

LYONS FERRY COMPLEX ANNUAL OPERATIONS PLAN

For the Period of

OCTOBER 1, 2013 – SEPTEMBER 30, 2014

Prepared by:

Washington Department of Fish and Wildlife



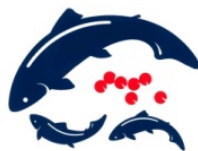
Nez Perce Tribe



Confederated Tribes of the
Umatilla Indian Reservation



**And Funded By
Lower Snake River Compensation Plan**



LOWER SNAKE RIVER
COMPENSATION PLAN
Hatchery Program

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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).

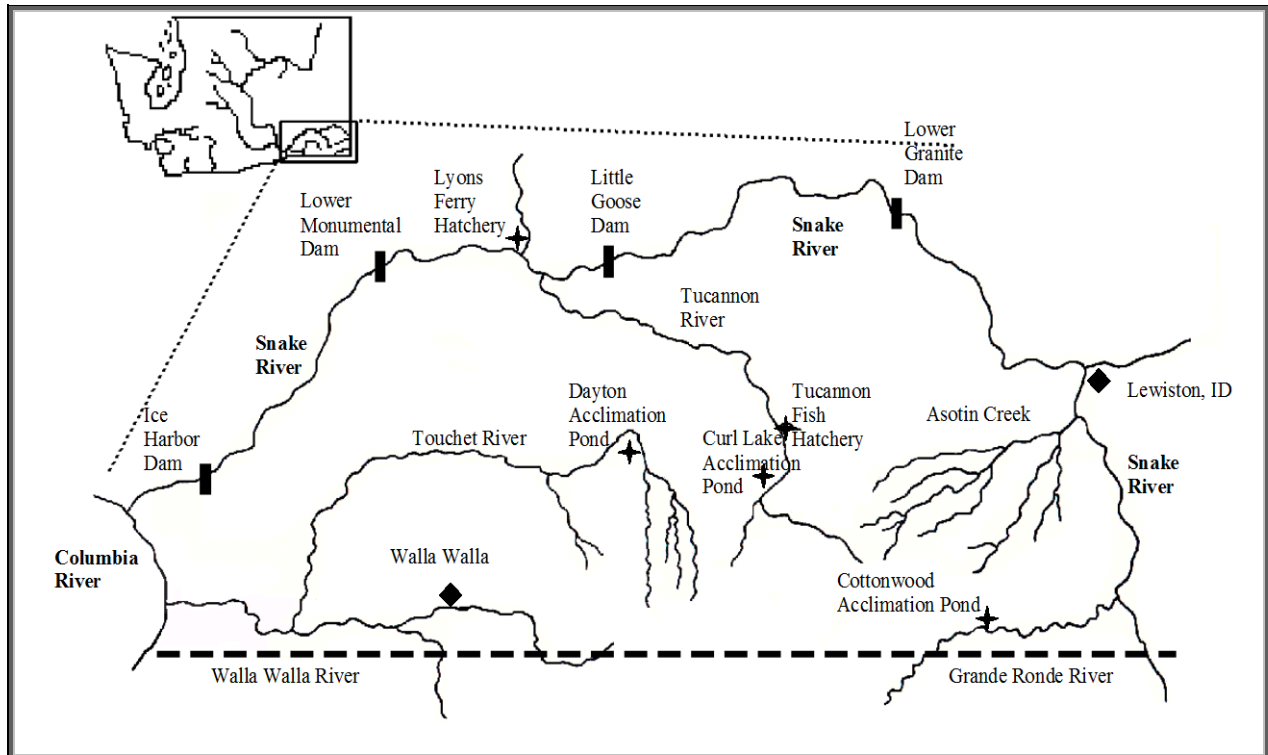


Figure 1. Map of the Lower Snake River Compensation Plan (LSRCP) LFC Facilities, and major rivers and streams in Southeast Washington.

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 79,000 pounds of rainbow trout production (currently planted at 3 fish per pound (fpp), including 73,200 fall Chinook for downstream harvest. In addition to these LSRCP hatchery production goals to mitigate for expected hydro system 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 Steel headers (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. A project proposal to install six 26' round tanks and 5 12' intermediate tanks in the former spring Chinook captive broodstock area is anticipated for summer 2015. These tanks will provide additional rearing space to accommodate increased production of steelhead and/or spring Chinook.

Water is supplied to LFH from the Marmes pump station, which has emergency power backup generation. The pump control system, which is nearly 30 years old, was scheduled to be completely upgraded in summer 2013, however, only half of the project was completed this year. The other half will be completed in summer of 2014. 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.

The underground medium-voltage loop at the hatchery was completely replaced in early spring 2013.

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 Wallowa 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. 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 BY2013 fall Chinook production based on table *B4B* in the *US v OR* agreement. 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 is utilizing one hatchery steelhead stock (Wallowa) for most harvest mitigation objectives under LSRCP, and natural endemic broodstocks in the Touchet and Tucannon Rivers. Hatchery production releases for summer steelhead in the Tucannon River, for both conservation and mitigation harvest objectives, will be Tucannon endemic stock beginning with 2014 releases. The numbers of fish released in 2013 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 project proposal to expand rearing capacity at LFH is currently being developed for potential implementation in the 2014-15 cycle. Remodeling proposals are focusing on the former spring Chinook captive brood area, to establish new intermediate rearing tanks, with an emphasis on rearing the endemic steelhead programs for 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 2013-14 production goals).

Facility	Location River (Mile)	Water Source	Species	Designed Capacity (#Fish)	Designed Capacity (Pounds)	Current Program Capacity (#Fish)	Current Program Capacity (Pounds)
Lyons Ferry ^a	Snake (59)	Wells	Fall Chinook	9,160,000	101,800	3,100,000	119,167
			Spring Chinook	132,000	8,800	230,000	8,000
			Steelhead	931,200	116,400	670,000	131,388
			Rainbow	260,000	86,000 ^d	122,100	47,893
			TOTALS	10,483,200	313,000	4,122,100	306,448
Tucannon ^b	Tucannon (36)	Wells, Springs, Tucannon R.	Spring Chinook	132,000	8,800	253,000 ^c	14,056
			Rainbow	210,000	39,285	97,298	37,377
			Steelhead	-0-	-0-	75,000	16,667
			TOTALS	342,000	48,085	425,298	68,100
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	18,750
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				
	2013 Goal	2013 Actual Plants and Transfers	2014 Goal ^a	Fish/Eggs on Hand For 2014 Goal	2015 Tentative Plan ^a
Fall Chinook					
<u>Yearling releases:</u>	<u>BY 2011</u>	<u>BY 2011</u>	<u>BY 2012</u>	<u>BY 2012</u>	<u>BY 2013</u>
LFH-on station	450,000	489,500	450,000	503,473	450,000
NPT – FCAP (transfer)	465,000	487,800	465,000	490,906	465,000
<u>Sub-yearling releases:</u>	<u>BY 2012</u>	<u>BY 2012</u>	<u>BY 2013</u>	<u>BY 2013</u>	<u>BY 2014</u>
LFH-on station	200,000	211,600	200,000	Unknown	200,000
NPT – FCAP (transfer)	1,400,000	1,402,300	1,400,000	Unknown	1,400,000
Direct- near Couse Cr (CCD)	200,000	205,300	-0-	-0-	-0-
Late release at Capt. Johns	-0-	-0-	200,000 ^d	Unknown	200,000 ^d
<u>Eyed Egg Transfers:</u>	<u>BY 2012</u>	<u>BY 2012</u>	<u>BY 2013</u>	<u>BY 2013</u>	<u>BY 2014</u>
Oxbow - IPC	211,000	-0-	-0-	-0-	0
Irrigon-IPC	842,000	1,480,000	1,110,000 ^e	Unknown	1,110,000 ^e
Irrigon - Direct – GRR	421,000	-0-	444,000 ^e	Unknown	444,000 ^e
Umatilla-ACOE Transportation Study	345,220	-0-	-0-	-0-	-0-
Spring Chinook					
	<u>BY 2011</u>	<u>BY 2011</u>	<u>BY 2012</u>	<u>BY 2012</u>	<u>BY 2013</u>
Tucannon stock	197,000	231,800	197,000	228,000 ^b	197,000
Yearling smolt production	28,000	30,044	28,000	28,600	28,000
Smolt rearing study @ TFH	-0-	-0-	-0-	-0-	-0-
Summer Steelhead (Stock)					
	<u>BY 2012</u>	<u>BY 2012</u>	<u>BY 2013</u>	<u>BY 2013</u>	<u>BY 2014</u>
On Station (LFH)	160,000	146,395	-0-	-0-	-0-
On Station (Wallowa) ^c	-0-	-0-	110,000	110,000	60,000
Touchet (LFH)	85,000	84,973	-0-	-0-	-0-
Touchet (Wallowa) ^c	-0-	-0-	85,000	86,000	85,000
Walla-Walla (LFH)	100,000	100,938	-0-	-0-	-0-
Walla-Walla (Wallowa) ^c	-0-	-0-	100,000	101,000-	100,000
Cottonwood (Wallowa)	200,000	206,012	200,000	201,000	200,000
Tucannon (Endemic)	75,000	58,462	100,000	93,000	100,000
Touchet (Endemic)	50,000	38,761	50,000	51,000	50,000
Spokane Rainbow Trout					
<u>Mitigation</u>	<u>BY 2011</u>	<u>BY 2011</u>	<u>BY 2012</u>	<u>BY 2012</u>	<u>BY 2013</u>
Catchables	196,798	204,732	197,500	168,715	197,500
Jumbo's	1,000	1,216	1,000	1,300	1,000
IDFG Catchables	15,950	18,475	17,600	7,500 ^f	17,600
Jumbo's – NPT's	1,650	1,725	1,650	800 ^f	1,650
<u>State Program</u>					
Jumbo's – TSS organization	4,000	4,178	4,000	4,600	4,000

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

^b Smolt production includes 28,600 from 2nd year of proposed rearing study at the Tucannon Hatchery.

^c Change in stock from LFH to Wallowa.

^d New: late Capt. Johns acclimation release as determined at a later date

^e Transfer numbers include an 11% overage to assure IPC meets mitigation goals if coagulated yolk problems persist at Irrigon.

^f Due to loss of triploid rainbow trout, IDF&G catchable and NPT's jumbo programs were reduced to the listed numbers and the remainder was planted at Rock Lake.

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 LSRCP 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 BY2013 fall Chinook production based on table *B4B*.

The LFH was initially designed to release 9.16 million fall Chinook sub yearlings (**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 transfers 465,000 yearlings and 1.4 million subyearlings annually to the FCAP for its program. 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. Approximately 1,554,000 eyed eggs are transferred to and reared at Irrigon Hatchery for LSRCP and IPC programs. ODFW will mark and tag the fish slated as Grande Ronde River and Hells Canyon subyearling releases. Fish destined for the Grande Ronde River will receive a WDFW tag code and will be released into the Grande Ronde River near Cougar Creek in Washington... The co-managers will coordinate release timing and location. The production destined for the Grande Ronde 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 LSRCP.

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	Irrigon ^c	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 ^d	DNFH/Umatilla	250,000	0+	Transportation Study^a	250K PIT Tag only
12	Irrigon ^a	200,000	0+	Grande Ronde River	200K AdCWT
14 ^d	DNFH/Umatilla	78,000	0+	Transportation Study^a	78K PIT tag only
13	Irrigon ^a	200,000	0+	Hells Canyon Dam	200K AdCWT
14	Irrigon ^a	200,000	0+	Grande Ronde River	200K Unmarked
15	Irrigon ^b	600,000	0+	Hells Canyon Dam	600K Ad only
TOTAL	Yearlings	900,000			
	Subyearlings	3,200,000			

^a for logistical purposes, fish are reared at Irrigon in lieu of Lyons Ferry. (LSRCP); ^f for logistical purposes, beginning in 2010, fish are reared at Irrigon in lieu of Umatilla; ^c Due to required intake screening modifications, fish to be reared @ Irrigon for BY-13; ^d The transportation study concluded w/BY-2011. These fish are no longer included in production.

A. Fish on Hand

Brood Year 2012

In August 2013, LFH had an estimated 993,000 (BY12) 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 early spring 2014. About 30,000 of the onstation yearlings were PIT tagged in late August. Approximately 500,000 yearlings will be released on-station at LFH, and a total of 490,000 are anticipated at transfer to all the FCAP facilities in Feb-Mar 2014. These fish may 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 select fish at Lower Granite Dam to radio tag as part of a fidelity and fallback study and to estimate smolt-to-adult returns.

Table 4. BY 2012 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	500,000	10	1+	242.5K AD CWT 242.5K CWT only	15,000 15,000	April 2014
Capt. John Rapids	155,000	164,000	13	1+	73K AD CWT 82K CWT Only	3,000*	Feb - 2014 (transfer)
Pittsburg Landing	165,000	164,000	12	1+	80K AD CWT 85K CWT Only	3,000*	Mar - 2014 (transfer)
Big Canyon	165,000	162,000	12	1+	80K AD CWT 85K CWT Only	3,000*	Mar - 2014 (transfer)

*Note: tags and tagging to be provided by NPT

B. Trapping

Brood Year 2013

Tribal, state, and federal inter-jurisdictional 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, in-season coordination, post season review and evaluation process. Weekly in-season coordination teleconferences occur and run projections, harvest estimates, and hatchery trapping and broodstock collection data are exchanged.

The trapping goal (**Appendix C**) for broodstock is up to 2,600 (which includes approximately 1,300 females – reduced for BY 2013 due to the conclusion of the transportation study) 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 numbers of fish that will need to be trapped to meet egg take goals through *Priority 15*. These goals are exclusive to stray culling requirements to assure the stray rate proportion does not exceed 5%.

Collection occurs primarily at LGR but may also occur at LFH. 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 (80 cm+). 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 not occur this year unless necessary to obtain total brood stock.

2. Lower Granite Dam

Trapping at LGR will begin on September 23 if water temperatures permit. (**Appendix C**). The trap rate at LGR has been set at 12% with the desire to remain at the established rate all season. Collected broodstock are divided between the LFH and NPTH (usually 70:30 ratios) as agreed upon annually, with a predetermined hauling schedule shared between both facilities to meet this need. Additional fish needed for run reconstruction needs will be hauled to LFH. This hauling schedule is adjusted accordingly for meeting the established ratio. The goal will focus on females in calculating the 70:30 split. Fish destined for Lyons Ferry will not be injected this year.

C. Spawning

Brood Year 2013

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 BY2013 is to continue the strategy for reducing 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 occur 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. This action began with the 2011 broodstock. 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: 2013 Trapping & Mating Protocol at LFH. Because the spawning population is usually large (>1,000), increasing genetic diversity is not presently a concern.

Eggs from jills will not be utilized for production during the first three spawns unless we are broodstock limited. Jills that are spawned are to be mated with true adults. 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 production goals can be met *without* using jills, we will cull the progeny of jills prior to seasons end, or release as unfed fry as they would be marked by PBT. See Table 5 for disposition of these unfed fry. 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 iodophor, and incubated in vertical stack incubators. Distribution of progeny based on ELISA sampling as identified in **SECTION X**.

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. If so, all LGR origin adults with CWT will be utilized for sampling, and any remaining adults will be released according to Table 5.

Table 5 on the following page lists the areas that have been identified for each broodstock facility as suitable for disposition of surplus adults or fry. In the event of broodstock releases, the fish will be marked to identify them as fish exposed to Aqui-S 20E.

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 -Mouth of Palouse River	-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 out planting. Also, it is contingent on a fishery for fish to have been exposed to MS-222 and released.

D. Rearing

Brood Year 2013

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 580 temperature units (TU's). After eggs are picked, Vexar is 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 as unfed fry 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 can occur at LFH if densities are exceeded or through additional handling, which induces stress. The un-marked groups that are CWT tagged in the adult ponds will come from the same egg takes as their cohorts that will receive CWTs and ad-clips (to the extent that the egg takes will allow), 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 index 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.

In spring 2012, the NPT decided to discontinue the 28-day Aquamycin feed treatment for the purpose of reducing the potential for Bacterial Kidney Disease. Previously, in 2011, the yearling fall Chinook treatment for the on-station release at LFH was discontinued. These decisions are due in part to the adult sampling protocols that are controlling the risk of an outbreak of BKD in

the progeny, 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 2013

In addition to the eyed egg transfers identified in Section D., this section outlines the anticipated subyearling and yearling production for BY2013 assuming full production of Table 3. All tagging, transfers, and releases are listed in Table 5.

Egg Transfers

Assuming full production of Table 3, Irrigon will receive 1,554,000 eyed eggs for the IPC program and Grande Ronde direct release (LSRCP program).

Sub-Yearlings

A total of 203,000 subyearlings are 100% coded-wire tagged and adipose fin clipped in April for release from LFH into the Snake River in early June. Staff will insert 20,000 PIT tags into the onstation subyearlings in May. Captain John Rapids Acclimation Facility (AF) receives 508,000 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 406,000 subyearlings in May. This group is comprised of 100,000 CWT, 100,000 AD+CWT, and 200,000 unmarked fish. Pending US v Oregon approval an additional 203,000 subyearlings, 100% AD+CWT and 3,000 PIT tags will be acclimated at Captain John Rapid and released in July at 50 fpp. This group was noted as a direct stream release into the Snake River near Couse Creek in the US v Oregon table. This decision was made by the co-managers after data showed a slight survival advantage of acclimated fish over direct stream released fish at CJR.

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 at 50 fpp.

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. From these 400,000 subyearlings, 200,000 fish will be AD+ CWT marked (*priority 12 & 14*), and 200,000 will be unmarked and untagged.

The IPC sub-yearling program at Irrigon Hatchery will receive eggs from Lyons Ferry in December. Due to intake screening concerns at Oxbow, BY 2013 production will be reared at Irrigon and released at Hells Canyon. The IPC group is direct released at the Forest Service boat launch below Hells Canyon Dam at a release goal of 50 fpp. All fish from Irrigon will be released mid-May. These fish will be 200k Ad+ CWT and 800k Ad only. See Table 6.

Yearlings

A yearling release of 450,000 fish from LFH directly into the Snake River at 10 fpp is programmed for 2015. All of these fish will be marked and/or tagged during July-August 2014

(half AD+CWT, and half CWT only), and transferred into Lake Two. A portion of these fish will also be PIT tagged (as many as 30,000) approximately 21 days later. PIT tags will provide improved estimates of escapement of adults through the hydro system to the Snake River, to estimate SARs, and some will be radio tagged at LGR when they return as part of a fidelity and fallback study. These fish will be released over an anticipated 4-day period into the Snake River starting April 1, 2015, depending on river flows and dam spills. Due to the unscreened bypass protocol 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 2014 (AD+CWT; CWT only) and up to 9,000 PIT tags and marking as provided by NPT in fall 2014, then transferred to Captain John, Big Canyon, and Pittsburg Landing acclimation sites (at ~ 12 fpp) for final rearing and release by NPT in April 2014 at a target of 10 fpp. Prior to transport, a proportion may be PIT tagged for evaluating emigration timing and survival through the hydro-system. Numbers and availability of PIT tags is to be determined by the funding entities. See Table 6 for proposed disposition of the BY-2013 yearlings.

Table 6. Proposed BY 2013 Snake River fall Chinook tagging, transfers and releases.

Site	Transfer Goal	Release Goal	Size (fpp)	Age	Mark/CWT/Elastomer	PIT Tags	Transfer/Release Date
Irrigon (IPC)	1,113,000	1,000,000	Eyed Eggs	0+	200K AD CWT 800K AD Only	3,000	Dec 2013 (transfer)
Grande Ronde Direct - Irrigon	441,000	400,000	Eyed Eggs	0+	200K ADCWT 200K Unmarked	1,500 1,500	Dec 2013 (transfer)
LFH	N/A	200,000	50	0+	100% AD CWT	20,000	May – Jun 2014
Capt. John	508,000	100,000 100,000 300,000	75 75 75	0+ 0+ 0+	CWT Only AD CWT Unmarked	3,000	May – 2014 (transfer)
Big Canyon	508,000	100,000 100,000 300,000	75 75 75	0+ 0+ 0+	CWT Only AD CWT Unmarked	3,000	May - 2014 (transfer)
Pittsburg Landing	406,000	100,000 100,000 200,000	75 75 75	0+ 0+ 0+	CWT Only AD CWT Unmarked	3,000	May – 2014 (transfer)
Late release Capt. John	203,000	200,000	50	0+	100% AD CWT	3,000	June 2014
LFH	N/A	450,000	10	1+	225K AD CWT 225K CWT Only	30,000	April 2015
Capt. John	155,000	150,000	13	1+	70K AD CWT 80K CWT Only	3,000	Feb - 2015 (transfer)
Pittsburg Landing	155,000	150,000	12	1+	70K AD CWT 80K CWT Only	3,000	Mar - 2015 (transfer)
Big Canyon	155,000	150,000	12	1+	70K AD CWT 80K CWT Only	3,000	Mar - 2015 (transfer)

*Note: The Couse Creek release near Capt. John may change to a late acclimation and release from Capt. John.

F. Research

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. The juvenile release portion of this study is completed. 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.

III. TUCANNON SPRING CHINOOK

The Tucannon River Spring Chinook Hatchery production began in 1985 using endemic broodstock. Currently, both natural origin and hatchery supplementation fish are collected for broodstock. Returning adults are collected at the Rainbow Lake intake above TFH and transported to LFH for holding. The release goal is 225,000 yearling smolts.

A. Fish on Hand

Brood Year 2012

In August 2013, LFH had an estimated 228,000 (BY12) juvenile spring Chinook on hand. Concurrently, TFH had an estimated 28,000 (BY12) juvenile spring Chinook on hand for the full-cycle rearing study, as proposed in fall 2012.

B. Tagging, Transfers, and Releases

Brood Year 2012

In July and August 2013, the BY12 progeny were 100% CWT tagged with no fin clip (**Table 7**). Each group from the experimental rearing study (TFH vs. LFH) was marked with a separate tag code.

These fish will be transferred to TFH in October for final rearing and release. At TFH, these fish are reared separately from the study group in concrete round ponds or raceways with river water supply, except when well water is added mid-winter to maintain water temperatures near 40⁰ F. Checks for CWT retention are conducted prior to transferring the fish to Curl Lake AP in February.

Table 7. Proposed BY 2012 Tucannon River spring Chinook tagging, transfers and releases.

Site (Type)	BY12 Goal	Expected at release	Size (fpp)	Age	Mark/CWT/Elastomer	PIT Tags	Release Date
Curl Lake AP	225,000	255,000	12	1+	100% CWT	15,000	Mar – Apr 2014

C. Spawning

Brood Year 2013

The egg take goal for BY2013 is 260,000 green eggs. It has been established that up to 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. No jacks were collected for broodstock in 2013. Spring Chinook adults trapped at TFH will be spawned during September 2013 at LFH. A 2 x 2 spawning matrix protocol is followed as approved by WDFW Evaluation staff. During the spawning activity, eggs and milt will be collected in individual bags and placed in a cooler until fertilization, which occurs in the incubation building. Fertilized eggs will be water hardened in 100-ppm iodophor for one hour. All spring Chinook carcasses are disposed of

on site. Due to fish health protocols regarding injected adults, fish may not be utilized for nutrient enhancement. Future injections (BY2014) will be determined following further discussions with Fish Health and the potential impacts of BKD and extended adult holding concerns.

D. Rearing

Brood Year 2013

The production estimate for BY2013 is 225,000 smolts. Eggs are treated with formalin daily to reduce fungus and are reared in vertical incubation trays. At eye-up, eggs from individual females are shocked, picked and placed in separate trays with substrate. Upon complete yolk-sac absorption (~1600 fpp), they will be transferred to the north side shallow troughs for introduction to feed and initial rearing at LFH. .

A prophylactic aquamycin treatment at a 3% dose is used to control BKD. This 28-day treatment is now administered in mid-January thru mid-February when the fish are approximately 400 fpp.

It is anticipated that enough eggs will be available to continue the full-cycle rearing study at TFH for another year. Beginning at the eyed egg stage, it is proposed that 30,000 eggs are transferred to TFH, for release of 28,000 smolts from Curl Lake. The remaining 197,000 fish will be reared at LFH. All fish will be marked with CWT only, with a portion 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.

In the event there are excess eggs above 110% of production goals, it is proposed that they be incubated separately and released as unfed fry near the mouth of the Tucannon River.

Table 8. Proposed BY 2013 Tucannon River spring Chinook tagging, transfers and releases.

Site (Type)	BY13 Goal	Expected at release	Size (fpp)	Age	Mark/CWT/ Elastomer	PIT Tags	Transfer/Release Date
Curl Lake AP	197,000 28,000*	197,000 28,000	12 12	1+ 1+	100% CWT 100% CWT	15,000	Mar – Apr 2015

*Note: Full-term rearing study at TFH. Fish will be integrated with production group at Curl in early February

E. Trapping

Brood Year 2014

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 based on a proposed sliding scale of predicted returns to the trap (Appendix G: *Proposed adult disposition model for Tucannon spring Chinook), and adjusted in-season, if necessary, to emphasize natural origin fish in the broodstock, whenever returns are large enough, and 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. A sliding scale adult management plan (Appendix H) that was agreed to by both tribes and WDFW incorporates more natural origin adults in the hatchery broodstock collections as the natural run size increases.

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 female adults are injected in the dorsal sinus at transfer with oxytetracycline and erythromycin. Females only are re-injected with erythromycin 30 days prior to the start of spawning. Adults will receive 167 ppm formalin treatments every-other day to control fungus and decrease pre-spawning mortality.

Table 9. Proposed BY 2014 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	15,000	Mar – Apr 2016

F. Research

The release size study concluded with BY2010. The BY2012 juveniles will be reared to a release goal of 12 fpp. The 2013 BY will be the final brood year used in the experimental rearing study (TFH vs. LFH).). The need to explore monitoring alternatives on adults bypassing the Tucannon River and ascending above LGR is still being evaluated. It is proposed for the second year to rear 28,000 fish (BY2012) to full term at the Tucannon Hatchery to determine feasibility of shifting part or all of the Tucannon spring Chinook program to the Tucannon Hatchery, but the total smolt production goal remains at 225,000. This rearing study will include three brood years for evaluation purposes.,. 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 two stocks of steelhead in the Snake River basin, (Tucannon, and Wallowa) and two stocks in the Walla-Walla basin (Touchet and Wallowa). The Wallowa stock is a non-endemic stock that was 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. With the elimination of the Lyons Ferry stock steelhead in December of 2013, the Wallowa stock steelhead will now be released in the Walla Walla Basin, and on-station at Lyons Ferry Hatchery.

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 were 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 survival (SAS) to Bonneville Dam, and smolt-to-adult return (SAR) to Ice Harbor Dam for the Tucannon Endemic stock is 2.0% and 1.4%, respectively for the 2004-2008 release years. In contrast, SAS and SAR to McNary for the Touchet Endemic stock is 0.65% and 0.52%, respectively. Because the Tucannon endemic program was meeting its survival goal and ongoing concerns about the depressed status of the Tucannon population, the program was increased to 75,000 smolts for Brood Year 2010, and increased to 100,000 smolts for BY 2013, with 50% of the production to be directed at harvest mitigation.

Additional changes to the steelhead program are needed to respond to results from evaluation of fish stock performance (Touchet Endemic program) and ESA related concerns regarding the ongoing releases of LFH stock steelhead into the Snake, Walla Walla and Touchet rivers. Such changes may require a departure from the general mitigation approach used for steelhead so far, but also will need careful planning to ensure that the change can be implemented within the limits of the hatchery facilities now or as planned to exist in the near future.

Actions that WDFW is proposing in the immediate future are:

- 1) Addition of circular ponds for expansion of the Tucannon River endemic stock program – These are required for further expansion of the program so we can re-establish a harvest mitigation fishery within the Tucannon River.
- 2) In going with one hatchery stock for releases in the Walla Walla River, Lyons Ferry, and Cottonwood, this action would free up a rearing lake at Lyons Ferry; which could allow

for the possibility of bringing in B-run steelhead, increased production of another stock, or allow for more spring Chinook production for LSRCP harvest mitigation either at LFH or another LSRCP funded facility.

Such wholesale changes to the LSRCP steelhead mitigation program will require careful coordination among co-managers and the LSRCP funding entity, and are therefore proposed here for early consideration and implementation starting in operations year 2013-2014.

V. LYONS FERRY SUMMER STEELHEAD

This program has been discontinued due to the expansion and implementation of the Wallowa stock program (see **section VIII**).

Trapping of the LFH stock steelhead will not occur this year. The ACOE request for adults was denied due to disagreement from co-managers.

VI. TOUCHET SUMMER STEELHEAD

The Touchet River summer steelhead is considered an endemic program, meaning all production is derived from natural parentage broodstock. The future status of this program is pending further discussions with the co-managers to resolve concerns on the intent of the program and whether to modify production strategies. 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 2013

In August 2013, LFH had approximately 51,000 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 2014.

B. Tagging, Transfers, and Releases

Brood Year 2013

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. In April 2014, these fish will be direct stream released at Baileysburg Bridge (Touchet RM 32) on the North Fork of the Touchet River (**Table 10**). These fish are currently not marked for harvest in the sport fishery.

Table 100. Proposed BY 2013 Touchet summer steelhead smolts tagging, transfers and releases.

Site	BY12 Goal	Expected at release	Size (fpp)	Age	Mark/CWT/Elastomer	PIT Tags	Transfer/Release Date
Touchet River (direct)	50,000	50,000	4.5	1+	100% CWT	-0-	April 2014

C. Trapping

Brood Year 2014

Trapping of BY14 Touchet River endemic stock normally 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. 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 14-15 spawned females (depending on age structure) 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 for the brood, or the progeny will be released as unmarked/untagged fry. The option of including HOR's was discussed but at this time no decision has been made.

D. Spawning

Based on fecundity and survival estimates, LFH typically spawns 14-15 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, ran through an automated egg sorting machine and enumerated, and placed 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 late summer 2015, new circular tanks should be installed and operational. These new tanks will be used for the Touchet and Tucannon endemic programs. Raceway space created by utilizing the new tanks, will provide the opportunity to increase the Tucannon endemic program for mitigation purposes.

In January, the Touchet endemics 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 111. Proposed BY 2014 Touchet summer steelhead smolts tagging, transfers and releases.

Site	BY13 Goal	Size (fpp)	Age	Mark/CWT/ Elastomer	PIT Tags	Transfer/Release Date
Touchet River (direct)	50,000	4.5	1+	100% CWT	5,000	April 2015

F. Research

No research is planned for the Touchet Endemic stock at this time.

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 100,000 smolts at 4.5 fpp. The co-managers have agreed to increase production to 150,000, with strategies for implementation of the long term goals for harvest. This increase in production is contingent on other changes to steelhead programs (See **Section IV and VII**) relative to available rearing space, or installation of new circular tanks, as proposed.

A. Fish on Hand

Brood Year 2013

In August 2013, approximately 93,000 Tucannon River summer steelhead juveniles were on hand at LFH. 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, eggs from IHN positive female greater than 10⁴ will be destroyed or released into the Tucannon River as un-fed fry following agreement with the co-managers. (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 12**). In February 2013, the supplementation fish (50K) 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 7,500 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. The group marked for harvest (balance minus 50K supplementation group) will be full term reared at Lyons Ferry and released at Marengo or downstream in April or early May. The evaluation staff will PIT tag 7,500 of these prior to release.

Table 122. Proposed BY 2013 Tucannon summer steelhead smolts tagging, transfers and releases

Site	BY13 Goal	Expected at release	Size (fpp)	Age	Mark/CWT/Elastomer	*PIT Tags	Transfer/Release Date
Tucannon River	50,000	50,000	4.5	1+	100% CWT	7,500	April 2014
	50,000	43,000	4.5	1+	20K AD/CWT 30K AD Only	7,500	April 2014

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

C. Trapping

Brood Year 2014

Current survival estimates indicate that 24 spawned females should provide enough eggs to meet the smolt production goal of 100,000. Therefore, 25 females and 25 males (natural and hatchery endemic origin) will need to be collected for the broodstock. The broodstock collection plan for 2014 is to collect adults over a four week period until about mid-April. The collection rate would be 50% of the natural origin females that arrive at the adult trap during this four week collection window and returning endemic steelhead adults will comprise up to 30% of the broodstock/spawners if necessary. To supplement broodstock needs, a fifth week of collection may occur including additional natural males that may be spawned at the trap and passed upstream. This broodstock collection plan would be reconsidered annually and revised after more data are available to help guide this process. 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 removed and put into the lakes or donated to local food banks. 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 are hung annually on a moveable aluminum cross beam four feet above the sheet pile cap. This diversion structure has contributed to the increased success of adult steelhead trapping.

D. Spawning

Based on fecundity, survival estimates, and potential IHN positive females, LFH typically spawns 24 females to provide 120,000 green eggs for the current conservation and harvest program. Spawning has occurred in March and 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, ran through an automated egg sorting machine and enumerated, and placed 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. The implementation of adipose clipping of Tucannon endemics would begin at

a hatchery production of 76K or larger, with 50k to remain unmarked at all production levels. This action would help restore the non-tribal fishery in the Tucannon River.

Table 133. Proposed BY 2014 Tucannon River summer steelhead production.

Site	BY13 Goal	Size (fpp)	Age	Mark/CWT/ Elastomer	PIT Tags	Transfer/Release Date
Tucannon River (above Curl Lk.)	50,000	4.5	1+	100% CWT	7,500	April 2015
Tucannon River (below TFH)	50,000	4.5	1+	20K ADCWT 30K AD only	7,500	April 2015

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 (*revised program*)

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 in December 2012, and will now produce steelhead to be released in the Walla Walla River (100,000), Dayton AF (85,000), Cottonwood AF (200,000), and on-station at Lyons Ferry (60,000-160,000 depending on Tucannon Endemic stock production).

A. Fish on Hand

Brood Year 2013

In August 2013, LFH had approximately 503,000 (BY13) Wallowa stock summer steelhead juveniles on hand. Adults were trapped and spawned at the Cottonwood Creek facility. Gametes were collected and transported to LFH in large coolers for fertilization. Many of the excess adults, or those that had to be culled for retrieval of CWTs, were provided to the local foodbank. All of these fish will be marked, tagged, and with the exception of the marked groups moved to Lake #1 & #3 in September.

B. Tagging, Transfers, and Releases

Brood Year 2013

In September 2013, these fish will be adipose fin clipped into Lake #1 & #3. (Table 14). In February 2014, 182K from Lake #3 and the 20K marked group will be 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). Also in February 2014, the balance of 66K in Lake #3 and the marked group of 20K will be transferred to the Dayton AF. They are reared for approximately 2.5 months, with volitional release into the Touchet River completed by the end of April 2014. In mid-April, about 80K fish from Lake #1 and the 20K marked group will be trucked to the Walla Walla River for direct stream release at the McDonald Bridge (RM 32) access site. The final 90K from Lake #1 and the 20K marked group of fish will be released directly from LFH into the Snake River in mid-April. Each release group will have representative PIT tagging for each rearing type.

Table 144. Proposed BY 2013 Wallowa stock summer steelhead tagging, transfers and releases.

Site	BY13 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	180,000 20,000	4.5	1+	AD Only AD/CWT	3,000 3,000	Transfer to Cottonwood AF in Feb, release in April 2014 *2,000 PIT tags are part of the CSS study from the Fish Passage Center
Dayton AF on the Touchet River	65,000 20,000	65,000 20,000	4.5	1+	AD Only AD/CWT	1,500 1,500	Transfer to Dayton AF in February 2014 for release in April
Walla- Walla River	80,000 20,000	80,000 20,000	4.5	1+	AD Only AD/CWT	1,500 1,500	Direct stream release in mid-April 2014
Snake River (On site at Lyons Ferry)	90,000 20,000	90,000 20,000	4.5	1+	AD Only AD/CWT	1,500 1,500	Direct stream release in mid-April 2014

C. Trapping

Brood Year 2014

Trapping of returning Wallowa stock adults occurs on Cottonwood Creek (a small tributary to the Grande Ronde River) March through April. 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 140 complete spawned females are needed to provide 700,000 green eggs for the program of 485,000 smolts. All unmarked steelhead are not retained for spawning, but passed upstream to spawn naturally. All spawned carcasses not considered good quality for food banks will be returned to LFH for burial. 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, or to expand production of this stock for release elsewhere in SE WA.

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, 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. 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, ran through an automated egg sorting machine and enumerated, and placed 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.

Table 155. Proposed BY 2014 Wallowa stock summer steelhead tagging, transfers and releases.

Site	BY14 Goal	Size (fpp)	Age	Mark/CWT/ Elastomer	PIT Tags	Transfer/Release Date
LFH on station - Snake River	90,000 20,000	4.5	1+	AD Only AD CWT	1,500 1,500	April 2014
Dayton AF- Touchet River	65,000 20,000	4.5	1+	AD Only AD CWT	1,500 1,500	Transfer to Dayton AF in February 2014, release in April 2014
Direct stream release - Walla Walla River	80,000 20,000	4.5	1+	AD Only AD CWT	1,500 1,500	April 2014
Cottonwood AF on the Grande Ronde	180,000 20,000	4.5 4.5	1+ 1+	AD-Only AD//CWT	1,500 1,500	April 2014 2,000 PIT tags are part of the CSS study from the

F. Research

At this time, there is no research planned for this stock.

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 opportunities as a result of construction and operation of the lower Snake River dams. The original LSRCP goal was 93,000 lbs. However, the Washington Department of Game determined that in stream habitat improvements, equivalent to the cost of producing 7,000 lbs. annually of hatchery trout, was a reasonable exchange, and that was implemented in 1983, at which reduced the annual production goal to 86,000 lbs for the Basin. The SE Washington production goal is 79,000 lbs. and the NW Idaho production goal is 7,000 lbs. A small, privately funded program (TSS) at the TFH rears rainbow to 1½ pounds each, providing a unique fishing opportunity in local lakes. This locally funded program replaced the previously state funded program in 2011 which had been in place since the LSRCP took ownership of the Tucannon Hatchery. The agreement at that time was that the state funded program would be allowed to continue at the TFH.

A. Fish on Hand

Brood Year 2012

In August 2013, LFH and TFH had a combined total of approximately 161,000 diploid Spokane stock rainbow trout on hand. LFH also had 47,000 *triploid* Spokane stock rainbow trout on hand, in which 17,600 are planned to be shipped to IDFG in late September 2013 as fall catchables, 29,500 to Rock Lake as fall catchables in October, and 1,650 for the NPT for spring released jumbos.

B. Tagging, Transfers, and Releases

The IDFG fall catchable will be planted in the Moose Creek Reservoir by IDFG staff in late September. All fish for IDFG are triploids from the Spokane stock rainbow trout. Refer to Table 16 for the 2013-14 proposed planting allotment.

In spring 2014, 57,550 catchable (2.5 fpp) and 1,000 jumbos (1.5 lbs each) will be planted by LFH drivers into various lakes in southeast Washington. Spring planting begins in February and is completed in March.

At the TFH, the goal is to plant 93,358 diploid Spokane stock rainbow trout into various lakes in southeast Washington as catchables (2.6 fpp, avg.). 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. No Spokane stock rainbow trout are tagged or fin clipped at LFH or TFH.

Table 166. Proposed BY 2012 Spokane rainbow trout tagging, transfers and plants

Facility	BY12 Goal	Expected at release	Size (fpp)	Lbs.	Age	Mark/CWT/Elastomer	PIT Tags	Transfer/Release Date
Lyons Ferry	17,600	17,600	3.0	5,867	1	None	None	Transfer to and planted by IDFG in Sept/Oct 2013
	29,500	29,500	3.0	9,833	1	None	None	Planted in early Oct 2013
	74,000	74,000	2.5	29,600	1+	None	None	Planted in Feb-Apr 2014
	1,000	1,000	0.67	1,493	1+	None	None	Planted in Feb-Apr 2014
	1,650	1,650	1.0	1,650	1+	None	None	Transfer to and planted by NPT in Mar-May 2014
Tucannon	94,000	94,000	2.5	37,600	1+	None	None	Planted in Mar-June 2013
	4,000	4,100	0.67	6,119	1+	None	None	Planted in Feb-May 2013

C. Rearing

Eggs for Washington’s legal and jumbo programs, along with Idaho’s fall catchable plants come from WDFW’s Spokane Hatchery (Spokane stock). WDFW managers completed an Inland Trout Stocking Plan in 2012 for all hatcheries and water bodies in Washington. The management strategy is to plant larger catchables (2.5 fpp) at reduced numbers. Total pounds reared were not affected (**Table 17**).

About 65,000 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 eyed rainbow eggs (Spokane stock 2013) 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 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.

The Inland Trout Stocking Plan will impact the numbers of catchable trout planted by LFH and TFH. A reduction of 35,116 catchable occurred in 2012 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 17** for the proposed BY 2013 Spokane rainbow trout program.

Table17. Proposed BY 2013 Spokane rainbow trout releases.

Site	Number	Size (fpp)	Lbs.	Age	Mark/CWT/Elastomer	Pit Tags	Transfer/release Date
SE Washington Lakes	29,500	3.0	9,833	1	None	None	Planted in early October 2014 Planted in February through June 2015
	150,908	2.5	67,200	1+	None	None	
	1,000	1.5 lbs ea	1,493	1+	None	None	
	4,000*	1.5 lbs ea	5,970*	1+	None	None	
IDFG	17,600	3.0	5,867	1	None	None	Transfer to and planted by IDFG in Sept/Oct 2014
NPT	1,650	1.0	1,650	1+	None	None	Transfer to and planted by NPT in Mar-May 2015

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

D. Research

At this time, there is no research planned for this stock.

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

The co-managers have agreed to discontinue injecting females in a portion or all of the broodstock in 2013. 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. 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.

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 spring Chinook broodstock will receive a pre-spawning injection with erythromycin. All females can receive multiple injections. 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 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 until combining occurs when they are tagged into the lakes.

Eggs from the Tucannon and Touchet endemic programs with high levels of IHN virus ($>10^4$) 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 10^4) 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 are either directly involved in the operation of the LFC, or in related programs and facilities.

Table18. Contact List.

Name	Agency	Position	Phone	E-mail
Policy				
Pete Hassemer	IDFG	Anadromous Manager	208-334-3791	phassemer@idfg.idaho.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
Jon Lovrak	CTUIR	Production Leader	541-429-7278	jonlovrak@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	LFH Supervisor	509-646-3454	Dick.Rogers@dfw.wa.gov
Doug Maxey	WDFW	TFH Supervisor	208-621-3502	Douglas.Maxey@dfw.wa.gov
Ace Trump	WDFW	LFC Manager	509-481-0525	Ace.Trump@dfw.wa.gov
Mike Key	NPT	FCAP	208-388-2353	mikek@nezperce.org
Paul Abbott	IPC	Hatchery Biologist	208-388-2353	pabbott@idahopower.com
Aaron Penny	NPT	NPTH Supervisor	208-621-3504	aaronp@nezperce.org
Marc Garst	ODFW	Irrigon Hatchery Manager	541-922-5732	Marc.Garst@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_kraker@fws.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
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
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: 2013 Requests for Fall Chinook Production Fish/Eggs (2013 Broodyear)

2008- 2017 US v Oregon	Priority under USvOR (SRFMP)	Who	Release site	Age	# for release	transfer	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		95.9%	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		Snake R. (Late CJ/CCD)	subs	200,000		95.9%	1.04267	208,533	for loss from transfer to release	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
12	13WDFW/Irrigon		GRR-direct release	eyed eggs	200,000	210,500	96.1%	1.04020	218,963	4.99% eye-release loss	3,573,599
14	16WDFW/Irrigon		GRR-direct release	eyed eggs	200,000	210,500	96.1%	1.04020	218,963	4.99% eye-release loss	4,096,920
14	14DNFH/Irrigon		Transportation	eyed eggs	78,000	82,095	96.1%	1.04020	85,396	4.99% eye-release loss	3,658,994
9	9IPC-Irrigon		HC Dam	eyed eggs	200,000	211,000	96.1%	1.04020	219,483	5.2% eye-release loss	2,663,866
13	15IPC-Irrigon		HC Dam	eyed eggs	200,000	210,500	96.1%	1.04020	218,963	4.99% eye-release loss	3,877,957
15	17IPC-Irrigon		HC Dam	eyed eggs	600,000	631,500	96.1%	1.04020	656,889	4.99% eye-release loss	4,753,809
					1,728,000						1,892,360

4,100,000 released		4,394,709 (4.4 million) green eggs to meet needs through priority 15	
number of Snake River /LGR origin females needed to spawn		1,280	(Estimated using 3,750 eggs/F)
For 2013..... Scenario #1 - presumes the majority of females for broodstock will be trapped at LGR			
1. LGR trapping		1,300	females
		1,300	males
2. LFH trapping		0	females
(will only be used if Short on broodstock.)		0	Males

Appendix B: 2013 Fall Chinook Trapping/Sampling Protocols at LGR

by

Debbie Milks, WDFW
Bill Arnsberg/Bill Young, NPT
Stuart Rosenberger, IPC
Stuart Ellis, CRITFC
August 27, 2013

The sample rate at LGR Trap will be set at 12% and kept at that level throughout the season, if possible. If the trap is swamped with fish: Shut down the 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 two staff for helping with the broodstock collection activities at LGR and the COE and NPT are providing Aquí-S for the fall trapping period. WDFW will be providing some Aquí-S for the 2014 trapping period but discussions will need to occur about who will supply the rest of the Aquí-S for the fall period. 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.

In an effort to reduce the numbers of jacks and jills hauled to the hatcheries and to reduce the numbers of fish sacrificed with wire for run reconstruction purposes the following protocols were approved by co-managers in the basin on 8/22/2013. The sub-sampling of wire tagged fish should allow for ample recoveries for evaluation purposes.

Mangers are in contact with food banks and it appears that it may be possible to fillet some of the fish after sampling, and use them in the food bank. Food bank fish will primarily come from the early wire tagged "SMALLS" group of males <70 cm wire tagged group trapped early in the season. Wire tagged females <70 cm will be added to the "BIGS" group of fish and may be used for broodstock if needed. If not needed for broodstock, these smaller younger aged females will be used for run reconstruction needs.

Appendix C: 2013 Fall Chinook Trapping/Sampling Protocols

Protocols:

- 1) This is the first year we will NOT operculum punch fish trapped at LGR.
- 2) This is the first year females will not be inoculated. Males will not be inoculated either.
- 3) Sort by code fish follow the same haul/release protocol below unless the tag action code indicates that the fish should be radio tagged
- 4) LFH will haul 70% of the fish trapped fish >70 cm and the NPT will haul 30%.
- 5) All wire tagged males <70 cm (aka: SMALLS) will be held separately in a tank and hauled to LFH.
- 6) Wire tagged females <70 will be added to the tank of “LARGE” fish and either hauled to LFH or NPTH.
- 7) Jacks suspected of being summers will need to be subsampled for wires.

Wire tagged fish:

Fork Length	Action
≥ 70cm	Haul all wires (no scales collected)
<70 cm	Haul 1 out of 5 wires (put F in with “LARGES” and M go into “SMALLS” tank)
	Release 4 out of 5 wires (no scales collected)

Untagged fish:

Fork Length	Action
≥ 70 cm	Haul all fish (collect scales on 1 in 3) data will be used to document arrival timing and profile the run for reconstruction needs.
<70 cm	Release all (collect scales on 1 in 3) data will be used to document arrival timing and profile the run for reconstruction needs.

October 2 changes to the protocol:

Increased trapping rate to 15% and gave 1-ROP punch to fish hauled to the hatcheries

October 9 changes to the protocol:

Increased trapping rate to 20%, hauled all females trapped (other than needed for radio tagging study), and gave 1-LOP punch to fish hauled to the hatcheries

Appendix D: 2013 Trapping & Mating Protocol at LFH

LFH opened its trap October 2, due to shortfall of females being collected at LGR. Staff targeted fish >80 cm to increase numbers of older aged fish for broodstock. The size criteria was further relaxed to 75 cm on October 15.

Sorting protocol

Sort LFH trapped fish during first spawn on October 22.

Count and sex all fish: 1) Males and females ≥ 75 , 2) Males and females <75.

Count LGR trapped females returned to the pond during the spawn day.

Mating protocol at LFH

Due to shortages in females, jills and strays will be included in broodstock. No more than 5% of the broodstock may be stray females.

All wire tagged fish must wait until their CWTs are decoded before they are used in a mating. Strays will be culled based on CWTs.

Wire tagged Males verified as adults can be used on multiple females.

Untagged Males ≥ 75 cm can be used on multiple females.

Untagged Males 70-74 cm will only be used in 1 x 1 crosses unless there is a shortage of males.

Males <70 cm will not be used in matings unless they are verified as adults. This size criteria may be adjusted in season.

Jills

Jills will be cycled back to the holding pond for the first three weeks. If we have enough adult females to make production goals, jills will not be used in production. If jills are used for broodstock they will be kept separate until a decision can be made regarding what to do with the eggs. Jills verified by CWTs will be spawned with males of a larger fork length. Any male used on a jill must also be used on a larger or older aged fish that will be retained for production. This will be done to ensure if the jill is culled or a fry plant is made, the gametes from the male will still contribute elsewhere in production.

NOTE: THE PBT PROPOSAL COVERS SAMPLING OF PRODUCTION GROUPS LISTED IN US V OREGON B4B. **PRODUCTION FROM JILLS ARE IN EXCESS OF B4B GOALS AND ARE THEREFORE NOT FUNDED THROUGH THE PROPOSAL.**

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; ring lock 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, micro diffusers 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 reduce 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 back flush 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, and 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.

Beginning in 2014, a second release group of approximately 200,000 sub-yearlings will be transferred to Captain John Rapids approximately four days after the release of the first group. This second group was used as a direct stream evaluation and released near Captain John rapids prior to 2014 as priority 11 in the US v OR Management agreement table. The five year direct stream release study has ended and co-managers agreed to change the release location and acclimate this group at Captain John Rapids.

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 2013:

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

Sub-yearling fish are acclimated approximately three weeks (two weeks for each group at Captain John Rapids) 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 2014:

- Pittsburg Landing – May 20
- Captain John Rapids first group – May 10
- Captain John Rapids second group – May 27
- Big Canyon – May 22

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: 2013 Releases - Fall Chinook Pit Tag Allocation (USvOR agreement)

Summary of PIT tag allocation for release year 2013 Snake River fall Chinook salmon hatchery production. Based on representative tagging for in-season run forecasting, sample sizes of 210,000 tags (60k yearlings and 150k subyearlings) plus additional tags for juvenile survival & small scale studies (6-8-2012).

Priority	Production Program						Release numbers available for PIT tagging		Tagging Lead / Uploading
							Subyearlings	4,245,000	
	Yearlings	60,000							
	Subyearling Sample Size	150,000							
Rearing Facility	Number	Age	Release Location(s)	PIT Tag #'s Monitor Mode	PIT Tag #'s Bypass if Collected	Yearlings	Subyearling Sample Size	Representative Allocation	
					BIC				
1	Lyons Ferry	450,000	1+	On station	30,000	0	30,000	WDFW/WDFW(monitor mode for SARs)	
2	Lyons Ferry	150,000	1+	Pittsburg Landing	10,000	4,000	10,000	NPT	
3	Lyons Ferry	170,000	1+	Big Canyon	10,000	4,000	10,000	NPT	
4	Lyons Ferry	155,000	1+	Captain John Rapids	10,000	4,000	10,000	NPT	
5	Lyons Ferry	200,000	0+	On station	50,000	0	50,000	WDFW/WDFW(monitor mode for SARs)	
6	Lyons Ferry	500,000	0+	Captain John Rapids	11,655	3,000	11,655	NPT	
7	Lyons Ferry	500,000	0+	Big Canyon	13,158	3,000	13,158	NPT	
8	Lyons Ferry	200,000	0+	Pittsburg Landing	4,662	3,000	4,662	NPT	
9	Irrigon	200,000	0+	Hells Canyon Dam	4,662	3,000	4,662-	IPC	
10	Lyons Ferry	200,000	0+	Pittsburg Landing	4,662	0	4,662	NPT	
11	Lyons Ferry	200,000	0+	Direct stream evaluation Near Captain John Rapids	4,662	3,000	4,662	NPT/WDFW	
13	Irrigon	200,000	0+	Grande Ronde River	4,662	3,000	4,662-	IPC?	
15	Irrigon	200,000	0+	Hells Canyon Dam	4,662	0	4,662	IPC	
16	Irrigon	195,000	0+	Grande Ronde River	4,545	0	4,545-	IPC?	
17	Irrigon	250,000	0+	Hells Canyon Dam	5,828	0	5,828	NPT	
NPTH 1	NPTH	500,000	0+	NPTH	13,158	3,000	13,158	NPT/NPT	
NPTH 2	NPTH	200,000	0+	Lukes Gulch	5,263	3,000	5,263	NPT/NPT	
NPTH 2	NPTH	200,000	0+	Ceder Flats	5,263	3,000	5,263	NPT/NPT	
NPTH 3	Irrigon	500,000	0+	North Lapwai Valley	13,158	3,000	13,158	NPT/NPT	
TOTAL	Yearlings	900,000					210,000	PIT Yearlings	PIT Sub-Yearlings
	Subyearlings	4,245,000						60,000	150,000

Evaluation Groups:

	Production	Sample Size
Clearwater Subyearling Production	1,900,000	50,000
Snake Subyearling	2,145,000	50,000
LFH on-station Subyearling	200,000	50,000
FCAP Yearling	450,000	30,000
LFH on-station Yearling	450,000	30,000

Total PIT tags:

Subyearling COE tags	0
Yearling COE tags	0
LSRCP tags	164,006
BPA tags	69,842
IPC tags	18,152

Appendix G - Adult Disposition Model for Tucannon spring Chinook (to be reconsidered and revised by 2017)

HOR = Hatchery origin return
 NOR = Natural origin return
 modified based on Tribal comments on Jan 18, 2013 -corrected formulas for 65% of run at trap
 MAT = 750, so 555 NOR at trap provides ~750 NOR to river

								Disposition Table				PNI Prior to harvest or transfer						
Predicted HOR = 350		at trap		Total predict. HOR= 538				NOR	NOR	HOR	HOR	Program	Tribal & Nontribal					
Predicted NOR = 300		at trap		Total predict. NOR= 462				Brood	SpEsc	Brood	SpEsc	Size	Harvest	Transfer	PNI	pNOB= 0.59		
Tot. Est Return at Trap = 650		at trap						100	307	70	398	225,000	0	0	0.51	pNOS= 0.44		
Total River Return = 1,000		w/ 35% below trap		1000				100	307	70	398	225,000	0	0	0.51	pHOS= 0.56		
Brood Target = 170								w/o harvest or transfer mgmt										
Predicted	NOR	HOR	PNOB (NOR)	At trap NOR	At trap HOR	At Trap Total	At trap NOR	NOR total river	HOR total river	Total River Escapem	Total Run Size	Total Escap	Total NOS	pNOS	Total HOS	pHOS		
at Trap	Broodst.	Broodst.	Brood %)	SpEsc	SpEsc	Esc	Esc%	escapem.	escapem.	NOR +HOR	in Tuc. R.	prespaw	Escapement	(NOS	Escapement	(HOS		
												loss	after 15%	escapement	after 15%	escapement		
													presp loss	(%)	presp loss	(%)		
50	50	120	100%	0	230	230	0.0%	27	418	445	615	379	23	6.0%	356	94.0%		
100	50	120	50%	50	230	280	17.9%	104	418	522	692	444	88	19.9%	356	80.1%		
150	75	95	50%	75	255	330	22.7%	156	443	599	769	509	132	26.0%	377	74.0%		
200	85	85	50%	115	265	380	30.3%	223	453	676	846	575	189	32.9%	385	67.1%		
250	85	85	50%	165	265	430	38.4%	300	453	753	923	640	255	39.8%	385	60.2%		
300	100	70	59%	200	280	480	41.7%	362	468	830	1000	706	307	43.6%	398	56.4%		
350	110	60	65%	240	290	530	45.3%	428	478	907	1077	771	364	47.2%	407	52.8%		
400	130	40	76%	270	310	580	46.6%	485	498	984	1154	836	413	49.3%	424	50.7%		
450	150	20	88%	300	330	630	47.6%	542	518	1061	1231	902	461	51.1%	441	48.9%		
500	170	0	100%	330	350	680	48.5%	599	538	1138	1308	967	509	52.7%	458	47.3%		
550	170	0	100%	380	350	730	52.1%	676	538	1215	1385	1032	575	55.7%	458	44.3%		
600	170	0	100%	430	350	780	55.1%	753	538	1292	1462	1098	640	58.3%	458	41.7%		
650	170	0	100%	480	350	830	57.8%	830	538	1368	1538	1163	706	60.7%	458	39.3%		
700	170	0	100%	530	350	880	60.2%	907	538	1445	1615	1229	771	62.7%	458	37.3%		
750	170	0	100%	580	350	930	62.4%	984	538	1522	1692	1294	836	64.6%	458	35.4%		
800	170	0	100%	630	350	980	64.3%	1061	538	1599	1769	1359	902	66.3%	458	33.7%		
850	170	0	100%	680	350	1030	66.0%	1138	538	1676	1846	1425	967	67.9%	458	32.1%		
900	170	0	100%	730	350	1080	67.6%	1215	538	1753	1923	1490	1032	69.3%	458	30.7%		
950	170	0	100%	780	350	1130	69.0%	1292	538	1830	2000	1556	1098	70.6%	458	29.4%		
1000	170	0	100%	830	350	1180	70.3%	1368	538	1907	2077	1621	1163	71.8%	458	28.2%		
1100	170	0	100%	930	350	1280	72.7%	1522	538	2061	2231	1752	1294	73.9%	458	26.1%		
1200	170	0	100%	1030	350	1380	74.6%	1676	538	2215	2385	1882	1425	75.7%	458	24.3%		
1300	170	0	100%	1130	350	1480	76.4%	1830	538	2368	2538	2013	1556	77.3%	458	22.7%		
1400	170	0	100%	1230	350	1580	77.8%	1984	538	2522	2692	2144	1686	78.7%	458	21.3%		
1500	170	0	100%	1330	350	1680	79.2%	2138	538	2676	2846	2275	1817	79.9%	458	20.1%		

Model Calculations and Assumptions

- Cell C5 - Predicted HOR at Tucannon FH trap: This is an entered number based on preseason projection
- Cell C6 - Predicted NOR at Tucannon FH trap: This is an entered number based on preseason projection
- Cell C7 - Total Estimated Run at the trap: Sum of HOR and NOR preseason projections
- Cell C8 - Total run at trap divided by 0.65 to estimate total return to Tucannon River, including downstream of trap (35%).
- Cell C9 - Brood Number: This is a constant number of 170 based on a 225,000 production level at HOR levels >500 - would be adjusted downward at lower HOR levels
- Column A - Predicted NOR at the trap: Lookup value column based on cell C6 preseason projection at trap.
- Column B - NOR Broodstock Requirement: generally 50% of brood need up to 350 NOR predicted return to trap, except at NOR < 100
- Column C - HOR Brood Requirement: Total brood need - NOR brood
- Column D - NOR Brood Percent: % NOR in broodstock
- Column E - NOR at trap minus NOR broodstock taken
- Column F - HOR Spawning Escapement above the trap after broodstock taken
- Column G - Total NOR and HOR Spawning Escapement above the trap after broodstock
- Column H - % NOR Escapement Percent above trap
- Column I - NOR total spawning escapement (trap passage plus 35% below the trap)
- Column J - HOR total spawning escapement (trap passage plus 35% below trap)