

LYONS FERRY COMPLEX ANNUAL OPERATIONS PLAN

For the Period of

OCTOBER 1, 2011 – SEPTEMBER 30, 2012

Prepared by:

Washington Department of Fish and Wildlife



Nez Perce Tribe



Confederated Tribes of the
Umatilla Indian Reservation



And Funded By
Lower Snake River Compensation Plan



LOWER SNAKE RIVER
COMPENSATION PLAN
Hatchery Program

TABLE OF CONTENTS

I. INTRODUCTION	1
A. Facilities	1
1. Lyons Ferry Hatchery	2
2. Tucannon Hatchery	3
3. Cottonwood Acclimation Facility	3
4. Dayton Acclimation Facility	4
5. Curl Lake Acclimation Pond	4
6. Fall Chinook Acclimation Project (FCAP)	4
B. Fish Production Summary	5
II. SNAKE RIVER FALL CHINOOK	8
A. Fish on Hand	10
B. Trapping	10
1. Lyons Ferry Hatchery	11
2. Lower Granite Dam	11
C. Spawning	11
D. Rearing	13
E. Tagging, Transfers, and Releases	14
F. Research	16
III. TUCANNON SPRING CHINOOK	17
A. Fish on Hand	17
B. Tagging, Transfers, and Releases	17
C. Spawning	17
D. Rearing	18
E. Trapping	19
F. Research	19
IV. SUMMER STEELHEAD - GENERAL	20
V. LYONS FERRY SUMMER STEELHEAD	21
A. Fish On Hand	21
B. Tagging, Transfers, and Releases	21
C. Trapping	22
D. Spawning	22
E. Rearing	23
F. Research	23
VI. TOUCHET SUMMER STEELHEAD	23
A. Fish on Hand	23
B. Tagging, Transfers, and Releases	24
C. Trapping	24
D. Spawning	25
E. Rearing	25
F. Research	26
VII. TUCANNON SUMMER STEELHEAD	26
A. Fish on Hand	26
B. Tagging, Transfers, and Releases	27
C. Trapping	27

D. Spawning.....	27
E. Rearing	28
F. Research.....	28
VIII. WALLOWA SUMMER STEELHEAD.....	28
A. Fish on Hand.....	28
B. Tagging, Transfers, and Releases.....	29
C. Trapping	29
D. Spawning.....	30
E. Rearing	30
F. Research.....	30
IX. SPOKANE RAINBOW TROUT	31
A. Fish on Hand	31
B. Tagging, Transfers, and Releases.....	31
C. Rearing	32
X. FISH HEALTH.....	34
A. Guiding Policies.....	34
B. Monitoring.....	34
C. Specific Fish Health Management	34
1. BKD Management – Fall Chinook	34
2. BKD Management – Spring Chinook.....	35
3. IHN Management – Summer Steelhead	35
4. Broodstock and Egg Fungus Management	35
Appendix A: 2011 Requests for Fall Chinook Production Fish/Eggs.....	37
Appendix B: 2011 Trapping/Sorting Protocol at LFH	38
Appendix C: 2011 Fall Chinook Trapping/Sampling Protocol at LGR	39
Appendix C-2: Revised 2011 Fall Chinook Trapping/Sampling Protocol at LGR	40
Appendix D: 2011 Mating Matrix for Spawning at LFH.....	41
Appendix E: FCAP Facilities	42
Appendix F: 2012 Releases - Fall Chinook Pit Tag Allocation (<i>UsvOr</i> agreement)	47

List of Figures

Figure 1. Map of the Lower Snake River Compensation Plan (LSRCP) LFC Facilities, and major rivers and streams in Southeast Washington.	1
---------------------------------------------------------------------------------------------------------------------------------------------	---

List of Tables

Table 1. LFC production capacities (historical design versus current).	6
Table 2. LFC plants and transfers by brood years (BY) – three-year profile.	7
Table 3. Revised production table listing Snake River fall Chinook salmon production priorities for LFH per the <i>UsvOR</i> Management Agreement, Table <i>B4B</i> , for Brood Years 2008-2017.9	
Table 4. BY 2010 Snake River fall Chinook tagging, transfers and proposed releases.	10
Table 5. Identified Areas for fall Chinook juvenile and *Adult out planting as presented in the June 1, 2006 Draft SRFMP.	13
Table 6. Proposed BY 2011 Snake River fall Chinook tagging, transfers and releases.	15
Table 7. Proposed BY 2010 Tucannon River spring Chinook tagging, transfers and releases. ..	17
Table 8. Proposed BY 2011 Tucannon River spring Chinook tagging, transfers and releases. ..	18
Table 9. Proposed BY 2012 Tucannon River spring Chinook tagging, transfers and releases. ..	19
Table 10. Proposed BY 2011 LFH stock summer steelhead tagging, transfers and releases.	22
Table 11. Proposed BY 2011 Touchet summer steelhead smolts tagging, transfers and releases.	24
Table 12. Proposed BY 2012 Touchet summer steelhead smolts tagging, transfers and releases.	25
Table 13. Proposed BY 2011 Tucannon River summer steelhead tagging, transfers and releases.	27
Table 14. Proposed BY 2012 Tucannon River summer steelhead production.	28
Table 15. Proposed BY 2011 Wallowa stock summer steelhead tagging, transfers and releases.	29
Table 16. Proposed BY 2012 Wallowa stock summer steelhead tagging, transfers and releases.	30
Table 17. Proposed BY 2010 Spokane rainbow trout tagging, transfers and plants.	32
Table 18. Current and Proposed Mitigation rainbow trout production comparison.	33
Table 19. Proposed BY 2011 Spokane rainbow trout releases.	33
Table 20. Contact List.	36

I. INTRODUCTION

A. Facilities

Lyons Ferry Complex (LFC; See [Figure 1](#)) includes Lyons Ferry Hatchery (LFH), Tucannon Hatchery (TFH), Cottonwood Acclimation Facility (Cottonwood AF), Dayton Acclimation Facility (Dayton AF), and Curl Lake Acclimation Pond (Curl Lake AP).

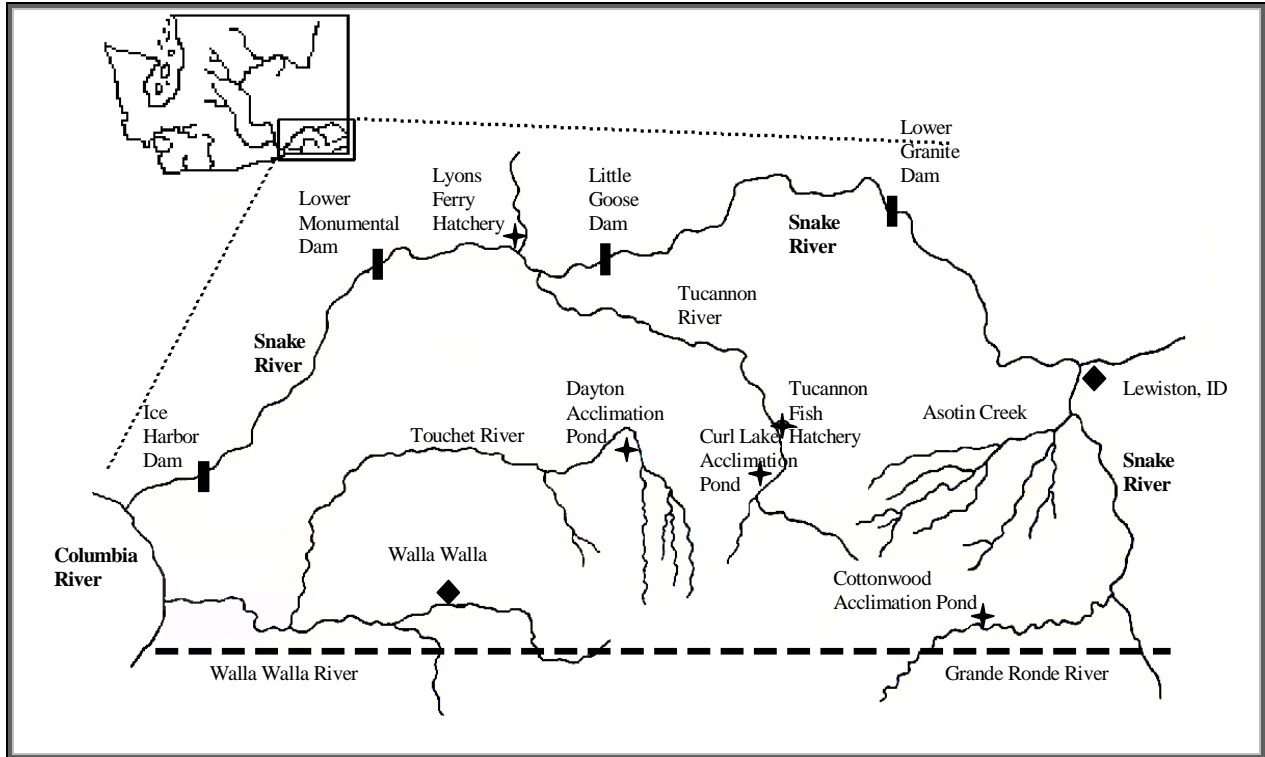


Figure 1. Map of the Lower Snake River Compensation Plan (LSRCP) LFC Facilities, and major rivers and streams in Southeast Washington.

LSRCP funded fish production in Washington began in 1983, with the construction of trout and steelhead rearing facilities at the LFH. Construction of salmon hatchery facilities and steelhead acclimation sites followed, and were completed in 1985. Major upgrades at TFH also occurred at that time, and operation of that facility has been funded by LSRCP ever since. Production at all facilities has been directed toward meeting established hatchery return goals of 18,300 adult fall Chinook, 1,152 adult spring Chinook, 4,656 adult summer steelhead; plus providing 67,500 angler days of fishing opportunity from 80,000 pounds of rainbow trout production (currently planted at 3 fish per pound (fpp)). In addition to these LSRCP hatchery production goals to mitigate for expected hydrosystem losses (approximately 48% of total desired population returns), the LSRCP hatchery program has contributed to conservation efforts to maintain and restore native populations of salmon and steelhead. Additional hatchery production of jumbo-

sized (1.5 pounds each) rainbow trout at TFH that historically was state funded is now funded by the Tri-State Steelheaders (non-profit organization).

1. Lyons Ferry Hatchery

The LFH is located along the Snake River at river mile (RM) 59.1, directly below the confluence of the Palouse River in Franklin County, Washington. Initially it was operated as two separate facilities. Washington Department of Wildlife (WDW) operated the north hatchery, producing steelhead and rainbow trout. Washington Department of Fisheries (WDF) operated the south hatchery, rearing spring and fall Chinook. A merger of the two agencies in 1994 led to a merging of the two facilities, and has since been operated by WDFW through LSRCP funding as LFH.

Facilities include two incubation buildings with office space and feed storage, plus adult fish trapping, holding and spawning structures. A visitor center provides interpretive information for guests of the hatchery. There are eight residences on-site for staff to fulfill security and emergency response needs.

The LFH rearing facilities include twenty-eight raceways at 10 ft x 100 ft x 2.8 ft and nineteen raceways at 10 ft x 88.5 ft x 3.5 ft. These raceways are covered in 2" square mesh netting . There are three rearing lakes also covered in 2" netting holding ~ 643,500 cubic feet (ft³) of water each, (1,100 ft x 90 ft x 6.5 ft dimensions). Netting has significantly reduced predation since being installed in 2006-08. The steelhead and spring Chinook adult holding facilities include three 83 ft x 10 ft x 5 ft adult raceways with an enclosed spawning building incorporated over the center of these ponds. There are four 8.5 ft x 150 ft x 4.3 ft and four 10 ft x 150 ft x 4.3 ft adult salmon holding ponds, which also accommodate sub-yearling rearing when not needed for adult holding in the spring. The incubation facilities include 112 full Heath Tray stacks (2 units of 8 trays each) of vertical incubators in the south-side building, and 88 shallow eyeing/hatching troughs and four 3.75 ft x 27.5 ft x 2 ft intermediate rearing troughs in the north-side building.

Water is supplied to LFH from the Marmes pump station, which has emergency power backup generation. Both generators were extensively serviced in the fall of 2009, which included new radiators and internal components. The Marmes pump (wells) facility has three 300 horsepower (hp) pumps, four 200 hp pumps and one 75 hp pump. The well water right for LFH is 53,200 gallons per minute (gpm), or 118.5 cubic feet per second (cfs) of flow, and water temperature is a constant 52° F.

2. Tucannon Hatchery

The TFH is located along the Tucannon River, between the towns of Dayton and Pomeroy Washington, at RM 36 in Columbia County. Fish production began in 1949 by the Washington Department of Game. In 1983, construction began to remodel the hatchery as part of a transfer of ownership to LSRCP. Since November 1986, when construction was completed, the LSRCP has funded operations.

The TFH includes a combined incubation and office building, back-up power generation building, feed storage shed, shop, domestic water building, two well houses and a spring water collection building. There is also a river intake and trapping facility located upstream of Rainbow Lake, along the Tucannon River. There are two residences for staff on site to fulfill security and emergency response needs.

The TFH is supplied with three different water sources. River water is captured from the Tucannon River and ranges in temperatures from 33 to 60 ° F during use by the hatchery. The intake is located one half mile upstream of the hatchery. This water travels down an open channel into Rainbow Lake. From the outlet of Rainbow Lake the water travels through an 18" above ground pipeline to the hatchery. This pipeline was completely replaced in 2005. Rainbow Lake functions as a reservoir to provide the hatchery with cooler water in the summer months and warmer water in the winter months. It also provides a pool of water to draw from when encountering adverse intake conditions, resulting in temporary loss of water flows. An estimated 8 hours of water supply is currently available, however, a proposed dredging project will increase its capacity and supply. The water right for this source is 16 cfs. Well water is pumped from two separate sources to an aeration tower, and then gravity fed to the rearing units and the domestic pump building. The combined well water right is 2 cfs, with well #2 running around 54 - 57° F and well #3 running a constant 61° F. Spring water is pumped from an underground collection site to the same aeration tower and gravity fed to rearing units. The water right for this source is 5.3 cfs, and has a stable temperature of 51 or 52° F.

The rearing vessels at TFH include 40 concrete 1 ft x 15ft x .5 ft shallow troughs, six concrete round ponds approximately 40 ft in diameter with a maximum of 2,660 ft³ of rearing area each, two concrete 10 ft x 80 ft x 3 ft raceways, one concrete 15 ft x 136 ft x 5 ft raceway, and one earthen rearing pond with a maximum of 136,221 ft³ of rearing space. The pond is approximately 170 ft x 200 ft x 6.5 ft in size.

3. Cottonwood Acclimation Facility

Cottonwood AF is located along the Grande Ronde River at RM 28.7, directly above the confluence with Cottonwood Creek in Asotin County, Washington. Construction was completed in February 1985.

This facility includes an adult trapping facility on Cottonwood Creek, and a small storage building. Cottonwood AF has a concrete channel with earthen walls and holds ~357,000 ft³ of water. It has a water right of 2,694 gpm (6 cfs) for the period January 1st through July 1st. It is supplied with water from Cottonwood Creek through a gravity water supply system, with the intake integrated into the adult trapping facility located ~ 0.10 miles above the pond. Water

temperatures range from 34 to 52° F during operation of the facility. It also has a small trailer for use by staff required to be on-site at all times while the pond is in operation. It is presently used for acclimation and release of Wallowa stock summer steelhead into the Grande Ronde River.

4. Dayton Acclimation Facility

Dayton AF is located along the Touchet River at RM 53 in Columbia County, Washington. There is an adult trapping facility on the Touchet River just upstream of the acclimation pond at RM 53.3.

Construction of the Dayton AF was completed in October 1986. This pond is asphalt lined and holds ~ 200,000 ft³ of water. The water right to this pond is 2,694 gpm (6 cfs) for the period of Jan 1st – June 1st of each year. It is supplied with water from the Touchet River through a gravity water supply system, with the intake located at the adult trapping and bypass facility just upstream of the pond. Water temperatures during operations for steelhead acclimation range from 34 to 52° F. The pond is located adjacent to the Snake River Lab evaluation office and has a storage garage for equipment and feed. It also has a small trailer for use by staff required to be on-site at all times while the pond is in operation. It is presently used for acclimation and release of LFH stock summer steelhead into the Touchet River. The intake, trap and water supply structure was rebuilt in 2008 and serves multiple functions. During the summer months, local irrigators collect water from the acclimation pond intake via a separate screen box and pipeline.

5. Curl Lake Acclimation Pond

Curl Lake AP is located along the Tucannon River at RM 41 in Columbia County, Washington. The construction of Curl Lake AP was completed in February 1985. Curl Lake AP is an earthen pond holding ~ 784,000 ft³ of water. It has a water right of 2,694 gpm (6 cfs). It is supplied with water from the Tucannon River through a gravity water supply system. It is currently utilized for acclimation of spring Chinook yearlings for release into the Tucannon River. Water temperatures at this time of year range from 34 to 48 ° F. Chinook acclimation in Curl Lake AP started in 1997. After the spring Chinook are released in early April, the pond is stocked with resident trout for fishing. It is emptied after fishing season ends October 31st each year, and recharged by hatchery staff prior to spring Chinook acclimation the following January.

6. Fall Chinook Acclimation Project (FCAP)

In addition to WDFW acclimation sites, LFC provides up to 465,000 yearling and 1,400,000 sub-yearling fall Chinook to three acclimation facilities operated by the Nez Perce Tribe (NPT): Pittsburg Landing and Captain John's Rapids on the Snake River between Asotin and Hells Canyon Dam, and Big Canyon on the Clearwater River. Size at transfer to the NPT AF's is 12 fpp for yearlings and 65 - 75 fpp for sub-yearlings. Size at release goal for acclimated fall Chinook yearlings is 10.0 fpp, and 50 fpp for sub-yearlings. Sub yearling size goals at transfer have been difficult to achieve due to increased marking, tagging and egg take strategies. Please refer to [Appendix E](#) for more details.

B. Fish Production Summary

Annual hatchery production is intended to meet LSRCP adult return goals for several species. Current production levels are set to either conserve and rebuild the Chinook populations, or to meet the adult hatchery return goals for steelhead most years while minimizing any adverse effects on ESA listed salmon and steelhead (**Table 1**). Production levels for salmon and steelhead at LFH have been approved through the *U.S. v Oregon (US v OR)* 2008-2017 Management Agreement. LFH is planning BY2011 fall Chinook production based on table *B4B* in the US v OR agreement (**Table 3**). Spring Chinook production is comprised of a hatchery smolt program. The release goal is 225,000 smolts per year (as agreed to under US v OR, for initial release in 2007). LFH has utilized two hatchery steelhead stocks (Lyons Ferry and Wallowa) in recent years for mitigation objectives under LSRCP, and has tested two natural broodstocks in the Touchet and Tucannon Rivers. The numbers of fish released in 2011 were annual goals proposed in 2005, (**Table 2**), and revised through the Production Advisory Committee (PAC) in 2010. Changes were negotiated by the co-managers.

It is important to stress that *any* change to a specific program at LFH or TFH will potentially impact the other programs, so “current capacity” values shown in **Table 1** represent rearing limits *as the programs are structured today*. Additionally, restrictions anywhere within the rearing cycle will determine program size. Restrictions can be rearing vessels, water, tagging groups and schedules, fish management decisions regarding harvest or adult return contribution and carrying capacity, etc. A proposed project to expand rearing capacity at LFH is currently being developed for the 2011-12 cycle. Remodeling the former spring Chinook captive brood area to incorporate 12 new circular tanks for rearing the endemic steelhead programs will enable future Tucannon steelhead production increases for mitigation.

Monitoring and Evaluation (M&E) has been ongoing since 1983 and 1985 for trout and salmon programs respectively. Recent emphasis has centered on meeting Endangered Species Act (ESA) permitting and recovery planning requirements. Hatchery Scientific Review Group and Hatchery Review Team (HRT) recommendations are likely to affect production actions and management decisions in the coming years. Routine monitoring includes length, weight, K factor, external fin evaluation, tag retention and fish health examinations. Pre-release quality control checks on fin clips, tag retention, etc. is completed on all WDFW releases by WDFW staff.

Table 1. LFC production capacities (historical design versus current).

Facility	Location River (Mile)	Water Source	Species	Designed Capacity (#Fish)	Designed Capacity (Pounds)	2011 Current Capacity (#Fish)	2011 Current Capacity (Pounds)
Lyons Ferry ^a	Snake (58)	Wells	Fall Chinook	9,160,000	101,800	3,100,000	119,167
			Spring Chinook	132,000	8,800	240,000	8,000
			Steelhead	931,200	116,400	675,000	150,000
			Rainbow	260,000	86,000 ^d	265,000	46,950
			TOTALS	10,483,200	311,000	4,280,000	324,117
Tucannon ^b	Tucannon (36)	Wells, Springs, Tucannon R.	Spring Chinook	132,000	8,800	240,000 ^c	20,000
			Rainbow	210,000	39,285	198,000	45,970
			Steelhead	-0-	-0-	100,000	22,222
			TOTALS	342,000	53,335	538,000	88,192
Cottonwood AF	Grande Ronde (28.7)	Cottonwood Creek	Steelhead	250,000	31,250	200,000	44,444
Curl Lake AP	Tucannon (41)	Tucannon R.	Steelhead	160,000	32,000	-0-	-0-
			Spring Chinook	-0-	-0-	225,000	20,000
Dayton AF	Touchet (53)	Touchet R.	Steelhead	125,000	27,750	85,000	18,889

^aLyons Ferry Hatchery was designed to accommodate sub-yearling Chinook based on the traditional density factor of 0.18. However, with regards to fish health, fish quality, increased yearling production, marking strategies that have been implemented since construction, and water composition, the density factor must not exceed 0.09 for sub-yearlings and 0.14 for yearlings.

^bTucannon Hatchery was initially designed for rainbow and spring Chinook. Following facility modifications in the 1980's, and the construction of Curl Lake as an acclimation site, increased production for rainbow trout, spring Chinook, and incorporating a steelhead conservation program, were all implemented.

^cSpring Chinook rearing capacity is during the fall/winter months when rainbow trout are reared in the earthen rearing pond on river water. Earthen pond not in use during the summer months due to high water temperatures. The spring Chinook and rainbow program cannot be reared concurrently to full term at TFH due to early rearing limitations.

^dRevised capacity. The initial designed capacity for rainbow trout was for 86,000 pounds under the mitigation agreement. Previous AOP's state 84,000 lbs as the capacity, which was incorrect.

Table 2. LFC plants and transfers by brood years (BY) – three-year profile.

Species	Year slated for release/transfer				
	2011 Goal	2011 Actual Plants and Transfers	2012 Goal ^a	Fish/Eggs on Hand For 2012 Goal	2013 Tentative Plan ^a
Fall Chinook					
<u>Yearling releases:</u>	<u>BY 2009</u>	<u>BY 2009</u>	<u>BY 2010</u>	<u>BY 2010</u>	<u>BY 2011</u>
LFH-on station	450,000	463,729	450,000	485,000	450,000
NPT – FCAP (transfer)	465,000	487,556	465,000	495,000	465,000
<u>Sub-yearling releases:</u>	<u>BY 2010</u>	<u>BY 2010</u>	<u>BY 2011</u>	<u>BY 2011</u>	<u>BY 2012</u>
LFH-on station	200,000	202,200	200,000	Unknown	200,000
NPT – FCAP (transfer)	1,400,000	1,442,100	1,400,000	Unknown	1,400,000
Direct- near Couse Cr (CCD)	200,000	202,300	200,000	Unknown	200,000
Direct-Grande Ronde River	-0-	-0-	-0-	-0-	-0-
<u>Eyed Egg Transfers:</u>	<u>BY 2010</u>	<u>BY 2010</u>	<u>BY 2011</u>	<u>BY 2011</u>	<u>BY 2012</u>
Oxbow - IPC	211,000	210,000	211,000	Unknown	211,000
Irrigon-IPC	842,000	680,000	842,000	Unknown	842,000
Irrigon - Direct – GRR	421,000	390,000	421,000	Unknown	421,000
Umatilla-ACOE	345,220	350,000	345,220	Unknown	-0-
Spring Chinook					
Tucannon stock	<u>BY 2009</u>	<u>BY 2009</u>	<u>BY 2010</u>	<u>BY 2010</u>	<u>BY 2011</u>
Yearling smolt production	225,000	231,437	225,000	203,000	225,000
Smolt rearing study @ TFH					28,000
Summer Steelhead (Stock)					
	<u>BY 2010</u>	<u>BY 2010</u>	<u>BY2011</u>	<u>BY 2011</u>	<u>BY 2012</u>
On Station (LFH)	160,000	164,813	160,000	145,000	160,000
Tucannon (LFH)	-0-	-0-	-0-	-0-	-0-
Touchet (LFH)	85,000	84,623	85,000	86,000	85,000
Walla-Walla (LFH)	100,000	102,341	100,000	100,000	100,000
Cottonwood (Wallowa)	200,000	197,839	200,000	180,000	200,000
Tucannon (Endemic)	75,000	77,683	75,000	51,700	75,000
Touchet (Endemic)	50,000	62,037	50,000	55,500	50,000
	<u>BY2009</u>	<u>BY2009</u>	<u>BY2010</u>	<u>BY2010</u>	
Touchet (Endemic 2-yr)	5,500	6,439	-0-	-0-	
Spokane Rainbow Trout					
<u>Mitigation</u>					
Catchables	236,725	242,840	234,435	225,000	197,358
Jumbo's	1,000	1,599	1,500	1,450	1,000
IDFG transfer-fingerlings	160,000	157,205	N/A	N/A	N/A
IDFG Catchables	4,950	4,369	4,950	4,500	12,950
Jumbo's – NPT's	1,650	1,675	1,650	1,600	1,650
<u>State Program</u>					
Jumbo's – TSS organization	4,000	4,360	4,000	4,100	4,000
Legals	-0-	-0-	-0-	-0-	-0-

^a Based on the *US v. Oregon* table B4b.;

II. SNAKE RIVER FALL CHINOOK

The fall Chinook production program at LFH is the cornerstone of a highly coordinated and integrated artificial program for Snake River fall Chinook, implemented through the LSRC program, the Idaho Power Company (IPC) Hells Canyon Settlement Agreement, and the Nez Perce Tribal Hatchery (NPTH). Broodstock for the program at LFH are collected at Lower Granite Dam (LGR) and at LFH.

The *US v OR* 2008-2017 Management Agreement included two tables that determined priority release locations and numbers for fall Chinook production at LFH; production priorities contained in Tables *B4A* and *B4B*. A policy decision has been made to use *B4B* from that agreement. For this AOP, LFH is planning BY2011 fall Chinook production based on table *B4B* (**Table 3**).

The LFH was initially designed to release 9.16 million fall Chinook subyearlings (**Table 1**) at around 90 fpp. Currently this facility produces 1.8 million subyearlings at approximately 50-75 fpp, and another 915,000 yearlings at 10-12 fpp. Out of this production, LFH provides 465,000 yearlings and 1.4 million subyearlings annually to the FCAP for its program. Additionally, LFH traps and spawns returning adult fall Chinook to meet egg take needs elsewhere, which includes providing over 1,000,000 eyed eggs annually for the IPC program. Marking and tagging will occur there as well. An additional 400,000 fish will be released into the Grande Ronde River in Washington as subyearlings by ODFW. The co-managers will coordinate release timing and location. This production was historically conducted at LFH. However, co managers recognized the opportunity to shift the program to Oregon, reducing densities, improving fish health, and creating some flexibility at LFH. Both facilities (Irrigon Hatchery and LFH) are funded by LSRC.

Table 3. Revised production table listing Snake River fall Chinook salmon production priorities for LFH per the *UsvOR* Management Agreement, Table *B4B*, for Brood Years 2008-2017.

Priority	Production Program				
	Rearing Facility	Number	Age	Release Location(s)	Marking
1	Lyons Ferry	450,000	1+	On station	225K AdCWT 225K CWT
2	Lyons Ferry	150,000	1+	Pittsburg Landing	70K AdCWT 80K CWT only
3	Lyons Ferry	150,000	1+	Big Canyon	70K AdCWT 80K CWT only
4	Lyons Ferry	150,000	1+	Captain John Rapids	70K AdCWT 80K CWT only
5	Lyons Ferry	200,000	0+	On station	200K AdCWT
6	Lyons Ferry	500,000	0+	Captain John Rapids	100K AdCWT 100K CWT only 300K Unmarked
7	Lyons Ferry	500,000	0+	Big Canyon	100K AdCWT 100K CWT only 300K Unmarked
8	Lyons Ferry	200,000	0+	Pittsburg Landing	100K AdCWT 100K CWT only
9	Oxbow	200,000	0+	Hells Canyon Dam	200K AdCWT
10	Lyons Ferry	200,000	0+	Pittsburg Landing	200K Unmarked
11	Lyons Ferry	200,000	0+	Direct stream evaluation Near Captain John Rapids	200K AdCWT
12	DNFH/Umatilla	250,000	0+	Transportation Study ^a	250K PIT Tag only
13	Irrigon ^b	200,000	0+	Grande Ronde River	200K AdCWT
14	DNFH/Umatilla	78,000	0+	Transportation Study ^a	78K PIT tag only
15	Irrigon ^c	200,000	0+	Hells Canyon Dam	200K AdCWT
16	Irrigon ^b	200,000	0+	Grande Ronde River	200K Unmarked
17	Irrigon ^c	600,000	0+	Hells Canyon Dam	600K Ad only
TOTAL	Yearlings	900,000			
	Subyearlings	3,528,000 (of which 328,000 are for Transportation Study)			

^a USACOE Transportation Study wild surrogate groups direct stream released into the Clearwater and mainstream Snake River

^b for logistical purposes, fish are reared at Irrigon in lieu of Lyons Ferry. (LSRCP);

^c for logistical purposes, beginning in 2010, fish are reared at Irrigon in lieu of Umatilla

A. Fish on Hand

Brood Year 2010

In August 2011, LFH had an estimated 980,000 (BY10) juvenile Snake River fall Chinook on hand. The program goal is to provide 465,000 yearlings to NPT acclimation sites and 450,000 yearlings for release at LFH in spring 2012. About 30,000 of the onstation yearlings were PIT tagged in late August. Approximately 485,000 yearlings will be released on-station at LFH, and a total of 495,000 is anticipated at transfer to all the FCAP facilities in Feb-Mar 2012. These fish will all receive PIT tags (see Appendix F). The PIT tag detections will be used to document the magnitude of the return as the fish are coming up the Columbia River. We will also use the PIT tag data to estimate recapture rates at the adult trap at LFH in addition to estimating smolt-to-adult return estimates.

Table 4. BY 2010 Snake River fall Chinook tagging, transfers and proposed releases.

Site	Expected Transfer	Expected Release	Size (fpp)	Age	Mark/CWT/Elastomer	PIT Tags	Transfer/Release Date
LFH	N/A	485,000	10	1+	242.5K AD CWT 242.5K CWTonly	15,000 15,000	April 2012
Capt. John Rapids	155,000	150,000	12	1+	73K AD CWT 82K CWT Only	19,000	Feb - 2012 (transfer)
Pittsburg Landing	170,000	165,000	12	1+	80K AD CWT 90K CWT Only	19,000	Mar - 2012 (transfer)
Big Canyon	170,000	165,000	12	1+	79K AD CWT 91K CWT Only	19,000	Mar - 2012 (transfer)

B. Trapping

Brood Year 2011

Tribal, state, and federal interjurisdictional management of fisheries for conservation of natural populations, sharing of harvestable returns and ESA take, trapping of hatchery broodstocks, and distribution of fish trapped in excess of brood needs is extremely complex. In an effort to better coordinate hatchery and harvest management, agencies in the basin have implemented a structured pre-season planning, inseason coordination, post season review and evaluation process. Weekly inseason coordination teleconferences where run projections, harvest estimates, and hatchery trapping and broodstock collection data are exchanged and will be particularly important for managing fall Chinook.

The trapping goal ([Appendix C](#)) for broodstock is 2,800 (which includes approximately 1,400 females) adults based upon stray rates and pre-spawning mortalities and we anticipate that the majority of the females needed for brood will be trapped at Lower Granite. This goal is the total number of fish that will need to be trapped to meet egg take goals through *Priority 17* (Table 3). These goals are exclusive to stray culling requirements to assure the stray rate proportion does not exceed 5%. Collection occurs at LFH and LGR. In effect, trapping is estimated for LGR,

and then the remaining numbers of fish needed to meet egg take goals are trapped at LFH. Fish collected at LFH will target larger adults. Adults trapped at NPTH may be used to supplement LFH production shortages of LGR and volunteer adult returns, and vice versa. In addition to the broodstock goals, up to another 1,200 fish will be collected for coded-wire tag recovery efforts.

1. Lyons Ferry Hatchery

Trapping at LFH will begin on September 17th, for steelhead and fall Chinook and continue throughout the spawning season, generally ending by late November or early December. Snake River fall Chinook that voluntarily enter LFH may be retained for spawning. For Brood Year 2011, the goal will be to selectively collect the largest adults entering the trap. During trap operation, staff will sort by size, diverting the larger (approx. ≥ 90 cm fork length = **FL**) adults to the holding pond, and returning the smaller adults and jacks back to the river. This will be done without handling the fish. Up to 600 larger adults will be collected, including any additional adults to ensure that broodstock needs are met. This sizing strategy is to minimize the impacts of younger aged adults in the broodstock ([Appendix B](#)). Coho salmon are occasionally identified at LFH during fall Chinook trapping operations and are returned to the river.

2. Lower Granite Dam

Trapping at LGR began on August 18. ([Appendix C](#)). The trap rate at LGR was set at 10% with the desire to remain at that rate all season. Collected fish are divided between the LFH and NPTH (usually 70:30 ratio) as agreed upon annually, with a predetermined hauling schedule shared between both facilities to meet this need. This hauling schedule is adjusted accordingly for meeting the established ratio. The goal will focus on females in calculating the 70:30 split.

C. Spawning

Brood Year 2011

Spawning will occur weekly, generally on Tuesdays and Wednesdays, starting the third or fourth week in October. It will continue until late November or early December, as necessary to meet egg-take goals. All recovered CWTs will be read during spawning to ensure separation of LFH origin fish from unknown fish.

Strays may be included in broodstock up to 5%. This limit may be adjusted if necessary to meet production goals and if approved by the co-managers. If not needed, strays will be destroyed. It is suggested that unmarked/untagged fish from LGR be used preferentially over unmarked fish at LFH, as they are more likely to be of Snake River origin. It is the intent of the co-managers to minimize use of out-of-basin fish in the broodstock.

All CWT's will be analyzed prior to matings to determine origin and age structure. We will continue to increase the percentage of four and five year old fish in the broodstock to offset the past high incorporation rate of jacks in the broodstock and the higher harvest rate of these fish in lower river fisheries. This was agreed to by all the co-managers. Also, the goal for BY2011 is to reduce the number of "true jacks" (i.e. one-salt fish) in the broodstock. Fork length criteria for broodstock will be adjusted in season to reflect accurate size at age estimates. Parental Based

Tagging (PBT) will be implemented this year on all broodstock during spawning as a way of identifying untagged progeny of hatchery produced in-basin fish when they return. Fin clips from broodstock will be archived for later analysis and profiling. Refer to the Hatchery and Genetic Management Plan (HGMP) and its Addendum for the full intent of the marking program.

Our mating protocol will minimize hatchery stray incorporation into Lyons Ferry Hatchery broodstock while incorporating potentially as many wild fall Chinook as possible. Mating will occur in a 1 female x 1 male cross but larger, older aged males may be used multiple times on different females. If a male is used multiple times it must be used on at least one older aged female. A mating matrix is provided in [Appendix D](#). Because the spawning population is large (>1,000), increasing genetic diversity is not presently a concern. Larger, older aged males (3 and 4 salt) will be split and used on multiple females if needed.

We will mate true jills to adult males. We desire to minimize the numbers of jills in our broodstock so they will be incubated separately until we can determine if production goals can be met with older aged females. If broodstock can be met without using jills, we will cull the progeny of jills prior to seasons end. If we are short on males, jacks may be used if they come from subyearling production groups.

Fertilized eggs will be water hardened for one hour in 100-ppm iodophore, and incubated in vertical stack incubators. Progeny from below-low enzyme linked immuno-sorption assay (ELISA) females are used for the yearling programs¹. Disposition of eggs from females yielding moderate or high titers during ELISA sampling is determined by co-managers as appropriate. These eggs are used for subyearling programs, or may be culled. Progeny of females not ELISA sampled are only used for subyearlings.

There is the potential that surplus Snake River origin fish may be available at the broodstock collection stations once egg take goals have been met. These fish will be top caudal clipped and returned to the river to continue their upstream migration, or out-planted above LGR Dam. All LGR origin adults with CWT must be retained for sampling. Table 5 on the following page lists the areas that have been identified for each broodstock facility as suitable for disposition of surplus adults.

Table 5. Identified Areas for fall Chinook juvenile and *Adult out planting as presented in the June 1, 2006 Draft SRFMP.

Facility	Out plant Locations		
	Adults/jacks	Fry	Subyearlings
Lyons Ferry Hatchery	-Tucannon River -Grande Ronde River -Mainstem Snake River	-Tucannon River -Mainstem Snake River near LFH -Mainstem Snake River above LGR	-Mainstem Snake near Captain John Rapids -Big Canyon -Grande Ronde River -Mainstem Snake downstream of Clearwater River
NPTH	-Lower mainstem Clearwater River, below North Fork	-Lower mainstem Clearwater River	-Lower mainstem Clearwater River

*According to Fish Health regulations, adults receiving antibiotic injections and/or were anesthetized with MS-222 cannot be utilized for outplanting.

D. Rearing

Brood Year 2011

Eggs are reared in the vertical incubators, and are treated with formalin to control fungus on a daily basis. They are shocked at eye-up around 550 temperature units (TU's). After eggs are picked, folded Vexar sheets are added to each tray for substrate Formalin treatments stop just before hatching. After complete yolk-sac absorption by hatched fry (at around 1900 TU's), they are transferred to raceways for rearing. Head troughs providing well water to the incubators are alarmed, and visual inspections of flow through the trays along with head trough levels are conducted daily.

LFH production fry are moved to outside raceways at ~1,600 fpp. In addition to standard raceways, adult salmon holding raceways are also utilized for subyearling fall Chinook rearing. By utilizing these larger ponds, densities in other raceways are substantially reduced. Chronic Bacterial Gill Disease has occurred in recent years at LFH, although no detection was present in the BY2010 program. To minimize handling and stress associated with tagging, the un-marked groups will be reared separately in the adult ponds. This has helped to reduce or eliminate bacterial gill disease issues in these ponds the past two years. The un-marked groups will come from same egg takes as their cohorts that will receive CWTs and ad-clips, and will be reared on the same growth regimen. The current density index for fall Chinook subyearlings at or smaller than 100 fpp is monitored not to exceed 0.09. Density values can increase on a sliding scale to a maximum value of 0.14 for yearlings at 10-12 fpp. These density index goals were developed to improve fish quality and survival.

Beginning in spring 2011, only the yearling fall Chinook fry for the NPT acclimation facilities (FCAP) are administered the 28-day Aquamycin feed treatment to reduce potential for Bacterial Kidney Disease. The yearling fall Chinook treatment for the on-station release at LFH has been discontinued. This decision was due in part to the adult sampling protocols that are controlling

the risk of an outbreak of BKD, minimizing stress on the juveniles associated with the treatment, and concerns about the number of drop-outs occurring in the fry.

E. Tagging, Transfers, and Releases

Brood Year 2011

In addition to the eyed egg transfers identified in Section D., this section outlines the anticipated subyearling and yearling production for BY2011 assuming full production of Table 3. All tagging, transfers, and releases are listed in Table 5.

Egg Transfers

Assuming full production of **Table 3**, IPC will receive 1,053,000 eyed eggs (842,000 for Irrigon Hatchery + 211,000 for Oxbow Hatchery). Irrigon also receives 421,000 eyed eggs for the Grande Ronde direct release. The request for these eyed egg transfers to Irrigon is by early December. The Umatilla Hatchery will receive 345,000 eyed eggs for the USACOE Transportation Study (final year of study). These transfers are listed in **Table 6**.

Sub-Yearlings

A total of 200,000 subyearlings are 100% coded-wire tagged and adipose fin clipped in April for release from LFH into the Snake River in early June. Captain John Rapids Acclimation Facility (AF) receives 500,000 subyearlings in May, as does Big Canyon AF, from LFH. Both groups are comprised of 100,000 CWT, 100,000 AD+CWT, and 300,000 unmarked fish. Pittsburg Landing AF will receive 400,000 subyearlings in May. This group is comprised of 100,000 CWT, 100,000 AD+CWT, and 200,000 unmarked fish. An additional 200,000 subyearlings, 100% AD+CWT, will be direct stream released into the Snake River near Couse Creek, downstream from Captain John Rapids. The co-managers will evaluate and consider acclimation of the Couse Creek direct release at Captain John Rapids.

All marking and tagging is completed by WDFW in March and April, prior to transfer. PIT tagging may occur prior to and/or post transfer to acclimation sites. These fish are acclimated and released in June by NPT.

Eyed eggs are transferred from LFH to the Irrigon Hatchery in mid December where the fish are reared and tagged prior to release. In late May, or early June ODFW will direct stream release 400,000 subyearlings at 50 fpp into the Grande Ronde River at Cougar Creek near the Washington border. This group of fish is identified as priorities 13 & 16 (**Table 3**). From these 400,000 subyearlings, 200,000 fish will be AD+ CWT marked (*priority 13*), and 200,000 will be unmarked and untagged.

The IPC sub-yearling program for Oxbow and Irrigon receive eggs from Lyons Ferry in December. These fish will be reared, marked and tagged in Idaho – Oregon. The IPC group is direct released at the Forest Service boat launch below Hells Canyon Dam at a release goal of 50 fpp. During the first week of May, Oxbow will release 200,000 subyearlings. Additionally, 800,000 from Irrigon are released in late May.

Yearlings

A yearling release of 450,000 fish from LFH directly into the Snake River at 10 fpp is programmed for 2013. All of these fish will be marked and/or tagged during July-August 2012 (half AD+CWT, and half CWT only), and transferred into Lake Two. A portion of these fish may also be PIT tagged (as many as 30,000) at the same time to better estimate escapement of adults through the hydro system to LFH, LGR, and the Tucannon River (**Table 6**). Fish will be released over a 4-day period from the rearing pond into the Snake River during the period of April 12-15, 2013, depending on river flows and dam spills. Due to the ongoing unscreened bypass study of lamprey at the McNary Dam, releases shall be coordinated as to not jeopardize survival of juveniles migrating through potentially exposed turbines. Since all three lakes share a common release structure, the fall Chinook release must be coordinated with steelhead releases.

Three yearling groups of 155,000 will be marked and/or tagged at LFH in July-August 2012 (AD+CWT; CWT only; and up to 45,000 PIT tags), then transferred to Captain John, Big Canyon, and Pittsburg Landing acclimation sites (at ~ 12 fpp) for final rearing and release by NPT in April 2012 at a target of 10 fpp. Prior to transport, 19,000 will be PIT tagged for each group for emigration timing and survival through the hydro-system. This tagging will be coordinated with the ACOE transportation study. This will be the final year of the transportation study.

Table 6. Proposed BY 2011 Snake River fall Chinook tagging, transfers and releases.

Site	Transfer Goal	Release Goal	Size (fpp)	Age	Mark/CWT/Elastomer	PIT Tags	Transfer/Release Date
Oxbow (IPC)	211,000	200,000	Eyed Eggs	0+	185K AD CWT 15K AD Only	-0- 15,000	Dec 2011 (transfer)
Irrigon (IPC)	842,000	800,000	Eyed Eggs	0+	200K AD CWT 600K AD Only	30,000- 50,000	Dec 2011 (transfer)
Umatilla/DNFH research	345,000	328,000	Eyed Eggs	0+	Unknown	328,000	Dec 2011 (transfer)
Grande Ronde Direct - Irrigon	421,000	400,000	Eyed Eggs	0+	200K ADCWT 200K Unmarked	15,408 15,023	Dec 2011 (transfer)
LFH	N/A	200,000	50	0+	100% AD CWT	20,000	May – Jun 2012
Capt. John	500,000	100,000 100,000 300,000	75 75 75	0+ 0+ 0+	CWT Only AD CWT Unmarked	38,521	May – 2012 (transfer)
Big Canyon	500,000	100,000 100,000 300,000	75 75 75	0+ 0+ 0+	CWT Only AD CWT Unmarked	38,521	May - 2012 (transfer)
Pittsburg Landing	400,000	100,000 100,000 200,000	75 75 75	0+ 0+ 0+	CWT Only AD CWT Unmarked	30,816	May – 2012 (transfer)
Direct near Capt. John	200,000	200,000	50	0+	100% AD CWT	15,408	June 2012
LFH	N/A	450,000	10	1+	225K AD CWT 225K CWT Only	28,000	April 2013
Capt. John	155,000	150,000	12	1+	70K AD CWT 80K CWT Only	19,000	Feb - 2013 (transfer)
Pittsburg Landing	155,000	150,000	12	1+	70K AD CWT 80K CWT Only	19,000	Mar - 2013 (transfer)
Big Canyon	155,000	150,000	12	1+	70K AD CWT 80K CWT Only	19,000	Mar - 2013 (transfer)

F. Research

The ACOE request for up to 345,000 eyed eggs from LFH for use in the in-river/transportation study will conclude with BY2011. The fish will serve as surrogates for natural fish. Eggs for this study will be shipped to the Umatilla Hatchery for incubation and rearing, and then transferred to Dworshak National Hatchery for final rearing and direct stream released into the Clearwater and the Snake Rivers. All of the fish could be PIT tagged prior to release, as funded and contracted by the ACOE. PIT-tags will be divided between all subyearling production releases in the Snake River basin, acting to represent the hatchery component of the in-river/transportation study. The LFH portion of these fish will be PIT tagged at LFH, as contracted and funded by the ACOE, and coordinated with hatchery staff.

The co-managers recognize that acclimation prior to release is expected to provide fish performance advantages, however current facility limitations within the basin preclude acclimation of all subyearling groups. A direct versus acclimated study is being conducted by the USFWS, WDFW and NPT to evaluate the merit of direct stream releases of fall Chinook subyearlings versus acclimated releases. Data collection on adult returns will continue through 2015. This study will provide managers with performance comparisons between CJR acclimated and directly released LFH reared subyearling fall Chinook including: (1) passage date at LGR, (2) travel time to LGR, (3) survival from release to the tailrace of LGR, (4) smolt-to-adult return rates (SAR's) measured from release to LGR, and (5) spawner fidelity to the Snake River. LGR will be the primary evaluation point for accomplishing all of these objectives with the exception of objective 6.

III. TUCANNON SPRING CHINOOK

The Tucannon River Spring Chinook supplementation program is solely comprised of a native broodstock source. Returning adults trapped at the TFH are collected as broodstock and transported to LFH for holding. The release goal is 225,000 yearling smolts.

A. Fish on Hand

Brood Year 2010

In August 2011, LFH had an estimated 203,000 (BY10) juvenile spring Chinook on hand.

B. Tagging, Transfers, and Releases

Brood Year 2010

In September 2011, the BY10 progeny will be 100% CWT/VIE (½ purple and ½ blue non-fluorescent) tagged with no fin clip (**Table 7**). Each size group for the evaluation study will be marked with a separate tag code, along with separate colored elastomer tags. The elastomer tags will be helpful to identify the different fish size groups when sampled, prior to release and during migration. As in the past, the “blue” VIE tag will be implanted in the group targeted for release at 9 fpp. The “purple” VIE tag will be implanted in the group targeted for release at 15 fpp.

Both fish groups will be transferred to TFH in October for final rearing and release. At TFH, both groups are reared in concrete round ponds or raceways on river water, except when well water is added mid-winter to maintain water temperatures near 40⁰F. Checks for elastomer and CWT retention are conducted prior to transferring the fish to Curl Lake AP in February.

Table 7. Proposed BY 2010 Tucannon River spring Chinook tagging, transfers and releases.

Site (Type)	BY10 Goal	Expected at release	Size (fpp)	Age	Mark/CWT/Elastomer	PIT Tags	Release Date
Curl Lake AP	112,500	104,000	15	1+	100% CWT VIE	12,500	Mar – Apr 2012
Curl Lake AP	112,500	98,000	9	1+	100% CWT VIE	12,500	Mar – Apr 2012

C. Spawning

Brood Year 2011

The egg take goal for BY2011 is 260,000 green eggs. It has been established that 85 females and 85 males are needed to meet the egg take goal. Preferably, a 50:50 ratio of natural origin and hatchery origin adults will be utilized in the broodstock. The proportion of jacks utilized for spawning is generally less than 5%. As of August 1, 2011, all female broodstock needed for the BY2011 egg take goal were collected. Spring Chinook adults trapped at TFH will be spawned during September 2011 at LFH. A 2 x 2 spawning matrix protocol is followed as approved by

WDFW Evaluation staff. Fertilized eggs will be water hardened in 100-ppm iodophore for one hour. All spring Chinook carcasses are disposed on site.

D. Rearing

Brood Year 2011

The production estimate for BY2011 is 225,000 smolts. Eggs are treated with formalin daily to reduce fungus and are reared in vertical incubation trays. As a pilot study, eggs from four (4) or (5) females from the first two takes will be placed in a Moist Air Incubator (MAI) utilizing the chiller unit to retard development. The intent is to match later takes in temperature units, and shift timing for ponding. This should improve CV's while supporting a better growth regimen. Fish have routinely been on a maintenance program at LFH, to retard growth. At eye-up, they are shocked, handpicked, and substrate is added to each tray. Upon complete yolk-sac absorption (~1600 fpp), they are transferred to outside raceways for introduction to feed and initial rearing at LFH. .

A prophylactic aquamycin treatment is used to control BKD. This 28-day treatment is typically administered in May and June through feed with 3.0% aquamycin.

Raceways are initially partitioned by screens to allow for individual spawn groups to be grown together in size before mixing, as mentioned above. This not only facilitates early development, it also decreases excess handling and stress. Hatchery staff utilize an in-line site tube in the venturi vacuum hose, to physically observe the hose to make sure no fish are accidentally vacuumed during routine pond cleaning. Hatchery staff are also using one type of screen seal for all stocks, proven to be most effective during rearing.

PIT tagging was increased to 25,000 in BY2009 and the use of VIE tags will be discontinued, beginning with BY2011.

Because 5-year-olds are a high proportion of the broodstock for BY2011, excess fish are anticipated. Beginning at the eyed egg stage, it is proposed that excess fish above the production goal will be reared full term at the Tucannon Hatchery, marked with CWT only, and PIT tagged and released as smolts at Curl Lake. The intent of this action is to determine feasibility while testing the productivity of full term rearing, should the program be modified in the future. All fish (~28,000) will be reared to mimic full production densities and flow indexes in the event the entire program is moved to TFH in the future.

Table 8. Proposed BY 2011 Tucannon River spring Chinook tagging, transfers and releases.

Site (Type)	BY11 Goal	Expected at release	Size (fpp)	Age	Mark/CWT/Elastomer	PIT Tags	Transfer/Release Date
Curl Lake AP	225,000	253,000	12	1+	100% CWT (NO VIE)	25,000	Mar – Apr 2013

E. Trapping

Brood Year 2012

Trapping for the Spring Chinook broodstock program is conducted exclusively at the TFH adult trap, located just upstream of the hatchery and adjacent to the Rainbow Lake intake. Broodstock collection will be up to 170 adults. The proportion of hatchery and natural origin adults will be determined based on the adult management plan and with-in season adjustments to meet the 225,000 smolt production goal (Table 9). One-ocean age (jacks: <61 cm FL) fish will be included in the brood at a rate not to exceed 10% of the adult males during low run years. The priority will be to collect both natural and hatchery origin broodstock to meet program goals. An adult management plan is under discussion between the co-managers for a strategy to outplant adults trapped at LGR or excess of broodstock needs at TFH into Asotin Creek.

WDFW may also retain all of the adult, ESA-listed, Snake River spring/summer Chinook salmon that return to the Tucannon River Fish Hatchery adult trap each year if the total annual adult returns to the trap is less than 105 fish. If the total annual adult returns to the trap are 105 fish or more, WDFW is authorized to retain up to 70 percent of the adult, ESA-listed, Snake River spring/summer Chinook salmon that return to the trap each year and must release at least 30 percent of the adult, ESA-listed, Snake River spring/summer Chinook salmon that return to the trap above the hatchery weir for natural spawning. Adults collected for spawning are transferred by truck to LFH for holding. All adults are injected in the dorsal sinus at transfer with oxytetracycline and erythromycin. Females only are re-injected with erythromycin every 30 days until spawning begins. Adults will receive 167 ppm formalin treatments every-other day to control fungus and decrease pre-spawning mortality.

Table 9. Proposed BY 2012 Tucannon River spring Chinook tagging, transfers and releases.

Site (Type)	BY12 Goal	Size (fpp)	Age	Mark/CWT/ Elastomer	PIT Tags	Transfer/Release Date
Curl Lake AP	225,000	12	1+	100% CWT (NO VIE)	25,000	Mar – Apr 2014

F. Research

The release size study concludes with BY2010. The BY2011 juveniles will be reared to a release goal of 12 fpp (**Table 8**). The need to explore monitoring alternatives on adults bypassing the Tucannon River and ascending above LGR is still being evaluated. The LSRCP and BPA have approved increased PIT tags to study Tucannon River by-pass behavior patterns. It is proposed that 28,000 excess BY2011 fish will be reared full term at the Tucannon Hatchery to determine feasibility of shifting part or all of the Tucannon spring Chinook program to the Tucannon Hatchery. This rearing study will include three brood years for evaluation purposes, unless broodstock collection does not meet a minimum of 210,000 for production. The development of a proposal to identify objectives and costs will be provided to LSRCP prior to implementation.

IV. SUMMER STEELHEAD - GENERAL

The LFC currently uses three stocks of steelhead in the Snake River basin, (LFH, Tucannon, and Wallowa) and two stocks in the Walla-Walla basin (Touchet and LFH). The LFH and Wallowa stocks are both non-endemic stocks that were originally collected from outside their respective release points. The Wallowa stock was originally collected by the Oregon Department of Fish and Wildlife from Lower Snake River dams (likely comprised of both A- and B-run fish from Oregon and Idaho), and then released in the Wallowa River in the Grande Ronde Basin. The LFH stock was derived primarily from a combination of Wells (upper Columbia River) and returning Wallowa stock fish to LFH. The Tucannon and Touchet stocks are both native to their respective streams. However, there is evidence of hatchery introgression in the Tucannon stock from Lyons Ferry releases over the years. All of these stocks are collected from a variety of traps located throughout SE Washington (see description for each stock below for specific trapping locations).

The NMFS 1999 Biological Opinion ruled that continued use of Lyons Ferry and Wallowa stocks were causing jeopardy to listed ESU Steelhead populations. It was recommended by NMFS to convert to endemic stock populations where possible. The Touchet and Tucannon endemic broodstock program began with the 2000 BY, with the original goal of collecting 16 pairs for spawning. Adjustments have been made to the broodstock collections because fecundity and survival values were higher than originally estimated.

The original evaluation plan was to utilize adult traps on the Tucannon and Touchet rivers to evaluate the returns and determine success of each program (smolt-to-adult survival rates of the endemic program compared to Lyons Ferry stock releases). However, adult traps have been only partially successful in trapping fish due to high stream flow events. As such, we are now using PIT tags to evaluate each program (smolt-to-adult returns). PIT tags have been incorporated into each endemic stock group since 2004. Returns to date from PIT tags indicate that smolt-to-adult survivals to Bonneville Dam of the endemic stock groups have increased (Touchet = 0.45%: 2004-2007 release years), Tucannon = 1.0% 2004-2007 release years). The Tucannon endemic program was increased to 75,000 smolts for Brood Year 2010, and we propose to increase the program to 100,000 smolts for BY 2013, with 50% of the production to be directed at harvest mitigation. Concurrently, the Lyons Ferry stock steelhead releases into the Tucannon River were re-located to direct releases into the Snake River at Lyons Ferry. Production adjustments to the on-station release from Lyons Ferry will be re-evaluated in the next two years.

V. LYONS FERRY SUMMER STEELHEAD

The LFH stock program was initiated to provide sport fishery opportunities for summer steelhead in the Snake River, its tributaries, and also includes off-site mitigation in the Walla-Walla Basin. Releases of the LFH stock into the project area have been very successful and adult returns have been reduced in recent years because of ESA concerns. Because of these concerns, it was determined by formal review (e.g. HSRG, HRT) that the releases of the LFH stock into the Tucannon River be discontinued. To sustain the level of production that is necessary to achieve mitigation goals, the on-station releases at LFH were increased by 100,000 for a total of 160,000 in the interim, but will be re-evaluated in the next two years. The egg take goal was previously reduced in 2009 to 460,000 eggs (106 females) from 520,000 (121 females) because of the higher egg and fry survival over the previous three seasons.

A. *Fish On Hand*

Brood Year 2011

In August 2011, LFH had 331,000 (BY11) LFH stock summer steelhead juveniles on hand. These fish were scheduled to be marked in late August into Lake #1 and will be planted as yearlings into the Snake, Touchet, and Walla-Walla Rivers in 2012. Excess Lyons Ferry summer steelhead fry were transferred in April 2011 to WDFW's Ringold Hatchery in the middle Columbia River to provide forage for the tiger musky program. These fish resulted from the electro-anesthesia study to analyze egg and early fry survival.

B. *Tagging, Transfers, and Releases*

Brood Year 2011

In August, all LFH stock summer steelhead were adipose fin clipped, with all but the individual tag groups and the entire Dayton release group, transferred to Lake #1. The three tag groups are retained in separate rearing ponds following the LV+CWT marking in September, and the ad-clipped only group for the Dayton AF (65k) are split into two additional ponds. This marking strategy was initiated by the hatchery staff in 2010 to help reduce fish handling, stress, and minimize Lake drawdown activities for discharge purposes. In mid-winter, the mark groups will receive PIT tags, as determined by WDFW evaluation and Fish Management staff (**Table 10**). In February 2012, about 86,000 fish will be transferred to Dayton AF. They are reared for approximately 2.5 months, with volitional release into the Touchet River completed by the end of April. In mid-April, about 100,000 steelhead are trucked to the Walla Walla River for direct stream release at the McDonald Bridge (RM 32) access site. The final 145,000 LFH steelhead smolts are released directly from LFH into the Snake River in mid-April.

Table 10. Proposed BY 2011 LFH stock summer steelhead tagging, transfers and releases.

Site	BY11 Goal	Expected at release	Size (fpp)	Age	Mark/CWT/ Elastomer	PIT Tags	Transfer/Release Date
LFH on station - Snake River	140,000 20,000	125,000 20,000	4.5	1+	AD Only ADLV CWT	2,000 2,000	April 2012
Dayton AF- Touchet River	65,000 20,000	65,000 20,000	4.5	1+	AD Only ADLV CWT	2,000 2,000	Transfer to Dayton AF in February 2012, release in April 2012
Direct stream release - Walla Walla River	80,000 20,000	80,000 20,000	4.5	1+	AD Only ADLV CWT	-0- 4,000	April 2012

C. Trapping

Brood Year 2012

The LFH stock adults are trapped on-station from volunteers that swim into the fish ladder. The LFH trapping goal is to operate between September 20th and October 15th, which provides adequate adults for the program. In past years, trapping protocols have been set to collect 1,650 fish (~200 fish/week over the time period cited). However, due to multiple recycling activities, the first 1,650 adults trapped will be kept and held. Fish will be held in two large adult holding raceways adjacent to the trap until sorting and spawning. All retained steelhead will be sorted using carbon dioxide (CO²) or electro-anesthesia (EN) in early/mid October. Fish not needed for broodstock or CWT recoveries will be returned to the Snake River for the fishery.

D. Spawning

Spawning will occur in January-February on a weekly basis. Spawning protocol calls for a 1:1 male to female spawner ratio, with each male only being used one time. Due to lower IHN virus detection and improved egg survival over the past few years, an estimated 106 females will be spawned to produce approximately 460,000 green eggs. Eggs or fry excess to projected program needs will be destroyed or planted as fry in area lakes or transferred to other programs as agreed to by co-managers. All carcasses from spawned fish will be buried on site. All unspawned fish that were retained for broodstock are sacrificed to obtain coded-wire tag run information. WDFW used more 2-salt fish (>62 cm) in the Lyons Ferry broodstock in the 2011 brood and will attempt the same strategy for 2012. In 2011, we incorporated 41% 2-salt fish into the broodstock. Without using this strategy, we would have likely used only 13%. There has been a shift over time in the age composition of returning Lyons Ferry stock adults. Utilizing more 2-salt fish in the broodstock may eventually return more older-age fish in the future.

E. Rearing

After spawning, fertilized eggs are water hardened in 100 ppm iodophor. They are incubated in down-welling iso-incubation buckets (one fish per bucket). Once virology sampling has confirmed no viruses are present, the eyed eggs are shocked, handpicked and weighed down in hatching baskets suspended over shallow troughs. After hatch and swim-up the fry are introduced to feed, and transferred to outside raceways at approximately 500 fpp in April. The untagged groups are reared in these raceways until marking and transfer to Lake #1 in late summer.

F. Research

At this time, there is no direct research associated with the LFH stock summer steelhead at the hatchery (i.e. time or size at release studies, growth studies, etc.). All LFH stock release groups have received PIT tags since 2008. Returns from these PIT tags groups will be analyzed separately or as an aggregate to estimate total returns for mitigation accounting purposes. In 2011, RM&E staff conducted a study on the effects of electro-anesthesia (EN) on the summer steelhead broodstock at Lyons Ferry, examining injury rates, egg mortality, and fry mortality. Results showed no difference in internal injuries in adults (MS222 - 6.3%; EN - 5.4%), egg (MS222 - 23.6% ; EN - 21.3%) or fry (MS222 - 2.7%; EN - 3.1%) mortality between MS-222 or EN treated fish during the spawning season. RM&E staff is proposing to conduct another study on the affects of EN in 2011/12 to examine long-term mortality of adults. It is proposed that 500-600 additional adults be trapped and held separately. RM&E staff will then conduct normal adult trap sampling activities (i.e. like at the Touchet River Adult Trap) with use of EN equipment, using no anesthetic, and a control group that is not handled at all. These fish will not be used as LFH broodstock. To utilize this equipment in future years on wild stocks at instream traps in the local area, it is desired to have an analysis to determine if any impacts may occur on released adults.

VI. TOUCHET SUMMER STEELHEAD

The Touchet River summer steelhead is considered an endemic program, meaning all production is derived from natural parentage broodstock. These adults are trapped on the Touchet River at the Dayton AF intake structure and transferred to LFH for holding and spawning. Their progeny have been planted in the North Fork of the Touchet River as yearlings each spring. All adults trapped and handled are anesthetized by EN.

A. Fish on Hand

Brood Year 2011

In August 2011, LFH had approximately 55,500 (BY11) Touchet River summer steelhead juveniles on hand. These fish will ultimately be direct stream released into the Touchet River at Baileysburg Bridge, roughly 1.5 miles upstream from the Dayton AF, in April 2012. However, WDFW is exploring acclimation as a strategy to improve SAR's. The Dayton AF may be an

alternative following the LFH steelhead releases from the site, provided sufficient water flows and temperatures are adequate. Further co-manager discussions will occur to formalize a study plan.

Two-Year Smolt Program

The Touchet River summer steelhead 2-year smolt study concluded with BY2009 releases in Spring 2011 at the Baileysburg Bridge. These fish were retained for a study on survival of 2-year smolts. It was determined that there were no overall significant increases in downriver survival to McNary Dam, though two-year smolts did survive at a higher rate compared to the “Touchet Small” groups. The 2-year smolts reared at LFH had increased precocity, compared to the yearlings. The first returns of 1-salt fish from the 2-year program are coming back this year. RM&E staff will obtain PIT tag returns over the next three years to compare SAR’s with the yearling program releases as planned in the study.

B. Tagging, Transfers, and Releases

Brood Year 2011

In September, all Touchet River endemic stock steelhead are CWT tagged, with no external fin clips. They will be reared in the raceways in two even groups of about 25,000. It is proposed that in March, one raceway of 25,000 will be transferred to the Dayton AF for a three to four week acclimation period. This group will be volitionally released from Dayton AF in mid to late April. During this same time period, a direct stream release group of 25,000 at Baileysburg Bridge (Touchet RM 32) on the North Fork of the Touchet River will also occur. Prior to the releases, evaluation staff will PIT tag 10,000 fish, 5,000 for each release group (**Table 11**). This will allow for data gathering on smolt-to-adult survival and migration comparisons for each release group. These fish are currently not marked for harvest in the sport fishery.

Table 11. Proposed BY 2011 Touchet summer steelhead smolts tagging, transfers and releases.

Site	BY11 Goal	Expected at release	Size (fpp)	Age	Mark/CWT/Elastomer	PIT Tags	Transfer/Release Date
Touchet River (direct)	25,000	30,000	4.5	1+	100% CWT	5,000	April 2012
Touchet River (Dayton AF)	25,000	25,000	4.5	1+	100% CWT	5,000	April 2012

C. Trapping

Brood Year 2012

Trapping of BY12 Touchet River endemic stock begins in January or February (depending on seasonal weather) at the Dayton AF adult trap (located adjacent to the pond intake) and is generally completed by mid-April. As in 2011, broodstock for BY2012 will be collected from the middle portion of the run. WDFW evaluation staff checks the trap daily, using EN to calm the fish for handling, transferring only a portion of unmarked adults to LFH based on broodstock needs. All trapped LFH stock fish are transferred to the Dayton Juvenile Pond to remove them

from the river and provide additional fishing opportunities, sacrificed for CWT retrieval, or donated or contributed to a Food Bank.

Current survival estimates indicate that 15 spawned females should provide enough eggs to meet the smolt production goal. Therefore, WDFW evaluation staff target collecting 16 females and 20 males for the broodstock (natural origin), with all other wild fish passed upstream for natural spawning. Hatchery fish (Touchet endemic origin) are passed above the trap to spawn naturally in the Touchet River. We will spawn a minimum of three (3) females, or the progeny will be released as unmarked/untagged fry.

D. Spawning

Based on fecundity and survival estimates, LFH typically spawns 15 females to provide 65,000 green eggs for the program. Up to 65,000 smolts may be reared full cycle and planted as yearlings in the spring. Fish in excess of 65,000, will be planted into the Touchet River as fingerlings in the fall. Spawning usually occurs in March and April. A Matrix type spawning protocol is employed to increase the effective breeder population (N_b), due to the relatively small founding population for this program. The intent of this protocol is to spawn two males with each female, increasing genetic diversity and successful fertilization of eggs. If not enough males are ripe to achieve this goal; 1:1 spawning is employed. A minimum of three spawned females are needed for each production cycle to occur.

E. Rearing

After spawning, fertilized eggs are water hardened in 100 ppm iodophor. They are incubated in down-welling iso-incubation buckets (one fish per bucket). Once virology sampling has confirmed no viruses are present, the eyed eggs are shocked, handpicked and weighed down in hatching baskets suspended over shallow troughs. After hatch and swim-up, they are introduced to feed, and transferred to the indoor intermediate raceways at around 500 fpp in June. They are transferred again to outside raceways at roughly 200 fpp in July. In January, these fish will be size selected into two rearing groups (larges and smalls). By sorting into different size groups, culturists can adjust growth rates to minimize size variance at release. Additionally, a number of non-traditional fish culture techniques have been employed on this stock to ensure release size goals are met.

Table 12. Proposed BY 2012 Touchet summer steelhead smolts tagging, transfers and releases.

Site	BY12 Goal	Size (fpp)	Age	Mark/CWT/Elastomer	PIT Tags	Transfer/Release Date
Touchet River	50,000	4.5	1+	100% CWT	7,500	April 2013

F. Research

Over the last few years, evaluation staff have annually PIT tagged portions of the Touchet River endemic stock group (by size) prior to release. PIT tags are being used to document smolt-to-adult survival rates. Results to date show that the group that is released per program goals and release time have survived at nearly twice the rate as those released later and sometimes at a smaller size. These results, and trapping data, suggests this could be a continual problem in the Touchet River stock. A two-year study on a two-year smolt program to determine if these fish would have improved survival based on an additional rearing year, concluded with BY2009.

A direct stream group in the standard release area, will occur concurrently with the volitional release at Dayton AF as a comparison. PIT tags will be used for the evaluation of the two release types and locations. Total release sizes for each of these groups will be determined at a later date, and agreed to by all parties. It is proposed that this release study include Brood Years 2011 and 2012 for evaluation purposes.

VII. TUCANNON SUMMER STEELHEAD

The Tucannon River summer steelhead is considered an endemic program, meaning all production is derived from natural parentage, or from 1st generation hatchery reared endemic stock fish. The adults for this program are collected at Tucannon FH, and their progeny planted in the upper Tucannon River as yearlings. Current release goals are 75,000 smolts at 4.5 fpp. The co-managers are exploring an increase in production to 100,000, with strategies for implementation of the long term goals for harvest.

A. Fish on Hand

Brood Year 2011

In August 2011, approximately 51,700 (BY11) Tucannon River summer steelhead juveniles were on hand at LFH. The program goal of 75,000 smolts was increased in March 2010 per co-manager agreement. The 75,000 smolt goal for BY11 will not be met due to high levels of IHNV detection in the broodstock. As such, much of the production from high-titer females was released as un-fed fry in 2011.

Following the low return of Brood Year 2008, managers agreed that should low production numbers (i.e. less than 20,000 fish at smolt release, ~5 females at trapping) occur in the future, the fish will not be reared full term, but released as parr/fingerlings in the upper Tucannon River. Less than 8,000 fish production would not allow enough fish for evaluations to occur. Also, in the event of IHNV detection, un-fed fry from IHN positive females will be released into the Tucannon River (see Fish Health [Section X](#)).

B. Tagging, Transfers, and Releases

In September, all Tucannon River endemic steelhead are CWT tagged, with no external fin clips at LFH (**Table 13**). In February 2012, these fish will be moved to the TFH where they are reared until release as yearlings in April or early May. Releases have been roughly five miles upstream of the TFH, just below the Curl Lake intake structure. Prior to release, evaluation staff will PIT tag 10,000-15,000 fish in this group. This will allow for improved data gathering because these fish are currently not marked for harvest in the sport fishery. The use of PIT tags is an alternative means to calculate smolt-to-adult survivals for program evaluation.

Table 13. Proposed BY 2011 Tucannon River summer steelhead tagging, transfers and releases.

Site	BY11 Goal	Expected at release	Size (fpp)	Age	Mark/CWT/Elastomer	*PIT Tags	Transfer/Release Date
Tucannon River	75,000	51,500	4.5	1+	100% CWT	10,000-15,000	April 2012

*Note: 15,000 fish will be PIT tagged if BPA funds can be obtained prior to tagging.

C. Trapping

Brood Year 2012

Current survival estimates indicate that 18 spawned females should provide enough eggs to meet the smolt production goal. Therefore, we will collect 20 females and 20 males (natural and hatchery endemic origin) for the broodstock. Managers have agreed that no more than 10% of the broodstock would be hatchery endemic origin. WDFW is intending to increase production to 100,000 in the near future, with strategies for implementation of the long term goals for harvest. Approximately 50 adults, with up to 15% endemic hatchery fish included in the broodstock, may be trapped beginning in BY2013 to meet the established increases. As in the past, all hatchery origin fish (LFH stock) collected at the TFH adult trap will not be passed upstream. Instead they will be marked and released downstream or taken back downriver below Marengo or removed and put into the lakes. All endemic and wild fish captured at the TFH will be passed upstream for natural spawning. A structure was built by hatchery staff in 2009 for deterring adults from jumping the sheet pile adjacent to the fish ladder. Clear vinyl panels were hung on a moveable aluminum cross beam four feet above the sheet pile cap. This diversion structure contributed to the increased success of adult steelhead trapping.

D. Spawning

Based on fecundity, survival estimates, and potential IHN positive females, LFH typically spawns 18 females to provide 90,000 green eggs for the conservation program. Spawning has occurred from February to early April. Matrix spawning is employed due to the relatively small founding population for this program. The intent of this protocol is to spawn two males with each female, increasing genetic diversity and helping ensure successful fertilization of eggs. If not enough males are ripe to achieve this goal; a 1:1 spawning matrix is employed. As stated above, a minimum of 3 females spawned is needed to continue with production for that year.

E. Rearing

After spawning, fertilized eggs are water hardened in 100 ppm iodophor. They are incubated in down-welling iso-incubation buckets (one fish per bucket). Once virology sampling has confirmed no viruses are present, the eyed eggs are shocked, handpicked and weighed down in hatching baskets suspended over shallow troughs. After hatch and swim-up, they are introduced to feed, and transferred to intermediate raceways at around 500 fpp in June. They are transferred again to outside raceways at roughly 200 fpp in July. In September, they are size-selected during marking and split into two raceways. By sorting into two size groups, culturists can adjust growth rates to minimize size variance at release. Additionally, a number of non-traditional fish culture techniques are being employed on this stock to ensure release size goals are met.

Table 14. Proposed BY 2012 Tucannon River summer steelhead production.

Site	BY12 Goal	Size (fpp)	Age	Mark/CWT/Elastomer	PIT Tags	Transfer/Release Date
Tucannon River (above Curl Lk.)	75,000	4.5	1+	100% CWT	7,500	April 2013

F. Research

At this time, there is no direct research associated with the Tucannon River endemic stock summer steelhead at the hatchery (i.e. time or size at release studies, growth studies, etc.). As indicated above, PIT tags along with CWTs will give us juvenile migration and SAR data. Further, PIT tags will allow for the continued monitoring of Tucannon River steelhead that migrate and remain above Lower Granite Dam. We have evidence that Tucannon River steelhead spawn in Asotin Creek and Alpowa Creek, but may be detected in other locations with increased monitoring efforts from other Agencies.

VIII. WALLOWA SUMMER STEELHEAD

The Wallowa stock program was initiated to provide a fishery for summer steelhead in the Grande Ronde River (for both Oregon and Washington anglers). The program was increased from 160,000 to 200,000 smolts per co-manager agreement in March 2010. Even though it is meeting return goals to the project area, it was determined that the adult return goals to the Snake River basin were not fulfilling the mitigation goals for the Columbia River Basin.

A. Fish on Hand

Brood Year 2011

In August 2011, LFH had approximately 180,000 (BY11) Wallowa stock summer steelhead juveniles on hand. Adults were trapped and hauled to LFH in March 2011 for holding before

spawning as a strategy to reduce the prevalence of IHNV. However, adult mortality was high, and IHNV was detected in 55% of the females. To supplement the egg take, eggs from 10 females were collected from Wallowa summer steelhead adults returning to the Wallowa Hatchery facility in Oregon. Virology sampling was performed and no detection of IHN was present in the Wallowa Hatchery females. All of these fish will be marked, tagged, and moved to Lake #3 in early September. In early February 2012, these fish will be transferred to the Cottonwood AF. After acclimation at the Cottonwood AF, they are released as yearlings at 4.5 fpp into the Grande Ronde River in April.

B. Tagging, Transfers, and Releases

Brood Year 2011

In September 2011, these fish were all adipose fin clipped, with 20,000 receiving left ventral clips and a coded wire tag (Table 15). In February 2012, they are transferred to the Cottonwood AF for final rearing and released into the Grande Ronde River. A total of 6,000 juveniles will be PIT tagged prior to release in April; 2,000 of those PIT tags will be used as part of the Comparative Survival Study (CSS) for steelhead production above Lower Granite Dam (Fish Passage Center).

Table 15. Proposed BY 2011 Wallowa stock summer steelhead tagging, transfers and releases.

Site	BY11 Goal	Expected at release	Size (fpp)	Age	Mark/CWT/Elastomer	PIT Tags	Transfer/Release Date
Cottonwood AF on the Grande Ronde River	180,000 20,000	160,000 20,000	4.5	1+	AD Only AD/LV/CWT	-0- 4,000 + 2,000	Transfer to Cottonwood AF in Feb, release in April 2012 2,000 PIT tags are part of the CSS study from the Fish Passage Center

C. Trapping

Brood Year 2012

Trapping of returning Wallowa stock adults occurs on Cottonwood Creek (a small tributary to the Grande Ronde River) March through April each year. This creek also supplies water to the Cottonwood AF. Because of potential low egg survival and/or IHN virus (both of which have been experienced in recent years), about 55 complete spawned females are needed to provide 240,000 green eggs for the program of 200,000 smolts. The preference is to half-spawn the first 110 returning females if adult returns are available. This will provide for better genetic variability. Unmarked steelhead are not retained for spawning, but passed upstream to spawn naturally. All spawned carcasses will be returned to LFH for burial, if spawned at Cottonwood Creek. The strategy to haul live adult broodstock to LFH for holding in 2011 to address the IHN concerns in Cottonwood Creek was not successful and therefore will not be repeated in 2012. If low water flow in the creek does not allow returning adults access to the trap, two alternate strategies may be employed. First, the acclimation pond outlet creek can be modified to allow adult capture there. Second, collection of broodstock at Big Canyon or the Wallowa Hatchery may occur. Surplus hatchery origin adults are removed from the creek at the trap to reduce the potential impacts of IHN to the spawning population and to juvenile hatchery fish being held in

the AF. Options for disposition of excess fish (Wallowa Stock HGMP) include 1) killed to collect Coded-Wire tags, 2) offered to local food banks, or 3) killed outright to prevent hatchery swamping of natural origin spawners. Each of these will be explored annually for best use of the excess fish. A discussion among the co-managers to shift the program to another early rearing location is ongoing.

D. Spawning

Spawning generally occurs in late March and early April on a weekly basis. All fish are spawned at the Cottonwood Creek trap site, or, at LFH, with the gametes transported to LFH for fertilization, incubation, and rearing. A 1:1 male to female mating ratio will continue to be employed whenever possible (see research section below). Excess adults from ODFW’s Wallowa Hatchery may be used to provide eggs for this program, as occurred in 2005, 2009, 2010, and 2011. Eggs/fry excess to projected program needs will be destroyed or planted in area lakes.

E. Rearing

After spawning, fertilized eggs are water hardened in 100 ppm iodophor. They are incubated in down-welling iso-incubation buckets (one fish per bucket). Once virology sampling has confirmed no viruses are present, the eyed eggs are shocked, handpicked and weighed down in hatching baskets suspended over shallow troughs. After hatch and swim-up, they are introduced to feed, and transferred to outside raceways at roughly 500 fpp in June. A discussion among the co-managers to shift the program to another early rearing location is ongoing.

Table 16. Proposed BY 2012 Wallowa stock summer steelhead tagging, transfers and releases.

Site	BY12 Goal	Size (fpp)	Age	Mark/CWT/Elastomer	PIT Tags	Transfer/Release Date
Cottonwood AF on the Grande Ronde River	180,000 20,000	4.5 4.5	1+ 1+	AD-Only AD/LV/CWT	-0- 4,000 + 2,000	April 2013 April 2013 2,000 PIT tags are part of the CSS study from the Fish Passage Center

F. Research

At this time, there is no direct research associated with the Wallowa stock summer steelhead at the hatchery (i.e. time or size at release studies, growth studies, etc.).

IX. SPOKANE RAINBOW TROUT

Rainbow trout are reared and planted in both southeast Washington and northwest Idaho, to meet LSRCP mitigation goals in both states for lost fishing opportunity as a result of construction and operation of the lower Snake River dams. A small, privately funded program (TSS) at the TFH rears rainbow to 1½ pounds each, providing a unique fishing opportunity in local lakes.

A. Fish on Hand

Brood Year 2010

In September 2011, LFH and TFH had a combined total of approximately 232,000 Spokane stock rainbow trout on hand. LFH also had 4,500 *triploid* Spokane stock rainbow trout on hand, which are shipped to IDFG in late September 2011. This new program was implemented in early 2010, along with 1,650 diploid spring jumbo trout for the Nez Perce Tribe. It replaced the Kamloops stock rainbow trout that was previously reared at LFH. The Kamloops stock program was discontinued in 2009.

B. *Tagging, Transfers, and Releases*

For 2010-2011, a modification in the program eliminating 50,000 fall fingerlings in exchange for 4,950 fall catchables and 1,650 spring jumbos was implemented by the co-managers. There were no changes in total bio mass relative to production levels. The fingerling outplants into the Clearwater Basin were discontinued by Idaho due to a lack of creel data supporting the program. The fall catchables will be planted in the Moose Creek Reservoir by IDFG in late September.

IDFG has also requested to discontinue its 160,000 spring fry (60 fpp) program designated for Idaho waters (August 2011). It was determined by IDFG Fish Management that these fry were not recruiting to the fishery. In exchange for the spring fry mitigation, an increased fall catchable program has been proposed. This change will include 8,000 additional fall catchables at 3.0 fpp, or the same biomass as the spring fry program. It is expected that this program modification will be more effective. All fish for IDFG will be triploids from the Spokane Trout Hatchery. Refer to **Table 17** for the 2012 planting allotment.

About 97,000 Spokane stock rainbow trout catchables (2.5 fpp) and 1,500 jumbos (1.5 lbs each) will be planted by LFH drivers into various lakes in southeast Washington in spring 2012. Planting begins in February and is completed in March.

At the TFH, approximately 125,000 Spokane stock rainbow trout will be planted into various lakes in southeast Washington as catchables (3.5 fpp, avg.). Due to IHN, all rainbow fry were lost or destroyed in April. Replacement fry received from the Wells and Spokane Hatcheries in May encountered multiple outbreaks of cold water disease, resulting in a shortage in the planting goals for TFH in 2012. Planting typically begins in April, and is completed sometime in July. The jumbo trout (usually around 4,000) are planted February through May each year, supplementing catchable plants.

The WDFW Inland Trout Stocking Plan will be implemented in 2012. This may affect the numbers of catchables planted as fish sizes are increased along with location. No Spokane stock rainbow trout are tagged or fin clipped at LFH or TFH.

Table 17. Proposed BY 2010 Spokane rainbow trout tagging, transfers and plants.

Facility	BY10 Goal	Expected at release	Size (fpp)	Lbs.	Age	Mark/CWT/Elastomer	PIT Tags	Transfer/Release Date
Lyons Ferry	4,950	4,500	3.0	1,500	1	None	None	Transfer to and planted by IDFG in Sept/Oct 2011
	96,935	100,000	2.5	40,000	1+	None	None	Planted in Feb-Apr 2012
	1,500	1,500	0.67	2,239	1+	None	None	Planted in Feb-Apr 2012
	1,650	1,650	1.0	1,650	1+	None	None	Transfer to and planted by NPT in Mar-May 2012
Tucannon	137,500	125,000	3.1	40,323	1+	None	None	Planted in Mar-June 2012
	4,000	4,100	0.67	6,119	1+	None	None	Planted in Feb-May 2012

C. Rearing

Eggs for Washington’s legal and jumbo programs, along with Idaho’s fry plants come from WDFW’s Spokane Hatchery (Spokane stock). WDFW managers are completing an Inland Trout Stocking Plan for all hatcheries and water bodies in Washington. The management strategy will be to plant larger catchables (2.5 fpp) at reduced numbers. Total pounds reared will not change. These anticipated changes will be implemented in the 2011 brood year. Refer to the current and proposed trout production changes for comparing the differences in overall numbers in Table 18

About 65,000 BY 2011 eyed triploid rainbow eggs for IDFG, NPT and the WDFW Rock Lake fall plant will be transferred from the Spokane Trout Hatchery to LFH in December. After trough rearing, they are transferred to outside standard raceways in March. In January, LFH will receive about 91,500 eyed Spokane diploid rainbow eggs for the balance of its catchable and jumbo program. Early rearing is conducted in either shallow troughs or intermediate raceways before transfer to outside standard raceways in April.

The Tucannon Hatchery will receive about 125,000 BY 2011 eyed rainbow eggs (Spokane stock) in January. Of these, 93,358 will be destined for planting as catchables (2.6 fpp) and 4,000 are destined for planting as jumbos (1.5 pounds each). After receiving these eggs in January, a small portion (1,750) is transferred from TFH to regional education programs, now privately funded by the Tri-State Steelheaders club. The current BY2010 catchable goal is 137,500 at 3.5 fpp. The catchable program group is started in shallow troughs, intermediate reared in outside round tanks, and final reared in the earthen rearing pond. The jumbos start in shallow troughs as well, and finish in the round tanks. The entire jumbo program at TFH is privately funded by the Tri-State Steelheaders organization..

Table 18. Current and Proposed Mitigation rainbow trout production comparison.

Current Program	Facility	Number	Size	Lbs.	Proposed			Differences	
					Number	Size	Lbs	Number	Lbs.
SE Washington Lakes	LFH	97,000 1,500	2.5 0.67	38,800 2,239	104,000 1,000	2.5 0.67	41,600 1,493	7,000 -500	2,800 -746
	TFH	137,500 4,000 ^a	3.5 0.67	39,286 5,970	93,358 4,000 ^a	2.6 0.67	35,907 5,970	-42,116 0	-2,800 0
IDFG	LFH	160,000	60	2,667	0	n/a	0	-160,000	-2,667
	LFH	4,950	3.0	1,650 ^b	12,950	3.0	4,317	8,000	2,667
NPT	LFH	1,650	1.0	1,650 ^b	1,650	1.0	1,650	0	0

^aJumbo trout from TSS funding; ^bLbs for program was a component of the discontinued Kamloops fall fingerling releases in 2009 (3,300 lbs-total). This total was split between IDFG and NPT.

The Inland Trout Stocking Plan will impact the numbers of catchable trout planted by LFH and TFH. A reduction of 35,116 catchables will occur based on the new recruitment-to-fishery size criteria of 2.5 fpp. However, the total pounds-of-production is minimally adjusted (-1,325 lbs) for SE Washington releases to better reflect the current mitigation goals for the LSRCP. Refer to Table 19 for the proposed BY 2011 Spokane rainbow trout program.

Table 19. Proposed BY 2011 Spokane rainbow trout releases.

Site	Number	Size (fpp)	Lbs.	Age	Mark/CWT/ Elastomer	Pit Tags	Transfer/release Date
SE Washington Lakes	197,358	2.55	77,507	1+	None	None	Planted in February through June 2013
	1,000	1.5 lbs ea	1,493	1+	None	None	
	4,000*	1.5 lbs ea	5,970*	1+	None	None	
IDFG	12,950	3.0	4,317	1+	None	None	Transfer to and planted by IDFG in Sept/Oct 2012
NPT	1,650	1.0	1,650	1+	None	None	Transfer to and planted by NPT in Mar-May 2013

*NOTE; Jumbo trout from TSS funding. Total numbers and/or pounds not included in mitigation.

X. FISH HEALTH

A. Guiding Policies

All fish production at LFH is conducted according to the co-managers Salmonid Disease Control Policy and Integrated Hatchery Operations Team (IHOT) fish health policy. Specifically, all lots of fish are monitored for fish health, all broodstock are inspected annually, strict hatchery sanitation procedures and fish culture practices (rearing criteria) are followed, and egg and fish transfer and release requirements are met. Bacterial kidney disease (BKD) management for chinook stocks and Infectious Hematopoietic Necrosis (IHN) management for steelhead stocks are outlined in [Section C](#)

Currently, IHN in Chinook salmon is not a concern at LFH. The strains of IHN found in the Columbia River Basin have been problematic for sockeye, steelhead and rainbow trout, but not for Chinook salmon. Therefore, standard hatchery practices of egg disinfection and use of pathogen-free rearing water during early rearing have been sufficient fish health measures.

The fish health specialist will respond to all fish disease outbreaks at the request of the hatchery staff.

B. Monitoring

The fish health specialist will visit LFH and TFH at least once a month. Mortality records and fish in all rearing containers will be inspected. Approximately 5 - 10 fish of each species may be killed and examined at the discretion of the fish health specialist.

At spawning, all broodstock will be tested for viral pathogens. Ovarian fluid and kidney/spleen samples from at least 60 females will be tested.

To comply with Idaho's fish import regulation, a 60 fish sample of kidney/spleen from rainbow trout will be tested for viral pathogens 4 to 6 weeks before transfer. Upon completion, results will be communicated to IDFG.

C. Specific Fish Health Management

1. BKD Management – Fall Chinook

All female fall Chinook broodstock will receive a pre-spawning injection with erythromycin. All females for use in the yearling production and eggs shipped to Oregon and Idaho will be tested for BKD via ELISA. WDFW categorizes BKD-ELISA optical densities as follows:

- Below-low = < 0.11,
- Low = 0.11 to 0.199,
- Moderate = 0.20 to 0.44,
- High = 0.45 or greater.

Progeny of negative (below low) females will be selected for the yearling fall Chinook program. Eggs from below low and low females will be selected for shipment to Oregon and Idaho. ODFW has agreed to perform the sampling and testing on 250 adults at LFH for the Grande Ronde releases and the ACOE Transportation study fish. Progeny of all low, moderate and high BKD-ELISA females and untested females may be utilized in the sub-yearling fall Chinook program for NPT and WDFW.

As in 2011, only the yearling fall Chinook fry for the NPT acclimation facilities (FCAP) will receive a 28 day Aquamycin feeding. However, the NPT is considering discontinuing the feed treatment on one of its FCAP facilities. This will be determined in spring 2012. The yearling fall Chinook treatment for the on-station release at LFH will be discontinued. It has been determined that the adult sampling protocols are controlling the risk of an outbreak of BKD, along with the concerns of post treatment stress, and an increase in the number of drop-outs occurring in the fry. If BKD prevalence increases to 2% or above, then more extensive sampling requirements will be implemented.

2. BKD Management – Spring Chinook

All female fall Chinook broodstock will receive a pre-spawning injection with erythromycin. All female spring Chinook will be tested for BKD using ELISA assay. No segregation or culling will occur. Spring Chinook fry will receive one 28 day Aquamycin feeding in late spring.

3. IHN Management – Summer Steelhead

All female steelhead broodstock will be tested for IHN virus via cell culture, and the IHN virus levels in the ovarian fluid will be determined. Eggs from LFH and Wallowa stock females with high levels of IHN virus ($>10^3$) will be destroyed. Eggs from negative and low IHN virus (10^1 to 10^3) females will be reared separately.

Eggs from the Tucannon and Touchet endemic programs with high levels of IHN virus ($>10^3$) may be destroyed, reared separately, or planted into their respective streams as fry, pending agreement among the co-managers. Eggs from negative and low IHN virus (10^1 to 10^3) females will be reared separately.

If IHN outbreaks occur in any fish-rearing vessel, fish from the affected rearing container will be promptly isolated and may be destroyed.

4. Broodstock and Egg Fungus Management

All Chinook and steelhead broodstocks will be treated with formalin every other day to control external fungus. All eggs will be treated with formalin daily to control fungus. Treatments will be started 24 hours after fertilization. Treatment of chinook eggs will halt at 7 days before hatch. Steelhead egg treatments will stop when the eggs are transferred to baskets for hatching. Rainbow trout eggs are received at the eyed stage and are not treated with formalin.

XI. COMMUNICATION

The list of people on the following table (**Table 19**) are either directly involved in the operation of the LFC, or in related programs and facilities.

Table 20. Contact List.

Name	Agency	Position	Phone	E-mail
Policy				
Pete Hassemer	IDFG	Anadromous Manager	208-334-3791	phassemer@idfg.idaho.gov
Heather Bartlett	WDFW	.Hatchery Division Mgr.	360-902-2662	Heather.Bartlett@dfw.wa.gov
Dave Johnson	NPT	Fisheries Dept. Manager	208-621-3736	davej@nezperce.org
Gary James	CTUIR	Fisheries Program Mgr.	541-276-4109	garyjmes@ctuir.com
Production				
Becky Johnson	NPT	Production Coordinator	208-621-4629	beckyj@nezperce.org
Brian Zimmerman	CTUIR	Production Supervisor	541-429-7286	BrianZimmerman@ctuir.com
Bruce McLeod	NPT	Acclimation Facilities	208-621- 2403	brucem@nezperce.org
Chris Starr	LSRCP	Hatchery Coordination	208-378-5329	chris_starr@fws.gov
Dick Rogers	WDFW	LFHC Supervisor	509-646-3454	Dick.Rogers@dfw.wa.gov
Doug Maxey	WDFW	TFHC Supervisor	208-621-3502	Douglas.Maxey@dfw.wa.gov
Steve Rodgers	NPT	NPTH Hatchery Manager	208-843-7384 Ext 3502	stever@nezperce.org
Mike Key	NPT	FCAP	208-388-2353	mikek@nezperce.org
Paul Abbott	IPC	Hatchery Biologist	208-388-2353	pabbott@idahopower.com
Jon Lovrak	WDFW	LFC Manager	509-646-9201	Jon.Lovrak@dfw.wa.gov
Aaron Penny	NPT	NPTH Supervisor	208-621-3504	aaronp@nezperce.org
Curtis Chan	ODFW	Umatilla Hatchery Manager	541-922-5659	curtis.chan@state.or.us
Diane Deal	ODFW	Irrigon Hatchery Manager	541-922-5732	Diane.E.Deal@state.or.us
Jeff Seggerman	IDFG	Oxbow Hatchery Manager	541-785-3459	jeffrey.seggerman@idfg.idaho.gov
Evaluation				
Bill Arnsberg	NPT	Fall Chinook M & E	208-621-3758	billa@nezperce.org
Debbie Milks	WDFW	Fall Chinook Biologist	509-382-1710	Deborah.Milks@dfw.wa.gov
Jay Hesse	NPT	Research Coordinator	208-621-3552	jayh@nezperce.org
Joe Bumgarner	WDFW	Steelhead Biologist	509-382-1710	Joseph.Bumgarner@dfw.wa.gov
Joseph Krakker	LSRCP	Fishery Biologist	208-378-5323	joe.krakker@fws.gov
Mark Schuck	WDFW	Evaluations	509-382-1004	Mark.Schuck@dfw.wa.gov
Michael Gallinat	WDFW	Spring Chinook Biologist	509-382-4755	Michael.Gallinat@dfw.wa.gov
Steve Yundt	LSRCP	Research Program Mgr.	208-378-5227	steve_yundt@fws.gov
Jason Vogel	NPT	Research Division	208-621-3602	jasonv@nezperce.org
Stuart Rosenberger	IPC	Hatchery M&E Biologist	208-388-6121	srosenberger@idahopower.com
Management				
Glen Mendel	WDFW	Fish Management	509-382-1005	Glen.Mendel@dfw.wa.gov
John Whalen	WDFW	Region 1 Fish Mgmt.	509-892-7861 Ext 304	John.Whalen@dfw.wa.gov
Scott Marshall	LSRCP	LSRCP Coordinator	208-378-5298	scott_marshall@fws.gov
Sam Sharr	IDFG	Anadromous Coordinator	208-334-3791	Sam.Sharr@idfg.idaho.gov
Joe Dupont	IDFG	Regional Fisheries Manager	208-799-5010	Joe.DuPont@idfg.idaho.gov
Coleen Fagan	ODFW	Fish Program Manager	541-962-1835	Colleen.E.Fagan@state.or.us
Fish Health				
Sam Onjuka	ODFW	Fish Pathologist	541-962-3823	sam.t.onjuka@state.or.us
Steve Roberts	WDFW	Fish Health Specialist	509-892-1001 Ext 300	steven.roberts@dfw.wa.gov

Appendix A: 2011 Requests for Fall Chinook Production Fish/Eggs (2011 Broodyear)

2008-2017 US v Oregon	Priority under USvOR (SRFMP)	Who	Release site	Age	# for release	Survival to release or transfer (revised 9/2009)	Expanded for loss prior release (1/F)	Estim # green eggs to meet priority	SRL Calcs	Total estim eggtake which will cover needs through this priority	
	1	1WDFW	onstation	yearlings	450,000	91.4%	1.09406	492,325	91.4% mean survival, 2005-2007BY	492,325	
	4	4NPT	CJ	yearlings	150,000	155,000	91.4%	1.09406	164,108	80.9% mean survival, 2004-2000BY	984,650
	3	3NPT	BC	yearlings	150,000	155,000	91.4%	1.09406	164,108		820,542
	2	2NPT	PIT	yearlings	150,000	155,000	91.4%	1.09406	164,108		656,434
					900,000					984,650	
	5	5WDFW	onstation	subs	200,000		1.04267	208,533	95.9% mean survival, 2005-2007BY	1,193,184	
	6	6NPT	CJ	subs	500,000	507,143	95.9%	1.04267	521,333	91.2% mean survival, 2004-2000BY	1,714,517
	7	7NPT	BC	subs	500,000	507,143	95.9%	1.04267	521,333	divided 20K b/t FCAP to acct	2,235,849
	11	11WDFW	direct-Snake R. (CCD)	subs	200,000		1.04267	208,533	for loss from transfer to rel		3,080,932
	8	8NPT	PIT	subs	200,000	202,857	95.9%	1.04267	208,533		2,444,383
	10	10NPT	PIT	subs	200,000	202,857	95.9%	1.04267	208,533		2,872,399
					1,800,000					1,876,799	
	12	12DNFH/Irrigon	Transportation	eyed eggs	250,000	263,125	96.1%	1.04020	273,704	96.1% mean survival, 2005-2007BY	3,354,636
	13	13WDFW/Irrigon	GRR-direct rel	eyed eggs	200,000	210,500	96.1%	1.04020	218,963	4.99% eye-rel loss	3,573,599
	16	16WDFW/Irrigon	GRR-direct rel	eyed eggs	200,000	210,500	96.1%	1.04020	218,963	4.99% eye-rel loss	4,096,920
	14	14DNFH/Irrigon	Transportation	eyed eggs	78,000	82,095	96.1%	1.04020	85,396	4.99% eye-rel loss	3,658,994
	9	9IPC-Oxbow	HC Dam	eyed eggs	200,000	211,000	96.1%	1.04020	219,483	5.2% eye-rel loss	2,663,866
	15	15IPC-Umatilla	HC Dam	eyed eggs	200,000	210,500	96.1%	1.04020	218,963	4.99% eye-rel loss	3,877,957
	17	17IPC-Umatilla	HC Dam	eyed eggs	600,000	631,500	96.1%	1.04020	656,889	4.99% eye-rel loss	4,753,809
					1,728,000					1,892,360	

4,428,000	released	4,753,809 (4.8 million)	green eggs to meet needs through priority 17
number of Snake River /LGR origin females needed to spawn		1,280	(Estimated using 3,750 eggs/F)
For 2011..... Scenario #1 - presumes the majority of females for broodstock will be trapped at LGR			
1. LGR trapping		1,200 females	
		1,000 males	
2. LFH trapping		200 females	
		400 males	

Appendix B: 2011 Trapping/Sorting Protocol at LFH

Begin trapping 9/20/2011. Tally fish diverted into the hatchery. A pittag array will be in place to estimate numbers trapped and recapture events based on PIT tag detections.

FCH

Attempt to collect larger adults ~90 cm FL or greater.

-goal is 600 fish (200 females)

-should have 25% of females by October 6 at sorting

REVISED September 27, 2011

Fish approximately **80 cm or greater** will be diverted into the hatchery.

2011 Sorting Plan

LGR ponds:

Work the LGR Pond containing fish <65cm FL “smalls”

Kill males and move females to the “Bigs” pond

Double check number and side of operculum punches on females

For females that do not have 1-ROP:

Give 1-ROP punch and make note of presence/absence of adipose clip and wire

Work the LGR Pond containing fish \geq 65 cm FL “bigs”

Count females, males \geq 75 FL, and males <75 FL

Double check number and side of operculum punches

For fish that do not have 1-ROP:

Give 1-ROP punch and make note of sex, clips, wire of that fish, and what operculum punches they had.

LFH pond:

Count males and females collected and return them to the pond.

Appendix C: 2011 Fall Chinook Trapping/Sampling Protocol at LGR

by

Debbie Milks, WDFW
Bill Arnsberg, NPT
Stuart Rosenberger, IPC
Stuart Ellis, CRITFC
August 17, 2011

Executive summary:

The sample rate at LGR Trap will be set at 10% and kept at that level throughout the season. If the trap is swamped with fish: Shut down trap for an hour or so but clearly identify in the data when the trap was shut down and when it was started up again. Do not shut down and stay shut down for the rest of the day because we need to have a pre and post shut down sample so we can average them to estimate what passed during the shutdown.

WDFW is providing 2 staff for helping with the broodstock collection activities at LGR. Scales sampled at the LGR Trap for run reconstruction needs will be mounted by WDFW staff at LGR and sent to Olympia every two weeks.

Data collected from spring/summer Chinook should be put on the same form that is used for FCH. Please note Spring or Summer under comments. If you are getting jacks suspected of being summers we will need to subsample those fish for wires as well.

Males, jacks and minijacks will all be entered on the data forms as males.

The tagging/sampling protocol for broodstock shipped to LFH and NPTH will be the same.

In an effort to reduce the numbers of jills and jacks hauled to the hatcheries and to reduce the numbers of fish sacrificed with wire for run reconstruction purposes the following protocol was approved by co-managers in the basin on 8/01/2011. The sub-sampling of wire tagged fish should allow for ample recoveries for evaluation purposes.

Protocol:

- 1) COLLECT & HAUL: Please give 1-ROP punch. Fish \geq 65 cm FL slated for hauling will be put together in tanks while fish < 65cm FL will be put together in another tank. Regardless of whose day it is to haul, any fish <65cm FL slated to be hauled will go to LFH. NPTH will not be taking any fish < 65cm FL, they will be hauled to LFH for processing
 - a. Wire tagged fish: haul every 2 out of 3 wire tagged fish regardless of size
 - b. All Untagged fish > 80 cm FL
- 2) PASS: Please give 1-LOP punch and take scales on every third fish that is not wire tagged/PIT tagged
 - a. 1 out of 3 wire tagged fish
All untagged fish <80 cm FL

Appendix C-2: Revised 2011 Fall Chinook Trapping/Sampling Protocol at LGR

by

FCH Coordination Team
Revised October 7, 2011

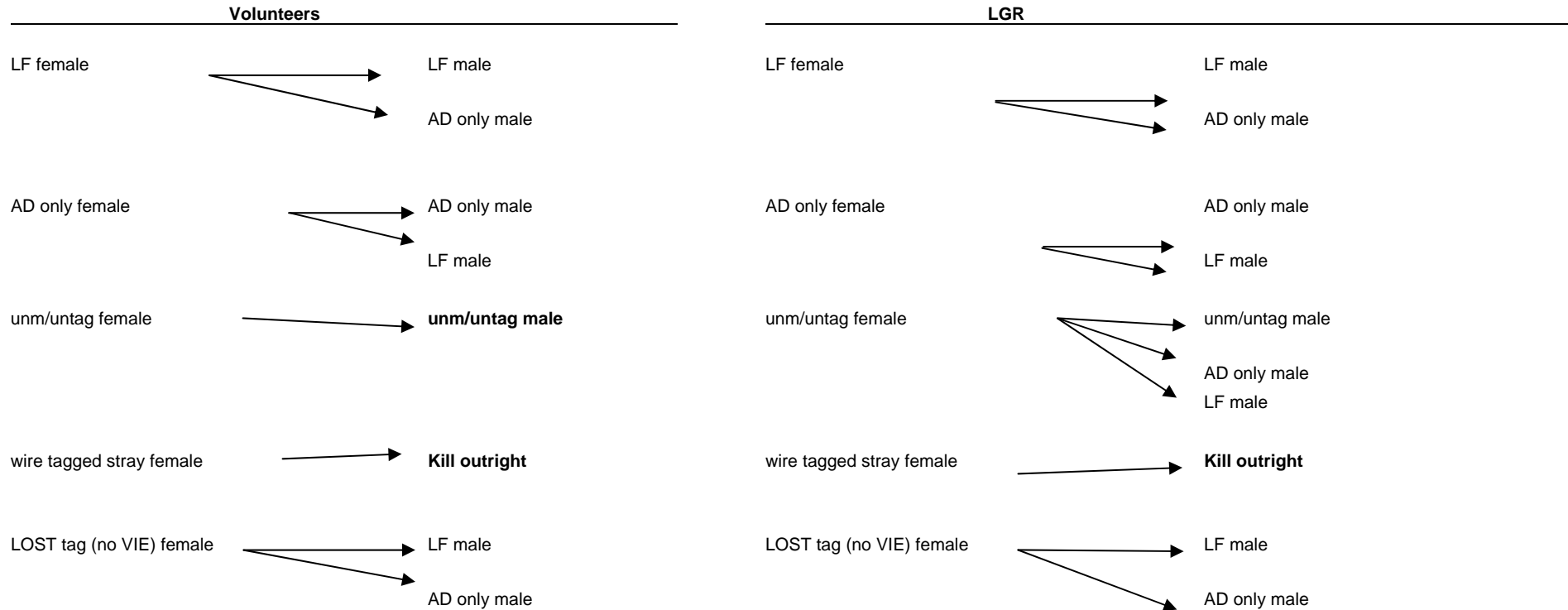
Executive summary:

Due to a lower than estimated return, the protocol was modified to increase the numbers of fish hauled to LFH and NPTH to assure eggtake goals will be met. All females (tagged and untagged) regardless of size will be hauled to the hatcheries.

Protocol:

- 1) COLLECT & HAUL: Please give 1-ROP punch. Fish ≥ 65 cm slated for hauling will be put together in tanks while fish < 65 cm will be put together in another tank. Regardless of whose day it is to haul, any fish < 65 cm slated to be hauled will go to LFH. NPTH will not be taking any fish < 65 cm, they will be hauled to LFH for processing
 - a. **Wire tagged FEMALES: haul all regardless of size**
 - b. Wire tagged MALES: haul every 2 out of 3 wire tagged MALES < 70 cm, and haul ALL MALES ≥ 70 cm
 - c. **Untagged FEMALES: haul all regardless of size**
 - d. Untagged MALES ≥ 70 cm
- 2) PASS: Please give 1-LOP punch and take scales on every third fish that is not wire tagged/PIT tagged
 - a. 1 out of 3 wire tagged fish **(DO NOT pass any females)**
 - b. All untagged males < 70 cm **(DO NOT pass any females)**

Appendix D: 2011 Mating Matrix for Spawning at LFH (2011 Broodyear)



Jacks (1salts) may be incorporated in broodstock up to 15% (subyearling jacks)

Only spawn two-salt and older age males.

Older age males will be used on multiple females. Untagged males >80 cm FL may be used on multiple female. Any male used multiple times must be used on at least one large female

Females will generally be mated to males that are larger than themselves.

Culling fish to reduce strays:

wire tagged STRAYS (LGR and LFH trapped)

Lost wire males will not be used in spawning.

Appendix E: FCAP Facilities

1.1 Pittsburg Landing

The acclimation facility at Pittsburg Landing consists of: 16 -20ft aluminum circular tanks; 2 aluminum distribution boxes; 4 river intake screens; ringlock flexible hose: 4" = 1,260 ft, 6" = 1,780 ft, 8" = 3,110 ft; camlock flexible hose: 6" = 2,080 ft; 1 - 500 gallon diesel storage tank; 1 - 20ft storage container; 2 - 30ft camp trailers; 1 - 1996 Chevy S-10 pickup; two alarm systems; 16 emergency oxygen systems - hoses, microdiffusers and regulators (1 per tank); a trailer mounted 4,000 watt generator light plant; one utility storage trailer; 16 camouflage nets; 2 trailer mounted hydrocyclones; miscellaneous bolts, seals, camlock fittings, etc. Equipment used at Pittsburg Landing and the other two facilities was purchased by USCOE, Walla Walla under the FY95 Congressional Add-on (Senate Report, 103-672, p7).

Water is pumped directly from the Snake River to the acclimation tanks by four, 4-inch diesel pumps. Water pumps are rented from a contractor because leasing appeared to offer the least cost over a ten-year life cycle. Each pump has a portable water intake screen that is placed into the river each year and connected to the pump by 120 ft of 6-inch plastic hose. The pumps provide 500 gpm of water and operate 24 hours each day throughout the 6-week acclimation period except for oil checks and servicing. A 1,000 gallon tank, placed within a spill containment barrier, supplies fuel for the pumps. The water is pumped to one of two 12 ft. high water distribution boxes, containing degassing towers to remove nitrogen gas, before flowing through a series of downsizing pipes to the rearing units.

The rearing units consist of 16 circular aluminum tanks, 20 ft in diameter and 4 feet deep. The tanks are transported from the storage area by a 20 ft flatbed lift-truck and placed on leveled 6-inch by 6-inch wood timbers. The tanks, made in two pieces and bolted together, drain water from the center of the tank through an 8-inch pipe placed in a plywood manhole running under the tank. The tank is fitted with vertical 12-inch circular perforated aluminum screen and the water depth controlled by a 6-inch center PVC standpipe.



The rearing water enters the tank through a 4-inch pipe located on the edge of the tank and is directed in a manner to facilitate a circular motion to aid the movement of fish waste and mortality to the center screen. Water flow is controlled by a 4-inch gate valve located on the incoming line and maintains flows at 100 gpm. The water discharge line is connected from the tank to the river by an 8-inch flexible plastic pipe, which is also used to release the fish.

A 24-volt alarm system constantly monitors water levels in each rearing tank and each of the two water distribution towers. An enunciator panel that provides a visual and audio alarm when a low water level is detected monitors the alarm system. The alarm control box and enunciator panel is located near the staff-housing trailer.

Assembly of the acclimation site begins in February each year with the transport of equipment and material from an offsite storage area. In 2006, the U.S. Forest Service (USFS) agreed to a trial operation of allowing the NPT to leave half of the assembled fish rearing tanks in place and remove the other half and related equipment at a storage site near the fish acclimation site. This agreement should greatly reduced equipment fatigue and reduced assembly and disassembly time by half.

1.2 Big Canyon

The Big Canyon facility uses identical or similar equipment to that of Pittsburg Landing. The rearing tank assembly has been changed over the years to include a single row of tanks that sit flat on the gravel surface. The center drain line is located in a trench dug under the tank, thus eliminating the need for 12-inch deep gravel pad that was previously used. This method can only be used where the proper elevation is available to facilitate water discharge to the river.

The USCOE agreed to furnish electric pumps to replace the diesel units that were rented each year. Electric pumps were installed and tested before the 2002 acclimation season. The electric pumps provide the same performance as the diesel pumps while reducing rental and maintenance costs, allowing onsite staff reduction and eliminates the risk of a major fuel spill.

FCAP Project Leader received verbal agreement from the Nez Perce Tribe that allows the fish rearing tanks and water distribution tower to remain assembled at the site the entire year. This eliminates the need for an assembly and disassembly contract and reduces equipment fatigue hence provide dollar savings to the program.

1.3 Capt. John Rapids

The Capt. John Rapids Fall Chinook Acclimation Facility is a single 150=X50= in-ground, lined pond that is supplied with Snake River water by two independent 1,250 gpm submersible electric pumps. Other facility equipment and capital construction consists of: 2 river intake screens; one camp trailer; one standby propane generator; one water well (domestic water); septic system; commercial electric service; alarm system; telephone service. The pumps and intake screens were designed to be placed into the river and then removed following fish acclimation each year but were replaced in 2001 with permanent intake screens located in the main Snake River channel. The pump intake screens are provided with an air backflush system to remove debris and an alarm system is available to monitor flows.

The pumps deposited large amounts of sand in the acclimation pond, which was removed by hand tools between each group of fish. The deposited sand created extremely poor environmental conditions for the fish during release

Negotiations with the USCOE resulted in the installation of two sand separators, two larger sized water pumps, upgrade of the electrical and pump control panels and changes in the pond water alarm system. Installation of the new equipment began in the fall of 2007 and testing indicated that the sand separators removed most of the sand load that had been deposited in previous years.

2. Operations

2.1 Fish transport

Approximately 150,000 fall Chinook salmon yearlings will be transferred from Lyons Ferry Hatchery to Captain John Rapids about February 01, at 12.5 fish per pound. Fish acclimated at Captain John Rapids are transported by WDFW one month earlier than the other acclimation facilities to make rearing space available for sub-yearlings at Lyons Ferry Hatchery. On or about 01 March, 150,000 yearlings will be transported to Pittsburg Landing and Big Canyon at 12 fish per pound. Transport to Pittsburg Landing and Big Canyon will be shared by WDFW and NPT.

Approximately 500,000 sub-yearlings will be transferred to the Big Canyon and Captain John Rapids facilities and 400,000 will be transferred to Pittsburg Landing during the first week in May. Captain John Sub-yearlings will be transported by WDFW, while Pittsburg Landing and Big Canyon transports will be shared by NPT and WDFW. Lyons Ferry Hatchery personnel provide schedules and facilitate loading and enumeration of the fish. Fish transport permits will be requested from IDFG.

2.2 Rearing

During acclimation, staff perform daily scheduled fish culture duties that includes: checking and recording oxygen levels in the rearing units three times each day, feeding the rearing units three times each day and picking fish mortality twice each day. Staff also observes fish behavior for abnormalities and assist in fish health checks and the fish-marking program. The fish are fed Clark's fry, manufactured by Skretting of Vancouver, B.C. Fish culture methods are the same as per Integrated Hatchery Operations Team (IHOT) guidelines and consistent with WDFW fish culture techniques at Lyons Ferry Hatchery. Environmental precautions are necessary to handle diesel and oil for the portable water pumps.

Fish health services are provided by contract with the USFWS, Dworshak Fish Health Center (DFHC). The contract provides diagnostic and pathogen survey services for all fall Chinook juveniles and smolts transported to the fish acclimation facilities. The services include a fish health check before transfer, bi-weekly exams during acclimation and a pre-release exam. Other health checks are performed as requested. Fish health protocols are as per AFS Blue Book, IHOT and Nez Perce Tribe fish health protocols.

2.3 Marking

Yearling and sub-yearling fish will be marked with coded wire tags (CWT), adipose fin clipped and pit tagged prior to transfer to the FCAP facilities.

2.4 Release

Yearling fish are reared and acclimated in the temporary facilities for six weeks (8 weeks at Capt. John Rapids) before release into the Snake and Clearwater Rivers in April, at a size of approximately 10 fpp, or 160-170 mm fork length. Anticipated release dates for 2011:

- Pittsburg Landing – April 12
- Captain John Rapids – April 1
- Big Canyon – April 13

Sub-yearling fish are acclimated approximately three to four weeks before release in late May or early June, at 50 fpp. Release typically occurs during rising water conditions and at night to minimize predation by birds or other fish. Anticipated release dates for 2011:

- Pittsburg Landing – May 23
- Captain John Rapids – May 24
- Big Canyon – May 25

The release of sub-yearlings from Captain John Rapids is being used to compare a direct stream release of fall Chinook from Lyons Ferry Hatchery at Couse Creek on the mainstem Snake. FCAP staff will coordinate size information and current or anticipated changes in environmental conditions as they occur. FCAP staff will coordinate with Lyons Ferry Hatchery personnel to schedule fish release from both facilities on the same day. The direct stream release study prevents any volitional release of fish from the Capt. John Rapids facility.

Emergency low water, water temperatures or facility equipment failure may necessitate an early release of fish from the facilities. The facility operator is authorized to determine when to release the fish if emergency circumstances warrant. Co-management agencies will be contacted within 24 hours with notification of an early release.

2.3 Communication

Verbal communications between FCAP personnel and co-managers is done on an as needed basis to facilitate planning, transportation and acclimation. Co-managers will be involved in any planned deviation to the fish acclimation schedule.

Fish release numbers will be reported and a FCAP fish acclimation summary will be completed by Nez Perce Tribe Research division. FCAP fish acclimation summary and other pertinent information will be presented to co-managers at the Snake River Fall Chinook Technical Group meeting.

FCAP personnel will complete and submit a project annual report to BPA in January each year.

FCAP contact list:

Becky Johnson: 208-843-7320 Ext. 2433; Cell #: 208-791-3392; E-mail: beckyj@nezperce.org
Bruce McLeod: 208-843-7320 Ext.2403; Cell #: 208-791-9625; E-mail: brucem@nezperce.org
Mike Key: 208-843-7320 Ext. 2486; Cell #: 208-791-2984; E-mail: mikek@nezperce.org

Appendix F: 2012 Releases - Fall Chinook Pit Tag Allocation (*UsvOr* agreement)

Table 1. Summary of PIT tag allocation in release year 2011 Snake River fall Chinook salmon hatchery production. Based on sample sizes of 250,000 tags for subyearling and 328,000 tags for surrogates. Applies 2008-2017 USvOR Agreement Table B4B, a 46/54 split of subyearling tags, and a 50/50 split of surrogate tags to T0 and C1 passage routes. (**Updated 8-15-2011**)

Priority	Production Program						Tagging Timeframe (tagging at rearing facilities)	Release numbers upstream of Lower Granite available for PIT tagging		Tagging Lead / Uploading
	Rearing Facility	Number	Age	Release Location(s)	PIT Tag #'s	PIT Tag #'s		Subyearlings	3,245,000	
					Transport if Collected	Bypass if Collected		Yearlings	450,000	
					TIC	BIC		Subyearling Sample Size	250,000	
								250,000 and 46 / 54 split		
1	Lyons Ferry	485,000	1+	On station	27,000	0	Aug. 15-18, 2011	30,000	WDFW/WDFW(monitor mode for SARs) BIOMARK/NPT	
2	Lyons Ferry	170,000	1+	Pittsburg Landing	15,000	4,000	January 30-31	19,000		
3	Lyons Ferry	170,000	1+	Big Canyon	15,000	4,000	January 29-30	19,000		
4	Lyons Ferry	155,000	1+	Captain John Rapids	15,000	4,000	January 28-29	19,000		
5	Lyons Ferry	200,000	0+	On station	20,000	0	Early to mid-April	20,000	WDFW/WDFW(monitor mode for SARs) BIOMARK?/NPT	
6	Lyons Ferry	500,000	0+	Captain John Rapids	17,720	20,801	Early to mid-April	38,521		
7	Lyons Ferry	500,000	0+	Big Canyon	17,720	20,801	Early to mid-April	38,521		
8	Lyons Ferry	200,000	0+	Pittsburg Landing	7,088	8,320	Early to mid-April	15,408		
9	Oxbow	200,000	0+	Hells Canyon Dam	7,088	8,320	Early to mid-April	15,408	IPC-IDFG/IDFG	
10	Lyons Ferry	200,000	0+	Pittsburg Landing	7,088	8,320	Early to mid-April	15,408	BIOMARK?/NPT	
11	Lyons Ferry	200,000	0+	Direct stream evaluation Near Captain John Rapids	7,088	8,320	Early to mid-April	15,408	BIOMARK?-WDFW?/NPT/WDFW	
12	DNFH/Irrigon	250,000	0+	Transportation Study ^a	125,000	125,000	Late May -early June	250,000	BIOMARK?/NOAA	
13	Irrigon	200,000	0+	Grande Ronde River	7,088	8,320	Early to mid-April	15,408	BIOMARK?-WDFW?/NPT?WDFW?	
14	DNFH/Irrigon	78,000	0+	Transportation Study ^a	39,000	39,000	Late June-July	78,000	BIOMARK?/NOAA	
15	Irrigon	200,000	0+	Hells Canyon Dam	7,088	8,320	Early to mid-April	15,408	BIOMARK?/NPT	
16	Irrigon	195,000	0+	Grande Ronde River	6,911	8,112	Early to mid-April	15,023	BIOMARK?-WDFW?/NPT?WDFW?	
17	Umatilla	450,000	0+	Hells Canyon Dam	15,948	18,721	Early to mid-April	34,669	BIOMARK?/NPT	
NPTH 1	NPTH	500,000	0+	NPTH	0	3,000	April-May	3,000	NPT/NPT	
NPTH 2	NPTH	200,000	0+	Lukes Gulch	7,088	8,320	April- May	15,408	NPT/NPT	
NPTH 2	NPTH	200,000	0+	Ceder Flats	7,088	8,320	April -May	15,408	NPT/NPT	
NPTH 3	Irrigon	500,000	0+	North Lapwai Valley	0	3,000	April	3,000	NPT/NPT	
above 17	DNFH/Irrigon	TBD	0+	Transportation Study	0	0		0	above 17	
TOTAL	Yearlings	900,000					TOTAL PIT	669,000	PIT Yrlngs.	PIT Sub-Yrlngs.
	Subyearlings	4,538,000 (of which 328,000 are for Transportation Study)							73,000	596,000