6	2	5	0	1
4-Sep	5.0	1	3	1	3	0	0
11-Sep	1.4	0	1	0	1	0	0
Total Goal		**25**	**57**	**23**	**55**	**0**	**6**

Table 11. BY 2022 Imnaha River weekly brood stock collection strategy, by sex and origin (natural-origin, NOR, and hatchery-origin, HOR) for Chinook salmon.

Week	Est. NOR Timing (%)	Females		Males		Jacks	
		NOR	HOR	NOR	HOR	NOR	HOR
< 11-Jun	0.4	0	0	0	0	0	0
18-Jun	5.7	1	2	1	2	0	0
25-Jun	7.4	2	6	2	6	0	0
2-Jul	16.1	6	18	6	18	2	2
9-Jul	26.0	9	27	9	27	3	3
16-Jul	18.3	7	21	7	21	2	2
23-Jul	10.7	5	16	5	16	0	0
30-Jul	5.1	3	9	3	9	0	0
6-Aug	1.4	1	4	1	4	0	0
13-Aug	3.1	1	3	1	3	0	0
20-Aug	2.5	0	0	0	0	0	0
27-Aug	2.7	0	0	0	0	0	0
3-Sep	0.6	0	0	0	0	0	0
Total Goal		**35**	**106**	**35**	**106**	**7**	**7**

Table 12. Grande Ronde Fall Chinook salmon brood year 2021 (BY 21) inventory from Irrigon Fish Hatchery (IFH) current as of 12/20/2021.

Release Site	Scheduled Release	Release Type	Stock	Expected at Release	Current Inventory	CWT (%)	PIT (N)	AD (%)
Grande Ronde River[a]	–	–	IFH (97H)	0	0	–	–	–
Grande Ronde River Total				**0**	**0**		–	

[a] *Due to unexpected egg loss at Lyons Ferry Hatchery, no BY21 fall Chinook will be reared at Irrigon for release into the Grande Ronde in 2022.*

Table 13. Grande Ronde basin Coho salmon brood year (BY) 2020 inventory, current as of 12/01/2021.

Release Site	Cascade Raceway	Release Type	N	Fish Size (fpp)	Marks			Transfer Date
					CWT (%)	PIT (N)[a]	AD (%)	
Lostine River	24	Acclimation	72,566	23.0	0.0	–	100	30-31 March
	25	Acclimation	72,555	23.0	0.0	–	100	30-31 March
	26	Acclimation	72,702	23.0	0.0	–	100	30-31 March
	27	Acclimation	72,493	23.0	0.0	–	100	30-31 March
	28	Acclimation	72,751	23.0	0.0	–	100	30-31 March
	29	Acclimation	72,935	23.0	90.3	–	100	30-31 March
	30	Acclimation	72,024	23.0	48.8	–	100	30-31 March
Lostine River Total			**508,026**					

[a] *Nez Perce Tribe expects 1,000 PIT tags will be applied to this release group, raceways TBD.*

Table 14. Tentative release numbers and locations of lamprey in the Grande Ronde River basin in 2022.

Program / Location	Life Stage	Estimated Release	Release Timing
Confederated Tribes of the Umatilla Indian Reservation (CTUIR)[b]			
Upper Grande Ronde River	Adult	0	400 released in fall 2021[b]
Catherine Creek	Adult	0	400 released in fall 2021[b]
Lookingglass Creek	Adult	0	400 released in fall 2021[b]
Indian Creek	Adults	0	41 released in fall 2021[b]
Sheep and McCoy Creeks	Adults	0	–
Wenaha River	Adults	0	200 released in fall 2021[b]
Five Points Creek	Adults	0	–
CTUIR Total		**0**	
Nez Perce Tribe (NPT)			
Wallowa River	Adult	50	April-May 2022
Minam River	Adult	50	April-May 2022
Joseph Creek[a]	Adult	0	April-May 2022
NPT Total		**100**	

[a] *Lamprey may be released at two or more locations including; but not limited to, Peavine Creek and at the confluence of Chesnimnus and Devil's Run Creeks (tributaries of Joseph Creek)*

[b] *CTUIR is not planning on releasing lamprey in the Grande Ronde Basin during spring 2022 due to constraints with holding facilities. Holding facilities are expected to be completed by summer 2022, which would allow for releases during spring of 2023. If facilities are not ready, releases will occur during the fall of 2022.*

Standard Operating Procedures

for

Lower Snake River Fish and Wildlife Compensation Programs

Grande Ronde and Imnaha Basins, Oregon

Spring Chinook Salmon

Fall Chinook Salmon

Coho Salmon

Pacific Lamprey / Freshwater Mussels

For the Period of

2017-2022

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 Administration

and

Bonneville Power Administration

Updated

2/17/2022

1. Grande Ronde and Imnaha Spring/Summer Chinook

A. Production Goals – Consistent with production tables specified in the *U.S. vs. Oregon* fish management agreement, production objectives for each tributary is described below. All production is conventional. Release target size is 20-25 fpp.

i. Upper Grande Ronde = 250,000
ii. Catherine Creek = 150,000
iii. Lookingglass Creek = 250,000
iv. Lostine River = 250,000
v. Imnaha River = 490,000

B. Smolt Releases

i. Key Contacts

1. Grande Ronde - Hatcheries: CTUIR (McLean, Lovrak), ODFW (Deal, Gibson, Lemanski), NPT (Zollman). Fish Research**:** CTUIR (Naylor, Crump) ODFW (Keniry, Feldhaus, Gibson), NPT (Vogel, Vatland, Young), IDFG (Putnam), and NOAA (Farman).
2. Imnaha - NPT (B. Johnson, Tennant, Vatland, Young, Vogel), ODFW (Feldhaus, Keniry, Bratcher), CTUIR (McLean, Lovrak), LSRCP (Starr, Engle, Robertson), NOAA (Farman), IDFG (Putnam).

ii. Acclimation facilities - All facilities should be set-up and operational at least 2 days prior to scheduled delivery of smolts.

1. Release numbers = Last physical inventory – mortalities.
2. Operators report final numbers to the ODFW LGH staff or Shari Beals.
3. Scan all acclimation mortalities for PIT tags. PIT tag data provided to NPT (Vatland) and ODFW (Keniry). Mortalities should be provided to fish health for examination.

iii. Contingencies – Under extreme conditions, smolts may be released earlier than scheduled. In those cases, notify downstream rotary trap operators immediately.

1. Grande Ronde Traps – Ted Sedell, Pat Keniry, Polly Gibson, Mike McLean, Les Naylor, Carrie Crump, Scott Putnam.
2. Imnaha Traps –Jim Harbeck, Jason Vogel, and Lora Tennant, Scott Putnam.
3. Notify co-managers, LSRCP, and NOAA within 24 hours.

iv. Site-specific scheduling

1. Upper Grande Ronde River Acclimation
   a. Fish are split equally into 4 containers.
   b. Two acclimation phases – early and late (half of production each, half of CWT only group in each acclimation).

2. Catherine Creek Acclimation
    a. Fish are split equally into 4 containers.
    b. One acclimation phase.

3. Lookingglass Creek Fish Hatchery
    a. Fish are forced out in mid-April.

4. Lostine River Acclimation
    a. Smolts are released after 7-10 days of acclimation.
    b. Fish are split evenly into 4 containers.
    c. Two releases – early and late (half of production each).

5. Imnaha River Acclimation and Direct
    a. Four raceways (280,000 smolts) are acclimated and released, and three raceways (210,000 smolts) are direct-stream released near the vicinity of the acclimation site.
    b. Two releases – Fish are forced out following an acclimation period, or direct released. Direct and forced acclimated releases are staggered by 2-3 days to avoid overwhelming downstream traps.

C. Adult Trapping

i. Key Contacts – Adult Trapping

1. Transportation - Facility operators (NPT and CTUIR) coordinates all hauling and notifies LGH (Deal) of the stock, number being hauled, and estimated arrival time.
2. Communications – Operators should distribute summaries of collections and operations to co-manager regularly (weekly or bi-monthly). Wallowa Hatchery provides a summary of fish provided for distribution/food bank (Lostine and Imnaha stocks).

ii. Grande Ronde Basin trapping guidelines

1. While in operation, trapping facilities are checked daily.
2. Captured fish will be collected for transport or released at the time they are first handled. If more than 15 adults are in the trap then fish will be collected and transported or passed upstream that day. If less than 15 fish are in the trap, fish may be held up to 72 hours.
3. Monitor water temperatures, and adjust schedule to best coincide their work with the coolest water temperatures.
4. Operators may conduct walking surveys, making visual observations of fish below weir sites to anticipate trapping numbers. Surveys may include snorkeling.
5. Bull Trout and Lamprey may be encountered at trapping facilities. If captured; enumerate, measure (Bull Trout only), and pass in the intended direction it was trapped. For Lamprey, notify contacts of any observations (*see* Section 4.A. Lamprey Overview).

iii. Imnaha trapping guidelines

1. The Imnaha satellite facility is staffed 24 hours per day, 7 days per week, while operational.
2. After the first Chinook is captured, trap is processed daily through the last week of July.

3. After July, trap is processed during weekdays. Exception is if 10 or more natural Chinook salmon, or 30 or more total fish or one bull trout are estimated in the trap on Saturday or Sunday, the trap will be processed on that day.
4. Broodstock is collected on Monday and Thursday of each week, or as needed. Extra broodstock can be collected if there is a deficit in brood numbers the prior week.
5. On all other days collected fish are passed above, held for broodstock in pen, recycled, or transported to Wallowa Hatchery.
6. Refer to Appendix E; Standard Operating Procedures for Imnaha River Weir, for further details.

iv. Trap installation and scheduling

1. Upper Grande Ronde and Catherine Creek
   a. Lead agency CTUIR.
   b. Weir will be installed when flows are lowest (March), but the trap will not become operational until chinook are present through late-July if river conditions allow. Weir installed early March on Catherine Creek. The traps are typically staffed overnight after mid-April.
      i. The Upper Grande Ronde weir is removed when the daily maximum water temperature exceeds 68° F (20° C).

2. Lookingglass Creek
   a. Lead agency ODFW.
   b. The intake trap at Lookingglass Hatchery is operated from early March (or as conditions allow) until the last spawning survey has been conducted (typically mid-September), or no later than September 30. ODFW and CTUIR staff will communicate to determine this date each year.
   c. Lower ladder will be operated to collect broodstock, but will not be functional until fisheries have ended.
   d. Operators should note when pickets are removed and if/how many adults/jacks are flushed downstream. When pickets are pulled, operators will notify CTUIR personnel.

3. Lostine River
   a. Lead agency NPT.
      Trapping begins mid-February for steelhead monitoring. Chinook are typically trapped beginning in May. The trap is operating until no Chinook are captured for 10 days after 1-Sep. During the pilot phase of the Grande Ronde Coho Salmon program, trapping will continue until mid-December or when icing prevents operation.

4. Imnaha River
   a. Lead agency ODFW.
   b. Trap is installed in early June, or as soon as river conditions allow, and operated until after the last spawning ground survey which occurs mid-September.
   c. Staffing guidelines:
      i. Weekdays - Two (2) ODFW staff each day (one Lookingglass Hatchery staff will stay at the weir and one Wallowa Hatchery staff travel on site). NPT provides one (1) staff that will travel on site each day.

ii. Weekends - ODFW provide two (2) staff daily (one Lookingglass Hatchery staff stay on-site, another travels on-site on Friday to stay the weekend if needed). NPT provides one (1) staff that will travel on site each day. NPT haul recycles and/or outplants. Any surplus fish beyond the capacity of the NPT tanker can placed in a holding pen. Alternatively, one hatchery staff may haul fish.

v. Site-specific weir management guidelines

1. Upper Grande Ronde River - 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 (Table 1).

   a. Fish are handled without anesthesia.
   b. Mark all hatchery and natural adults released upstream of the weir with a right opercle punch (1-ROP).
   c. Collect scale samples from all natural-origin fish passed upstream.
   d. Inject broodstock with erythromycin and Oxytetracycline, and transport to the adult holding ponds (*see* vii. Adult holding Ponds).

2. Catherine Creek – Pre-season run projections and the sliding scale (Table 2) are used to determine brood collection and natural spawning objectives, and may be reassessed with PIT tag data during the run.

   a. Surplus - If surplus hatchery fish are available, the first 50 should be outplanted to Indian Creek (1 LOP), then 100 to Lookingglass Creek below the weir (2 LOP), then 50 more to Indian Creek (1 LOP), and remainder to Lookingglass below the weir (2 LOP).
   b. Fish are handled using electro narcosis.
   c. Mark all hatchery and natural adults released upstream of the weir with a right opercle punch (1 ROP).
   d. Collect scale samples from all natural origin fish passed upstream.
   e. Inject broodstock with erythromycin and oxytetracycline and transport to the adult holding ponds (*see* vii. Adult holding Ponds).

3. Lookingglass Creek – Contingent on annual approvals from NOAA Fisheries, disposition of Lookingglass Creek adults trapped at either the LGH intake weir or lower ladder will occur as follows:

   a. At run size projections <400 adults (to the mouth of Lookingglass Creek): Balance broodstock collections with upstream escapement. Manage a 50:50 escapement to brood pass:keep ratio on a weekly basis.
   b. At run size projections >400 adults: Broodstock collections follow the schedule outlined in Table 9. All adults not taken for brood are passed upstream.
   c. At run size projections >750: Recycling of hatchery-origin adults back into the fishery will also be considered, with details specified in the AOP.
   d. Disposition of trapped fish before and after 4-Jul follows guidelines provided in the Lookingglass Creek management plan.

e. Fish are handled without anesthesia.
f. All hatchery and natural adults released upstream of the weir captured at the upper ladder will be marked with a right opercle punch (1-ROP), while fish captured at the lower ladder will receive two right opercle punches (2-ROP).
g. Genetic samples are collected from all adults passed upstream. Scale samples are collected on all wild fish passed upstream.
h. Inject broodstock with erythromycin and oxytetracycline and transport to the adult holding ponds (*see* vii. Adult holding Ponds). All fish that are not injected with erythromycin, such as those that are received after August 1st, will be given 3 caudal fin punches.
i. Release all natural origin jacks upstream.
j. Do not release hatchery jacks upstream. Sacrifice all hatchery origin jacks for tag recoveries and provide carcasses for tribal distribution, foodbank, or bury. Hatchery jacks without CWT can be provided for distribution, foodbank, buried, or recycled below the weir on Lookingglass Creek.
k. Do not release identifiable out-of-basin (within or outside Grande Ronde basin) stray salmon upstream of the weir.
    i. Strays from the Upper Grande Ronde River trapped at Lookingglass receive a 2 ROP and yellow tag, and added to the Grande Ronde broodstock or held for return to the river.
    ii. Adults arriving at the weir that are identifiable as Upper Grande Ronde stock (non-ad clip + wire) will be kept for that program's broodstock.
    iii. Catherine Creek strays can be recycled below the weir on Lookingglass Creek, used for Catherine Creek brood or, if needed Lookingglass brood.
l. Additional guidance can be found in the Lookingglass Creek Spring Chinook Management Plan.

4. Lostine River - Pre-season run projections and the sliding scale (Table 4) are used to determine brood collection and natural spawning objectives, and may be reassessed with PIT tag data during the run. The basic collection guidelines are as follows:

    a. Fish are handled using electro narcosis, with MS-222 as a backup.
    b. Release all natural origin jacks upstream. Hatchery jacks should represent a maximum of ten percent (10%) of the total male hatchery fish released upstream. Natural- and hatchery-origin fish may be radio tagged and released at the weir.
        1. Radio-tagged fish are included in estimates of the hatchery/natural composition of fish passed above the weir.
        2. Inject broodstock with oxytetracycline and transport to circular tanks in endemic building (*see* vii. Adult holding Ponds).
    c. Hatchery-origin fish may be transferred to Wallowa Hatchery for distribution or recycled for harvest.
    d. Surplus hatchery may be outplanted according to these guidelines:
        i. Hatchery fish can be outplanted to the Wallowa River and tributaries (Bear Creek, Hurricane Creek, and Prairie Creek).
        ii. If outplants occur in new reaches, subsequent spawning success will be monitored in target reaches by NPT and/or ODFW staff.

e. Marking - Fish captured at the Lostine weir, and not retained for broodstock, will receive an opercle punch that indicates their intended disposition:
   i. Pass above weir = 1 LOP
   ii. Trapped and hauled to acclimation = 2 LOP
   iii. Recycled to fishery = 1 ROP
   iv. Outplanted for natural spawning = 2 ROP

5. Imnaha River - Pre-season run projections and the sliding scale (Table 5) are used to determine brood collection and natural spawning objectives, and may be reassessed with PIT tag data during the run.

   i. See Appendix E. Standard Operating Procedures for the Imnaha River weir for handling guidelines.
   ii. ODFW staff will determine 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 and Lookingglass Hatcheries 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.
   iii. *Chinook salmon* - Inject broodstock females with erythromycin and oxytetracycline. Males are injected with oxytetracycline and erythromycin. All fish that are not injected with erythromycin, such as those that are received after August 1st, will be given 3 caudal fin punches. Transport to the adult holding ponds (*see* vii. Adult holding Ponds). After broodstock and upstream passage, surplus hatchery jacks and adults can be utilized as described above.
      1. If fish are exposed to MS-222, a 21-day period is required before they are used for consumption. Fish held for distribution are sampled according to Appendix A.
      2. A total of 300 live hatchery adults can be outplanted to Big Sheep Cr. and Lick Cr. If more adult out plants are anticipated, notification should be provided to NOAA Fisheries and ODFW Wallowa District.
      3. Surplus carcass jacks can be disposed of in Big Sheep Cr. and Lick Cr. Surplus live hatchery jacks can be released in Big Sheep Cr. And Lick Creek after the last redd count survey.
      4. Collect scales on ~50% of natural origin adults passed above the weir.
   iv. *Steelhead* – See Imnaha weir SOP (Appendix E).
   v. *Bull Trout* – See Imnaha weir SOP (Appendix E).
   vi. Marking - Fish captured at the Imnaha weir, and not retained for broodstock, will receive an opercle punch that indicates their intended disposition:
      1. Pass above weir = 1 ROP
      2. Outplant = 1 LOP
      3. Recycle = 2 LOP
      4. Double recycle = 3 LOP (previously recycled fish will have another LOP applied).
   vii. Mortalities and carcasses
      1. Before redd surveys: Imnaha staff collects the first 10 weir mortalities, seals them intact in a labelled plastic bag, freezes them, and notifies Fish Health that they are ready for pathology sampling. Note: avoid collecting fallbacks

for Fish Health samples. Dead fish found on the weir that are not collected for fish health should be sampled for bio data that includes: fork length, sex, pre-spawn status, record fin clip, the opercle punch (for recapture status), and collect snouts on carcasses with a CWT.

2. After redd surveys: Fish research will sample mortalities as described above, then carcasses should be clearly identified as sampled (tails removed) and returned to the river below the weir.
3. Biological data will be sent to ODFW Fish Research (Brandt).

vi. Broodstock transportation

1. CTUIR and NPT will transport fish from Upper Grande Ronde, Catherine Creek, and Lostine River sites. ODFW or NPT will provide transportation of fish from the Imnaha weir to Lookingglass Hatchery.
2. Broodstock should be hauled daily, and not held more than 72 hours. Imnaha broodstock will be hauled on Monday and Thursday, or as needed to make broodstock.
3. Drivers should complete a transfer data sheet, provide to Lookingglass Hatchery staff for data entry in the HMIS system.
4. Minimize shock by hauling during morning hours to take advantage of cooler stream temperatures. Temperature differences between transport container and facility water should not exceed 10^{o} F (5.6^{o} C). Temper if needed.
5. 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.

vii. Adult holding at Lookingglass Hatchery

1. Upper Grande Ronde – One (1) adult holding pond
2. Catherine Creek – One (1) adult holding pond
3. Lookingglass Creek – One (1) adult holding pond, food bank fish held in circular tank 19
4. Lostine River – Endemic building, circular tank 20 and 21. Food fish held at Wallowa Hatchery.
5. Imnaha River – One (1) adult holding pond, food fish held at Wallowa Hatchery.

D. Spawning

i. Key Contacts – Crump, Smith, McLean, Zollman, Brigante, Deal.

ii. Schedule - A pre-sort to determine sex ratio and allow adjustments to brood stock collections, will occur mid to late July. The first sort will occur in early to mid-August, with an expected first spawn during mid-August. These days can be adjusted by workload and water temperatures Fish are spawned weekly as described below:
   1. Tuesday – Upper Grande Ronde and Catherine Creek.
   2. Wednesday – Lookingglass Creek.
   3. Thursday – Imnaha and Lostine

iii. Anesthetic – Electro-anesthesia used in main building, MS-222 used in circulars.

iv. Spawning – Broodstock are spawned at Lookingglass Hatchery. Sorting and spawning for each stock takes place on the same day.

1. Hatchery and co-manager staffs will determine fertilization matrices.

v. Pairing
1. Fertilize a maximum of 10% of the eggs with three year old males.
2. Maximize the amount of the eggs fertilized with five year old males, when available (UGR, LGC, and CC males >80cm, and LR and IM males >85cm).
3. Large males may be spawned up to 3 times.
4. Conduct jack spawning 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.
5. Incubate fertilized eggs at Lookingglass hatchery.
6. Determine fecundity at eye-up.

vi. General fertilization procedures
1. Sort and euthanize ripe females.
2. Collect eggs preventing addition of outside containments (other body parts).
3. Store eggs separately for each individual female.
4. Drain ovarian fluid from eggs.
5. Sort males, spawn in dry cup.
6. Mix sperm with eggs, activate with pathogen free water (~100 ml).
7. Wait 60 seconds, rinse eggs.
8. Treat fertilized and rinsed eggs in 100 ppm Iodophor solution for minimum of 45 minutes.
9. Tray eggs, 1 tray per individual female.

vii. Surplus - Fish that are surplus to broodstock needs may be returned to stream. Fish injected with antibiotics will not be used for human consumption or released where legal harvest is possible.

viii. Staffing support - CTUIR will provide fish culture support for Upper Grande Ronde, Catherine, and Lookingglass stocks. The Nez Perce Tribe will provide fish culture support for spawning of the Imnaha and Lostine River stocks.

E. Incubation

i. All eggs will be incubated to eyed stage at Lookingglass Hatchery. Until eye-up, segregate individual females. After eye-up, eggs will be enumerated and segregated by disease profile. No eggs will be culled after egg enumeration, unless segregated by individual females after enumeration. If possible, only low risk BKD eggs will be reared (<0.200 OD units). Eggs will be combined after picking with 6,000 eggs/tray.

ii. Eggs are incubated using chilled and un-chilled well water and UV treated Lookingglass Creek water incubators. Untreated creek water may have to be used in the event of power outage or other emergency.

iii. If excess production is expected (i.e., greater than 110% of smolt release levels outlined in Table 1 of the Annual Operating Plan), co-managers have the following dispositions available for each program:
   1. Upper Grande Ronde: up to 35,000 eggs or fry can be released into Meadow and Sheep Creeks.
   2. Catherine Creek: up to 21,000 eggs or fry can be released into Indian Creek
   3. Lookingglass Creek: up to 35,000 eggs or fry can be released into Lookingglass Creek
   4. Lostine River: up to 48,016 eyed eggs, fry, or parr can be released into Bear Creek, Hays Fork Prairie Creek, the Wallowa River, and Lostine Rivers.
   5. Imnaha River: up to 95,000 eggs or fry can be released into Lick Creek
   6. Specific locations, timing, and marking plans for excess will be coordinated on a case-by-case basis amongst co-managers.

F. Smolt Production

i. Size at release - Smolts are produced at a target size of 20-25 fpp at release.

ii. Early Rearing – Fry are reared in double deep troughs at Lookingglass Hatchery on UV-treated Lookingglass Creek water. Fish are transferred outside to Lookingglass Creek water in April or May. Trough loading will be range from 30,000-50,000 per trough.

iii. Final Rearing – In May, fish are moved to outdoor raceways. After marking and spawning, fish will be placed in final rearing containers. Refer to AOP for final ponding plan.

iv. Lookingglass Hatchery raceway allocation - Eleven raceways are allocated for Grande Ronde tributary production, seven raceways for Imnaha production. Lookingglass Creek smolts are reared in the adult holding ponds (AHP). Current allocation by stock is:

   1. Upper Grande Ronde River – 4 raceways.
   2. Catherine Creek – 2 raceways.
   3. Lookingglass Creek – 1 raceway and 4 adult holding ponds.
   4. Lostine River – 4 raceways.
   5. Imnaha River – 7 raceways.

G. Marking

i. Key Contacts - ODFW (Kenny Taber - Clackamas, Feldhaus, LaPoint, and Keniry), NPT (Vatland, Vogel)

ii. Mark Type
   1. Adipose clipping –occurs during the last two weeks of August.
   2. Coded wire tagging (CWT) - occurs during the last two weeks of August.
   3. PIT tagging –occurs during the first two weeks of October.
   4. See AOP for marking, CWT and PIT tag number information.

H. Monitoring and Evaluation

i. Key Contacts: ODFW (Keniry, Feldhaus), CTUIR (Naylor, Crump), NPT (Vogel, Vatland)

ii. Data is collected on behalf of several ongoing monitoring efforts, including: program evaluations, monitoring differences between natural and hatchery production, growth and survival of natural-origin fish (in collaboration with ODFW Early Life History Project).

iii. PIT tags are used to detect fish at main stem dams, in-stream arrays, and weirs to assess downstream and upstream survival and timing.
    1. Catherine Creek and Imnaha stocks are part of the Comparative Survival Study (CSS), and therefore receives PIT tags from the Fish Passage Center.

iv. Data collection efforts

    1. During pre-liberation sampling the following data is collected per raceway:
        a. Collect 50 weights
        b. Collect 250 lengths
        c. Collect 50 genetic samples for Genetic Stock Index (for each stock, not raceway)
        d. Check 500 fish per tag code for tag retention and fin clip quality

    2. While processing adult fish (live or mortalities) at trapping facilities, operators should collect the following data:
        a. Data collection – count, length, marks/tags
        b. Tissue collection – snout/scales, kidney sample, genetic samples

    3. During broodstock spawning and early incubation, collect the following:
        a. Length (all fish), weight (females), marks/tags, eyed egg weights, individual fecundity
        b. Tissue collection – snout/scales, kidney sample, genetic sample

    4. During spawning ground surveys, the following data is collected:
        a. Redds (count, GPS)
        b. Live fish (count)
        c. Carcasses (count, length, marks/tags, snout/scales, kidney sample, genetic sample)

    5. Genetic tissue collection for monitoring and pedigree analysis
        a. Un-punched Chinook carcasses recovered above weirs on Catherine Creek, Lookingglass Creek, and the Lostine River.

2. Grande Ronde and Snake River Fall Chinook Program

A. Smolt Release

i. Grande Ronde River - Priority 10 in the 2018-2027 *U.S. vs. Oregon* production table B4 targets a total production of 200,000 sub-yearlings scheduled for release in the Grande Ronde River around the first week of June at 50 fpp. Marks for this release are as follows:

1. 200,000 AdCWT

B. Adult collections and spawning – refer to Lyons Ferry AOP.

C. Incubation and Rearing

i. Incubation 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.
ii. Fish are reared and tagged at Irrigon Hatchery prior to release.

D. Key Contacts

i. Lyons Ferry Hatchery (Bumgarner), ODFW (Blessing, Keniry, Bratcher), CTUIR (McLean, Lovrak), NPT (Johnson), IDFG (Putnam), IPC (Rosenburger)

3. Grande Ronde Coho Salmon Program

A. Overview

i. Consistent with production tables specified in the *U.S. vs. Oregon* fish management agreement, the production objective for this program is 500,000 smolts released in the Lostine River.

ii. Management objective – To reintroduce coho salmon to Northeast Oregon, continue to provide measurable harvest benefits that these fish provide for treaty and non-treaty fisheries in the mainstem Columbia, and develop fisheries in the Snake and Grande Ronde rivers. Concurrently this program could reestablish natural production of coho salmon in the Wallowa/Lostine River and provide the opportunity for natural recolonization of coho in Grande Ronde tributaries (e.g., Minam and Wenaha rivers) that historically produced coho salmon.

iii. The coho program described in this document is the first step of a phased approach to reintroduce coho salmon to the Grande Ronde basin. This first 'pilot' phase will direct stream release smolts during 2017-2024 and evaluate subsequent adult returns to determine if this Grande Ronde program can be self-sustaining.

B. Smolt release

i. Final rearing - Fish are reared to smolt at Cascade Hatchery.

ii. Transportation – Coho smolts will be hauled from Cascade Hatchery to the Lostine River for direct stream release in April. Transportation is coordinated between NPT and ODFW.

iii. Release – Fish are direct-stream released into the Lostine River from Cascade Hatchery. The release site and timing will be in the vicinity of the Lostine River acclimation site during March or April, and will be coordinated annually between NPT and ODFW.

1. Rotary screw trap operators in the Lostine River should be notified prior to release. Key contacts are Gibson and Keniry (ODFW), and Vatland (NPT). Screw trap is removed from operation (cone raised) for 48 hours after release. After that, NPT provides support to the Lostine River trap until trap resumes normal operations.

C. Adult collections and spawning

i. Trap installation and scheduling

1. The first returns of adult coho salmon began in 2017.
2. The Lostine River weir will remain in operation following trapping for Chinook salmon, and all applicable guidelines described above for spring Chinook salmon will be followed (see Grande Ronde and Imnaha Spring Chinook Salmon, Adult Trapping).
3. Broodstock is not collected during this pilot phase of the program. Coho salmon are enumerated and sampled for marks (see monitoring and evaluation below).
    a. During the pilot phase, disposition of coho will be coordinated annually with NPT and ODFW.

ii. Spawning - Tanner Creek stock from the Bonneville Complex or other Tanner Creek sources will be used for the program until a local broodstock can be developed.

D. Incubation, and rearing

i. Incubation and rearing – Rearing from eyed egg to smolt will occur at Cascade Hatchery.

E. Marking

i. Smolts are marked consistent with the following guidelines, and revisions to marked schemes may be coordinated in the *U.S. vs. Oregon* forum:
   1. Adipose clipping – 100%
   2. Coded Wire Tagging (CWT) - Appropriate level of CWT to evaluate harvest contribution (~90,000 AdCWT).
   3. PIT Tags - A portion of juveniles will be implanted with PIT tags to assess downstream survival (initial goal of 5,000 AdPIT, depending on funding).

F. Monitoring and evaluation

i. Objectives - During the pilot phase of this program, monitoring objectives will be limited to the following:
   1. Enumerate adult returns to weir.
   2. Estimate smolt-to-adult survival of release, contribution to fisheries, and straying using Coded Wire Tags (CWT).
   3. Determine if natural spawning is occurring in the Lostine River.
      a. Other Grande Ronde tributaries may be surveyed (Minam, Wenaha, Wallowa Rivers).

ii. Data Collection – Data will be limited to adult returns at the Lostine River weir, but may be expanded if resources allow. At the Lostine weir, operators collect the following data:
   1. Enumerate coho catch.
   2. Disposition, as decided by co-managers annually (will be marked and released upstream).
   3. Examine for external marks.
   4. Estimate sex and measure length of individual fish.
   5. Scan for CWT and PIT Tags, collect genetic sample (opercle punch).

G. Key Contacts

i. Key Contacts – B. Johnson, Zollman, Vatland (NPT); Gibbs, Harrod, Bratcher, Ruzycki (ODFW); McLean, Lovrak (CTUIR); Alex Clark (ODFW Cascade Hatchery).

4. Grande Ronde Lamprey / Freshwater Mussels

A. Lamprey Overview

i. Objectives - 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.

ii. CTUIR program

1. Adult collection – Adult lamprey are trapped and collected by CTUIR at main stem dams on the Columbia River.
2. Adult holding – Once trapped, lamprey are held at Minthorn Springs facility in the Umatilla basin.
3. Adult releases – Release locations and numbers will be determined on an annual basis. See Table 14 in AOP section.
4. Key contacts – Aaron Jackson (CTUIR – aaronjackson@ctuir.org), Lemanski (ODFW)

iii. NPT Program

1. Adult collection – Adult lamprey are trapped and collected by NPT Fisheries staff at Bonneville, The Dalles, and John Day dams.
2. Adult Holding – Once trapped, lamprey are held at Nez Perce Tribal hatchery on the Clearwater River through winter months.
3. Adult releases – Adult Lamprey are released to spawn naturally in tributaries of the Clearwater and Grande Ronde Rivers, including Asotin Creek in Washington. In Oregon, lamprey have been released in the Wallowa and Minam Rivers, and Joseph Creek. Release locations will be determined on an annual basis, and as availability of lamprey allows.
4. Key contacts – Harbeck, Vatland, Tod Sween (NPT, tods@nezperce.org); Bratcher, Lemanski (ODFW)

iv. Fish Health

1. 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.

B. Freshwater Mussel Project Overview

i. Objectives - The purpose is to evaluate the status and distribution of freshwater mussel populations in the Grande Ronde sub-basin. This information will be used to inform

conservation efforts of remaining freshwater mussel populations and to identify and characterize broodstock populations for future restoration efforts.

ii. Planned activities - The CTUIR Freshwater Mussel Project will:

1. Conduct surveys to identify and monitor freshwater mussel populations in the Grande Ronde River and tributaries. Freshwater mussel surveys are visual, non-destructive surveys performed by snorkeling or wading in the channel during low water time periods.
2. Collect mussel tissue samples for species identification or for population genetic characterization. Mussels are collected by hand, with minimal disturbance to substrates.
3. Collect gravid adult females for broodstock. Individuals used for broodstock are collected by hand with minimal disturbance to substrates, non-brooding animals are returned to sediments in the same location.
4. Conduct mussel surveys, salvages, translocations, and follow-up monitoring at restoration project sites with in-stream activities that could negatively impact freshwater mussels.
5. The Xerces Society and the CTUIR Freshwater Mussel Project collaboratively maintain a database of western freshwater mussel records. Please help maintain this critical conservation tool by reporting mussel observations to the CTUIR Mussel project or the Xerces Society (mussels@xerces.org).

iii. Key Contacts – Alexa Maine (CTUIR, AlexaMaine@ctuir.org).

Table 1. Upper Grande Ronde River weir management guidelines for broodstock collection and passage.

Total adult escapement to the mouth (HOR+NOR)[a]	HOR at mouth (%)	Maximum NOR in Broodstock (%)	HOR to retain for Broodstock (%)[b]	HOR adults released above weir (%)	Minimum NOR in broodstock (%)	Strays allowed above weir (%)[c]
Any	Any	Up to 50	Up to 100	Up to 100	–[d]	≤5

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

Table 2. Catherine Creek Spring Chinook broodstock/upstream passage management guidelines.

Total adult escapement to the mouth (HOR+NOR)[a]	HOR at mouth (%)	Max of NOR Run in Broodstock (%)	HOR to retain for Broodstock (%)[b]	HOR adults released above weir (%)	Minimum NOR in broodstock (%)	Strays allowed above weir (%)[c]
< 250	Any	40	40	–[d]	–[d]	≤5
251-500	Any	20[d]	20	≤70	≥20	≤5
>500	Any	≤20	–[e]	≤50	≥30	≤5

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

Table 3. Lookingglass Creek weir management guidelines for broodstock collection and passage. Current weir management strategy is consistent with Lookingglass Management Plan. Table is a placeholder until permanent agreement is in place.

Escapement Level	Passed Above (%)	Retain for Broodstock (%)
150	67	33
200	60	40
250	55	45
300	50	50

>300 – adjustments will be made based on brood needs. If brood need has been met remainder to be released upstream

Table 4. Lostine River weir management guidelines for broodstock collection and passage. Assumes program goal of 250,000 smolts (166 adults for broodstock).

Estimated Natural Run of ADULTS to River Mouth (proportion of minimum abundance threshold recommended by ICTRT[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
< 0.05 of Critical	< 8	0	0	NA	NA
0.05 – 0.5 of Critical	8 – 74	50%	4 – 37	NA	NA
0.5 of Critical - Critical	75 – 149	40%	30 – 60	70%	20%
Critical – 0.5 of Viable	150 – 249	40%	60 – 100	60%	25%
0.5 Viable – Viable	250 – 499	30%	75 – 150	50%	30%
Viable – 1.5 Viable	500 – 749	30%	150 – 225	40%	40%
1.5 – 2.0 Viable	750 – 999	25%	188 – 250	25%	50%
>2.0 Times Viable	> 1,000	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 (1,000) after broodstock collection and fishery.

Table 5. Sliding scale management tool for Imnaha Chinook hatchery program utilized for managing disposition of Chinook salmon adults for broodstock and escapement to natural spawning areas (Table 1 excerpted from Imnaha spring Chinook HGMP May 2011).

Estimated natural run of ADULTS to river mouth as a proportion of minimum interior TRT minimum abundance threshold (MAT)	Number of ADULT natural fish to river mouth	Expected handle rate at weir of ADULT natural fish (50%)	Max % natural ADULTS for broodstock[2]	Number of ADULT natural fish retained for broodstock	Max proportion of ADULT hatchery fish released above weir	% Natural ADULTS in Broodstock[3]
< .05 of Critical[4]	< 15[4]	< 8[4]	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 MAT	300 - 499	150 -249	40%	60 - 100	60%	25%
.5 Viable – MAT	500 - 999	250 - 499	30%	75 - 150	50%	30%
			40%[1]			
Viable - 1.5 MAT	1000 - 1499	500 - 749	30%	150 - 225	40%	40%
			40%[1]		30%	
1.5 - 2 x MAT	1500 - 1999	750 - 999	25%	188 - 250	25%	50%
> 2 x MAT	> 2000	> 1000	25%	> 250	<10%	100%

[1] Percentage highlighted will be implemented after three consecutive years (or 3 year mean) at viable or greater

[2] Maximum percent of wild adults handled at weir collected for Broodstock

[3] Target percent natural adults in Broodstock

[4] In the submitted HGMP, the less-than (<) symbols shown above are displayed in error as greater-then (>) symbol

Appendix A. 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 any fish handling or pond cleaning activities	-As per attached iodophor protocol -Includes CWT, 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_2O or 6.7 oz.=189ml	10 min.	-Equipment should be pre-rinsed to remove dirt, mucus or other organic material which reduces the efficacy of disinfection and sanitization -Rinse equipment to remove harmful residue if equipment is going into standing water containing fish or fish are being placed into the equipment (tank or bucket). Remember that iodine at 1:20,000 is harmful to fish. -Argentyne or other buffered iodophors such as Western Chemicals "PVP iodine" would be acceptable. Note: if DRAW 476 is used remember this product is 1.75% active iodine and unbuffered so should not be used for water- hardening eggs
	Water hardening eggs	100 ppm	Minimum 15 minutes	This is the statewide general practice
	Egg transfers - disinfection at receiving station	100 ppm	10 minutes	
Virkon Aquatic	Footbaths, nets, boots & gear			As per label
Chlorine or Aqueous solution as sodium hypochlorite (Household Bleach)	Lib truck tanks Raceway disinfection	10 ppm 100 ppm	10 min.	Organic matter binds and neutralizes Left to dry and breakdown in sun. Need to assure that no bleach goes to effluent.

[a]Within a stock, operations will start with groups determined to be of lowest disease risk proceeding to raceways of higher disease risk. The latest fish health information should be used to determine the least risky raceway sequence.

[b] All chemical use will be done in accordance with label use and reporting requirements. Disinfecting and disinfected water must be disposed of in an approved manner.

Appendix B. Juvenile Chinook fish health monitoring plan and disease treatments.

Location	Stock	Examination Category	Protocol	Comment/Disease Treatment
Lookingglass Hatchery	200 201 80 29 81	Routine Monthly	-Gill & skin wet mounts from a combination of moribund and healthy fish. -A subset of mort/moribund per stock, kidney smears on TYE-S agar. Gill culture if suspect gill disease. *R. salmoninarum* assays (D-FAT or ELISA) if bacterial kidney disease is suspect. -tissues (gill/ kidney/spleen) will be assayed for cultivable viruses from a sub-sample of fish as is consistent with clinical signs (priority in raceways with increased daily loss). -Grab sampled and moribund fish will be assayed for EIBS (blood smears and hematocrits) during exams as needed (i.e., persistent anemia).	A 21-day Aquamycin feed will be implemented for all raceways for each stock, except for all the Lostine River raceways and 2 raceways of the Imnaha stock. Disease outbreaks - treated on a case-by-case basis. Therapies and remedial measures are based on conventional and available treatments, new information, and innovation and other treatments to be implemented if recommended by Fish Health Services in order to maintain health of fish. Formalin treatments may be implemented for Ichthyobodo (costia) infestations. Fungus - Formalin flushes (1 hour) are prescribed after fin clipping, PIT tagging, VIE tagging and coded wire tagging for two consecutive days. Formalin requires a veterinarian prescription when used off-label. Treat CWD with medicated feed if necessary, using a Veterinary Feed Directive (VFD) through Fish Health Services.
Lookingglass Hatchery	200 201 80 29 81	Pre-transfer & Annual Myxobolus cerebralis testing	-n = 60 grab-sampled smolts per stock -R. salmoninarum by ELISA -tissues (gill/kidney/spleen) from 5 fish pools for culturable viruses -wet mounts of skin & gill tissue from a minimum of 5 fish -*O.mykiss* on water supply for 6 months (60 fish) for *Myxobolus cerebralis*	Pre-transfer grab-sample numbers may vary depending on disease history and number of fish for a given brood year. A small group of *O. mykiss* should be reared at Lookingglass Hatchery for annual *M. cerebralis* testing 181 days after ponding. The timing of the 181 days is at the hatchery's discretion and should be chosen to coordinate with hatchery operations.
Chinook acclimation IM, LR, CC & UGR		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. -If available, some fresh, non-frozen moribunds and mortalities will be examined.	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. Adult Chinook fish health monitoring plan and disease treatments at Lookingglass Hatchery.

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 or pooled (3 per pool) 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	- Up to 10/stock (before Sep 1st): -Kidney sampled for BKD by ELISA -Examined and worked up as needed per Fish Pathologist	• 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 sub-sample of 30 kidney samples from adult Chinook above the weir (hatchery intake)	• Fish Health Request

Appendix D. Disease treatments and other drugs for adult Chinook Broodstock.

Location	Stock	Treatment for	Chemical/Drug	Protocol	Comment
Lookingglass	200 201 80 29 81	Fungus Control	Formalin	Formalin administered 3 days per week at 167 ppm for 1 hr. Hydrogen peroxide 3 days per week at 100 ppm	If formalin cannot be used then use hydrogen peroxide (second choice) at the recommendation of fish health services Continue treatments throughout the entire spawning season.
Lookingglass, Catherine Creek, Upper Grande Ronde, Imnaha and weirs	201 80 29 81	BKD Furunculosis-Enteric Redmouth & other gram negative bacterial infections	Erythromycin Oxytetracycline	Injection 20 mg/Kg(INAD) Injection 10 mg/kg (Veterinary Prescription) Inject fish kept for broodstock.	

Appendix E. Standard Operating Procedures for Imnaha River Weir

Standard Operating Procedures (SOP) for processing fish at the Imnaha River Weir

Purpose: The Imnaha satellite facility is an adult collection and juvenile acclimation and release facility for the Imnaha River Spring/Summer Chinook Salmon Program. The adult weir and trap collects returning Chinook salmon for program broodstock and allows for selective management of natural spawners upstream of the facility. During annual operations, non-target ESA-listed species are also encountered at the weir site. Bull trout are collected and marked for ongoing population monitoring, and post-spawn steelhead kelts are migrating downstream past the weir. This document is intended to provide guidance to operational staff for handling and processing ESA-listed species at the Imnaha facility, with the goal of minimizing stress and risk of latent injury to each individual.

Annual Coordination: Imnaha River weir operations are coordinated with funding agencies and co-managers during the Lower Snake River Compensation Plan (LSRCP) annual operations plan (AOP) process. Co-managers agree that the annual planning process will be consistent with this SOP, and meet the intent of this guidance. Significant deviations in annual operations may require broader coordination and an update of the SOP. Prior to each trapping season, staff involved in operating the weir facility should review this document, the AOP, ESA-permits, and any associated Section 7 consultation documents, and understand any constraints regarding changes and/or modifications to procedures pursuant to these other documents.

Equipment List by Species

Chinook Salmon

- Large dip net(s)
- Measuring board
- PIT tag reader
- Coded wire tag (CWT) reader
- Extra batteries (AA)
- Operculum punches
- Syringes
- Needles
- Antibiotics
- Sharps container
- Electronic thermometer
- Datasheets
- Scale Cards

Bull Trout

- Dip net(s)
- MS-222
- Measuring board
- PIT tag reader
- Electronic thermometer
- PIT tag injectors
- PIT tag needles and tag (single use)
- Recovery tank

Steelhead

- Long-handled dip nets
- Anesthesia vessel
- MS-222
- Scale Cards
- Genetic samples
- Measuring board
- PIT tag reader
- PIT tagging equipment

Trapping operations

1. The following operational criteria will be in place during ladder operation and brood stock collection at the Imnaha Weir.
   a. A one foot (1.0) difference of water elevation between water in the ladder and in the river. This should correspond to 8.0 ft/second water velocity through the ladder aperture for fish passage and attractant flow into the river. The apparatus gate will be open during the trapping season unless the water elevation of one foot (1.0) cannot be satisfied.

b. An RM&E plan with additional operational information will be developed and coordinated through the Imnaha technical working group for implementation prior to 2020 operations (May/June).

2. Based on annual flows, and historical PIT tag detections and travel time of adult Chinook salmon in the Lower Imnaha River from (IR1/IR2 arrays) to the weir, the flexible start date of the weir occurs sometime in early June. This can be moved back or pushed forward based on agreement of the co-managers. The exact installation date will depend on environmental conditions. The weir will be operated until the second Friday in September, or until the last scheduled spawning ground survey for Chinook salmon.
3. The adult weir and trap will be staffed 24 hours per day, 7 days per week, while operational, beginning with the capture of the first Chinook or bull trout.
4. From initial operations through the last week of July, fish will be removed and processed daily.
5. After the last week of July and through the end of operations, fish will be removed and processed daily from Monday-Friday. During this latter period, if 10 or more natural Chinook salmon, or 30 or more fish total, are estimated in the trap on Friday and/or Saturday fish will be removed and processed during the weekend. If a bull trout is observed in the trap on Friday and/or Saturday, all fish will be removed and processed during the weekend.
6. Trap modifications
    a. Modifications were made to the trap/ladder in 2018-2020 included:
        i. A new screen was attached to the existing V entrance to help reduce escapement out of the trap.
        ii. Shade cover over ladder.
        iii. Improved maintenance of finger weir with varying flows.
        iv. Another moveable bar was placed on the entrance to the trap to reduce escapement of smaller bull trout.
        v. A flush gate will be installed in the third step of the ladder to be able to draw down the trap level if necessary.

Morning trap and weir check – Each morning, on-site staff at the Imnaha satellite facility will check trap conditions, recover weir and/or trap mortalities, and communicate staffing needs to Lookingglass Hatchery.

1. Measure facility temperatures in the raceway using an electronic thermometer. If water temperatures of are expected to exceed 16^0C (61^0F) by 10:00 AM, notify staff of expedited bull trout procedures (see below).
    a. If temperatures in excess of 16^0C (61^0F) are anticipated during subsequent processing days, notify Lookingglass Hatchery manager. Processing times may be adjusted to start earlier to avoid higher temperatures for all species.
2. Estimate the numbers of Chinook (by-origin) and bull trout in the trap.
    a. If more than 30 Chinook salmon are estimated in the trap, assume that at least 10 are natural-origin.
    b. Bull trout can be differentiated from Chinook salmon by the presence of a white leading edge on their fins.
    c. On Fridays and Saturdays, if trap abundance thresholds are met or a bull trout is encountered notify Lookingglass Hatchery manager to ensure staff is scheduled for weekend processing (*see above*; Trapping Operations, item 4).
3. Recover trap and weir mortalities. Ensure passage chutes within weir are unblocked.
    a. On-site staff will check for Chinook salmon, steelhead, and bull trout mortalities and;
        i. Inspect the intake and inspect the trap and surrounding walkways (for jump-outs). Remove any mortalities from the trap.

ii. Inspect the upstream face of the weir for mortalities, recover if flows safely allow.
iii. Inspect the passage chute opening for debris (if flows safely allows). Release/clean panels if debris/bedload may be lodged in chutes.

b. Mortality Recovery Procedures
   1. Bull Trout: Scan for existing PIT tag, measure fork and total length, and inspect for hooking wounds. Record location of recovery.
      a. Retain all recovered mortalities in the freezer at the Imnaha satellite facility for further investigation. Immediately notify and provide recovery information to Kyle Bratcher, Wallowa District Fisheries Biologist, Mark Robertson LSRCP, and Rick Wilkison IPC. Care must be taken in handling sick or injured fish to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. In conjunction with the care of sick or injured fish, or the preservation of biological materials from a dead animal, LSRCP has the responsibility to ensure that information relative to the date, time, and location of the fish when found, and possible cause of injury or death be recorded and provided to the Service.
   2. Steelhead: NPT will provide a steelhead carcass tote to hold carcasses until NPT staff can examine the fish.
      a. NPT will process the carcasses similar to methods used for live upstream steelhead.
      b. After examination carcasses will be passed downstream.
   3. Chinook salmon: All weir mortalities recovered before the first regularly scheduled spawning ground survey will be processed by on-site staff.
      a. After the first annual spawning ground survey, which typically occurs the last week in August or the first week in September, weir carcasses should be processed from Friday to Tuesday.
      b. For each carcass, weir staff will document the fork length (mm), sex (M, F), fin mark (e.g., AD = adipose clip; none = Unclipped), type of opercle mark present on the carcass (e.g., 1LOP, 1ROP), Percent spawn for female carcasses (0% = full of eggs, 100% = completely spawned), and presence/absence of a CWT. If there is a CWT, staff will collect a snout and each snout will receive a unique snout identification number (SNID). Weir staff does not need to collect scales or kidney samples. After the carcass is processed, the tail will be removed and the carcass tossed back into the river below the weir.
      c. Before redd surveys: Imnaha staff will collect the first 10 weir mortalities, seal them intact in a labelled plastic bag, freeze them, and notify Fish Health that they are ready for pathology sampling. Note: avoid collecting fallbacks or degraded carcasses for Fish Health samples.

Processing shed setup – Prior to staff arrival for daily processing, on-site staff at the weir will setup the processing shed and test equipment.

1. Test the tower door and braille to ensure operation before fish are crowded.
2. Inspect hoses, valves, and fittings used to supply water to the processing shed and liberation trucks.
3. Inspect and test oxygen supplies in the holding tank.
4. Setup processing tables and tanks. Place rubber mats around fish processing stations.

5. Ensure that all items listed above (*see*: equipment list by species) are present and operational.
    a. Test PIT tag reader with a dummy tag.
6. Fill liberation trucks upon arrival. Install electronic thermometers and oxygen sensors, and monitor throughout fish processing.

Crowding / Sorting

1. Begin filling the holding tank. Turn on the oxygen supply and monitor levels with a DO monitor.
2. Herd fish in the trap towards the tower door using long handled dip nets.
3. Lower the mechanical crowder on the west end of the trap.
4. Slowly move the mechanical crowder toward the tower door, monitoring for fish that may get impinged on the trap walls or floor.
5. Depending on trap densities, leave enough space for fish to move around freely in-between loading groups of fish into the tower.
6. While loading fish in the tower, move the mechanical crowder as far as possible towards the east end of the trap. Use a long-handled crowder to herd fish along the trap walls towards the tower door.
    a. When loading a group into the tower, attempt to target no more than 20 Chinook salmon.
7. Once the trap is full and processing equipment is ready, raise the braille slowly to move fish into the holding tank.
    a. Attempt to transfer no more than 20 Chinook salmon into the holding tank at one time.
8. The holding tank will have a divider, with a cover, that allows separation between Chinook salmon and bull trout and prevents fish from jumping out of the holding tank.
9. To the best degree possible, bull trout should be isolated from Chinook salmon as soon as possible to minimize interactions. Staff can opportunistically net bull trout as they spill from the tower into the holding tank, or net bull trout directly from the larger portion of the holding tank into the portion reserved for bull trout.
    a. It is not necessary to separate *every* bull trout before processing begins. Additional stress will be caused by attempting to net fish, so staff should isolate what is immediately possible and separate the rest as Chinook salmon are processed.

Bull Trout Processing

1. General guidelines
    a. Bull trout will normally be processed before Chinook salmon. On high volume days, both species can be processed concurrently if staff resources allow.
    b. Bull trout will be processed in a manner that minimizes time out of water and risk of dropping (i.e., use nets at all time).
    c. Bull trout are thermally-intolerant; therefore, staff will note water temperatures prior to processing trap catch each day. Expedited processing procedures will be followed when water temperatures are expected to exceed 16^0C (61^0F) before processing is completed.

Normal procedures (≤61^{0}F)	Expedited procedures (>61^{0}F)
1. Anesthetize with MS-222 2. Scan for existing PIT tags 3. Measure for fork and total length (mm) 4. Inspect for previous injuries, including hooking scars 5. Mark new captures with PIT tag 6. Transfer to release pipe.	1. Scan for existing PIT tags 2. Estimate fork length (within 2-inch size class) 3. Inspect for previous injuries, including hooking scars 4. Transfer to release pipe.

2. Anesthetization
    a. Tricaine methanesulfonate (MS-222) will be used as a primary anesthesia.
    b. Bull trout will be processed in a separate MS-222 tank.
        i. For MS-222 as an Anesthetic
            1. Bull trout will be placed in separate MS-222 tank for anesthesia. The tank will be monitored for temperature to ensure dosage guidelines are met and/or changed with cool water regularly.
                a. Dosage = 50-60 mg/L at 13-16C (moderate dosage)
                b. Duration = lack of equilibrium before 5 minutes, up to 5 minutes in solution.
                c. Recovery of anesthetized bull trout will take place in the recovery channel after being released down the release pipe. (see Section 5 - Release).
                d. Fish will be observed in the recovery channel several times during processing of fish. Staff is instructed to regularly inspect recovery channel for any impacts/concerns of recovery.

3. Marking / PIT-tagging
    a. PIT tagging equipment will be supplied by Idaho Power (IPC) and procedure/guidance provided by IPC staff will be followed for the PIT tagging process.
    b. All bull trout will be scanned for an existing PIT tag using a PIT tag reader. While scanning with a handheld device, emphasize the area of the fishes' body around the dorsal fin (see P4 instructions below).
    c. Record existing PIT tag codes as 'recaptures'.
    d. Measure
    e. Record both fork and total length (mm) for new and recaptured bull trout.
    f. Inspect for injuries or Record external appearance and identify wounds
        i. Wound location: Mouth/maxillary, head, body
        ii. Size: 1) = less than 1 inches; 2) = 1 to 3 inches; 3) = over 3 inches
        iii. Record whether wound is healed or unhealed?
    g. For previously unmarked (new) fish, apply a 12mm PIT tag to the dorsal sinus using a preloaded syringe.
    h. Properly dispose used PIT tag needles in a designated sharps container.

4. Release
    a. Release Protocol
        i. Bull trout will be released into the release channel and allowed to volitionally leave the facility. Fish can be hand netted from the anesthetic tank and released directly into the recovery channel.
            a. Undesirable impacts/concerns would be observation of fish against the weir, dead in the recovery channel, or any weir mortalities following releases in the channel.
        ii. Should undesirable impacts/concerns be observed during initial 2021 operations, handled bull trout will be placed into a recovery tank on a truck and then driven up to intake for release (by hand/net) identical to past operations (2016).

Chinook salmon processing

1. General guidelines
    a. Natural-origin fish will be differentiated from hatchery-origin fish by the presence of an adipose fin.
    b. ODFW staff will be responsible for determining fish disposition on-site. Weekly and/or daily guidance will be provided by the Lookingglass Hatchery Manager and/or Wallowa District staff.
    c. Co-managers have agreed to the following dispositions, in order of priority:

Natural-origin	Hatchery-origin
1. Broodstock	1. Broodstock
2. Pass above weir for natural spawning	2. Pass above weir for natural spawning
	3. Recycle downstream for fishery contribution
	4. Tribal distribution and/or foodbank
	5. Outplant

2. Processing / Marking
    a. Identify the origin of fish (natural or hatchery), estimate sex (male or female), and record the fork length (mm).
        i. Sex identification will be based on phenotypic traits (snout shape/size and anal vent characteristics).
    b. Scan for a coded wire tag (CWT) near the snout. Note presence or absence of a CWT.
    c. Place fish on measuring/pit tag board and identify if the fish has a pit tag present. If present, scan fish with a hand held PIT reader and record the PIT tag code with other biological information.
    d. Designated staff will select a disposition for each fish based on broodstock and natural spawning objectives for that week.
    e. Salmon selected to spawn upstream will be released in the existing upstream release tube. All other dispositions will be transferred to the respective liberation truck for transport.
        i. Fish designated for tribal distribution / food bank, or outplanting, may be held on-site until transportation is available. These fish will be held in a net pen in the rearing pond.

ii. Fish designated for tribal distribution/food bank, or any mortality (i.e., trap mort) or weir fallback is checked for CWT. For tribal distribution, no more than 25% of hatchery fish will have a snout removed. For Oregon foodbanks, a minimum of 50% of hatchery fish will have the snout removed. When a snout is collected, the sample is placed into a snout bag with an ID and all biological information (length, sex, origin, marks, etc.) is recorded on a separate datasheet along with the snout ID.

3. Electronic PIT tag data collection (P4)
    a. This section to be developed if provided with necessary equipment.

4. Release
    a. After processing, Chinook salmon will be transferred via hand net to a liberation truck.
    b. The tank will be monitored for oxygen saturation and water temperature while in transfer.

Steelhead Processing – During the early portion of the trapping season, upstream-migrating steelhead may be encountered in the Imnaha weir trap. The Nez Perce Tribe will provide staff, on request, to assist with processing steelhead. Adult steelhead observed in the Imnaha trap box will be handled, processed and passed upstream. NPT staff will be at the Imnaha weir to assist on a daily basis from the date the Imnaha weir begins operation in the spring until June 15 or until it can be determined that adult steelhead will no longer be present at the weir site. NPT can also be reached at the Joseph Field Office via telephone (541-432-2501).

1. Procedures
    a. 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.
    b. 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).
    c. 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.
    d. 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.
    e. Steelhead will be recovered in fresh water. After recovery, steelhead will be released in the upstream release tube.

Downstream migrants – Chinook salmon, bull trout, and steelhead (kelts) may be observed on the upstream side of the weir. On-site staff will make efforts (within reason) to safely pass steelhead kelts and bull trout downstream, while restricting the downstream movement of Chinook salmon.

1. If bull trout and/or steelhead are observed on the upstream side of the weir, on-site staff will assess feasibility of passing fish downstream.
    a. Criteria should depend on flows and presence of Chinook salmon. Chinook salmon that are passed above the weir are uniquely marked and abundance is managed. Therefore, all steps should be taken to avoid allowing Chinook salmon downstream.
    b. On-site staff will monitor the relative presence of fish above the weir, and select the best time of day to pass fish without allowing salmon downstream.
2. Staff will use long-handled nets to herd steelhead and bull trout toward a selected weir panel.

3. The selected weir panel will be temporarily raised to allow bull trout and steelhead downstream.
4. ODFW will document and provide NPT with the Imnaha weir kelt passage data.

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 long handled net and gaff for recovery and 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.