LYONS FERRY COMPLEX
ANNUAL OPERATIONS PLAN

For the Period of

OCTOBER 1, 2014 – SEPTEMBER 30, 2015

Prepared by:

Washington Department of Fish and Wildlife

Washington Department of FISH AND WILDLIFE

Nez Perce Tribe

NEZ PERCE FISHERIES

IDAHO POWER. An IDACORP Company

Confederated Tribes of the Umatilla Indian Reservation

OREGON Fish & Wildlife

Funded By the Bonneville Power Administration through the Lower Snake River Compensation Plan

LOWER SNAKE RIVER COMPENSATION PLAN *Hatchery Program*

BONNEVILLE POWER ADMINISTRATION

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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).

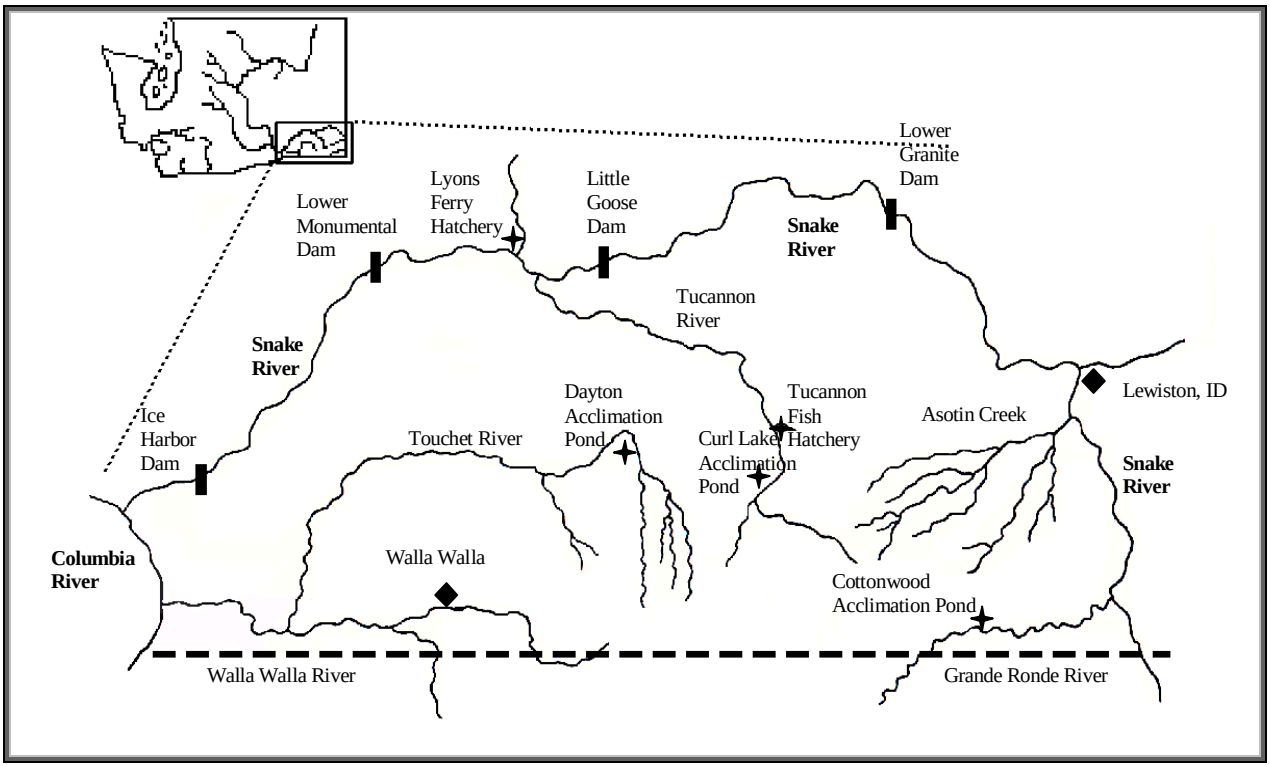

Figure 1. Map of the Lower Snake River Compensation Plan (LSRCP) LFC Facilities, and major rivers and streams in Southeast Washington.

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 2.5 fish per pound (fpp), including 73,200 fall Chinook, 4,608 spring Chinook and 9,312 summer steelhead 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 the Washington Department of Fish and Wildlife (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 (ft^3) 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 subyearling 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 that year with the second half completed in the 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^o 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 ^{o} 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^{o} F and well #3 running a constant 61^{o} F. Spring water is pumped from an underground collection site to the same aeration tower as the well water and gravity fed to the rearing units. The water right for this source is 5.3 cfs, and has a stable temperature of 51 or 52^{o} 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 ft^{3} 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 ft^{3} 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 ft^{3} 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^{o} 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 ft^{3} 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^{o} 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 ft^{3} 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 ^{o} 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 455,000 yearling and 1,600,000 subyearling 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 BY2014 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. The first releases were in 2014. The numbers of fish released in 2014 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. The emphasis on this area will be increased rearing area for the Tucannon endemic steelhead program with new and larger rearing tanks. Current recommendations are to increase the mitigation release numbers from 100k to 150k for this program.

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 (HSRG) 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 Spring Chinook Steelhead Rainbow TOTALS	9,160,000 132,000 931,200 260,000 **10,483,200**	101,800 8,800 116,400 86,000 **313,000**	3,100,000 230,000 670,000 122,100 **4,122,100**	119,167 8,000 131,388 47,893 **306,448**
Tucannon[b]	Tucannon (36)	Wells, Springs, Tucannon R.	Spring Chinook Rainbow Steelhead TOTALS	132,000 210,000 -0- **342,000**	8,800 39,285 -0- **48,085**	253,000[c] 97,298 75,000 **425,298**	14,056 37,377 16,667 **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 Spring Chinook	**160,000** -0-	**32,000** -0-	-0- **225,000**	-0- **18,750**
Dayton AF	Touchet (53)	Touchet R.	Steelhead	**125,000**	**27,750**	**85,000**	**18,889**

[a]Lyons Ferry Hatchery was designed to accommodate subyearling 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 subyearlings and 0.14 for yearlings.

[b]Tucannon 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.

[c]Spring 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.

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

Species	Year slated for release/transfer				
	2014 Goal	2014 Actual Plants and Transfers	2015 Goal [a]	Fish/Eggs on Hand For 2015 Goal	2016 Tentative Plan [a]
Fall Chinook					
Yearling releases:	**BY 2012**	**BY 2012**	**BY 2013**	**BY 2013**	**BY 2014**
LFH-on station	450,000	503,273	450,000	480,000	450,000
NPT – FCAP (transfer)	465,000	487,800	465,000	480,000	455,000
Subyearling releases:	**BY 2013**	**BY 2013**	**BY 2014**	**BY 2014**	**BY 2015**
LFH-on station	200,000	209,972	200,000	0	200,000
NPT – FCAP	1,400,000	1,441,603	1,403,000	0	1,403,000
NPT – Capt. John 2	200,000	191,220	201,000	0	201,000
Eyed Egg Transfers:	**BY 2013**	**BY 2013**	**BY 2014**	**BY 2014**	**BY 2015**
Irrigon-IPC	1,112,000	1,155,504	1,100,000[d]	0	1,100,000[d]
Irrigon - Direct – GRR	421,000	403,926	440,000[d]	0	440,000[d]
Spring Chinook					
	BY 2012	**BY 2012**	**BY 2013**	**BY 2013**	**BY 2014**
Yearling smolt production	197,000	231,800	197,000	220,000	225,000
Smolt rearing study @ TFH	28,000	30,044	28,000	28,000[b]	0
Summer Steelhead (Stock)					
	BY2013	**BY 2013**	**BY2014**	**BY 2014**	**BY 2015**
On Station (Wallowa)[c]	110,000	117,500	110,000	99,000[f]	60,000[g]
Touchet (Wallowa)[c]	85,000	86,000	85,000	86,000	85,000
Walla-Walla (Wallowa)[c]	100,000	109,076	100,000	101,000	100,000
Cottonwood (Wallowa)	200,000	201,000	200,000	201,000	200,000
Tucannon (Endemic)	100,000	93,000	100,000	116,000	150,000[g]
Touchet (Endemic)	50,000	51,000	50,000	56,000	50,000
Spokane Rainbow Trout					
Mitigation	**BY 2012**	**BY 2012**	**BY 2013**	**BY 2013**	**BY 2014**
Catchables	196,798	204,732	197,500	220,000	197,500
Jumbo's	1,000	1,216	1,000	1,200	1,000
IDFG Catchables	15,950	7,500[e]	17,600	20,000	17,600
Jumbo's – NPT's	1,650	800[e]	1,650	1,700	1,650
State Program					
Jumbo's – TSS organization	4,000	4,178	4,000	5,254	4,000

[a] Based on the *US v. Oregon* table B4b.;
[b] Smolt production includes 28,000 from 3rd year of proposed rearing study at the Tucannon Hatchery.
[c] Change in stock from LFH to Wallowa.
[d] Transfer numbers include an 10% overage to assure IPC meets mitigation goals if coagulated yolk problems persist at Irrigon.
[e] 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.
[f] Number reduced due to bad outbreak of Bacterial Cold Water disease.
[g] Dependent on agreed upon adult mgmt. plan and broodstock collection plan and round tanks installed at LFH for rearing. Per the US v OR agreement: The on-station release at Lyons Ferry will vary from 60,000-135,000 related to smolt production targets for the Tucannon River so that the total program equals 210,000 (e.g., 100,000 Tucannon + 110,000 on-station at Lyons Ferry).

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 primarily collected at Lower Granite Dam (LGR), but may be collected at LFH if trapping at LGR is limited.

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 BY2014 fall Chinook production based on table *B4B*.

The LFH was initially designed to release 9.16 million fall Chinook subyearlings (**Table 1**) at around 90 fpp. Currently this facility produces 1.8 million subyearlings at approximately 50-75 fpp and another 915,000 yearlings at 10-12 fpp. For the last several years more fish have been released than targeted due to improved survivals in the hatchery and at FCAP facilities. Transfer numbers will be reduced for BY14 to minimize the chance that hatchery release goals will be exceeded. Out of this production, LFH will transfer 455,000 yearlings and 1.604 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 subyearlings. Size at release goal for acclimated fall Chinook yearlings is 10.0 fpp and 50 fpp for subyearlings. Approximately 1,540,000 eyed eggs will be transferred to and reared at the Oregon Department of Fish and Wildlife's (ODFW) 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	225KAd+CWT 225K CWT
2	Lyons Ferry	150,000	1+	Pittsburg Landing	70K Ad+CWT 80K CWT only
3	Lyons Ferry	150,000	1+	Big Canyon	70K Ad+CWT 80K CWT only
4	Lyons Ferry	150,000	1+	Captain John Rapids	70K Ad+CWT 80K CWT only
5	Lyons Ferry	200,000	0+	On station	200K Ad+CWT
6	Lyons Ferry	500,000	0+	Captain John Rapids 1	100K Ad+CWT 100K CWT only 300K Unmarked
7	Lyons Ferry	500,000	0+	Big Canyon	100K Ad+CWT 100K CWT only 300K Unmarked
8	Lyons Ferry	200,000	0+	Pittsburg Landing	100K Ad+CWT 100K CWT only
9	Irrigon	200,000	0+	Hells Canyon Dam	200K Ad+CWT
10	Lyons Ferry	200,000	0+	Pittsburg Landing	200K Unmarked
11	Lyons Ferry	200,000	0+	Captain John Rapids 2	200K Ad+CWT
12	Irrigon	200,000	0+	Grande Ronde River	200K Ad+CWT
13	Irrigon	200,000	0+	Hells Canyon Dam	200K Ad+CWT
14	Irrigon	200,000	0+	Grande Ronde River	200K Unmarked
15	Irrigon	600,000	0+	Hells Canyon Dam	600K Ad only
TOTAL	**Yearlings**	**900,000**			
	Subyearlings	**3,200,000**			

A. Fish on Hand

Brood Year 2013

In mid-August 2014, LFH has 920,000 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 2015. Approximately 30,000 of the on-station yearlings were PIT tagged in August. Approximately 450,000 yearlings will be released on-station at LFH, and a total of 465,000 are anticipated at transfer to all the FCAP facilities in Feb-Mar 2015. These fish may receive PIT tags (see **Appendix F**). The PIT tag detections will be used to estimate downstream survivals and document the magnitude of the adult return as the fish are coming up the Columbia and Snake Rivers. 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 2013 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	450,000	10	1+	227.5K AD CWT 225K CWT only	15,000 15,000	April 2015
Capt. John Rapids	154,000	153,000	13	1+	73K AD CWT 82K CWT Only	1,000*	Feb – 2015 (transfer)
Pittsburg Landing	155,000	154,000	12	1+	73K AD CWT 83K CWT Only	1,000*	Mar – 2015 (transfer)
Big Canyon	155,000	154,000	12	1+	73K AD CWT 83K CWT Only	1,000*	Mar - 2015 (transfer)

*Note: tags and tagging to be provided by NPT

B. Trapping

Brood Year 2014

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. Co-managers have agreed to a goal of 30% natural origin fish in the broodstock. Trapping protocols at Lower Granite and broodstock management will be targeted at achieving this goal.

The trapping goal (**Appendix C**) for broodstock is up to 2,600 (which includes approximately 1,300 females) adults based upon stray rates and pre-spawning mortalities and we anticipate that

the majority of the females needed for brood will be trapped at Lower Granite. This goal is the total numbers of fish that will need to be trapped to meet egg take goals through *Priority 15*. Collection occurs primarily at LGR, but may also occur at LFH or NPTH to meet broodstock goals. Adults trapped at NPTH may be used to supplement LFH production shortages of LGR and volunteer adult returns, and vice versa.

1. Lyons Ferry Hatchery

Trapping at LFH will not occur unless necessary to meet broodstock goals.

2. Lower Granite Dam

Trapping at LGR will begin on August 18 if water temperatures permit. (**Appendix C**). If the run is similar in size to last year, the trap rate at LGR is set at 10% with the desire to remain at the established rate all season. Collected broodstock are divided between the LFH and NPTH (usually 70:30 ratio) as agreed upon annually, with a predetermined hauling schedule shared between both facilities to meet this need. 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.

C. Spawning

Brood Year 2014

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 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. Also, the goal for BY2014 is to continue the strategy for reducing the number of "true jacks or jills" (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

Full exclusion of strays in broodstock is preferred to retain Snake River stock integrity. To abide by the US v Oregon agreement to reach eggtake goals, if broodstock limited, stray females may be included in broodstock as long as matings including a stray do not exceed 5% of the total numbers of matings at LFH. Strays will be incubated separately until we can determine if production goals can be met with Snake River origin females. If the goals can be met without using stays, we will cull the progeny prior to seasons end. 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.

Jills, (one salt fish), will not be used in production unless it has been determined that we are broodstock limited. Jills will be returned to the pond during the first three weeks of spawning regardless of maturity. 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.

Our mating protocol will minimize hatchery stray incorporation into LFH broodstock while incorporating potentially as many wild fall Chinook as possible, up to the 30% PNOB goal 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. Because the spawning population is usually large (>1,000), increasing genetic diversity is not presently a concern. A mating matrix is provided in Appendix D.

Parental Based (PBT) samples will be collected on all broodstock during spawning. 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.

Fertilized eggs will be water hardened for one hour in 100 ppm iodophor and incubated in vertical stack incubators. Distribution of progeny based on BKD ELISA sampling as identified in the fish health section of this document.

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 transported adults with CWT will be sampled for run reconstruction and any remaining non CWT fish 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 with a caudal clip 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 guidelines, adults receiving antibiotic injections and/or being anesthetized, must meet the withdrawal period for the antibiotic and/or anesthetic used prior to out planting.

D. Rearing

Brood Year 2014

Eggs are reared in the vertical incubators and are treated with formalin at a rate of 1:600 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. Hatched fry are transferred to raceways for rearing after yolk sac absorption, approximately 1,900 TU's. 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 (BGD) can occur at LFH if densities are exceeded or through additional handling, which induces stress. The un-marked groups that are CWT'd in the adult ponds will come from the same egg takes as their cohorts that will receive CWT's 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.

E. Tagging, Transfers and Releases

Brood Year 2014

In addition to the eyed egg transfers identified in Section D., this section outlines the anticipated subyearling and yearling production for BY2014 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 1,540,000 eyed eggs for the IPC program and Grande Ronde direct release (LSRCP program). Eyed eggs are transferred from LFH to the Irrigon Hatchery in mid-December where the fish are reared and tagged prior to release. Coded wire tags for the fish destined for the Grande Ronde will be purchased by WDFW and will have a WDFW Agency prefix. Quality control checks will be completed by WDFW and PIT tags will be inserted by IPC and WDFW staff as part of a cooperative effort. In first week of 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 and 200,000 will be unmarked and untagged, (priorities 12 & 14).

The IPC subyearling program at Irrigon Hatchery will receive eggs from Lyons Ferry in December and be released at Hells Canyon. Coded wire tags for the fish destined for Hells Canyon will be purchased by IPC and will have an ODFW Agency prefix. Quality control checks will be completed by WDFW and funded by IPC. PIT tags will be inserted by IPC and

WDFW staff as part of a cooperative effort. 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 to late May. These fish will be 200k Ad+ CWT and 800k Ad only. See Table 6.

Subyearlings

A total of 201,000 subyearlings are 100% coded-wire tagged and adipose fin clipped in April by WDFW and are released from LFH into the Snake River in early June. WDFW Staff will insert 20,000 PIT tags into the on-station subyearlings in May. Quality control checks will be completed by WDFW staff.

Captain John Rapids (CJR) Acclimation Facility (AF) receives 501,000 subyearlings in May, as does Big Canyon AF, from LFH. 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. Both groups are comprised of 100,000 CWT, 100,000 AD+CWT, and 300,000 unmarked fish. Pittsburg Landing AF will receive 401,000 subyearlings in May. This group is comprised of 100,000 CWT, 100,000 AD+CWT, and 200,000 unmarked fish. These fish are acclimated and released in late May by NPT at 50 fpp. Quality control checks, PIT tagging, and the purchase of the PIT tags for fish destined for FCAP facilities, including the second release of subyearlings from CJR described below, will be completed by NPT staff.

An additional 201,000 subyearlings, 100% AD+CWT including 2,000 PIT tags will be transferred to CJR in late May, acclimated, and released in June at 50 fpp. This group was previously designated for 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.

Yearlings

A yearling release of 450,000 fish from LFH directly into the Snake River at 10 fpp is programmed for 2016. All of these fish will be marked and/or tagged during July-August 2015 (225,000 AD+CWT, and 225,000 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 by WDFW staff. 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, 2016, depending on river flows and dam spills. Due to the unscreened bypass protocol for lamprey at the McNary Dam, releases shall be coordinated as to not jeopardize survival of juveniles migrating through potentially exposed turbines. Screens are fully in place at McNary Dam by April 15 each year. Since all three lakes share a common release structure, the fall Chinook release must be coordinated with steelhead releases.

Three yearling groups of 152,000 will be marked and/or tagged at LFH in July-August 2015 (AD+CWT; CWT only) and up to 9,000 PIT tags and marking as provided by NPT in fall 2015, then transferred to Captain John, Big Canyon, and Pittsburg Landing acclimation sites (at ~ 12 fpp) for final rearing and release by NPT in April 2016 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-2014 yearlings.

Table 6. Proposed BY 2014 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)	1,100,000	1,000,000	Eyed Eggs	0+	200K AD CWT 800K AD Only	1,500 1,500	Dec 2014 (eggs transfer)
Grande Ronde Direct - Irrigon	440,000	400,000	Eyed Eggs	0+	200K ADCWT 200K Unmarked	1,500 1,500	Dec 2014 (egg transfer)
LFH	N/A	200,000	50	0+	100% AD CWT	20,000	May – Jun 2015
Capt. John	501,000	100,000 100,000 300,000	75 75 75	0+ 0+ 0+	CWT Only AD CWT Unmarked	2,000	May – 2015 (transfer)
Big Canyon	501,000	100,000 100,000 300,000	75 75 75	0+ 0+ 0+	CWT Only AD CWT Unmarked	2,000	May - 2015 (transfer)
Pittsburg Landing	401,000	100,000 100,000 200,000	75 75 75	0+ 0+ 0+	CWT Only AD CWT Unmarked	2,000	May – 2015 (transfer)
Capt. John 2	201,000	200,000	50	0+	100% AD CWT	2,000	May/June 2015
LFH	N/A	450,000	10	1+	225K AD CWT 225K CWT Only	15,000 15,000	April 2016
Capt. John	152,000	150,000	13	1+	70K AD CWT 80K CWT Only	1,000	Feb - 2016 (transfer)
Pittsburg Landing	152,000	150,000	12	1+	70K AD CWT 80K CWT Only	1,000	Mar - 2016 (transfer)
Big Canyon	152,000	150,000	12	1+	70K AD CWT 80K CWT Only	1,000	Mar - 2016 (transfer)

*Note: The Couse Creek release near Capt. John has been changed to a late acclimation and release from Capt. John.

F. Research

Refer to M&E SOW for LGR fidelity and fall back radio tagging study.

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 2013

In mid-August 2014, LFH has 213,800 juvenile spring Chinook on hand that have been CWT'd.

Concurrently, TFH has an estimated 28,000 juvenile spring Chinook on hand for the full-cycle rearing study, as proposed in fall 2012. This will be the final BY for the rearing study. We will be awaiting adult return data before discussing whether or not to move the entire program to TFH. The fish at TFH will be CWT'd in September.

B. Tagging, Transfers, and Releases

Brood Year 2013

In August 2014, the BY13 progeny were 100% CWT tagged with no fin clip at LFH and will be tagged at TFH in September (**Table 7**). Each group from the experimental rearing study (TFH vs. LFH) was marked with a separate tag code.

The fish at Lyons Ferry 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 40^0 F. Checks for CWT retention are conducted prior to transferring the fish to Curl Lake AP in March. Study group fish are hatched in shallow troughs, moved to round tanks and then to Curl Lake with the fish from LFH for final acclimation. Fish brought up from LFH go into round ponds and raceways. Due to predation at Curl lake on the pre-smolts, LSCRP is providing the funding to have a cyclone fence installed around the pond to reduce mammalian access. WDFW staff will then maintain and monitor the fence. If fence is not installed, other release options will be evaluated.

Prior to fish being moved to Curl Lake for final acclimation, Biomark Inc. will come in and PIT tag 15,000 fish, 7,500 fish from each group, TFH and LFH rearing.

Table 7. 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	Release Date
Curl Lake AP	225,000	235,000	12	1+	100% CWT	15,000	Mar – Apr 2015

C. Spawning

Brood Year 2014

The egg take goal for BY2014 is 240,000 green eggs. It had been established that up to 85 females and 85 males are needed to meet the egg take goal. Due to past fecundity data, low pre-spawn mortality rates and the extremely low eyed egg mortality at LFH, this number has been reduced. There are currently 68 females and 62 males on hand at LFH as broodstock, (42 NOR females, 51 NOR males, 26 HOR females and 11 HOR males). There are an additional eight NOR females at LFH that will be put back into the Tucannon river on August 22nd. These females are above and beyond what is needed for broodstock. The current broodstock on hand is 71% NOR. No jacks were collected for broodstock in 2014. Spring Chinook adults trapped at TFH will be spawned during August through September 2014 at LFH. A 2 x 2 spawning matrix protocol is followed. 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 100ppm iodophor for one hour. All spring Chinook carcasses are disposed of on site. Staff have engaged DOE for the possibility of using spawned male carcasses for nutrient enhancement in the future.

D. Rearing

Brood Year 2014

The production estimate for BY2014 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 has been used to help in the prevention of BKD in past years. Starting with BY 2014, this treatment will no longer be administered. If needed in the future due to disease concerns we will revisit this. The 28-day treatment had been administered in mid-January thru mid-February when the fish were approximately 400 fpp.

In the event there are excess eggs above 110% of production goals, it is agreed to that they be marked parr releases at Russell Springs.

Table 8. Proposed BY 2014 Tucannon River spring Chinook tagging, transfers and releases.

Site (Type)	BY14 Goal	Expected at release	Size (fpp)	Age	Mark/CWT/ Elastomer	PIT Tags	Transfer/Release Date
Curl Lake AP	225,000	225,000	12*	1+	100% CWT	15,000	Mar – Apr 2016

* Size at release will be reevaluated at the next AOP based on adult return data from the study conducted in prior years.

E. Trapping

Brood Year 2015

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 is permitted up to 170 adults, but the target will be 140 adults. The proportion of hatchery and natural origin adults will be based on a proposed sliding scale of predicted returns to the trap and adjusted in-season, if necessary, to meet the 225,000 smolt production goal (Table 9). One-ocean age (jacks: <61 cm FL) fish will be included in the brood at a rate not to exceed 10% of the adult males during low run years. 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 adults are injected in the dorsal sinus at transfer with oxytetracycline and draxxin. Females only are re-injected with draxxin 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 2015 Tucannon River spring Chinook tagging, transfers and releases.

Site (Type)	BY15 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 2017

* Size at release will be reevaluated at the next AOP based on adult return data from the study conducted in prior years.

F. Research

The U.S. Army Corps of Engineers provided the WDFW Snake River Lab with 49 radio tags in order to tag spring Chinook at the adult trap in 2014 in an attempt to determine the reason for the high pre-spawn loss that has been observed in the last two years. Based on the observed high mortality associated with the gastrically implanted tags, tagging was discontinued after 47 fish were tagged. This study will not be conducted next year due to the high mortality incurred.

The release size study concluded with BY2010. The 2013 BY was 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. Some BY 2014 adults that ascended LGR fell back and went up the Tucannon River. This was seen in PIT tag data as the fish passed PIT tag arrays on the Tucannon.

NEW PROGRAM:

Beginning with BY2015, an additional spring chinook program was agreed upon at the AOP. WDFW will be receiving eyed eggs from the Rapid River stock. The first two years will target 325k smolts for release. This is just a heads up for the upcoming program and a full section will be included in the next AOP when the program is slated to begin. Co-managers will begin discussions on everything in the near future.

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 ODFW 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 are now released in the Grand Ronde river, Walla Walla and Touchet rivers and on-station at Lyons Ferry Hatchery into the Snake river.

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 1.8% and 1.4%, respectively for the 2004-2010 release years. In contrast, SAS and SAR to McNary for the Touchet Endemic stock is 0.64% and 0.51%, 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 the full expansion of the program to the agreed to 150k level.

2) In going with one hatchery stock for releases in the Walla Walla River, Lyons Ferry and Cottonwood, this action will free up a rearing lake at Lyons Ferry; which will allow for

the possibility of bringing in another stock for LSRCP harvest mitigation. At this time the third lake is intended to get Rapid River stock spring Chinook starting with BY2015.

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 2015-2016.

V. TOUCHET SUMMER STEELHEAD

The Touchet River summer steelhead is considered an endemic program. Through brood year 2014, all production was derived from natural parentage broodstock. Beginning in BY15, co-managers have agreed to begin incorporating HORs into the brood stock. A 3 to 5 year study will be conducted comparing performance of 100% pNOB against 50% pNOB groups. 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 electric narcosis (EN).

A. Fish on Hand

Brood Year 2014

In mid-August 2014, LFH had approximately 56,200 Touchet River summer steelhead juveniles on hand. These fish will ultimately be direct stream released into the Touchet River at Baileysburg Bridge, (Touchet RM 32) in April 2015.

B. Tagging, Transfers, and Releases

Brood Year 2014

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 2015, 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 10. Proposed BY 2014 Touchet summer steelhead smolts tagging, transfers and releases.

Site	BY14 Goal	Expected at release	Size (fpp)	Age	Mark/CWT/ Elastomer	PIT Tags	Transfer/Release Date
Touchet River (**direct**)	50,000	52,000	4.5	1+	100% CWT	**-0-**	April 2015

C. Trapping

Brood Year 2015

Trapping of BY15 Touchet River endemic stock will begin 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. Per co-manager agreement, WDFW evaluation staff target collecting 16 females and 20 males for the broodstock (75% natural origin and 25% hatchery origin), with all other wild fish passed upstream for natural spawning. Hatchery fish (Touchet endemic origin) not collected for brood will also be passed above the trap to spawn naturally in the Touchet River. We will spawn a minimum of three (5) females for the brood or the progeny will be released as unmarked/untagged fry. An additional 5,000 PIT tags are being purchased to provide a total of 10,000 to monitor adult returns on WxW and HxW crosses. Brian Zimmerman and Jeremy Trump or Ali Fitzgerald are the leads on acquiring the additional tags. A new PIT tag array is planned to be installed on the lower Touchet to monitor adults as they return.

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 60,000 smolts may be reared full cycle and planted as yearlings in the spring. Fish in excess of 60,000, 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, the fry 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.

Table 11. Proposed BY 2015 Touchet summer steelhead smolts tagging, transfers and releases.

Site	BY13 Goal	Size (fpp)	Age	Mark/CWT/ Elastomer	PIT Tags	Transfer/Release Date
Dayton AP	50,000	4.5	1+	100% CWT	10,000	April 2016

F. Research

A paired release study will be performed utilizing 10,000 PIT tags. Fish will be tagged in January by WDFW staff, 5,000 HxW and 5,000 WxW. A new PIT tag array has been proposed for the lower Touchet River for evaluation purposes. Brian Zimmerman and Jeremy Trump or Ali Fitzgerald are the leads on acquiring the additional 5,000 PIT tags needed for the study. This study will be conducted for three-five years. Releases of these two study groups will be from the Dayton Acclimation pond after the Wallowa stock has been released. Fish will be held for two to three weeks dependent on water right and water availability. NOAA Fisheries will be contacted in the next few months to inform them of the changes proposed in the broodstock composition, and change of release location. Since this program is still considered in an "experimental" phase, we don't anticipate any problems.

VI. TUCANNON SUMMER STEELHEAD

The Tucannon River summer steelhead program 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 TFH 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 and the development of a sliding scale and adult management plan for broodstock collection and disposition of hatchery fish at the weir.

A. Fish on Hand

Brood Year 2014

In mid-August 2014, approximately 113,700 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 20,000 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 10^4 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 the first 50,000 receiving no external fin clips at LFH (**Table 12**), but all fish destined for the harvest component will be 100% adipose fin clipped. In March 2015, the supplementation fish (50K) will be moved to the TFH where they will be 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. It is the intention to obtain the necessary equipment to monitor pit tags as they are loaded into the trucks for release. The group marked for harvest (balance minus 50K supplementation group) will be full term reared at Lyons Ferry and released at Marengo in April or early May. The evaluation staff will PIT tag 7,500 of these prior to release.

Table 12. Proposed BY 2014 Tucannon summer steelhead smolts tagging, transfers and releases

Site	BY14 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 2015
Tucannon River	50,000	60,000	4.5	1+	25K AD/CWT 35K AD Only	7,500	April 2015

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

C. Trapping

Brood Year 2015

Co-managers will be meeting on October 1 to go over an adult management plan and sliding scale for broodstock collection. If all is worked out we will be targeting the 150k smolt release beginning with this BY, (50k for conservation and 100k for harvest). If no agreement is reached we will go with the same plan as was used for the 2014 BY. An amendment will be provided at a later date addressing this issue after agreement is reached. This section does not currently match the mgmt. plan but language from the mgmt. plan will be added when the document is completed. This increase in production hinges on co-manager agreement and at least some of the new round tanks for early to intermediate rearing for this stock of fish.

D. Spawning

Based on fecundity, survival estimates, and potential IHN positive females, LFH typically spawned 24 females to provide 120,000 green eggs for the current conservation and harvest program. With the increase of smolt production to 150,000, we intend to spawn 36 females to

provide 180,000 green eggs to meet the conservation goal of 50,000 smolts and harvest goal of 100,000 smolts. Spawning occurs 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. We will avoid the possibility of sibling crosses by not crossing a hatchery by hatchery mating.

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 75K or larger, with 50k to remain unmarked at all production levels. This action would help restore the non-tribal fishery in the Tucannon River. In late summer 2015, new circular tanks should be installed and operational. These new tanks will be used for rearing the Tucannon endemic program. Raceway space created by utilizing the new tanks will provide the opportunity to increase the Tucannon endemic program for harvest mitigation purposes.

Table 13. Proposed BY 2015 Tucannon River summer steelhead production.

Site	BY15 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 2016
Tucannon River (below TFH)	100,000	4.5	1+	25K ADCWT 75K AD only	**7,500**	April 2016

F. Research

VII. 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 2014

In mid-August 2014, LFH had approximately 480,000 (BY14) 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 CWT's, were provided to the local food bank.

B. Tagging, Transfers, and Releases

Brood Year 2014

All of these fish were 100% adipose fin clipped and moved to Lakes #1 and #3 in August. A portion of the fish will be CWT and PIT tagged and held in raceways until transfers (Dayton, Cottonwood or Wallowa Hatchery Acclimation Facility (WHAF)) or release (on-station or Walla Walla) (**Table 14**). In February 2015, 142K 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. Another 40k will be transferred to the WHAF as part of a release study to be conducted by WDFW and ODFW. Another 40k will transferred from Irrigon Hatchery to CCAF as the second half of the release study, (Please see the release study sent along with this document). A total of 6,000 juveniles will be PIT tagged by WDFW for Cottonwood AP 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 2015, 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 2015. 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 80K 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 14. Proposed BY 2014 Wallowa stock summer steelhead tagging, transfers and releases.

Site	BY14 Goal	Expected at release	Size (fpp)	Age	Mark/CWT/ Elastomer	PIT Tags	Transfer/Release Date
Cottonwood AF on the Grande Ronde River	140,000 20,000	140,000 20,000	4.5	1+	AD Only AD/CWT	3,000* 3,000*	Transfer to Cottonwood AF in Feb from LFH, release in April 2015
	15,000 25,000	15,000 25,000	4.5 4.5	1+ 1+	AD Only Ad/CWT	4,000	Transferred from Irrigon hatchery.
Cottonwood AF Total	**200,000**	**200,000**	**4.5**	**1+**	**AD Only + AD/CWT**	**10,000**	**Combined for all groups**
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 2015 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 2015
Snake River (On site at Lyons Ferry)	90,000 20,000	80,000 20,000	4.5	1+	AD Only AD/CWT	1,500 1,500	Direct stream release in mid-April 2015
Wallowa Hatch. AF (from LFH)	40,000	40,000	4.5	1+	AD Only	4,000	Transfer to WHAF in Feb. from LFH, release in April 2015

*2,000 of these PIT tags are part of the CSS study from the Fish Passage Center

C. Trapping

Brood Year 2015

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 15. Proposed BY 2015 Wallowa stock summer steelhead tagging, transfers and releases.

Site	BY15 Goal	Size (fpp)	Age	Mark/CWT/ Elastomer	PIT Tags	Transfer/Release Date
LFH on station - Snake River	40,000* 20,000	4.5	1+	AD Only AD CWT	1,500 1,500	April 2016
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 2016, release in April 2016
Direct stream release - Walla Walla River	80,000 20,000	4.5	1+	AD Only AD CWT	1,500 1,500	April 2016
Cottonwood AF on the Grande Ronde River	140,000 20,000 15,000 25,000	4.5 4.5 4.5 4.5	1+ 1+ 1+ 1+	AD Only AD CWT AD Only AD CWT	3,000 3,000 4,000	April 2016 Transferred from Irrigon hatchery.
Cottonwood AF Total	200,000	4.5	1+	AD/CWT and Ad only	10,000	Combined for all groups
Wallowa Hatch. AF (from LFH)	40,000	4.5	1+	AD Only	4,000	Transfer to WHAF in Feb. from LFH, release in April 2016

** Goal reduced from 90k to 40k due to anticipation of the Tucannon endemic program moving up to the 150k release goal.* ***Per the US v OR agreement: The on-station release at Lyons Ferry will vary from 60,000-135,000 related to smolt production targets for the Tucannon River so that the total program equals 210,000 (e.g., 100,000 Tucannon + 110,000 on-station at Lyons Ferry).***

F. Research

See additional document sent, Wallowa Stock rearing/acclimation study proposed by WDFW and ODFW.

VIII. 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 to1½ 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 2013

In July 2014, 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 2014 as fall catchables, 29,500 to Rock Lake as fall catchables in October, and 1,650 for the NPT for spring released jumbos. We are also adding 3,000 catchables to be planted into Spring and Blue lakes, (1,500 each) in the Tucannon wildlife area in September and October to provide additional recreational opportunity for small and big game hunters during the day or after they fill their daily limits or tags.

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. Proposed BY 2013 Spokane rainbow trout tagging, transfers and plants for the 2014-15 proposed planting allotment**.**

In spring 2014, 77,000 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 94,000 diploid Spokane stock rainbow trout into various lakes in southeast Washington as catchables (2.5 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 16. Proposed BY 2013 Spokane rainbow trout tagging, transfers and plants

Facility	BY13 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 2014
	29,500	32,500	3.0	9,833	1	None	None	Planted in early Oct 2014
	74,000	74,000	2.5	29,600	1+	None	None	Planted in Feb-Apr 2015
	1,000	1,000	0.67	1,493	1+	None	None	Planted in Feb-Apr 2015
	1,650	1650	1.0	1,650	1+	None	None	Transfer to and planted by NPT in Mar-May 2015
Tucannon	94,000	94,000	2.5	37,600	1+	None	None	Planted in Mar-June 2015
	4,000	4,100	0.67	6,119	1+	None	None	Planted in Feb-May 2015

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 (**Table17**).

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 in January. Of these, 94,000 will be destined for planting as catchables (2.5 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 (TSS) 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 2014 Spokane rainbow trout program.

Table17. Proposed BY 2014 Spokane rainbow trout releases.

Site	Number	Size (fpp)	Lbs.	Age	Mark/CWT/ Elastomer	Pit Tags	Transfer/release Date
SE Washington Lakes	32,500 160,000 1,000 4,000*	3.0 2.5 1.5 lbs. ea. 1.5 lbs. ea.	9,833 67,200 1,493 5,970*	1 1+ 1+ 1+	None None None None	None None None None	Planted in early October 2015 Planted in February through June 2016
IDFG	17,600	3.0	5,867	1	None	None	Transfer to and planted by IDFG in Sept/Oct 2015
NPT	1,650	1.0	1,650	1+	None	None	Transfer to and planted by NPT in Mar-May 2016

*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.

IX. 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 agreed to discontinue injecting female broodstock in 2013. All females for use in the yearling production and eggs shipped to Oregon and Idaho will be tested for BKD using ELISA method.

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 300 adults at LFH. Progeny of all low, moderate and high BKD-ELISA females and untested females may be utilized in the subyearling 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 spring Chinook broodstock will receive a pre-spawning injection with Tulathromycin and oxytetracycline. All females will receive a second injection 30 days prior to spawning. 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.

X. 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.

Table 18. Contact List.

Name	Agency	Position	Phone	E-mail
Policy				
Steve Yundt	USFWS	LSRCP Project Lead	208-378-5227	steve_yundt@fws.gov
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
John Whalen	WDFW	Region 1 Fish Mgmt.	509-892-7861	John.Whalen@dfw.wa.gov
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	USFWS	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	509-843-1430	Douglas.Maxey@dfw.wa.gov
Ace Trump	WDFW	LFC Manager	509-646-9201	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 Manager	208-621-3502	aaronp@nezperce.org
Carl East	NPT	Production Biologist	208-621-3503	Carle@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
Bill Young	NPT	Hatchery Eval Coordinator	208-634-5290	billy@nezperce.org
Jay Hesse	NPT	Research Coordinator	208-621-3552	jayh@nezperce.org
Joe Bumgarner	WDFW	SRL Lead	509-382-1004	Joseph.Bumgarner@dfw.wa.gov
Joseph Krakker	USFWS	Fishery Biologist	208-378-5323	joe_krakker@fws.gov
Michael Gallinat	WDFW	Spring Chinook Biologist	509-382-4755	Michael.Gallinat@dfw.wa.gov
Todd Miller	WDFW	Steelhead Biologist	509-382-1710	Todd.Miller@dfw.wa.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				
Vacant	WDFW	Fish Management	509-382-1005	
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.onjukka@state.or.us
Steve Roberts	WDFW	Fish Health Specialist	509-892-1001 Ext 300	steven.roberts@dfw.wa.gov

Appendix A: 2014 Requests for Fall Chinook Production Fish/Eggs
(2014 Broodyear)

Priority under USvOR	Who	Release site	Age	# for release	Transfer (unrounded)	Survival to release or transfer (revised 6/16/14)	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	WDFW	onstation	yearlings	450,000		96.0%	1.042	468,994	96.0% mean survival, 2009-2012BY	468,994
4	NPT	CJ	yearlings	150,000	151,515	93.7%	1.067	160,085	99.0% survival transfer to rel BY07-11	949,249
3	NPT	BC	yearlings	150,000	151,515	93.7%	1.067	160,085	3.3% green to eye, est 2% eye-transf, 1% transf-rel	789,164
2	NPT	PIT	yearlings	150,000	151,515	93.7%	1.067	160,085		629,079
				900,000					949,250	
5	WDFW	onstation	subs	200,000		94.7%	1.057	211,305	94.7% mean survival, 2009-2012BY	1,160,554
6	NPT	CJ	subs	500,000	501,002	94.7%	1.057	531,062	94.0% survival to transfer for subs	1,691,616
7	NPT	BC	subs	500,000	501,002	94.7%	1.057	531,062		2,222,678
11	WDFW	acclim-(CJ2)	subs	200,000	200,401	94.7%	1.057	212,425		3,087,461
8	NPT	PIT	subs	200,000	200,401	94.7%	1.057	212,425		2,435,103
10	NPT	PIT	subs	200,000	200,401	94.7%	1.057	212,425		2,875,036
				1,800,000					1,910,704	
12	DNFH/Irrigon	Transportation	eyed eggs	250,000		96.3%		0		
13	WDFW/Irrigon	GRR-direct rel	eyed eggs	200,000	220,000	96.7%	1.034	227,508	3.3% green-eye loss BY09-13	3,314,969
16	WDFW/Irrigon	GRR-direct rel	eyed eggs	200,000	220,000	96.7%	1.034	227,508		3,769,985
14	DNFH/Irrigon	Transportation	eyed eggs	78,000		96.3%		0		
9	IPC-Oxbow	HC Dam	eyed eggs	200,000	220,000	96.7%	1.034	227,508		2,662,611
15	IPC-Umatilla	HC Dam	eyed eggs	200,000	220,000	96.7%	1.034	227,508		3,542,477
17	IPC-Umatilla	HC Dam	eyed eggs	600,000	660,000	96.7%	1.034	682,523		4,452,508
				1,400,000	3,597,752				1,592,555	
				4,100,000	**released**			**4,452,508**	**green eggs to meet needs through priority 17**	
								1154	BY11-13 LGR (3860 eggs/F)excluding jills	
					number of Snake River origin females needed to spawn					

Appendix B: 2014 Fall Chinook Trapping/Sampling Protocols at LGR

by

Debbie Milks, WDFW
Bill Arnsberg/Bill Young, NPT
Stuart Rosenberger, IPC
Stuart Ellis, CRITFC
August 2014

The following protocol presumes 24 hour trapping 7 days per week: The trapping rate will be set at 10% 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.

If trapping is changed to 4 hours per day operation, any fish collected during that time MUST receive an operculum punch on the right side if they are hauled to the hatcheries.

WDFW is providing two staff for helping with the broodstock collection activities at LGR as well as Aqui-S for trapping.. 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. An additional two staff will be provided by WDFW as part of the Snake River Fall Chinook Salmon Fidelity and Fallback Study (radio telemetry) funded by BPA.

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 8/15/2014. The sub-sampling of wire tagged fish should allow for ample recoveries for evaluation purposes.

This will be the second year that carcasses of fish used for run reconstruction will be given to Asotin Count Food bank after sampling. Food bank fish will primarily come from wire tagged males <70 cm trapped early in the season. The small males will be held separately from the larger fish for easy access. The food bank may collect fish weekly starting in October.

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: 2014 Fall Chinook Trapping/Sampling Protocols

Protocols:

1) **These protocols presume a 24 hour/day, 7 days per week trapping.** Fish trapped during a 24 hour 7 day a week trapping period will not be operculum punched. **If the trapping protocol is changed to only 4 hours per day, all fish hauled to the hatcheries must receive an operculum punch on the right side (ROP) .**

2) This is the second 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 and released.

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.

Appendix D: 2014 Trapping & Mating Protocol at LFH

LFH may start up the volunteer trap if a shortfall of females being collected at LGR happens. Staff will target fish >80 cm to increase numbers of older aged fish for broodstock. The size criteria will be further relaxed to 75 cm in mid-October if necessary.

Sorting protocol

Sort LFH trapped fish during first spawn in October.
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

Our goals are to maximize the use of potentially natural origin fish and larger/older aged fish and to exclude jills and strays from broodstock.

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. If broodstock limited, up to 60 stray females may be spawned and retained, presuming 1200 matings are needed to make production1. All stray males will be culled. Any male used on a stray female must also be used on another female that will be retained for production (inbasin hatchery origin, or untagged unknown origin).

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 two12 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 l00 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 CJR around the 1st of February at 12.5 fish per pound. Fish acclimated at CJR are transported by WDFW one month earlier than the other acclimation facilities to make rearing space available for subyearlings 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 subyearlings will be transferred to the Big Canyon and CJR facilities and 400,000 will be transferred to Pittsburg Landing during the first week in May. CJR subyearlings 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 with BY 2013, a second release group of approximately 200,000 subyearlings were 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 subyearling 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 2015:

- Pittsburg Landing – April 6-14
- Captain John Rapids – April 1
- Big Canyon – April 7 - 15

Subyearling fish are acclimated approximately three weeks (two weeks for each group at CJR) 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 2015:

- Pittsburg Landing – May 20-25
- Captain John Rapids first group – May 20-25
- Captain John Rapids second group – First week of June
- Big Canyon – May 20-25

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.

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Appendix F: 2015 Releases - Fall Chinook Pit Tag Allocation (*USvOR* agreement)

Summary of PIT tag allocation for release year 2015 Snake River fall Chinook salmon hatchery production.

Priority	Production Program						Release numbers available for PIT tagging		Tagging Lead / Uploading
							Subyearlings		
	Rearing Facility	Number	Age	Release Location(s)	PIT Tag #'s Monitor Mode	PIT Tag #'s Bypass if Collected	Yearlings		
							Subyearling Sample Size		
						BIC	Representative Allocation		
1	Lyons Ferry	450,000	1+	On station	30,000	0		WDFW/WDFW(monitor mode for SARs)	
2	Lyons Ferry	150,000	1+	Pittsburg Landing		1,000		NPT/NPT	
3	Lyons Ferry	170,000	1+	Big Canyon		1,000		NPT/NPT	
4	Lyons Ferry	155,000	1+	Captain John Rapids		1,000		NPT/NPT	
5	Lyons Ferry	200,000	0+	On station	20,000	0		WDFW/WDFW(monitor mode for SARs)	
6	Lyons Ferry	500,000	0+	Captain John Rapids		2,000		NPT/NPT	
7	Lyons Ferry	500,000	0+	Big Canyon		2,000		NPT/NPT	
8	Lyons Ferry	200,000	0+	Pittsburg Landing		2,000		NPT/NPT	
9	Irrigon	200,000	0+	Hells Canyon Dam		1,500		IPC/IPC	
10	Lyons Ferry	200,000	0+	Pittsburg Landing				NPT/NPT	
11	Lyons Ferry	200,000	0+	Captain John Rapids 2		2,000		NPT/NPT	
13	Irrigon	200,000	0+	Grande Ronde River		1,500		WDFW/WDFW	
15	Irrigon	200,000	0+	Hells Canyon Dam		1,500		IPC/IPC	
16	Irrigon	195,000	0+	Grande Ronde River		1,500		WDFW/WDFW	
17	Irrigon	250,000	0+	Hells Canyon Dam				IPC/IPC	
NPTH 1	NPTH	500,000	0+	NPTH		2,000		NPT/NPT	
NPTH 2	NPTH	200,000	0+	Lukes Gulch		2,000		NPT/NPT	
NPTH 2	NPTH	200,000	0+	Ceder Flats		2,000		NPT/NPT	
NPTH 3	Irrigon	500,000	0+	North Lapwai Valley		2,000		NPT/NPT	
TOTAL	**Yearlings**	**900,000**					**0**	PIT Yearlings	PIT Subyearlings
	Subyearlings	**4,245,000**						**0**	**0**

Total PIT tags:

LSRCP tags
BPA tags
IPC tags 3,000

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

HOR = Hatchery origin return — **modified based on Tribal comments on Jan 18, 2013** -corrected formulas for 65% of run at trap

NOR = Natural origin return — MAT = 750, so 555 NOR at trap provides ~750 NOR to river

Predicted HOR =	369	at trap	Total predict. HOR=	568	
Predicted NOR =	473	at trap	Total predict. NOR=	728	
Tot. Est Return at Trap =	842	at trap			
Total River Return =	1,295	w/ 35% below trap		1295	
Brood Target =	140				

Dispostion Table

NOR Brood	NOR SpEsc	HOR Brood	HOR SpEsc	Program Size	Tribal & Nontribal Harvest	Tribal & Nontribal Transfer	PNI Prior to harvest or transfer: PNI	
								pNOB= 1.00
								pNOS= 0.49
140	**469**	**0**	**483**	**225,000**	**0**	**0**	**0.66**	pHOS= 0.51
		w/o harvest or transfer mgmt						

Enter predicted Adult run size at the TFH trap in cells C5 and C6

Predicted NOR at Trap	NOR Broodst.	HOR Broodst.	PNOB (NOR Brood %)	At trap NOR SpEsc	At trap HOR SpEsc	At Trap Total Esc	At trap NOR Esc%	NOR total river escapem.	HOR total river escapem.	Total River Escapem NOR +HOR	Total Run Size in Tuc. R.	Total Escap after 15% prespawn loss	Total NOS Escapement after 15% presp loss	pNOS (NOS escapement %)	Total HOS Escapement after 15% presp loss	pHOS (HOS escapement %)
50	50	90	36%	0	279	279	0.0%	27	478	505	645	429	23	5.3%	406	94.7%
100	50	90	36%	50	279	329	15.2%	104	478	582	722	494	88	17.9%	406	82.1%
150	75	65	54%	75	304	379	19.8%	156	503	658	798	560	132	23.7%	427	76.3%
200	85	55	61%	115	314	429	26.8%	223	513	735	875	625	189	30.3%	436	69.7%
250	85	55	61%	165	314	479	34.4%	300	513	812	952	690	255	36.9%	436	63.1%
300	100	40	71%	200	329	529	37.8%	362	528	889	1029	756	307	40.7%	449	59.3%
350	110	30	79%	240	339	579	41.5%	428	538	966	1106	821	364	44.3%	457	55.7%
400	130	10	93%	270	359	629	42.9%	485	558	1043	1183	887	413	46.5%	474	53.5%
450	140	0	100%	310	369	679	45.7%	552	568	1120	1260	952	469	49.3%	483	50.7%
500	140	0	100%	360	369	729	49.4%	629	568	1197	1337	1017	535	52.6%	483	47.4%
550	140	0	100%	410	369	779	52.6%	706	568	1274	1414	1083	600	55.4%	483	44.6%
600	140	0	100%	460	369	829	55.5%	783	568	1351	1491	1148	666	58.0%	483	42.0%
650	140	0	100%	510	369	879	58.0%	860	568	1428	1568	1214	731	60.2%	483	39.8%
700	140	0	100%	560	369	929	60.3%	937	568	1505	1645	1279	796	62.3%	483	37.7%
750	140	0	100%	610	369	979	62.3%	1014	568	1582	1722	1344	862	64.1%	483	35.9%
800	140	0	100%	660	369	1029	64.1%	1091	568	1658	1798	1410	927	65.8%	483	34.2%
850	140	0	100%	710	369	1079	65.8%	1168	568	1735	1875	1475	993	67.3%	483	32.7%
900	140	0	100%	760	369	1129	67.3%	1245	568	1812	1952	1540	1058	68.7%	483	31.3%
950	140	0	100%	810	369	1179	68.7%	1322	568	1889	2029	1606	1123	70.0%	483	30.0%
1000	140	0	100%	860	369	1229	70.0%	1398	568	1966	2106	1671	1189	71.1%	483	28.9%
1100	140	0	100%	960	369	1329	72.2%	1552	568	2120	2260	1802	1319	73.2%	483	26.8%
1200	140	0	100%	1060	369	1429	74.2%	1706	568	2274	2414	1933	1450	75.0%	483	25.0%
1300	140	0	100%	1160	369	1529	75.9%	1860	568	2428	2568	2064	1581	76.6%	483	23.4%
1400	140	0	100%	1260	369	1629	77.3%	2014	568	2582	2722	2194	1712	78.0%	483	22.0%
1500	140	0	100%	1360	369	1729	78.7%	2168	568	2735	2875	2325	1843	79.2%	483	20.8%

Model Calculations and Assumptions