Salmon/Snake River Annual Production Plan:
Standard Operating Procedures for Hatcheries, Traps, and Weirs

1 Contents

2 STEELHEAD

All steelhead *Oncorhynchus mykiss* in Idaho are summer steelhead, determined by time of entry into the Columbia River. All steelhead in a brood year spawn in the spring. Idaho steelhead enter fresh water in one year and spawn the following spring. Idaho has A and B strains of

steelhead based on life history characteristics. Generally A-strain steelhead spend one year in the ocean and return to fresh water during the summer. The B-strain steelhead commonly spend two years in the ocean before returning to fresh water in late summer or autumn.

Steelhead for the Salmon River steelhead program are reared at Hagerman National (HNFH), Magic Valley (MVFH), and Niagara Springs (NSFH) fish hatcheries. All 3 hatcheries are located out-of-basin in the Hagerman Valley. HNFH is operated by the U. S. Fish and Wildlife Service (FWS). MVFH and NSFH are operated by IDFG. HNFH and MVFH are funded by the Lower Snake River Compensation Program (LSRCP), while NSFH is funded by Idaho Power Company (IPC).

Eggs for the steelhead program are collected at East Fork Salmon River weir (EF weir), Dworshak National Fish Hatchery (DNFH), Hells Canyon Trap (HC trap), Pahsimeroi Fish Hatchery weir (PFH), Sawtooth Fish Hatchery weir (SFH), and Squaw Creek pond and weir (Squaw Creek).

In order to simplify steelhead rearing at HNFH and MVFH changes in numbers and stocks of fish occurred beginning in BY-2009. Beginning in 2009, Dworshak and Upper Salmon River B stocks are reared at MVFH. HNFH rears primarily Sawtooth A stock, EF natural stock, and occasionally Pahsimeroi A stock. Additionally, Pahsimeroi A steelhead not reared at NSFH are reared at MVFH.

All steelhead reared at HNFH, MVFH, and NSFH are transported to the Snake River below Hells Canyon Dam and Salmon River release sites from late March through early May, and released. Transportation protocols follow IHOT guidelines. Releases are coordinated between hatcheries to minimize highway traffic and safety concerns.

2.1 Dworshak National Fish Hatchery

Dworshak National Fish Hatchery provides B-Run summer steelhead green eggs to Idaho Department of Fish and Game for their Magic Valley Hatchery program.

2.1.1 Ladder Operation

A fish ladder in the N.F. Clearwater River traps returning adults at the hatchery. The holding pond at the top of the ladder is 15'x 75'x 8'. Broodstock are collected passively using a ladder that enters the hatchery from the North Fork Clearwater River. Adults are collected during two time periods:

Adults begin entering the Clearwater River in the fall. The ladder is opened in October, is kept open until about 500 adults are collected, and is usually closed by early December. The ladder is then reopened in February and is operated intermittently through May, the usual end of the run, collecting only what we need for broodstock each week.

The Dworshak steelhead program seldom observes a 1:1 sex ratio in adult returns. Our typical sex ratio is about 3 females:1 male. We require about 550 females to provide all the eggs we need for Dworshak's program. To meet all programs supplied with steelhead eggs about 1,200 females are needed, this includes eggs for LSRCP programs including

Clearwater and, Magic Valley fish hatcheries. To meet all programs, we need to collect about 4,000 to 4,500 fish total to account for the male to female ratio and pre-spawning mortality. Unfortunately, during the early and late portions of the run, it is not uncommon to be limited in the number of ripe males. During the middle portion of the run, the ratio is usually closer to one on one.

2.1.2 Adult Handling

Broodstock are held in three 15' x 75' x 8' concrete ponds. Adults in these ponds are crowded into a 370 gallon anesthetic tank. From here the fish are lifted to an examining table and are checked for ripeness and either spawned or returned to the holding pond for later examination or outplanting.

Excess broodstock is handled in several ways, depending on the level of excess. First option is to outplant excess steelhead into the South Fork Clearwater River for harvest augmentation and SF tributaries for natural production. If it is early in the season adults are typically released to augment sport harvest then closer to spawning and when the tributaries are accessible fish are released for natural spawning. When fish have to be culled, it is normally done by selecting those fish that are coded-wire tagged. This ensures recovery of the tags for evaluation purposes.

If carcasses are in good condition, they are given to the Nez Perce Tribe for subsistence or the food bank. If the carcasses are unsuitable for human consumption they are given to the IDFG fertilization program or the wildlife programs at either the U of I or WSU to feed eagles or bears and finally, as a last resort, carcasses are taken to the landfill for disposal.

2.1.3 Spawning and Egg Take

Randomly from ripe fish on a certain day, fish collected over the past week are used first, and then if more are needed, ripe fish from previous weeks are selected. No backup males used, fish are spawned randomly on a certain day. Jacks are used as they are randomly taken on the spawning rack. Repeat spawners are used as needed when the number of males returning during steelhead spawning is extremely low.

Adults are crowded from a fish trap at the end of the fish ladder into a crowding channel, moved into a channel basket, and placed into an anesthetic bin. Steelhead adults are anesthetized with carbon dioxide at a rate of 400 to 1000 mg/l solution buffered with 8 to 10 pounds of sodium bicarbonate. Although carbon dioxide is more stressful on the fish than MS-222, carcasses anesthetized with CO^2 can be used for human consumption. Spinal columns of ripe females are severed using a pneumatic knife. The females are then placed on a table for 1-20 minutes for blood drainage. The ventral side is then cut open using a spawning knife and eggs are collected in disinfected colanders. After ovarian fluid is drained, the eggs are poured into a clean bucket.

Milt from ripe males is stripped into Styrofoam cups and a one-percent saline solution is added to assist in milt motility. The milt solution is poured onto the eggs and swirled for more complete fertilization. After sufficient time has elapsed for fertilization to take place (one to two minutes), the eggs are rinsed of sperm, blood, and other organic matter.

2.1.4 Egg Incubation

Dworshak NFH provides green eggs to the Idaho Department of Fish and Game for the Magic Valley Hatchery program and does not provide incubation for that program.

2.1.5 Egg and Fry Shipping

After fertilization, green eggs are transferred from Dworshak NFH by the Idaho Department of Fish and Game to Clearwater Hatchery and then to Magic Valley Hatchery. See appropriate sections for those hatcheries for details on egg and fry shipping.

2.1.6 Fish Health

Formalin is applied to adults during holding, as needed, to control fungus. Refer to Magic Valley Hatchery for further fish health information.

2.1.7 Communication

During the spawning season, information on broodstock collection numbers, biological information, spawning numbers, and other information is reported in weekly updated reports and recorded in established databases. A summary of spawning operations and all data are provided in annual spawning reports available from Dworshak NFH.

2.2 East Fork Salmon River Weir

East Fork Salmon River Weir (EF weir) is used to collect East Fork natural stock eggs collect broodstock, enumerate hatchery- and natural-origin steelhead and to control escapement above the weir using a sliding scale. The sliding scale allows the proportion of natural-origin returns in the broodstock and the proportion of naturally spawning adults that is composed of hatchery-origin returns to slide with variable natural-origin escapement. The goal of this hatchery program is to aid in the recovery of the natural steelhead population in the East Fork Salmon River buy supplementing the natural spawning population.

The hatchery production goal is to release 170,000 integrated steelhead smolts into the E.F. Salmon River near the adult trap annually. To achieve this production goal approximately 220,000 green eggs are needed. As integrated and natural-origin smolts return as adults, they will be: 1) used as broodstock for the next generation of integrated smolts, or 2) released upstream of the weir to supplement natural spawning.

2.2.1 Ladder Operation

Ladder and trap operations begin the last week of March and continue until mid-May. Once the velocity barrier is in place, fish swim into attraction water and into a trapping and holding area.

2.2.2 Adult Handling

Fish are checked daily. At checking, fish are examined for gender, length measured, checked for various marks, radios, CWT, injuries, and readiness to spawn. Subsequent to checking, ripe fish are spawned when ripe males and females are available. Genetic material and scale samples are collected from all unmarked steelhead. Genetic samples are also collected from all spawned adults for Parentage Based Genetics (Appendix 3).

Unmarked and marked steelhead and other trapped species are released upstream of the hatchery weir. Any ad-clipped adults are considered strays and are subsequently killed and checked for CWT.

Due to whirling disease amplification issues, carcasses are not used for nutrification of local waters. Carcasses or unspawned adults are returned to Sawtooth, frozen, and transferred to a rendering plant.

2.2.3 Spawning/Egg Take/Egg Incubation/Egg and Fry Shipping

Target is 45 pair for integrated broodstock of hatchery and natural origin adult fish. Spawning protocol is random 2 males: 1 female with two female's eggs combined prior to water hardening of eggs. Green eggs are transported to Sawtooth FH for eye-up, and then to HNFH for final incubation and rearing.

2.2.4 Fish Health

EF weir will not have 150 females, thus collect from up to 60 females (half of them sample ovarian fluid, half sample tissues (kidney/spleen). Sixty kidney samples are collected for ELISA testing for *RS*. Twenty head wedges are collected and examined for *Myxobolus cerebralis*.

2.2.5 Communication

Coordination of eyed egg shipments among the hatcheries is discussed weekly. Eyed egg requests are finalized at the annual AOP meeting. Weekly communications occurs with IDFG research, hatchery, and Salmon Region personnel, and SBT.

2.3 Hagerman National Fish Hatchery (HNFH)

HNFH is located in the Hagerman Valley, Idaho along the Snake River. HNFH receives eyed eggs from multiple locations for rearing to smolt. Smolt production capacity is currently 1.36 million at 4.5 per pound. Smolt production capacity has been reduced from original design targets due to increased size at release and reductions in the hatchery water supply.

The HNFH is part of the LSRCP. The LSRCP goal is to return 27,200 adult steelhead for harvest below Lower Granite Dam (LGR) and escape 13,600 adults above Lower Granite Dam and back to the Snake and Salmon river basins. Eggs are collected and eyed at various locations. Eyed eggs are transferred to HNFH for rearing to smolt, then transported to the Salmon River for direct stream release at multiple sites.

2.3.1 Egg Incubation

HNFH receives eyed eggs from SFH. Eyed steelhead eggs are received with between 370 and 450 TUs. Shipments occur in May and June. Eyed eggs are loaded into upwelling incubators at 20,000 to 30,000 eggs per jar with a flow rate of 6 to 8 gallons per minute (gpm). Sac fry are transferred from incubators into indoor rearing tanks.

2.3.2 Nursery Rearing

Feeding is initiated when 80% of the fry achieve swim-up. Feeding typically begins 15 to 17 days post-hatch. Dry salmon diets are fed at a minimum frequency of once per hour during rearing in the hatchery buildings 8 hours per day. Flows in rearing tanks are ramped up to, and then maintained at 60 gpm. Fish are reared inside to a density index of 0.80 and a flow index of 1.00. Fish are marked from the hatchery buildings in August at approximately 100 fpp and ponded in final rearing raceways.

2.3.3 Raceway Rearing

Fish are reared in 3 flow-through banks of raceways at a maximum density index of 0.20 and a maximum flow index of 1.20. Water is serially reused in the second and third bank. All fish are fed dry extruded floating diets which are placed into demand feeders twice weekly. A length-at-release standard of 180 to 250 mm is established under the NOAA Fisheries 1999 Biological Opinion. Meeting the release size standard is achieved by adjusting the hatchery constant. Oxygen and ammonia are monitored during periods of peak loading. Water temperature remains a constant 59^0F.

2.3.4 Fish Health

Pre-liberation inspections are performed at least two weeks prior to the first day of liberation. Prior to release, a 60 fish sample is taken and assayed for IHNV, IPNV, VHSV, *Aeromonas salmonicida, Yersinia ruckerii, BKD,* and *Myxobolus cerebralis*. Fish health exam forms are provided to the hatchery as well as a summary at year-end.

2.3.5 Fish Release/Transportation

All of the HNFH steelhead smolt releases are trucked. Hauling occurs Monday through Friday during April and early May. IHOT fish transportation guidelines and NZMS HAACP plans are followed. Hauling is coordinated with several hatcheries to minimize traffic and safety concerns.

2.3.6 Communication

HNFH distributes a monthly hatchery production summary, a monthly narrative, and an annual report. HNFH evaluates production programs through a Hatchery Evaluation Team (HET). The HET meets quarterly to plan and coordinate specific studies and program changes or adjustments. The HET will need to review and approve any requests for a particular brood year in advance.

2.3.7 Monitoring and Evaluation

M&E staff annually develop representative marking and loading plans for CWT and PIT at each hatchery facility to evaluate harvest and survival. For a more detailed description of the intended use of these tags see the tagging information section at the end of the appendix. These marks and tags were applied by the Pacific States Marine Fisheries Commission marking crew. All marks and tags that were applied to BY 2010 and proposed for BY 2011 are identified in the "proposed 2011 release" table.

2.4 Hells Canyon Trap

Idaho Power Company's (IPC) current mitigation goal for A- steelhead production at Hells Canyon Trap (HC trap) and Oxbow FH (OFH) is to trap and spawn a sufficient number of adult steelhead to produce 800,000 smolts at 4.5 per pound. 1.2 million green eggs are necessary to achieve this goal. Approximately 550 adult steelhead are trapped in the fall and held over winter. An additional 50 females or 10% of the broodstock are trapped the following spring. This provides for pre-spawning mortality, culling for disease management and manipulation of run timing. It will also provides a small surplus for use at PFH and SFH in the event that returns to those weirs do not meet production goals Steelhead spawning occurs in the spring and the resulting eggs and swim up fry are transferred to NSFH beginning in June.

2.4.1 Ladder Operation

The HC Trap is operated as a cooperative effort by IPC and OFH. Fall trapping at the HC Trap takes place in October and November. Trapping in the spring is influenced by flow in the Snake River and the resulting water releases from Hells Canyon Dam. Flow in excess of 50,000 ft^3/s at Hells Canyon Dam requires cessation of trapping because the trap is inundated. Trapping resumes in April and continues until the broodstock target (10% of the females) is reached.

2.4.2 Adult Handling

All returning adult steelhead are scanned for CWTs and PIT tags and examined for other marks, tags, and injuries. Adults to be held for broodstock are maintained in holding ponds at OFH until spawning occurs in the spring. Genetic samples are collected from all spawned adults for Parentage Based Genetics (Appendix 1). Depending on run strength, surplus adults may be trapped at HC Trap. Surplus fish are distributed to Idaho, Oregon, and the Nez Perce Tribe in equal proportions. The Idaho and Oregon shares are released to supplement sport fisheries and receive a left operculum punch. In recent years the Nez Perce Tribe distributes their share for subsistence. Additional out-plants may take place at agreed upon locations if excess fish are trapped. Carcasses from pre-spawning mortality are placed into a garbage dumpster and picked up weekly by the local sanitation company.

2.4.3 Spawning/Egg Take/ Egg Incubation/ Egg and Fry Shipping

HC trap and OFH are responsible for trapping and spawning sufficient steelhead broodstock to provide 440,000 eyed eggs and 440,000 swim-up fry to NSFH. Using a 5 year average fecundity of 5,800 eggs per female and a 5 year average eye-up rate of 82%, approximately 600 adult steelhead broodstock are needed to meet that goal. Spawning occurs twice each week beginning about March 10 and continuing until mid-May. Eggs from one female are drained of ovarian fluid and fertilized with milt from one male. Females with poor egg quality or bloody ovarian fluid are not be used for production. Males expelling bloody or watery milt are not used. Fertilized eggs from two females are combined for water hardening.

Eggs are incubated at regulated well water temperatures ranging from 53ºF to 42ºF to consolidate egg shipments to NSFH. All eggs will receive an iodophore flush three times a week. Oxbow-A eggs will be reared to the eyed egg or fry stage and then transferred to

NSFH for rearing or distribution as directed by the IDFG Fisheries Bureau. Any surplus eggs or fry may be transferred to Hagerman State FH or reared to the fry stage and released into Cascade Reservoir. Eyed eggs are transported in coolers and button-up fry are placed inside large screened tubes, loaded onto a tank trailer or tank truck, and transported to rearing facilities or reservoirs for release.

2.4.4 Fish Health

At least 120 ovarian fluid and 30 tissue (kidney/spleen) samples are collected to assay for viral replicating agents from at least 150 females. Sixty kidney samples are collected for ELISA testing for *RS.* Twenty head wedges are collected and examined for *Myxobolus cerebralis.*

2.4.5 Communication

During steelhead trapping, HC trap data is uploaded daily to the IDFG trap record database for each day the trap is operated. Adult releases are uploaded to the IDFG release database at least weekly. In addition, weekly trap updates are sent to the IPC hatchery biologist.

2.5 Magic Valley Fish Hatchery (MVFH)

The MVFH LSRCP adult mitigation return goal is to provide 23,320 adult returns for lower river fisheries and 11,660 adult steelhead to Lower Granite Dam. To attain that goal, the planned production is: 650,000 Pahsimeroi/Sawtooth A; 830,000 Dworshak B; and 120,000 Upper Salmon B smolts. Eggs for the program are obtained from adults trapped at SFH, PFH, DNFH, and Squaw Creek. All stocks are reared to smolt size at MVFH and transported for direct or acclimated stream release at multiple sites in the Salmon River. Smolt production capacity is currently 1.54 million at 4.5 per pound. Smolt production capacity has been reduced from original design targets due to increased size at release and reductions in hatchery water supply.

2.5.1 Egg Incubation

Transfer of eggs occurs between 370 and 450 TUs. As a result of the completion of the new PFH, eggs received from PFH may arrive later due to their ability to incubate with chilled water. Delayed transfer of eggs is beneficial because fish will be off feed for fewer days during the final rearing period. To further ensure egg quality eggs taken at PFH remain on station until eyed. Egg shipments and deliveries will be coordinated with SFH, PFH, and Clearwater FH.

Eyed eggs are loaded into upwelling incubators at 50,000 to 65,000 eggs per jar with a flow rate of 6 to 8gpm. All stocks are reared in the incubation building.

2.5.2 Nursery Rearing

Sac fry volitionally swim from incubators into indoor rearing tanks and feeding is initiated when approximately 100% of the fry achieve button-up. Feeding typically begins 18 to 21 days post-hatch. Rangen's semi-moist starter salmon diets are fed at a minimum frequency of once per hour during rearing in the hatchery building. After feed size zero, all early rearing diets are changed to dry feed. Starting flows in rearing tanks are set at 100 gpm, and then increased up to 250gpm prior to transfer to outside raceways. Fish are reared inside to

a maximum density index of 0.60 and a maximum flow index of 1.19. Fish are transferred at approximately 32,000 fish per outside section for a total of 51 sections. Transfer to outside raceways begins in late July and is completed by early September. Fish will range in size from 115 to 250 fpp.

2.5.3 Raceway Rearing

Fish are reared in four banks of raceways split in half with two west banks and two east banks. Density typically reaches an index of 0.30 and a maximum flow index of 1.20. All fish are fed Rangen's 470 dry extruded slow sinking diet. This high protein diet is used in an attempt to reduce the incidence of sore-back and to meet TMDL and NPDES limits. Fish are fed on a Five-day-on and Two-day-off schedule to control growth as needed during the fall. Seven-day-a-week feeding resumes as soon as possible in the spring. A length at release target of 180 mm to 250 mm was established under the NOAA Fisheries 1999 Biological Opinion. Steelhead are projected for an average size of 220 mm at release. This is accomplished by adjusting the fish feeding rate. Sample counts are performed monthly on representative ponds, and length frequencies are calculated prior to transport. Dissolved oxygen and total gas saturation are monitored intermittently throughout the rearing cycle. Water temperature remains a constant 58^0F.

The upper decks are used for initial outside rearing. Screens are placed at the fifty foot keyway and the upper 100 foot section is divided into two rearing sections. Approximately 32,000 fish will be placed in each section. Once outside, fish are hand-fed Rangen's #3 crumble and 2.0mm extruded pellet then graduate to larger sizes as growth continues. For approximately the last seven months of growth, smolts are fed Rangen's 470 extruded slow sinking feed. Feeding duration varies by fish and feed size from as high as six times per day, to as low as three times per day. When fish approach density indexes of 0.30, inventory in the lower 50 feet of the A deck, they will be moved to the lower 100 feet (B section) and the inventory in the upper 50 feet will have the entire A section for the final rearing period. The NOAA Fisheries 180 to 250 mm length at release criteria is met by adjusting the hatchery constant. Sample counts are performed monthly on representative ponds and length frequencies are calculated prior to release

2.5.4 Fish Health

Fish health inspection and diagnostic services will be provided by the EFHL. Diagnostic services will be provided as needed at the request of hatchery personnel. Quarterly on-site inspections will include tests for the presence of viral replicating agents and general bacterial pathogens. A pre-liberation inspection will be done on all stocks 30-45 days prior to transportation, including an organosomatic index of fish quality. Specific pathogens tested for at pre-liberation will include IHNV, IPNV, VHSV, *RS, Aeromonas salmonicida, Yersinia ruckerii,* and *Myxobolus cerebralis.*

2.5.5 Fish Release/Transportation

All of the MVFH steelhead smolt releases are trucked. Hauling occurs Monday through Friday during April. IHOT fish transportation guidelines and NZMS risk assessment guidelines are followed. Hauling is coordinated with several hatcheries to minimize traffic and safety concerns.

2.5.6 Communication

MVFH distributes monthly hatchery production summaries and annual reports. These are sent to IDFG Fisheries Bureau personnel, Doug Munson (EFHL Pathologist), Phil Mamer (EFHL Supervisor), and the LSRCP office coordinator. Monthly summaries and annual reports are made available to the contact list (Section 5) by request.

2.5.7 Monitoring and Evaluation

M&E staff annually develop representative marking and loading plans for CWT and PIT at each hatchery facility to evaluate harvest and survival. For a more detailed description of the intended use of these tags see the tagging information section at the end of the appendix. These marks and tags were applied by the Pacific States Marine Fisheries Commission marking crew. All marks and tags that were applied to BY 2010 and proposed for BY 2011 are identified in the "proposed 2011 release" table.

2.6 Niagara Springs Fish Hatchery (NSFH)

IPC's mitigation goal at NSFH is to annually produce 400,000 pounds of healthy steelhead smolts. This equates to approximately 1.8 million smolts at a mean size of 4.5 fpp. Eggs for the program are obtained from adult returns spawned at PFH and OFH. The fish are reared from eyed eggs and swim-up fry to smolts at NSFH and released into the Pahsimeroi River below the PFH weir, into the Snake River below Hells Canyon Dam, and into the Little Salmon River at Stinky Springs or Hazard Creek.

2.6.1 Egg Incubation

NSFH requests a total of 1,104,000 Pahsimeroi stock eyed eggs and fry from PFH (Table 13). One half of the swim-up Pahsimeroi eggs collected at the PFH are incubated on chilled water at the PFH then shipped to NSFH as eyed eggs. The other half are incubated at PFH on chilled water through hatch and button-up to further retard their rate of development. These are shipped as swimup fry in June. In addition, NSFH requests 440,000 Oxbow-A eyed eggs and 440,000 Oxbow-A swim-up fry from OFH (Table 14). These eggs and fry are also incubated on chilled well water to slow their development. Eyed eggs from both facilities will be shipped to NSFH in June (at approximately 400 TUs) and placed in upwelling incubators inside the hatchery building. Swim-up fry are received in June (at approximately 950 TUs) and ponded directly into the outside raceways. Upon arrival at NSFH, eyed eggs are disinfected with Iodine at 100-ppm for 30 minutes prior to tempering and placing in upwelling incubators. Loading densities in the incubators range from 20,000 to 55,000 eggs, depending on water availability. Incubator flows range between 20 to 25 gpm, depending on water availability.

2.6.2 Nursery Rearing

After hatch, fry exit upwelling incubators directly into nursery rearing vats. Flows in vats will approach 50 gpm. Maximum flow indices should not exceed 0.8lbs/gpm/in, while density indices will peak at 1.13 lbs/ft^3/in. in the hatchery building even if we continue to only take ½ of total egg request as eggs and ½ as fry. (Swim-up fry attain a density index of .57 lbs/ft^3/in when they leave the incubators for the vats.) Swimup fry received directly from PFH and OFH are tempered in the hauling trailer prior to ponding directly into the outside nursery raceways. Fish hatched at NSFH from Oxbow-A eyed eggs are transferred

from indoor vats to outdoor nursery raceways 1 and 3 when they reach approximately 1,100 to 1,300 fpp. Oxbow-A fry are ponded directly into nursery raceways 5 and 7 at 950 TUs (2,000 fpp). Fish hatched from Pahsimeroi-A eyed eggs and Pahsimeroi-A swim-up fry are ponded in the remaining six nursery raceways, 9 through 19, at similar sizes and TUs, respectively. Rearing space is increased as fish grow and their density index approaches 0.30 lbs/ft^3/in. Fry will be hand-fed Rangen's dry feed in the indoor nursery areas. Hand-feeding occurs at least once per hour and will be supplemented by Zeigler belt feeders.

2.6.3 Raceway Rearing

Fish are reared in three banks of raceways at a maximum density index of 0.35 lbs/ft^3/in and a maximum flow index of 0.9 lbs/gpm/in. As densities increase in the nursery sections, screens are removed and fish are allowed to move down to the next screened raceway bank. Once the nursery area is lengthened to the 200-ft mark, AD-clipping and CWT marking begins (second week of September) and fish are evenly distributed into all raceways. Steelhead are fed Rangen's dry feeds throughout the early rearing period at Niagara Springs FH. Feed is dispensed by hand-feeding and supplemented with Ziegler belt feeders in the outdoor nursery areas. When fish reach 75 fpp, they are switched to Rangen's slow-sinking 470 extruded diet to allow staff to utilize two bulk tanks, a feed conveyor system, a fines separator and bridge feeders.

At least one-half of the fish are vaccinated with an autogenous *Aeromonas salmonicida* bacterin obtained from Aqua Health Limited. Fish are dipped in an oxygenated, vaccination solution of 18 liters of water to 2 liters of vaccine with a one-percent (1%) salt solution incorporated into the vaccine to reduce stress brought about by physical handling and to increase the uptake of vaccine by the fish. Vaccine will be applied at a rate of 220 lbs of fish per liter of vaccine, for at least 40 seconds. Because of a furunculosis outbreak during brood year 2006, and the lack of outbreaks during years when at least 50% of the population is vaccinated, NSFH will continue to vaccinate all future brood years. Mortalities will be recorded on all the raceways each month after vaccination until stocking.

A length at release standard of 180 to 250 mm is established under the NOAA Fisheries 1999 Biological Opinion. The BY2009 steelhead are projected for an average size of 220 mm at release. This is accomplished by holding the fish off feed and receiving eggs from later spawn dates to decrease fish size and minimize days off feed. Sample counts are performed bimonthly on representative raceways until December and then performed once per month until release. Length frequencies are checked periodically during outside rearing. Approximately 25,000 fish receive PIT tags in January. These computer chips are injected into the body cavities of the fish and information can be accessed as to hatchery origin, length, and weight, and release watershed, date of release, downstream migration, timing, and travel rates. In this manner, an individual fish can be tracked on its seaward migration without sacrificing the fish. CWT retention and fin clip quality checks are performed prior to pulling raceway screens for mixing or shipping. Dissolved oxygen is monitored during periods of peak loading. Water temperature remains a constant 59°F.

2.6.4 Fish Health

Fish health inspection and diagnostic services is provided by personnel at the Eagle Fish Health Laboratory (EFHL). Diagnostic services are provided as needed at the request of hatchery personnel. Quarterly on-site inspections include tests for the presence of viral replicating agents, *RS* (RS) and other pathogens. To control low levels of coldwater disease (*Flavobacterium psychrophilum*) that typically show up in January, a ten-day treatment with medicated feed (Oxytetracycline) is administered during February and March. Treatments are scheduled to comply with 21-day withdrawal times needed prior to release. A pre-liberation inspection of 60 fish from each stock (Pahsimeroi-A and Oxbow-A) including an organosomatic index of fish quality is done on all lots no more than 30-45 days prior to transportation. Specific pathogens tested for at pre-liberation will include IHNV, IPNV, VHSV, RS, *Flavobacterium psychrophilum*, *Aeromonas salmonicida*, *Yersinia ruckerii* and *Myxobolus cerebralis.*

2.6.5 Fish Release/Transportation

All NSFH steelhead smolts are trucked to release sites using three IPC 5,000-gallon fish tankers. IPC contracts with Neil Ring Trucking, Inc. to haul fish to release locations. Hauling begins about March 19 and concludes the fourth week of April. All fish are hauled in chilled spring water with the temperature adjusted to be within 3 degrees F of the receiving water. Tankers are loaded with approximately 5,000 lbs. of steelhead smolts each, not to exceed 5,500 lbs. Shipping occurs five days per week until all fish are stocked, with one day off in early April to complete a mid-season service on the tankers' generators. To reduce potential traffic and safety issues, releases at the Little Salmon River are coordinated with MFH, MVFH, and HNFH, and Bruce McLeod of the NPT. Releases at the Pahsimeroi River and Snake River sites are coordinated with the PFH and OFH managers.

2.6.6 Communication

NSFH distributes monthly hatchery production summaries, monthly hatchery narratives and annual reports. These are currently not sent to the Contact list (Section 5), but are maintained at the hatchery and IDFG headquarters and are available by request. NSFH program objectives are discussed at the Salmon River AOP, IDFG Anadromous Meetings, hatchery manager meetings and additional meetings to discuss and resolve any issues. In addition, the IPC hatchery biologist and IDFG anadromous hatcheries supervisor maintain close contact with the hatchery manager and staff for consultation as problems arise.

2.6.7 Monitoring and Evaluation

M&E staff annually develop representative marking and loading plans for CWT and PIT at each hatchery facility to evaluate harvest and survival. For a more detailed description of the intended use of these tags see the tagging information section at the end of the appendix. These marks and tags were applied by the Pacific States Marine Fisheries Commission marking crew. All marks and tags that were applied to BY 2010 and proposed for BY 2011 are identified in the "proposed 2011 release" table.

2.7 Pahsimeroi Weir

IPC's mitigation goal for steelhead production at PFH is to take up to 1,382,400 green eggs to produce 1 million smolts @ 4.5 per pound at NSFH. Using an assumed average fecundity of 4,800 eggs per female and an eye-up rate of 80%, approximately 288 pairs of adult steelhead broodstock are needed to supply NSFH with 1,104,000 eyed eggs. PFH also traps and spawns additional adult steelhead to provide 500,000 eyed eggs for the SBT egg box program and 625,000 for the LSRCP programs at MVFH (Table 14). These additional eggs require the spawning of 292 pairs of adult steelhead.

2.7.1 Ladder Operation

Trapping begins approximately February 20 and continues until a period when no fish are trapped for 10 days (typically mid-May). The trap will be checked weekdays during that period. With large numbers of steelhead expected in 2011 the trap may be checked 7 days a week if necessary.

2.7.2 Adult Handling

At trapping, all fish are measured for length, scanned for PIT tags, examined for gender, checked for various clips, tags, injuries, and readiness to spawn. All CWT fish are killed the day they are trapped and all pertinent information is recorded.

Tissue samples are collected from all marked steelhead used for broodstock and all unmarked steelhead and wild adult trout that enter the trap. All unmarked steelhead and trout will be released upstream of the weir. Tissue samples are collected for genetic parentage based analysis (Appendix 1).

Surplus hatchery adults are either planted into the Blue Mountain Pond in Challis, ID or the Kid's Pond in Salmon, ID. All steelhead out-planted from the PFH will either receive an operculum punch or caudal punch to identify recaptures. Recaptured fish will be killed and given to the general public or charities.

Each day during spawning operations, carcasses are given to the SBT, the Shoshone Paiute Tribe, the public, and to charitable organizations in accordance with IDFG policy. Current charitable organizations on file at PFH include: American Legion in Challis, Eastern Idaho Community Action Partnership (Idaho Falls and Salmon), the Idaho Food Bank, Montana Food Bank, and the Northwest Food Bank. Due to whirling disease amplification issues, carcasses are not used for nutrification of local waters. Fish not suitable for public or charitable distribution are placed in a refrigeration unit and hauled to a rendering plant in Kuna, ID for disposal.

2.7.3 Spawning/Egg Take/Egg Incubation/Egg and Fry Shipping

On spawn days, steelhead in the trap are sorted and checked for readiness to spawn. During sorting, males and females are collected in equal numbers. The ripe females are killed in groups of ten using the SI-5 stunner. Each female is individually incised and eggs are collected in a colander, allowing excess ovarian fluid to drain off. The drained eggs are placed in a bucket and fertilized by one male (one X one cross). The sperm is expressed directly into the bucket of eggs. Females with poor eggs or bloody ovarian fluid are

discarded. Males that expel bloody or watery sperm are not be used. Lengths are collected at spawning to evaluate age structure of the broodstock. Tissue samples are taken from spawned males and females and sent to the genetics lab for Parental Based Tracking (PBT).

Eggs are watered hardened in a 100 ppm solution of Argentyne at the lower PFH, placed in aquaseed tubes, then into coolers of well water and transferred to the upper PFH. Once eggs are received at the upper PFH, egg coolers are disinfected externally with Argentyne at 100 ppm for 15 minutes. Eggs are then tempered for up to 30 minutes as needed, then placed into incubation trays. Incubator trays will be loaded at the rate of 1 to 3 females per tray. Eggs are incubated on a range of water temperatures varying from 40F to 50F. This is dependent upon when each entity wants eyed-egg shipments and fry. Forty-eight hours after collection until eye-up, all eggs incubated at upper PFH receive 1,667 ppm fifteen minute formalin treatments administered Mondays, Wednesdays and Fridays. A 500 ml iodine California Flush is also administered on Tuesdays, Thursdays, and Saturdays. At eye up, eggs are shocked twice by pouring them into a bucket of water from a height of approximately 16 inches. Dead eggs are picked and enumerated with a Jensorter electronic counter/picker.

The Upper Salmon River B (USRB) steelhead program is currently being shifted to Pahsimeroi Fish Hatchery. USRB eggs are being received from Sawtooth Fish Hatchery and are being incubated at our upper facility. Once eyed, the eggs are shipped to Magic Valley Hatchery for production. Smolts are returned and released in the Pahsimeroi River below the weir. In 2010, the first USRB smolt release was made at Pahsimeroi. The program goal is to release up 120,000 USRB smolts annually at Pahsimeroi. The first returning adults are expected to return to Pahsimeroi in 2012.

A change is being made to the shipping methods to other hatcheries to be as pathogenically sound as possible. PFH staff is requesting that NSFH, MVFH and HNFH eggs be shipped in each hatcheries respective coolers.

2.7.4 Fish Health

At least 120 ovarian fluid and 30 tissue (kidney/spleen) samples are collected to assay for viral replicating agents. Sixty kidney samples are collected for ELISA testing for *RS.* Twenty head wedges are collected and examined for *Myxobolus cerebralis*.

2.7.5 Communication

Steelhead trapping updates are entered on the Hatchery Database Management System daily throughout the run and are available online through the HDMS database website http://fishandgame.idaho.gov/ifwis/hdmsdownload/defaultpage.aspx. Records of adult outplants are uploaded to the Department's fish release database as they occur. Pahsimeroi Hatchery personnel coordinate with the SBT, NSFH, and MVFH to determine a schedule to obtain and transfer eyed eggs and fry.

2.8 Sawtooth Fish Hatchery and Weir (SFH)

SFH weir is used to collect Sawtooth-A stock adult steelhead to provide 2,120,000 eyed eggs to MVFH and HNFH to produce smolts for release, and to the Shoshone-Bannock Tribes eggbox program.

2.8.1 Ladder Operation

Ladder and trap operations begin the last week of March and continue until early May. Steelhead swim into fish ladder attraction water, then into a single adult holding pond.

2.8.2 Adult Handling

Fish are sorted on Mondays and Thursdays. At sorting, fish are examined for gender, length measured, checked for various marks, radios, CWT, injuries, and readiness to spawn. Subsequent to sorting, ripe fish are spawned. Unmarked steelhead and other trapped species are released upstream of the hatchery weir. Genetic material and scale samples are collected from all unmarked steelhead and hatchery brood stock steelhead for genetic parentage analysis (Appendix 1).

First priority for spawned out carcasses is to Tribal ceremonial and subsistence programs and charitable organizations. Second priority for spawned-out carcasses is to the general public on a first-come-first-served basis. Due to whirling disease amplification issues, carcasses are not used for nutrification of local waters. Any remaining carcasses or unspawned adults are frozen and disposed of through rendering plant operation.

2.8.3 Spawning/Egg Take/ Egg Incubation/ Egg and Fry Shipping

Approximately 525 females will be spawned. Adult brood need is 1350 (assumes ~ 60:40 male:female ratio, 4,800 eggs per female fecundity, and 86% eye-up) to produce the eyed egg request. Spawning protocol is random 1: 1 with two female's eggs combined prior to water hardening of eggs.

All eggs will be water hardened and disinfected with PVP iodine per product label. Prior to transport, eggs will receive a flush with formalin three times per week during incubation. After eggs manifest a strong "eye" the eggs are sorted and enumerated mechanically. Only eyed eggs (no live fish) are transferred to HNFH and MVFH due to concerns with transfer of fish pathogens between stations.

2.8.4 Fish Health

At least 120 ovarian fluid and 30 tissue (kidney/spleen) samples are collected to assay for viral replicating agents from at least 150 females. Sixty kidney samples are collected for ELISA testing for *RS.* Twenty 20 head wedges are collected and examined for *Myxobolus cerebralis.*

2.8.5 Communication

Coordination of eyed egg shipments among the hatcheries is discussed weekly. Weekly communication for egg delivery status is undertaken with SBT Biologists. Twice weekly, run status is updated on the IDFG Webpage. Weekly summaries are provided to interested parties via e-mail. Eyed egg requests are finalized at the annual AOP meeting.

2.9 Shoshone Bannock Tribes Egg Box Program

The SBT developed supplementation activities aimed at improving the viability of natural steelhead populations. One million eyed steelhead eggs (Table 2) are outplanted in three Upper Salmon River tributaries: 1) Yankee Fork; 2) Indian Creek; and 3) Panther Creek. Eyed-eggs for Yankee Fork come from Sawtooth FH and eyed-eggs for Indian Creek and Panther Creek come from PFH. DNA tissue samples are collected from all steelhead at SFH and PFH to produce eggs for the egg box program for parentage based analysis (Appendix 1). Upon eye-up, eggs are transferred to remote incubators where they are incubated on river water to mimic natural hatch timing in the system.

2.9.1 Egg Incubation

Eyed eggs incubated and obtained from Sawtooth A hatchery stock will be placed into SSI in Yankee Fork. Eggs obtained from PFH are incubated at PFH and placed into stream side incubators (SSI) in Panther and Indian creeks.

SBT staff actively participates in spawning of steelhead adults at SFH. SBT staff collects genetic samples, gametes, and fork length for each parent fish isolated for Yankee Fork. Mating is conducted as 1:1 female to male and eggs are incubated separately from general production gametes. Adults utilized for Panther Creek and Indian Creek are spawned, tissue sampled, and measured at the PFH.

Incubators are standardized with 2-inch PVC pipe with a 3-inch head pipe to collect additional flow from the stream. Each head pipe was fitted with ¼ inch mesh screen to minimize sediment and debris collection. Each incubator consists of a 50-gallon polyurethane cylinder with a sediment tray, gravel, saddles, six egg trays, and one cover tray to contain eggs until hatching occurs. Each catch tank is a 30-gallon Rubbermaid polyurethane tub with a custom fit cover.

Incubators are monitored twice weekly from initial construction through complete volitional emigration. Staff records water condition, temperature, dissolved oxygen, conductivity, pH, and embryo stage as well as clean and remove debris from head pipe screens.

Upon full volitional emigration, hatch success is estimated from enumerating dead eggs in the incubator and dead fry in the catch tank. Fry seeded is estimated as the number of eggs planted minus the number of dead eggs/fry enumerated

2.9.2 Fish Release/Transportation

Eggs are transferred in bags within iced coolers to constructed incubators within each tributary. Eyed egg outplants are not to exceed 100,000 per upweller unit. Once on site, eggs are proportionately loaded onto six trays within the upweller. Family identity is preserved during egg outplant by recording which broodstock pairs are represented in each streamside incubator.

2.9.3 Communication

PFH, SFH, and SBT personnel coordinate to determine a schedule to obtain and transfer eyed eggs. Results and conclusions from the streamside incubation project are presented in an annual report to the Lower Snake River Compensation Plan.

2.10 Squaw Creek Pond/Weir

In an effort to provide large, predominantly 2-ocean (B-Run) returning adult steelhead to the upper Salmon River, progeny from steelhead spawned at Dworshak Fish Hatchery have been released into sites in the upper Salmon River. Beginning in brood year 1999, an effort to establish locally adapted B-run steelhead in the upper Salmon River was initiated at Squaw Creek. The goal was to phase out the practice of releasing progeny from adults spawned at Dworshak Fish Hatchery and replace them with progeny produced from a locally adapted Upper Salmon B-run stock (USB). Lack of a permanent trapping facility at Squaw Creek and high harvest rates of returning adults has limited collection of sufficient broodstock to replace the Dworshak releases. In 2009, IDFG initiated a plan to move this program forward by moving the broodstock collection to the PFH. This facility has a structurally secure weir that can be kept in operation through the entire spawning migration. Plans call for releasing up to120,000 USB and at least 60,000 DworB smolts annually (180,000 smolts annually) at PFH to serve as broodstock when they return as adults. To differentiate between the Pahsimeroi stock, all 120,000 USB smolts will have intact adipose fins but will be 100% CWT. This marking strategy will allow differentiation between the two stocks and also allow the USB fish to escape mark selective fisheries. We estimate that the combination of utilizing a good trapping facility and marking strategy will be sufficient to return enough adults to completely replace the Dworshak outplants in the upper Salmon River with a locally adapted USB stock.

Production depends on available broodstock. Salmon River B-stock program goal is 660,000 smolts. DNFH B stock eggs will provide the difference between Squaw Creek pond /weir and eggs needed to produce 660,000 smolts.

Approximately 140 pair of B-run steelhead adults are needed annually to provide eyed eggs (Table 14) for smolts to be released into the upper Salmon River. Squaw Creek pond is a steelhead smolt release pond. This pond is no longer used for steelhead smolt releases. The Squaw Creek weir and attached fish trap are used to capture returning upper Salmon River B-run steelhead.

2.10.1 Ladder Operation

A weir and trap box will be put into place in Squaw Creek approximately 200m upstream of the confluence of Squaw Creek with the Salmon River. Trapping occurs from late March through early May, except during periods of extreme high flow or cold temperature. Trap is monitored daily. Trap boxes are also placed in the main Salmon River below Squaw Creek where angler caught adult steelhead can be deposited.

2.10.2 Adult Handling

Steelhead deposited in angler caught trap boxes are collected by IDFG staff daily and taken to East Fork trap holding ponds for sorting and spawning. Females larger than 75cm in length or males larger than 79cm in length are considered B-run steelhead. All ad-clipped B-run steelhead are taken to the EF weir and held for spawning. Squaw Creek and angler caught B-steelhead receive an unique external mark to differentiate from East Fork Natural steelhead. B-steelhead at the EF weir are spawned with other B-steelhead when ripe males and females are available. Fish not meeting the criteria for B-stock fish are considered A-stock fish. These fish are examined for CWT. If a CWT is present, the snout is taken and the carcass is taken to SFH. If no CWT is detected, unmarked fish are released into Squaw Creek above the weir. Ad-clipped steelhead not meeting the size criteria are released into the Salmon River after receiving an opercle punch. Genetic samples are collected from all unmarked fish trapped at the weir and all fish that are spawned (Appendix 1). All unmarked steelhead are released above the Squaw Creek weir.

First priority for spawned out carcasses is to Tribal programs, and charitable organizations. Second priority for spawned-out carcasses, as well as for unspawned steelhead, surplus to spawning need, is to the public on a first-come-first-served basis. Due to whirling disease amplification issues, carcasses are not used for nutrification of local waters. Any remaining carcasses or unspawned adults are returned to Sawtooth, frozen, and then transported to a rendering plant.

2.10.3 Spawning/Egg Take/Egg Incubation/Egg and Fry Shipping

All B-run hatchery steelhead are spawned at EF weir following a 1f:2m mating protocol. Each female's eggs is separated into two equal portions then fertilized with two individual males. Male selection preference first is in-basin 2-ocean B-program, and second is in-basin 1-ocean male B-program (> 68 cm with proper CWT code).

All eggs are water hardened and disinfected with PVP iodine per product label. Prior to transport, eggs will receive a flush with formalin three times per week during incubation. After eggs manifest a strong "eye" the eggs are sorted and enumerated mechanically.

2.10.4 Fish Health

Sixty kidney samples are collected for ELISA testing for *RS.* Twenty 20 head wedges are collected and examined for *Myxobolus cerebralis.*

2.10.5 Communication

IDFG Research assists SFH personnel in developing trap management plans. Egg production and shipments are coordinated between SFH, PFH and MVFH.

3 CHINOOK

Chinook salmon *Oncorhynchus tshawytscha* are native to the Columbia River drainage and spawn in fresh water during the summer and fall months. Idaho's Chinook enter the fresh water system the same year they spawn, usually beginning in spring of each year. Spawning begins in August and continues as late as November. Spring, Summer, and Fall Chinook are designated by the time of entry into the Columbia River system.

3.1 Eagle Fish Hatchery (EFH)

EFH is responsible for producing captive reared adults for release in the West Fork Yankee Fork and East Fork Salmon River. Approximately 300 eyed eggs are necessary from each stream to achieve adult production goals. Eyed eggs are collected from redds in each stream. Collected eyed eggs are transported to EFH for hatch and rearing. Adult production goals for each stream are to release a minimum of 20 pairs or age 3, age 4 and age 5 adults, annually. The Captive rearing and production part of this program has been completed (the last eyed-eggs were collected in 2005 with the last adults released in 2010). Monitoring and Evaluation activities are continuing on the East Fork Salmon River. *Dan Baker*

3.2 East Fork Weir

Depending on spring runoff conditions, ladder and trap operations will begin early June and continue through the end of September. Adults trapped at the weir are sampled and passed above the weir to spawn naturally. *Eric Stark*/*Brent Snider*

3.2.1 Adult Handling

Fish are checked daily. At checking, fish are examined for gender, length measured, checked for various marks, radios, CWT, injuries, Genetic material and scale samples are collected from all unmarked Chinook salmon. Unmarked Chinook salmon and other trapped species are released upstream of the hatchery weir. *Eric Stark/Brent Snider*

3.2.2 Monitoring and Evaluation

Genetic samples from natural/wild adult Chinook salmon collected at the EFSR adult trap will be analyzed to assess the relative reproductive success of captive-reared adults previously released to spawn naturally in the EFSR. Genetic material from these adults will be analyzed with samples from all captive-reared adults released to spawn, all previous years' natural adult returns, and all carcasses recovered from the study area. These samples will be used in parental exclusion analyses through the use of microsatellite markers (parental exclusion analysis: Estoup et al. 1998; Bernatchez and Duchesne 2000; Eldridge et al. 2002). *Eric Stark*

3.2.3 Communication

Chinook Salmon Captive Propagation Technical Oversight Committee (CSCPTOC) meets quarterly providing program updates to participating agencies.

3.3 Johnson Creek Weir

The goal of the Johnson Creek Artificial Propagation Enhancement (JCAPE) project is to reduce the demographic risk of extirpation of the ESA listed Johnson Creek summer Chinook salmon and begin its recovery through supplementation. A secondary goal is to maintain genetic diversity of the artificially propagated summer Chinook salmon population and the natural population. The intent is to increase adult returns through increased juvenile survival and improved homing in order to preserve and recover the Johnson Creek salmon population.

3.3.1 Supplementation (O&M) Goal

Conduct necessary operations to produce 100,000 smolts annually for release back into Johnson Creek. In order to meet this supplementation goal, up to 40 pairs of natural origin adults are needed to produce 100,000 smolts annually.

3.3.2 Monitoring and Evaluation (M&E) Goal

Establish baseline information on the Johnson Creek summer Chinook salmon population. Monitor and evaluate the effectiveness of supplementation to aid in the recovery of the natural population of Johnson Creek summer Chinook salmon.

3.3.3 Weir operation

The Johnson Creek weir is installed late May/mid June when water flows subside to 700cfs or below. Adult Chinook, encountering the Johnson Creek weir, enter a trap box. The weir contains both upstream and downstream trap boxes to capture upstream and downstream migrating adults. Fish are processed out of the trap boxes daily. The weir is removed when no fish have been captured for seven consecutive days, usually in mid September. *John Gebhards*

3.3.4 Adult handling

Up to 40 pairs of natural origin adults are kept for brood stock, and are taken and held until spawning at the South Fork Salmon River (SFSR) trap. At the SFSR trap, Johnson Creek adults are treated similar to SFSR adults (see MCFH adult handling). Additional natural origin and all hatchery origin adults captured at Johnson Creek weir are either: 1) released upstream for natural spawning; 2) released downstream if captured in the downstream trap box; or 3) euthanized and placed into Johnson Creek for nutrient enhancement (stray AD fin clipped fish only). All fish released above the weir are opercle tagged. Broodstock transported to the SFSR are both opercle and floy tagged.

All adult Chinook (excluding jacks) trapped on Johnson Creek are injected via an intraperitoneal route with 20 mg/kg erythromycin prior to transport to the SFSR Trap or release back into Johnson Creek. A maximum of 40 natural origin Johnson Creek adult pairs (including jacks) are taken for broodstock and transported to the SFSR trap for holding. Eggs from 32 females allow for high BKD culling and to maintain smolt production near 100,000. Broodstock are marked with a numbered tyvek opercle tag and a numbered floy tag to differentiate from SFSR broodstock. *John Gebhards*

3.3.5 Carcass disposition

All trap/weir pre-spawning mortalities and spawned out carcasses are transported back to Johnson Creek and released by NPT fishery personnel for nutrient enhancement. *John Gebhards*

3.3.6 Spawning/egg take plans, mating protocol

Johnson Creek broodstock are spawned at the SFSR trap on the same days as the SFSR broodstock. Spawn pairing is one male to one female. An additional male is used when sperm quantity or quality is questionable.

Johnson Creek origin eggs are transported in individual egg bags to the MCFH for incubation in Heath style incubators trays. Eggs are loaded into trays at one female per tray. Incubation procedures are the same as those used for SFSR production eggs.

During spawning, all brood females are sampled for *RS* by ELISA technology. Eggs from females with optical densities of 0.25 and above are culled from production. Brood fish are also examined for viral replicating agents and *Myxobolus cerebralis.* Eggs from parents with serious pathogens are culled. The APHIS veterinarian-in-charge is notified of any reportable pathogens. *John Gebhards/Doug Munson*

The JCAPE project has cryopreserved semen available for use in spawning (Appendix A). The use of these samples would follow the guidelines established by the NPT Cryopreservation project and with approval from NOAA Fisheries. *John Gebhards*

3.3.7 Early rearing

After hatch Chinook fry are transferred into two indoor rearing vats with screens initially placed at ½ lengths. Fry are initially reared in two indoor rearing tanks. Hourly hand feeding during the day commences when 80% of fry achieve swim-up. Flows are initially set at 80 gpm then increased to 130 gpm (maximum) when fry are well on feed. Individual vats are extended to full length when the density index reaches 0.40 to 0.45. Following June reserve SFSR salmon ad fin clip marking, the Johnson Creek Chinook are divided into additional vats to reduce rearing densities. All Johnson Creek Chinook receive a CWT in mid-July (MATS) and are moved back into the indoor vats for continued rearing. As density indices approach 0.40 Chinook parr are subdivided into additional vats.

Johnson Creek Chinook parr are moved into the outdoor collection basin in November following VIE elastomer marking. Chinook are hand fed a dry pellet diet with a low phosphorus formulation and fortified with an EIBS vitamin pack (2.5 mm and 3.0 mm feed size). Sample counts are conducted monthly to monitor growth. *John Gebhards*

The JCAPE project is integrated with a comprehensive M&E program that follows a detailed M&E Plan (Vogel et al. 2005). The monitoring and evaluation program quantifies 41 regionally standardized performance measures to evaluate the supplementation program. These standard performance measures help inform decisions on Abundance, Survival-Productivity, Distribution, Genetic, Life History, and Habitat. The evaluation plan utilizes comparative performance tests at multiple life stages and involves treatment vs. natural

experiments and repeated measures testing (treatment vs reference). This program, initiated prior to the first releases of supplemented fish, has been collecting baseline life-history characteristic information, to examine survival of the wild fish in Johnson Creek and any potential effects that the supplementation program may have on the natural population.

All Johnson Creek Chinook are CWT tagged, 50,000 receive VIE elastomer tags and approximately 4,000 are PIT tagged. MATS marking trailers are used to insert CWT in July by IDFG personnel. Fishery personnel from the NPT are responsible for VIE elastomer (50,000) and PIT tagging (4,000). A baseline mark quality assessment is conducted by NPT fishery personnel as they PIT tag the smolts. *John Gebhards/Craig Rabe*

The Nez Perce Tribe operates six PIT tag arrays (see Table below) in the South Fork Salmon River Basin (SFSR) to help evaluate the survival of the juvenile releases out of the SFSR and survival back as adults. This PIT tag array also helps provide real time estimates of adults into the SFSR and help evaluate natural and hatchery composition. Information about PIT tag recapture information can be viewed at "www.ptoccentral.org/dbaccess/InStrmDtctn/InStrmDtctn_query.html".

South Fork Salmon River flat panel passover PIT tag array locations and site codes operated by the Nez Perce Tribe.

Site	GPS	River km	Site Code
Secesh River Upstream	N45.03340 W115.73373	522.303.215.059.003	ZEN A0
Secesh River Downstream	N45.03348 W115.73219	522.303.215.059.003	ZEN B0
EFSFSR Upstream	N44.95756 W115.52892	522.303.215.060.021	ESS A0
EFSFSR Downstream	N44.95583 W115.53801	522.303.215.060.020	ESS B0
Upper SFSR	N44.97840 W115.72700	522.303.215.065	KRS
Lower SFSR	N45.17575 W115.57998	522.303.215.030	SFG

3.3.8 Fish health

Johnson Creek Chinook are reared at MFH and follow MFH fish health protocols. The EFHL provides diagnostic and inspection services to these fish. A pre-liberation sample consisting of 60 randomly collected fish is examined for *Renibacterium salmoninarum (RS)*, parasites, and viral replicating agents. Goede's organosomatic index is also

performed on these fish. The preliberation sample is performed within 45 days of release. *John Gebhards/Doug Munson*

3.3.9 Communication

The JCAPE project provides weekly updates during the adult trapping and spawning season. These updates are distributed via e-mail. The JCAPE project is responsible for preparing annual brood year reports that are submitted to both NOAA Fisheries and BPA. These reports are not currently sent to the contact list (Section 5), but are available upon request or through BPA's website or from the JCAPE project staff. The JCAPE project is required to prepare and submit as a condition of ESA Section 10 permitting an Annual Operation Plan (AOP) for the JCAPE project to NOAA Fisheries. Once the AOP is approved by NOAA Fisheries, it will be available for upon request. *John Gebhards*

3.3.10 Transportation

Johnson Creek summer Chinook are transported to release site by NPT fisheries personnel. The NPT provide personnel and up to four 1-ton 4x4 trucks with 300 – 400 gallon tanks for transporting smolts to Johnson Creek near Wapiti Ranch for release. One scheduled release trip (3 to 4 trucks per trip) is planned for each day. Release of these smolts is scheduled for mid-March. *John Gebhards*

3.4 Lemhi River Supplementation Project (LRCSS)

The Lemhi River has been chosen by the ICTRT (2006) as one population that must meet the viability criteria as it provides important connectivity to other Major Population Groups, as a large, downstream population and historically may have supported summer Chinook production. Coordinating parties have committed to reviewing options for the Lemhi River to develop details for objectives, rearing strategies and facilities, release numbers, and a mark plan.

As a result, the Shoshone-Bannock Tribes has initiated planning to implement a hatchery supplementation program in the Lemhi River. Planning for this hatchery would commence with FY 2009 funding and include the development of a Hatchery Genetics Management Plan (HGMP) and a feasibility plan which includes engineering, design, and construction costs. Meanwhile, the Tribes would determine the existing population size, genetics, and applicable information for determining the best available stock for re-introduction. Initiation of this project would promote recovery and production of the ESU and help in achieving an ESU standard where the population is no longer at risk or needs protection.

3.5 McCall Fish Hatchery (MCFH) and South Fork Salmon (SFSR) Weir

MCFH requires 1,380 returning SFSR reserve summer Chinook salmon to support program release objectives of 300,000 eyed eggs (SBT Dollar Creek in-stream incubator boxes), 285,000 green eggs (Crooked River summer Chinook introduction to be reared at Clearwater FH) and a 1.0 million smolt release at Knox Bridge on the SFSR (MCFH production goal). To accomplish this, 612 females and 768 males (including 31 jacks) need to be ponded as brood stock. On average this should allow for spawning of 444 females given an average pre-spawning mortality rate of 25%. A 1:1 (male to female) spawning ratio will be used and males will be killed following milt collection. Assuming an effective BKD High culling rate

of 6% and an average fecundity of 4,500 eggs per female would provide a total of 1,867,500 green eggs for various program uses. Given an average eye-up rate of 85% and a rearing mortality rate of 4%, post eye-up at MCFH, this egg take should meet the release goal of 1,000,000 smolts, 300,000 eyed eggs and 285,000 green eggs. Overall, MCFH's adult return goal is 8,000 SFSR summer Chinook above Lower Granite Dam.

Program direction is to adopt an integrated "stepping stone" brood stock management plan in which some natural genetics will be included in the annual smolt production goals (differential marked from reserve production). In 2010, managers initiated the development of an integrated stepping stone program in the SFSR with a goal of producing 250,000 smolts derived from natural-origin returns (NORs). As these integrated smolts return as adults, they will be: 1) used as broodstock for the next generation of integrated smolts or 2) released upstream of the weir to supplement natural spawning, or 3) used as broodstock in the segregated stepping stone component of the program (if enough integrated adults return to meet priority 1, and 2 above).

Ideally, adults spawned to create the integrated program would be derived using 100% NORs for the first generation. However, due to ongoing supplementation research in the SFSR, managers decided to reduce the number of NORs retained for broodstock to avoid confounding research results. All spawn crosses used to create the 250,000 integrated smolts will be hatchery-origin by natural-origin (HxN) for brood years 2010-2012. The number of male NORs collected at the weir will drive the size of the integrated component up to a maximum of 250,000 smolts. Smolts produced from HxN crosses will be marked differentially (100% CWT, no-fin clip) from the segregated harvest component (100% Ad-clip). Spawn crosses used to create the 750,000 smolt segregated harvest component for the SFSR, the Shoshone –Bannock Egg-box program, and eyed eggs for the SFCR program will be hatchery by hatchery (HxH). Beginning with brood year 2013, full implementation of the sliding scale will be initiated.

By 2013, evaluation of adult abundance and productivity measures from the ongoing supplementation research in the SFSR will have ended. As such, managers will begin retaining both male and female NORs trapped at the SFSR weir as outlined by the sliding scale. Annually, the number of NORs that are either retained for broodstock or released to spawn naturally will be based on the sliding scale. The sliding scale allows the proportion of NORs in the broodstock (pNOB) and the proportion of naturally spawning adults that is composed of HORs (pHOS) to slide with variable NOR escapement.

Additionally, MCFH rears up to 100,000 Johnson Creek origin summer Chinook salmon, to smolt, annually.

3.5.1 SFSR Weir Operation

Summer Chinook for the MCFH summer Chinook program are collected at the SFSR weir. The SFSR weir is installed after high water when river flows begin to subside. The bridge/weir design allows for placement when the F.S. USGS Krassel Gauging Station staff reading reaches 4.0 to 4.2; typically the second week of June. Hatchery personnel monitor

flows physically at the SFSR and on-line to determine the appropriate river stage when to lower weir panels.

During periods of heavy fish movement, access into the trap will be blocked by means of pickets inserted at the end of the ladder once approximately 400 fish have entered the trap to prevent potential smothering. Trapping operations will continue through the end of spawning until no fish have been trapped for one week, at which point water to the ladder will be shut off and weir panels preventing upstream fish passage will be removed.

Prior to trapping in 2009, Biomark installed a PIT tag array system into the ladder of the South Fork trap. This system consists of four antennas (two top water and two floor orifice) that are designed to detect all fish with PIT tags entering the trap.

3.5.2 Adult Handling

Upstream migration of returning salmon will be stopped by the SFSR weir allowing for adult interception in the adjoining trap. All Chinook are processed through the trap where they are identified by mark type, sexed, measured, scanned for PIT tags and CWT, and any definable injuries are noted. Tissue samples are collected from all natural origin fish released above the weir during trapping, for the genetics baseline. During spawning genetic samples are taken from males and females spawned and recorded in a manner to allow for parental genetic analysis. All CWT snouts collected are sent to the Nampa Research office for tag extraction and processing. Unmarked adults receive an operclum hole punch prior to being passed upstream to spawn naturally. This is done to help management efforts in evaluating weir efficiency. No salmon processed through the SFSR trap will be injected with erythromycin due to environmental concerns and logistics needed to insure a 30-day withdrawl period is reached prior to in-stream disposal of brood stock carcasses. Salmon intended as brood stock are placed into the holding ponds separated by sex; East holding pond – females, West holding pond – males and sub-divided section for outplants or subsistence redistributions.

All brood females are sampled for *RS* by ELISA technology. Eggs from females with optical densities of 0.250 and above are culled from production. Ovarian fluids from 60 females and kidney/spleen tissues from 30 fish are collected for viral replicating agent examination, while head wedges are collected from 20 fish for *Myxobolus cerebralis* examination. The APHIS veterinarian-in-charge is notified of any reportable pathogen.

All unmarked returning salmon are visibly checked for the presence of any detectable elastomer mark; indicating the fish to be a Johnson Creek supplementation “stray.” Any Johnson Creek strays encountered are segregated, and then transferred to Nez Perce fishery personnel who are responsible for transporting/releasing the fish into Johnson Creek. All unmarked salmon will be scanned using a coded-wire-tag detection wand as part of being processed through the SFSR Trap. On a positive CWT detection, additional attention is exercised to check for the possible presence of an elastomer mark. If no elastomer mark is detected, returning Chinook that have no marks with CWT are killed and the snout collected for coded-wire-tag analysis. *Gene McPherson/ Steve Kammeyer*

Priority use of reserve Chinook, in excess of hatchery needs, is to provide additional harvest opportunity during sport and tribal seasons. The operculum of excess reserve Chinook not intended for use as brood stock are hole punched, double punched if the presence of a CWT is detected, and placed into a subdivided section of the West holding pond until they are either loaded onto a truck for transport to in-basin release sites, primarily downstream near Roaring Creek (during fisheries), or are dispatched for subsistence purposes to support Tribal and non-Tribal charitable relief organizations These fish are not injected with erythromycin.

Pre-spawn mortalities are returned to the SFSR for nutrient supplement at a specified location immediately downstream from the trap water intake or are redistributed to upstream sites coordinated through the IDFG Regional Anadromous Fishery Biologist. Prior to disposal external tags are removed and the tail is completely severed from the body to identify these fish for those conducting spawning ground surveys. All female spawning carcasses exhibiting gross internal signs consistent for BKD, as determined by fish pathologists, are frozen and disposed of in a public landfill. *Gene McPherson/Steve Kammeyer*

3.5.3 Spawning/Egg take/Incubation/Shipping

Spawning protocols initiated with BY2009 SFSR summer Chinook production will be continued in response to enhanced egg requests, continued direction to provide genetic samples that will allow for parental genetic analysis and the need to reduce the number of males being held for spawn-taking activities. All reserve salmon will be spawned at a 1:1 (Male to Female) spawning ratio. Integration spawn pairs (natural x reserve) will be spawned at a 1:1 (Male to Female) spawning ratio as a split random cross. Milt will be pre-collected from natural males the day prior and the day of spawning and kept refrigerated until use. Natural males will be released upstream of the weir following milt collection used to fertilize of the half the eggs from each of two reserve females. At the time of spawning, genetic samples will be collected from each spawning pair. To facilitate this action, reserve males will be killed following milt collection. A minimum of 444 reserve summer Chinook females will need to be spawned to meet program objectives as: 291 females (to provide for 1,000,000 MCFH smolt production), 85 females (to produce 300,000 eyed eggs for SBT Dollar Creek egg boxes) and 68 females (to provide 285,000 green eggs for the introduction of summer Chinook to Crooked River). Key assumptions made include: 4,500 average fecundity, 6% effective BKD High culling rate and an 85% eye-up rate. Spawn taking activities take place on Tuesdays and Fridays and may begin at primary sort – Tuesday of the 2nd week of August. Spawning is limited to a maximum of 150 females per day. A kidney sample for ELISA BKD analysis will be collected from all females spawned. Ovarian fluid and cranial wedges, number to be determined by fish pathologists, are collected from a portion of the spawned females for viral testing and whirling disease. All eggs collected are linked to an individual egg tray, or genetic samples, based on the ELISA BKD disease sample collected. *Gene McPherson/Steve Kammeyer*

3.5.4 Egg incubation

Hatchery production eggs and eggs spawned for SBT egg boxes are returned to MCFH for incubation in Heath style incubators trays following water hardening at SFSR trap. Green eggs collected for summer Chinook introduction in Crooked River are transported to Clearwater FH for incubation by IDFG personnel following water-hardening at the SFSR trap. Reserve eggs are loaded into trays as two females per tray and any integration production eggs produced will be incubated as 1-female per tray. Formalin is added to each incubation stack to retard fungus development daily at a rate of 1,667 ppm (10-min drip). Formalin treatments are initiated 2 days following spawning and continue until immediately prior to hatch. A light "rodding" of trays to remove sediments begins weekly once eggs accumulate 400 TU's. At 550-600 TU's eggs are shocked then picked/ enumerated the following day. Eggs generated from females demonstrating ELISA optical densities greater than 0.250 will be destroyed prior to eye-up and egg enumeration; individual Lot averages will be assigned to these eggs for fecundity and % eye-up. Once eggs have been enumerated additional eggs may be culled, based on ELISA results, to reduce inventory to achieve a "full capacity" hatchery level. A secondary "pick" is performed following complete egg hatch (1,000 – 1,050 TU's). Fry are transferred to indoor vats for early rearing at swim-up (1,700 – 1,750 TU's). *Gene McPherson/Steve Kammeyer*

3.5.5 Fish Health

Chinook salmon reared at this facility are inspected by the EFHL on a quarterly basis for *RS*, viral replicating agents, parasites, and bacterial pathogens. Diagnostic services are provided upon request. A preliberation sample consisting of 60 randomly selected fish is examined for *RS*, viral replicating agents and whirling disease *M. cerebralis*. Goede's organosomatic index is performed as a part of this preliberation examination. The preliberation examination is performed between 30 and 45 days prior to release. The APHIS veterinarian-in-charge is notified of any reportable pathogen.

3.5.6 Early Rearing

At swim-up summer Chinook fry are transferred into 12 indoor vats with screens initially placed at ½ vat length. Fry are setout in a manner to allow for spawn timing proportionality representation for CWT and individual pond marking. Approximately 90,000 fry are setout in each vat. Hourly hand feeding during the day commences when 80% of set out fry have achieved swim-up. Extruded "BioVita" starter feeds, produced by Skretting/ BioOregon, are used during early rearing. Flows are set at 80 gpm then increased to 140 gpm (maximum) when fry are well on feed. Individual vats are extended to full length when the density index reaches 0.50 to 0.55. Approximately ½ of the fry are marked (hand Ad-clipped) into outdoor ponds in early to mid-June (200-350 fpp). At this time remaining fry are subdivided into 5 of the emptied vats to provide space for continued rearing (40,000 to 55,000 in 11 vats). Remaining indoor fry (100 – 150 fpp) are marked (MATS Automated Trailer) into the outdoor ponds during the 3rd week of July with ending individual vat densities ranging from 0.30 – 0.50 (flow indices0.70 – 1.20).

3.5.7 Final Rearing

Final rearing takes place in one of two outdoor rearing ponds which are partially covered to allow for natural light penetration. Summer Chinook in the ponds are hand fed a dry pellet diet (BioDry-1000 LP w/ EIBS vitamin pack), produced by Skretting/ BioOregon, with a low phosphorus formulation and fortified with an EIBS vitamin pack. Sample counts are conducted monthly to monitor growth. No prophylactic erythromycin medicated feed treatments are scheduled. At time of release density and flow indices do not exceed 0.25 and 2.00, respectively. Ponds are connected to a collection basin where fish are crowded for loading onto transport trucks for release.

In response to a request by IDFG fishery research personnel, BY10 parr will be marked into both of the outdoor rearing ponds during June and July mark sessions. Also, fish that receive a CWT will be distributed equally between the outdoor ponds. Currently, all SFSR summer Chinook are Ad-clipped, and approximately 150,000 of these are also CWT. Additionally, 39,000 of the Segregated brood smolts and 13,000 of the Integrated brood smolts receive a PIT tag prior to release. The current mark schedule is set to hand AD-clip 500,000 SFSR Reserve parr starting on June 6th; divided between both ponds. The MATS trailer will be used to AD-clip 100,000 and AD-clip w/ CWT 150,000 SFSR Reserve parr and CWT only 250,000Integrated brood parr beginning on July 11th; also into both ponds. PIT tags will be inserted into 52,000 pre-smolts from both pond one and two in mid-February 2012. These PIT tags will be proportionally distributed between segregated (39,000) and Integrated (13,000) fish. In the two weeks prior to release a sample of 300 summer Chinook (crowded with a seine to make selection more random) from each pond will be checked by MCFH staff to provide a baseline for mark quality, release size and fish condition.

The approximately 39,000 PIT tagged fish are part of the CSS study which began in 1996, the 13,000 are Integrated brood fish. A background and summary of the CSS study (10 year retrospective report) can be found at http://www.fpc.org/documents/CSS/FINAL. Hatchery staff recovers PIT tags from pre-release mortalities and sweeps raceways with a magnet post release to recover any shed PIT tags. In addition, a PIT tag array system will be used on the fish pump at the time of loading fish to be hauled to the SFSR in an effort to get a final release estimate for PIT tagged fish.

The Nez Perce Tribe operates six PIT tag arrays (see Table below) in the South Fork Salmon River Basin (SFSR) to help evaluate the survival of the juvenile releases out of the SFSR and survival back as adults. This PIT tag array also helps provide real time estimates of adults into the SFSR and help evaluate natural and hatchery composition. Information about PIT tag recapture information can be viewed at "www.ptoccentral.org/dbaccess/InStrmDtctn/InStrmDtctn_query.html".

3.5.8 Monitoring and Evaluation

M&E staff annually develop representative marking and loading plans for CWT and PIT at each hatchery facility to evaluate harvest and survival. For a more detailed description of the intended use of these tags see Appendix A. These marks and tags were applied by the Pacific States Marine Fisheries Commission (PSMFC) marking crew in the summer (CWT)

and winter (PIT) prior to release. All marks and tags that were applied to BY 2009 and proposed for BY 2011 and 2012 are identified in the "proposed release table".

3.5.9 Communication

Hatchery staff maintains communication with LSRCP coordinators, IDFG Fishery Bureau Staff, IDFG Fish Health Pathologists, IDFG Fish Marking Coordinators, and NPT Fishery Staff through rearing cycle as needed. In addition, monthly production narratives are provided to representatives from each organization. *Gene McPherson/Steve Kammeyer*

As eggs are enumerated MCFH will coordinate with SBT fishery personnel to determine a schedule to transfer eyed eggs. Spawning summaries will be included in the annual run report. *Gene McPherson/Steve Kammeyer*

Prior to initiation of transportation activities the MCFH hatchery manager contacts the Valley County Road Department to notify them of the hatcheries hauling schedule to ensure the Warm Lake road plowing crews are aware of our presence. The MCFH hatchery manager also contacts McCall field offices of the IDFG and NPT, prior to releases, so they were aware of the hatcheries release schedule and the operation of fish sampling screw-traps can be suspended. *Gene McPherson/Steve Kammeyer*

South Fork Salmon River flat panel passover PIT tag array locations and site codes operated by the Nez Perce Tribe.

Site	GPS	River km	Site Code
Secesh River Upstream	N45.03340 W115.73373	522.303.215.059.003	ZEN A0
Secesh River Downstream	N45.03348 W115.73219	522.303.215.059.003	ZEN B0
EFSFSR Upstream	N44.95756 W115.52892	522.303.215.060.021	ESS A0
EFSFSR Downstream	N44.95583 W115.53801	522.303.215.060.020	ESS B0
Upper SFSR	N44.97840 W115.72700	522.303.215.065	KRS
Lower SFSR	N45.17575 W115.57998	522.303.215.030	SFG
SFSR Trap	N44.66660 W115.70292	522.303.215.110	STR

3.5.10 Transportation strategies

The MCFH LSRCP transport truck, MCFH adult transport truck, MFH resident 2-Ton transport truck and two resident transport trucks (from Nampa FH) are utilized to move salmon smolts to the SFSR release site at Knox Bridge. Approximately 8,500 pounds of fish are transported during each release trip and 2 release trips are scheduled each day. At Knox Bridge, water from the SFSR is pumped onto the trucks to provide tempering prior to release. Release takes place using a transfer tube stretching from the roadway to the river. Johnson Creek origin summer Chinook smolts are emptied from the hatchery collection basin before SFSR SU transportation begins.

3.5.11 Adult Outplants

Adults returning to the SFSR vary in terms of numbers, origin, sex ratios, and age class (some years there are lots of jacks). Because of this, it is our desire to have general agreement on what to do with fish that are in excess of harvest, broodstock, and subsistence distribution. Given the variability of the adult returns on an annual basis, the most useful guidance tool is a table that lists out the priorities of where and how the excess fish will be handled. Fish that are out-planted into areas are intended to help boost natural spawning with the anticipation of bringing back more "natural" fish. Fish that are out-planted need to be sexed at the weir to ensure an equal sex ratio. In addition, out-planting of jacks should be limited $\leq$ 10% of the males, in order to ensure that the fittest individuals are spawning and not to promote jacking, in case that trait is heritable. Last, the timing of out-plants should occur late enough to 1) encourage fish to remain in outplant sites for intended spawning (i.e. after July 25), and 2) to ensure that fish sufficiently mature to decrease chances of fish straying into other tributaries.

The table below provides a prioritized list of release locations and numbers for locations within the larger SFSR drainage. These locations and numbers give adult spawners a chance to seed under utilized habitat in order to maximize spawner success, with the anticipation of bringing back more natural adults in future years. In order to ensure that monitoring and evaluation programs have the correct evaluation tools, all out-planted fish need to be differentially marked with a unique opercle punch pattern to differentiate 1) fish recycled for the fishery, 2) fish out-planted into upper mainstem SFSR, and 3) fish out-planted into EFSFSR (three distinct marks). In addition, for fish out-planted into the EFSFSR a genetic sample will be taken (the opercle punch is adequate), in order to evaluate the fish that may spawn in Johnson Creek. The NPT has an ongoing genetic parentage study for all returning adults to Johnson Creek.

The table presumes that prior to out-planting, harvest, broodstock, and subsistence distribution needs are satisfied. Out-planting will occur after the upper mainstem South Fork Salmon River reaches the Nez Perce Tribe minimum viable number of 1,000 spawners. Releases should occur late enough to encourage fish to remain in outplant sites for intended spawning (i.e. after July 25) to ensure that fish sufficiently mature to decrease chances of fish straying into other tributaries(SFSR-South Fork Salmon River, EFSFSR – East Fork South Fork Salmon River, 2LOP- Two left opercle punches, 2ROP- Two right opercle punches).

Outplant table for excess adult Chinook from upper mainstem South Fork Salmon River weir, listed by Priority, stream, numbers, and applied marks.					
Prioriti-zation of Outplants	Outplant Stream	Release Location	Number males Outplanted	Number Females Outplanted	Core Mark
1	SFSR	Goat Ck/ Roaring Ck	200	400	2LOP
2	EFSFSR	Above Glory Hole	200	400	2ROP
3	EFSFSR	Below Glory Hole	200	400	2ROP
4	SFSR	Goat Creek/ Roaring Ck	200	400	2LOP
5	EFSFSR	Above Glory Hole	200	400	2ROP
6	EFSFSR	Below Glory Hole	200	400	2ROP
7	EFSFSR	Above Glory Hole	200	400	2ROP
8	EFSFSR	Below Glory Hole	200	400	2ROP
		SFSR Total	400	800	
		EFSFSR Total	1,200	1,800	
		Grand Total	1,600	2,600	

3.6 Pahsimeroi Hatchery (PFH) and Weir

The mitigation goal for PFH is to release up to 1,000,000 summer Chinook smolts annually into the Pahsimeroi River. Approximately 300 pair of adult summer Chinook are required to meet this mitigation when considering a pre-spawning mortality rate of 3% to 5%, 4,500 eggs/female fecundity, an estimated 85% eye-up rate, and culling of bacterial kidney disease positive adults at an expected rate of 3%.

PFH is composed of upper and lower facilities. Adults are trapped at the Lower PFH. Eggs are incubated and fish are reared at the Upper PFH.

In 2010, mangers initiated the development of an integrated stepping stone program in the Pahsimeroi River with a goal of producing 200,000 smolts derived from natural-origin returns (NORs). As these integrated smolts return as adults, they will be: 1) used as broodstock for the next generation of integrated smolts or 2) released upstream of the weir to supplement natural spawning, or 3) used as broodstock in the segregated stepping stone component of the program (if enough integrated adults return to meet priority 1, and 2 above).

Ideally, adults spawned to create the integrated program would be derived using 100% NORs for the first generation. However, due to ongoing supplementation research in the Pahsimeroi River, managers decided to reduce the number of NORs retained for broodstock to avoid confounding research results. All spawn crosses used to create the 200,000 integrated smolts will be hatchery-origin by natural-origin (HxN) for brood years 2010-2012. The number of male NORs collected at the weir will drive the size of the integrated component up to a maximum of 200,000 smolts during this period. Smolts produced from HxN crosses will be marked differentially (100% CWT, no-fin clip) from the segregated harvest component (100% Ad-clip). Spawn crosses used to create the 800,000 segregated harvest component for the Pahsimeroi River will be hatchery by hatchery (HxH). Beginning with brood year 2013, full implementation of the sliding scale will be initiated. By 2013, evaluation of adult

abundance and productivity measures from the ongoing supplementation research in the Pahsimeroi River will have ended. As such, managers will begin retaining both male and female NORs trapped at the Pahsimeroi weir as outlined by the sliding scale. Annually, the number of NORs that are either retained for broodstock or released to spawn naturally will be based on the sliding scale. The sliding scale allows the proportion of NORs in the broodstock (pNOB) and the proportion of naturally spawning adults that is composed of HORs (pHOS) to slide with variable NOR escapement.

3.6.1 Weir operation

The PFH weir and trap operates to collect summer Chinook from approximately June 15 through October 1. The trap is checked weekdays and usually is not checked on weekends. Additionally, the ladder is shut off during heavy weekend fish periods to avoid overloading the adult fish trap. With surplus salmon expected this year the trap may be checked 7 days a week. *Todd Garlie*

3.6.2 Adult Handling

At trapping, fish are measured for length, scanned for PIT tags, examined for gender, checked for various clips, tags, and injuries. Snouts are removed from all fish containing CWT's and are sent to the Nampa Research office for CWT extraction and processing. Tissue samples are collected from all marked Chinook used for broodstock and all unmarked Chinook that enter the trap. Tissue samples are collected for genetic parentage based analysis. All unmarked Chinook will be released upstream of the weir.

If enough Chinook return to provide a fishery, out-plant sites will be determined by the IDFG Fisheries Bureau and Salmon Region biologists. Additional surplus jacks will be outplanted to the Salmon Kid's Creek pond, Blue Mountain Meadow pond, or selected for charitable/tribal fish giveaways. Surplus fish killed for charitable/tribal giveaways are not injected with erythromycin. Once the fish reach a point where they can no longer be used for food and fisheries are closed, surplus fish are killed and stored in a refrigerated trailer unit until they are transferred to a rendering plant in Kuna, ID. Neither excess adult fish nor carcasses are transferred out of the upper Salmon River Basin due to whirling disease concerns.

A total of 300 pairs of broodstock are needed to meet mitigation goals and only up to 10% of these can be jacks. The decision process for ponding broodstock is determined by historical hatchery run timing records. The run timing is broken into weekly increments on a percentage basis and a corresponding percentage of broodstock are ponded each week based on these records. Only these ponded broodstock fish are injected with erythromycin. Fish in excess of these weekly percentages are given away to charitable/tribal entities based on their availability. When entities are not available or fish numbers exceed what the entities can handle, fish are outplanted/recycled.

Each fish that is ponded for broodstock receives an intra-peritoneal injection of erythromycin at a rate of 20 mg/kg body weight for BKD management. All brood females are sampled for *RS* by ELISA technology.

Salmon ponded for broodstock are treated with 60 minute 167 ppm flow-through formalin treatments 3 times per week between July 1 and August 1. As water temperatures increase during August, formalin treatments are increased to 5 days per week from August 1 through September 15, as needed, to control mycotic infections and to prevent outbreaks of ICH. Fish are selected at random for broodstock in an attempt to represent the run.

3.6.3 Spawning/egg take/ mating protocol

The first sort and spawn generally occurs around September 1 each year. Spawning occurs twice per week, usually on Monday and Thursday. A spawning ratio of 1:1 is used. Jacks are limited to 10% of the spawning population. The spawning goal is to collect approximately 1,283,000 green eggs to yield the mitigation target of 1,000,000 smolts at release. In addition wild males are crossed with two hatchery females to produce and integrated broodstock with a goal of 200K smolts. This is achieved by collecting approximately 285,714 green eggs at a 70% eye-up rate. On spawn days, wild males are sorted from the trap, check for ripeness, spawned and then released back into the Pahsimeroi River above the weir.

Eggs from females with ELISA optical densities of 0.25 and above are culled from production. Sixty ovarian fluid samples and 30 tissue samples (kidney/spleen) are collected from 90 females and examined for viral replicating agents. Twenty head wedges are removed from returning adult salmon to ascertain *Myxobolus cerebralis* prevalence. The APHIS veterinarian-in-charge is notified of any reportable pathogens detected in brood fish sampling.

3.6.4 Egg incubation

All eggs are collected at Lower PFH. Following water hardening, eggs are transferred to Upper PFH in Aqua Seed tubes for incubation and early rearing on well water and secondary rearing on river water. All eggs are incubated to eye-up at PFH using well water chilled from 50ºF to 40ºF. The incubator trays are loaded at the rate of one female per tray. From 48 hours after spawning until eye-up, eggs at Pahsimeroi FH are treated three times a week with a 1,667-ppm formalin treatment to prevent fungal growth on the eggs. A 500 ml iodine California Flush is also administered on Tuesdays, Thursdays, and Saturdays. At eye up, the eggs are shocked twice by dropping them into a bucket of water from a height of approximately 16 inches. Dead eggs are picked and enumerated with a Jensorter electronic counter/picker.

3.6.5 Early rearing

Early rearing takes place in the Upper PFH vat room on 50ºF well water. Rearing is segregated according to lineage designation and BKD status as stated above. Fry are ponded directly into 1,280 cubic foot, 80’ long indoor vats, with each vat having a mix of progeny by age class and run timing based on lot number. Approximately 65,000 fry are ponded into each vat. All 18 vats are used to rear approximately 1,180,000 fry. Hand feeding begins two days after ponding to allow for proper sealing of egg yolk prior to exposure to feed. Currently, all vats are hand fed with the exception of four vats which are fed by belt feeders. All vats are supplied with pathogen-free well water. Flow indices are kept below 1.0 lbs/gpm/in and density indices are kept below 0.3 lbs/ft^3/in. Target size for

ponding is 100 fpp to achieve a refractory WD size prior to exposure to river water containing the WD causative agent. Feeding regime is regulated to achieve this size by May 30 when ad clipping and CWT marking occurs. Following marking, fish are moved outside into two covered rearing ponds.

3.6.6 Final rearing

Feeding regimes vary based on size of fish and rearing water temperature. Due to the perennial infestation of *Ichthyophthirius multifilis*, prophylactic treatments of formalin, at a 167 mg/l are applied five times per week during July and August to limit mortalities to this parasite. Fish are reared until they reach their release size of approximately 15 fpp.

Beginning in 2007, large scale representative PIT tagging was implemented at PFH and has been ongoing since that time. Fish released will be 100% AD clipped, receive approximately 120,000 CWT's, and 21,400 PIT tags (Table 6). The large PIT tag group will be part of the CSS study which began in 1996. IPC provides 15,000 PIT tags and CSS provides approximately 6,400 tags. A background and summary of the CSS study (10 year retrospective report) can be found at http://www.fpc.org/documents/CSS/FINAL.

The fish are scheduled to be released at the end of March each year. Screens are removed and the fish are allowed to volitionally move out of the two rearing ponds and into the Pahsimeroi River. After two weeks of volitional release, remaining fish are forced out of the rearing ponds by hatchery personnel. Final release numbers are determined using sample counts along with marking numbers minus mortality. Pre-liberation condition factors and mark quality assessments are conducted prior to release.

3.6.7 Monitoring and Evaluation

M&E staff annually develop representative marking and loading plans for CWT and PIT at each hatchery facility to evaluate harvest and survival. For a more detailed description of the intended use of these tags see Appendix A. These marks and tags were applied by the Pacific States Marine Fisheries Commission (PSMFC) marking crew in the summer (CWT) and winter (PIT) prior to release. All marks and tags that were applied to BY 2009 and proposed for BY 2011 and 2012 are identified in the "proposed release table".

3.6.8 Juvenile fish health

Chinook salmon reared at this facility are inspected by EFHL on a quarterly basis for *RS*, viral replicating agents, parasites, and bacterial pathogens such as *Aeromonas*, and *Flavobacterium psychrophilum*. Diagnostic services are provided upon request. A pre-liberation sample consisting of 60 randomly collected fish are examined for *RS*, *Myxobolus cerebralis*, and viral replicating agents. Goede's organosomatic index is also performed. The preliberation sample is performed within 45 days of release.

Egg inventory numbers are available to EFHL in December to facilitate erythromycin medicated feed pre-mix needs.

3.6.9 Communication

Pahsimeroi FH distributes trapping and spawning updates three times per week during the summer Chinook run. These data summaries are provided electronically to a distribution list. Trapping information is also uploaded to the Hatchery Data Management System daily and is available online through the HDMS database website http://fishandgame.idaho.gov/ifwis/hdmsdownload/defaultpage.aspx.

Monthly inventory summaries are provided to an electronic distribution list which includes IDFG Fisheries Bureau, LSRCP, and IPC offices.

3.6.10 Fish Release/Transportation

None, direct release.

3.7 Rapid River Hatchery (RRFH) and Weir and Oxbow Hatchery (OFH) and Hells Canyon (HC) Trap

Approximately, 2,500 spring Chinook salmon are needed annually for broodstock for the RRFH spring Chinook salmon program. This number includes jacks and accounts for pre-spawning mortality at the 20-year average as well as average female culling required by disease management constraints and average fecundity. This brood level provides 3.4 million green eggs and 3.0 million smolts at an average of 88% eyed egg-to-smolt survival to meet the smolt release goals. *Ralph Steiner*

Rapid River Fish Hatchery is composed of the hatchery complex and Rapid River weir located approximately two miles downstream from the hatchery complex. HC trap and OFH operate as part of the RRFH program. All spring Chinook salmon are reared at the Rapid River Hatchery and released volitionally into Rapid River or transported for release to the Snake River at Hells Canyon and the Little Salmon River. A portion of the marked adult spring Chinook salmon that are trapped at HC trap are transported to RRFH where they are held and mixed with marked adult spring Chinook salmon collected at Rapid River weir. *Ralph Steiner*

3.7.1 RRFH weir operation

The RRFH weir management related to broodstock collection is determined by projected number of returning salmon. Collection of broodstock and fish disposition are modified to accommodate projected return as projections are refined throughout adult migration. The adult trapping facility is put into operation approximately March 16. Spring Chinook arrive at the trap beginning in May. Trapping continues through the first week of September. When trapping ceases, the adult trap is reconfigured to allow migration around the weir. During trapping extreme conditions may occur, and the trap may be closed until trapping can resume. *Ralph Steiner*

3.7.2 HC trap operation

The HC Trap operates three days/week Monday – Wednesday as flows permit (less than 50k ft^3/s). Trapping for spring Chinook salmon begins in May and continues to into July. HC trap operation is affected by projected return to RRFH. The trap is operated by IPC and adults are transported to OFH for holding or distribution. Spring Chinook salmon to be

held for spawning will be held at OFH for transport to RRFH weekly or more often depending on water temperatures. Fish to be transported to RRFH are loaded into a 1,000-gallon tanker and transported by IPC personnel. All fish entering the trap are electronically scanned for PIT tags and scrutinized for jaw tags, VIE tags, radio transmitters, and fin clips. Adult spring Chinook salmon to be held for broodstock receive an intra-peritoneal injection of Erythromycin base injectable Gallimycin-100 at a rate of 20 mg/kg to limit pre-spawning mortality due to bacterial kidney disease (BKD). After being added to RRFH broodstock, monitoring is consistent with practices at RRFH. *Ralph Steiner*

The carcasses will be frozen until the end of the spawning season and then hauled to a cold storage facility.

Carcasses from holding and trapping mortality are placed into a garbage dumpster and picked up weekly by the local sanitation company. They will be transported to the Halfway transfer station and eventually to an approved ODEQ landfill. *Kent Hills/Ralph Steiner*

3.7.3 Adult handling

Upon arrival into the trap, all marked hatchery fish to be added to broodstock are anesthetized, counted, intra-peritoneally injected with Erythromycin base injectable Gallimycin-100 at a rate of 20 mg/kg, and transported to the hatchery holding ponds for broodstock. Arriving marked spring Chinook salmon are not sexed at this time because dimorphism is not expressed when they arrive at the trap. Marked spring Chinook salmon are held for broodstock to fill RRFH mitigation needs and to supply eggs to other programs. The broodstock includes a cross section of the run. Formalin treatments will be applied at 167 mg/L seven days a week. *Ralph Steiner*

Pre-spawning mortality of adult spring Chinook salmon will be categorized by suspected cause. Formalin treatments will start upon ponding of broodstock. Formalin treatments will be applied at 167 mg/L seven days a week. *Ralph Steiner*

If broodstock needs are exceeded, fish will be provided to tribal and humanitarian organizations. Surplus fish may also be transported back into the Salmon River or Little Salmon River to re-enter fisheries, or be transported to other drainages to provide fishing opportunity or for supplementation. These hatchery fish will be loaded directly from the fish trap and will not be anesthetized or injected. The decision to release hatchery fish will be made based on the number of rack returns, run size as projected by IDFG, and on the overall condition of fish trapped earlier in the run. All fish will have an opercle punch. *Ralph Steiner*

Ancillary species will enter the fish trap. All steelhead entering the trap will be sexed, measured, scanned for CWT and PIT tags, and given a right operculum punch to identify recaptures. Wild steelhead will be sampled for DNA and scales, and released into Rapid River above the weir. Hatchery steelhead including unmarked hatchery fish (determined by morphology) will be released into the Little Salmon River about a mile above the

confluence of Rapid River unless they scan positive for CWT. When a CWT is detected hatchery steelhead will be sacrificed and the snout collected. Bull trout entering the trap will be measured and processed based on protocol supplied by the United States Forest Service (USFS) Rocky Mountain Research Center. Unmarked Chinook salmon will be counted, sexed, measured, given a right operculum punch, sampled for DNA, and released above the weir. *Ralph Steiner*

Dispersed fish will not be anesthetized or treated with antibiotics. Unmarked Chinook salmon will be counted, sexed, measured, given a caudal fin right operculum punch to identify recaptures, and released into the Snake River below Hells Canyon Dam. They will not be anesthetized or treated with antibiotics. *Kent Hills/Ralph Steiner*

All steelhead entering the trap will be sexed, measured, scanned for CWT and PIT tags, and given a right operculum punch to identify recaptures. Hatchery steelhead including unmarked hatchery fish (determined by morphology) will be released into the Little Salmon River about a mile above the confluence of Rapid River unless they scan positive for CWT. Unmarked Chinook salmon will be counted, sexed, measured, given a right operculum punch, sampled for DNA, and released above the weir. *Ralph Steiner*

3.7.4 RRFH Spawning/Egg take/Incubation/Shipping

Beginning approximately August 10, all adults are collected, and sorted by sex. All ripe females are spawned each spawn-day. Spawning takes place twice each week for each holding pond and continues through mid-September. The RRFH employs a random cross of two males/female, as recommended in the Integrated Hatchery Operations Team (IHOT) guidelines for genetic management. All eggs from females exhibiting gross signs of pathology are discarded after consultation with staff from the Eagle Fish Health Laboratory (EFHL) on-site. After fertilization, the eggs are transported to the incubation building for water hardening. Eggs are water hardened/disinfected with a 100-mg/L solution of iodine. All brood females are sampled for BKD and the samples are analyzed by ELISA technology at EFHL. Spawned female carcasses are marked with a numbered tag, matched with an egg bucket number, and a tray number to facilitate tracking for ELISA BKD analysis. A total of 90 fish are sampled by a combination of 30 tissue samples (kidney/spleen) and 60 ovarian fluid samples for viral replicating agents. The **Animal and Plant Health Inspection Service** (APHIS) veterinarian-in-charge is notified of any reportable pathogens detected in adult or production fish sampling. *Ralph Steiner*

Carcasses are measured, scanned for PIT tags and CWT. Females are scanned for PIT tags before spawning to ensure that any PIT tags that are deposited in egg containers are not missed. *Ralph Steiner*

Egg inventory numbers are available to EFHL to facilitate erythromycin medicated feed pre-mix orders. *Doug Munson*

Single female/tray incubation is the standard however it is necessary to load two females/tray and/or transfer green eggs to OFH for initial incubation to achieve a goal of 3.4 million eyed eggs. Upon receiving ELISA results, eggs are segregated or culled based

on titers >0.249. Hatchery personnel are in regular communication with staff from the EFHL for guidance on culling and segregation. Beginning on the fourth day of incubation, all egg lots are treated with formalin three times each week at 1,667 mg/L for 15 minutes. This continues until each egg lot accumulates 800 daily thermal units (TU). At eye-up (approximately 500 TU), all egg lots are shocked and picked using a Jensorter™ model BM-4 picker/counter then returned to the cleaned incubators. A second pick is performed at 750 TU. Hatch occurs about 800 TU. At 1,000 TU, all egg lots undergo another pick off to remove dead eggs or fry and eggshells. At 1,500 TU fry undergo a fourth pick off and swim-up fry are ponded at 1,750 TU. After eggs have accumulated 300 TU incubator trays are rodded weekly or more often if necessary throughout the incubation period to remove silt. *Ralph Steiner*

3.7.5 OFH Egg incubation

Due to space limitations at RRFH it is routinely necessary to transport green eggs from RRFH to OFH for incubation. Eggs for transport will be placed in egg tubes and water hardened in coolers filled with 100-mg/L iodophore for 30 minutes. Then, iodophore is displaced from the coolers with well water. About one gallon of ice is added, and the coolers sealed for transport. When the green eggs arrive at OFH they are disinfected in 100-mg/L iodophore then placed in vertical incubation stacks at a rate of one female/tray. Green eggs are incubated to eye-up, enumerated, picked, and returned to RRFH. When they arrive at RRFH they are disinfected in 100-mg/L iodophore and placed in vertical stack incubators. The EFHL will notify OFH with the results ELISA BKD analysis and culling will take place at OFH. *Kent Hills/Ralph Steiner*

3.7.6 Early Rearing

Fry are moved from vertical stack incubators to eleven outside raceways. Density and flow indices do not exceed 0.49 lb/ft^3/in and 1.11 lb/gal/min/in, respectively. In mid June, when the fingerlings are marked, they are moved to the final rearing ponds. *Ralph Steiner*

One prophylactic feeding of erythromycin-medicated feed will be applied to juveniles with a target dose of 100 mg/kg. *Ralph Steiner*

Fish are sampled biweekly for weight. Samples are comprised of at least 300 fish/rearing unit. At the end of each month, 60 fish sub-samples are measured to determine average total length and condition factor. *Ralph Steiner*

3.7.7 Final Rearing

Rearing continues in the rearing ponds until mid April. Final rearing density and flow indices do not exceed 0.22 lb/ft^3/in and 2.25 lb/gal/min/in respectively at the beginning of release. *Ralph Steiner*

The fish are sampled biweekly for weight. Samples are comprised of at least 300 fish/rearing unit. At the end of each month, 60 fish sub-samples are measured to determine average total length and condition factor. Starting the month marking was completed and continuing until release, a quality check of adipose fin (AD) clips is performed on the sub-samples and fish are categorized as full clip, partial clip, or no clip. *Ralph Steiner*

Fish released will be 100% AD clipped and receive approximately 120,000 CWT's. Approximately 52,000 fish are PIT tagged as part of the CSS study. IPC provides 20,000 PIT tags and CSS provides approximately 32,000 tags. Seventy percent of PIT-tagged fish within the release are treated as run-at-large (monitor mode) at each Columbia River hydro-system collection facility. The balance of the PIT tagged fish are diverted back to the river (default bypass mode) for reach survival estimates. A background and summary of the CSS study (10 year retrospective report) can be found at http://www.fpc.org/documents/CSS/FINAL. *John Cassinelli*

Pursuant to US vs. OR 2008 – 2017 Management Agreement Table B1, release sites will include Rapid River, the Snake River below Hells Canyon Dam, and the Little Salmon River. For production at or above 3.0 million, releases will be 2.5 million into Rapid River and alternating releases of 100,000 to Hells Canyon and 50,000 to Little Salmon River (footnote 11 to Table B1 US vs. OR 2008-2007 Management Agreement).

Volitional release at Rapid River begins about March 15 and ends about April 24. In most years about 99% of the smolts emigrate volitionally. The remaining smolts are seined from the ponds.

3.7.8 Monitoring and Evaluation

M&E staff annually develop representative marking and loading plans for CWT and PIT at each hatchery facility to evaluate harvest and survival. For a more detailed description of the intended use of these tags see Appendix A. These marks and tags were applied by the Pacific States Marine Fisheries Commission (PSMFC) marking crew in the summer (CWT) and winter (PIT) prior to release. All marks and tags that were applied to BY 2009 and proposed for BY 2011 and 2012 are identified in the "proposed release table".

3.7.9 RRFH Fish Health

Spring Chinook salmon reared at this facility are inspected by EFHL personnel on a quarterly basis for *RS*, viral replicating agents, parasites, and bacterial pathogens such as *Aeromonas*, and *Flavobacterium psychrophilum*. Diagnostic services are provided upon request. A preliberation sample consisting of 60 randomly collected fish is examined for *RS, Myxobolus cerebralis*, and viral replicating agents. Goede's organosomatic index is also performed. The preliberation sample is performed within 45 days of release. *Ralph Steiner*

3.7.10 OFH Fish Health

Juvenile spring Chinook salmon are not reared at OFH. All juveniles are reared at RRFH. *Ralph Steiner*

3.7.11 Communication

Trapping information is updated on site and uploaded to the IDFG Fisheries Bureau via the hatchery database (HDMS) daily and to IPC weekly. The Fisheries Release Database is updated and uploaded at least weekly. PIT tag files are uploaded to PTAGIS as the run

progresses. As incubation and rearing progresses, Monthly Production Summaries and a Monthly Narrative Report are submitted to the IDFG Anadromous Fish Hatchery Supervisor and IPC. Release groups are reported to the IDFG Fisheries Bureau via the IDFG Fish Release Database and to the IDFG Research Bureau via the Data Entry Form for Release Database. *Ralph Steiner*

3.7.12 Transportation

IPC tanker trucks transport smolts for release at the USFS boat ramp below Hells Canyon Dam and Pinehurst Bridge on Little Salmon River. Transport takes place in oxygenated Rapid River water at a loading density of 0.6 lbs/gallon. *Ralph Steiner*

3.8 Sawtooth Hatchery (SFH) and Weir

The LSRCP has a mitigation goal to provide adult returns of 19,445 adult Chinook above Lower Granite Dam annually. The SFH was constructed from 1983-1985 and began operations in 1985 to contribute to this adult spring Chinook salmon goal to return 11,310 to the SFH, 6,090 to the East Fork Salmon River and 2,045 to Valley Creek (based on a SAR of 0.87%). The original production design for SFH was for 2.3 million smolts including 1.3 million smolts in the Salmon River at SFH, 700,000 for the East Fork Salmon River and 300,000 smolts released in Valley Creek. The Valley Creek component of the program has never been pursued and the East Fork Salmon River component was changed in 1998 to a natural production program. Approximately, 1,000 broodstock are needed for the SFH spring Chinook salmon program. This number includes jacks and accounts for pre-spawning mortality. This brood level will provide 1.9 million green eggs at 4,500 egg fecundity and 1.7 million smolts at an average of 88% eyed egg-to-smolt survival to meet the SFH component. Currently, SFH has sufficient specific, pathogen-free water to rear 600,000 parr to 7 cm target size prior to transfer to final rearing on raw river water.

Beginning in 2010, managers initiated the development of an integrated supplementation broodstock component at Sawtooth Fish Hatchery with a goal of producing 200,000 smolts derived from natural-origin returns (NORs). As these integrated smolts return as adults, they will be: 1) used as broodstock for the next generation of integrated smolts or 2) released upstream of the weir to supplement natural spawning or 3) potentially used as broodstock in the segregated component of the program (if enough integrated adults return to meet priority 1, and 2 above).

Ideally, adults spawned to create the integrated program would be derived using 100% NORs for the first generation. However, due to ongoing supplementation research in the upper Salmon River, managers have decided to reduce the number of NORs retained for broodstock to avoid confounding research results. All spawn crosses used to create the 200,000 integrated smolts will be hatchery-origin by natural-origin (HxN) for the period 2010-2012. The number of NORs collected at the weir will drive the spawning protocol and the size of the integrated component up to a maximum of 200,000 smolts during this period. Smolts produced from HxN crosses will be marked differentially (100% CWT, no-fin clip) from the segregated harvest component (100% Ad-clip). Spawn crosses used to create the 1,300,000 segregated harvest component for the upper Salmon River will be hatchery by hatchery (HxH) and broodstock for the 200,000 yearling smolts for the Yankee Fork Salmon may be a

combination of adults trapped in the Yankee Fork Salmon River and at the Sawtooth Fish Hatchery. Beginning with brood year 2013, full implementation of the sliding scale will be initiated. By 2013, evaluation of adult abundance and productivity measures from the ongoing supplementation research in the upper Salmon River will have ended. As such, managers will begin retaining both male and female NORs trapped at the Sawtooth Fish Hatchery weir as outlined in the sliding scale. Annually, the number of NORs that are either retained for broodstock or released to spawn naturally will be based on the sliding scale. The sliding scale allows the proportion of NORs in the broodstock (pNOB) and the proportion of naturally spawning adults that is composed of HORs (pHOS) to slide with variable NOR escapement.

Prior to trapping in 2010, Biomark installed a PIT tag array system into the ladder of the Sawtooth trap. This system consists of four antennas (two top water and two floor orifice) that are designed to detect all fish with PIT tags.

Prior to full Yankee Fork Chinook Salmon Supplementation Program operations, SFH will rear Yankee Fork smolts under normal hatchery operations. Tribal staff will participate with IDFG personnel in spawning activities, genetic tissue collection, tagging operations, and loading and transport of smolts and adults to the Yankee Fork. Smolt releases in the Yankee Fork will be represented across the entire run. Adult outplants excess of broodstock may occur in area waters including Yankee Fork Salmon River. The Tribes will operculum punch, genotype, and phenotype adult hatchery-origin Chinook salmon outplanted in the Yankee.

3.8.1 SFH Weir operation

Depending on spring runoff conditions, ladder and trap operations will begin between mid-May and mid-June and continue through Labor Day weekend. Generally, the weir can be fully placed into operation as a descending Salmon River USGS hydrograph located near the mouth of the Yankee Fork Salmon River discharge reading approaches 3,000 cfs. Adult broodstock need is approximately 1,000 fish. *Brent Snider*

Adults are treated with formalin three to seven days per week depending on river water temperatures and fish health. Genetic samples are collected from all unmarked fish and all hatchery spawned broodstock. *Brent Snider*

3.8.2 Adult handling

Trapped fish are removed daily, examined for marks, gender, injuries, brood stock treated with injectable erythromycin (Gallimycin 100), and either placed into one of three adult holding ponds or released directly into the Salmon River above the hatchery, depending upon what mark or gender the fish may have. Unmarked Chinook are released above the hatchery intake after daily trap operations have ended. Hatchery-origin marked fish are defined as fish with either an adipose fin-clip only (AD), adipose clip/Coded Wire Tag (AD/CWT), or CWT only. Unmarked fish are defined as fish with no external markings or CWT. Brood fish for reserve group production made up of marked hatchery fish while integrated smolt production will incorporate unmarked natural male Chinook. About fifty pair broodstock will be used to meet the current 200,000 Integrated smolt goal. Milt

collected from unmarked natural males is held less than 24 hours prior to use to fertilize green eggs from marked hatchery females. The spawn crosses are 1 male to 1 female. The progeny from the Integrated crosses are kept separate from any Segregated progeny until smolt release or until unique fish marking. After the milt collection the males are release above the hatchery intake for natural spawning. Integrated group egg incubation and fish rearing through smolt release mimics Segregated group fish culture practices. Previous smolt supplementation groups were produced from hatchery and natural spawn crosses.

Adult Chinook salmon identified as brood stock are injected with a 20 mg/kg intra-peritoneal injection of erythromycin to control Renibacterium. To reduce prespawning mortality due to *Ichthyophthirius multifilis*, broodstock holding water will be treated with 167 mg/l formalin for up to 7 days per week. Once water temperatures exceed 65ºF, an extended formalin treatment of 40 mg/l for 6 hours will be implemented if *I. multifilis* is detected (under veterinary extra-label prescription). All brood females are sampled for *RS* by ELISA technology. Eggs from females with optical densities of 0.25 and above are culled from production, except when adult return fails to provide adequate number of eggs for full hatchery production. Sixty Chinook released above the SFH weir to spawn naturally are sampled through carcass recovery efforts for viral replicating agents to ascertain IHNV prevalence, estimate risk of horizontal infection to SFH production fish, and to facilitate the decision process in regards to the timing of fish production events. Brood Chinook salmon are examined for viral replicating agents (60 fish by ovarian fluid sample and 30 fish will have kidney/spleen sample taken for viral assay). A 20 fish sample is collected to monitor *Myxobolus cerebralis* prevalence. The APHIS veterinarian-in-charge will be notified if reportable pathogens are detected. Pre-spawning mortality of adult spring Chinook salmon will be categorized by suspected cause.

Neither excess adult Chinook, nor carcasses, will be transferred out of the upper Salmon River Basin due to whirling disease concerns except directly to approved rendering plants.

Adult and jack Chinook surplus to brood need are ponded separate from broodstock and made available for Tribal ceremonial and subsistence and charitable organizations and adult outplants to SBT YFCSS. Excess Chinook are not treated with injectable erythromycin, anesthetized with MS-222 or treated with formalin.

Carcass disposition

Carcasses are placed into totes in the back of a refrigerated freezer trailer. At the end of the season these carcasses will be taken to a rendering plant.

3.8.3 Spawning/egg take plans, mating protocol

Approximately, 500 females and 500 males are needed for broodstock for the SFH spring Chinook salmon program. Marked hatchery fish are spawned with marked hatchery fish across brood years where possible using the following spawning protocol; > 100 pairs then 1m: 1f random cross, 50 to 100 pair then 2m : 1f split random cross , 25 to 50 pair then 3m: 1f split random cross and < 25 pair then 4m : 1f split random cross. The split random cross includes eggs from one female being split in equal groups of one, two, three to four then each group fertilized by one male. After fertilization the eggs are recombined into a single

group for incubation and water hardening. If cryopreserved sperm is needed fill out request form (Appendix A) Assistance will be provided to NPT cryopreservation program. *Brent Snider/Bill Young*

3.8.4 Egg Incubation

Eggs are water hardened and following label directions of buffered PVP iodine. Formalin will be added daily to each incubation stack to retard fungus development at a rate of 1,667 ppm (15-min drip). Formalin treatments are initiated 2 days following spawning and continue until immediately prior to enumeration. After eggs manifest a strong "eye" the eggs are sorted and enumerated mechanically. Likely two female's eggs will be incubated in a single incubation tray. *Brent Snider*

3.8.5 Early Rearing

At swim-up summer Chinook fry are transferred into 14 indoor vats with screens initially placed at full vat length. Approximately 128,00 fry are set out in each vat. Hourly hand feeding during the day commenced when 80% of set out fry achieved swim-up. Extruded "BioVita" starter feeds, produced by Skretting/ BioOregon, will be used during early rearing. Flows were set at 50 gpm then increased to 110 gpm (maximum) when fry were well on feed. When density index reaches 0.50 to 0.55 approximately ½ of the fry will be transferred into an outdoor pond about mid February. At this time remaining half fry will be reared inside and the other half reared outside. Remaining indoor fry (100 – 150 fpp) will be marked (MATS Automated Trailer) into outside raceways beginning the third week of May.

3.8.6 Final Rearing

Final rearing takes place in one of fourteen outside raceways. These raceways are supplied with raw, river water. Outside fish marking begins the third week of May. If needed, final marking will begin mid-September. The target density index and flow index at release are 0.15-0.20 and 1.0 – 1.6 respectively. At release the hatchery mitigation smolts are crowded into the connected raceway tailrace then crowded from the tailrace to the Salmon River via a buried 24 inch pipeline.

Standard protocol is to sample count at least monthly for growth monitoring during their rearing cycle, and approximately one week before release. Length frequencies and condition factors will be determined from a representative sample prior to release. A fin clip quality check and CWT retention check will be completed before release.

One prophylactic feeding of erythromycin-medicated feed is planned for juveniles with a target dose of 100 mg/kg for 28 days.

Starting in 2007, large scale representative PIT tagging was implemented at Sawtooth and has been ongoing since that time. PIT tags are provided by LSRCP and the Comparative Survival Study (CSS). The contribution of in-river tags from CSS is expected to continue into the future. A background and summary of the CSS study (10 year retrospective report) can be found at http://www.fpc.org/documents/CSS/FINAL. Hatchery staff recovers PIT tags from pre-release mortalities and sweeps raceways with a magnet post release to

recover any shed PIT tags. Returning adult fish pass through a PIT array located in the hatchery trap ladder and are scanned by a PIT antenna mounted in measuring board.

3.8.7 Monitoring and Evaluation

M&E staff annually develop representative marking and loading plans for CWT and PIT at each hatchery facility to evaluate harvest and survival. For a more detailed description of the intended use of these tags see Appendix A. These marks and tags were applied by the Pacific States Marine Fisheries Commission (PSMFC) marking crew in the summer (CWT) and winter (PIT) prior to release. All marks and tags that were applied to BY 2009 and proposed for BY 2011 and 2012 are identified in the "proposed release table".

3.8.8 Fish Health

Chinook salmon reared at this facility are inspected by EFHL personnel on a quarterly basis for *RS*, viral replicating agents, parasites, and bacterial pathogens such as *Aeromonas*, and *Flavobacterium psychrophilum*. Diagnostic services will be provided upon request. A preliberation sample consisting of 60 randomly collected fish is examined for *RS*, *Myxobolus cerebralis*, and viral replicating agents. Goede's organosomatic index is also performed on these fish. This sample is taken within 45 days of release. The APHIS veterinarian-in-charge is notified if reportable pathogens are detected. *Doug Munson*

Egg inventory in December will be available to EFHL so as to make predictions for erythromycin medicated feed pre-mix needs. *Doug Munson*

3.8.9 Transportation strategies

Smolt destined for the Yankee Fork Salmon River (YFSR) as part of Shoshone-Bannock Tribal Chinook Supplementation program will be transported according to IHOT guidelines. Smolts will be transported before last week of April using contract drivers part of HNFH transportation contract. Trucks will release smolts into a pipeline with outflow positioned over the YFSR near mouth of Jordan Creek.

3.8.10 Communication

Final plans are determined when fish run projection is clear. Discussion with ISS project leaders, IDFG, SBT, and LSRCP is ongoing. Planning coordination occurs with NPT for cryopreservation program. Monthly hatchery narrative reports are available to all requesting to be included on the distribution list. Summary run report, Annual Operation and Maintenance report and final Brood Year report are available after completion and upon request. Weekly adult trapping information is available on the IDFG website.

3.9 Shoshone Bannock Tribes Egg Box Program

The SBT initiated an in-stream egg incubation program in Dollar Creek, a tributary of the South Fork Salmon River to maintain, rehabilitate, and enhance salmon population viability. Eyed summer Chinook eggs are placed into hatch-boxes in late fall, incubated in stream water, and allowed to volitionally emigrate at approximately the same time as fry in the natural system. This supplementation activity is designed to mimic natural production and develop a naturally spawning tributary component of the SFSR.

3.9.1 Egg incubation

Rearing to the eyed stage follows the procedures and guidelines at McCall Fish Hatchery. Eggs destined for the Tribes eggbox program will be incubated separately, but following regular hatchery procedures. Eggs are transferred in bags within iced coolers to Dollar Creek. Once placed into in-stream hatch boxes, incubation will occur on stream water in the natural environment. Eggboxes are distributed throughout incubation areas. Eggboxes are planted following standard Tribal protocols. At least one recording thermograph is installed at the location of the middle eggbox site. Temperature information from the thermograph will be used to ascertain time of hatching and emigration from the eggboxes. When fry are estimated to have vacated the eggboxes in substantial numbers, eggboxes are examined and number of remaining dead eggs enumerated to estimate hatch success rate.

3.9.2 Communication

McCall FH and SBT personnel will coordinate to determine a schedule to spawn, obtain, and transfer eyed eggs. Results and conclusions from the in-stream incubation project will be presented in an annual report to the Lower Snake River Compensation Plan.

3.10 Yankee Fork Supplementation Project (YFCSS)

The Yankee Fork Chinook Salmon Supplementation (YFCSS) program was established to increase the number of threatened Snake River spring/summer Chinook salmon through development of a locally adapted salmon run in the Yankee Fork Salmon River using Upper Salmon River stock. The goal of the YFCSS is to maintain, rehabilitate, and enhance salmon population viability with harvest potential, aid to spatial distribution, and contribute to diversity. In addition, supplementation action in Yankee Fork is necessary to prevent near-term extinction, avoid further losses of genetic variation, and promote recovery of the ESA listed population.

3.10.1 Weir operation

Two portable picket weirs are installed on the Yankee Fork Salmon River annually. The lower weir is located just below Pole Flat Campground (approximately 3.5 miles upstream of confluence) to trap returning natural-origin and hatchery-origin adults. The upper weir is installed just above 5 Mile Creek to hold transported hatchery adults for natural spawning. Construction of the weirs occurs in mid to late June when flow drops to a level for safe installation. The lower weir is removed generally in September after seven consecutive days of no trapping occurrences. The upper weir is not removed until after spawning is complete to ensure no downstream migration of hatchery-origin adults.

3.10.2 Adult Handling

All fish are measured and right operculum punched at the lower weir for genetic tissue (DNA) and mark-recapture analysis to estimate total adult Chinook salmon escapement above the weir. All natural adults trapped at the weir are processed and immediately released above for natural distribution and spawning. Hatchery adults are transported and released at three sites above the upper weir for natural spawning. All mortalities are removed and data is collected on date, time, sex, cause of death (if known), and body condition. Mortalities are placed in the mainstem Yankee Fork spawning habitat to replenish depleted marine nutrients in the system.

If determined hatchery returns to Sawtooth are sufficient to meet the broodstock goal of 1.7 million Chinook smolts, surplus adults above broodstock needs may be outplanted in area waters including Yankee Fork Salmon River. Tribal and IDFG personnel will coordinate to transport and release Sawtooth hatchery adult Chinook salmon above the Five-Mile weir in three locations. Sawtooth adult outplants are left operculum punched (for further genetic evaluations).

3.10.3 Carcass disposition

Trap boxes will be checked daily, seven days a week trap tenders. Mortalities will be removed and data will be collected on date, time, sex, cause of death (if known), and body condition. Biological samples will be collected and placed in proper containers for later analysis. Mortalities will then be spread across the spawning habitat to help replenish depleted marine nutrients in the system.

3.10.4 Spawning/egg take plans, mating protocol

TBD with final approval of HGMP.

3.10.5 Egg Incubation

Incubation for the YFCSS program will occur in the interim at the Sawtooth Fish Hatchery under normal guidelines and operations.

3.10.6 Early Rearing

Rearing for the YFCSS program will occur in the interim at the Sawtooth Fish Hatchery under normal guidelines and operations.

3.10.7 Final Rearing

Rearing for the YFCSS program will occur in the interim at the Sawtooth Fish Hatchery under normal guidelines and operations.

Fish Health

Chinook salmon reared at this SFH are inspected by EFHL personnel on a quarterly basis for *RS*, viral replicating agents, parasites, and bacterial pathogens such as *Aeromonas*, and *Flavobacterium psychrophilum*

3.10.8 Fish Release/Transportation

Yankee Fork smolt releases and transportation is currently to be determined and will be finalized in a Memorandum of Agreement between the Tribes, IDFG, and LSRCP. Outplanted adults are transported using a 300 gallon tank mounted on a three-quarter ton truck. The tank has one compartment of 300 gallon capacity and was modified to include an oxygen tank, diffuser, and circulating pump. The tank is filled with water pumped directly from Yankee Fork or acquired at the SFH. Normal hauling guidelines are followed for adult fish, which is approximately one pound of fish per gallon of water.

3.10.9 Communication

The Tribes will coordinate with IDFG and SFH personnel on all activities related to the YFCSS program. The YFCSS will complete weekly, monthly, and annual reports to the cooperating agencies during in-season management and post-season analysis, respectively.

4 SOCKEYE

4.1 Eagle Fish Hatchery/Burley Creek Fish Hatchery

Approximately 400 – 500 eyed-eggs are needed to meet and maintain genetic diversity for broodstock replacement goals for the Eagle Hatchery Sockeye salmon captive broodstock program. This number is currently 1,000 eyed-eggs to address additional broodstock for 2013 needed to meet future eyed-egg goals for Springfield Fish Hatchery (500,000 to 1,000,000 smolts produced annually). A replicate group of eyed-eggs is transferred to Burley Creek FH (NOAA Fisheries Manchester Marine Lab in Washington State) as a spread the risk strategy. Spawn crosses made from each brood year will also meet production goals in the Salmon River Basin. Production goals may be adjusted annually based on recommendations provided by the Stanley Basin Sockeye Technical Oversight Committee (SBSTOC) to agency policy staff. Current production goals for the Salmon River Basin are: 50,000 eyed-eggs to Pettit Lake released in November/December; 75,000 pre-smolts released in October (45,000 Redfish Lake, 15,000 Pettit Lake and 15,000 Alturas Lake); and 250 captive reared adults released in September. Note: Production rearing (pre-smolts and smolts) is included in Sawtooth FH and Oxbow FH summaries.

4.1.1 Ladder operation

Fish weirs on Salmon River at Sawtooth FH and Redfish Lake Creek are monitored from mid-July through mid-October. All anadromous sockeye trapped are returned to Eagle FH for temporary holding or will be released directly to Redfish Lake. *Brent Snider/Dan Baker*

4.1.2 Adult fish health

Adults returned to Eagle FH to be incorporated into the spawning matrix are sampled for all viral and bacterial pathogens. Special precautions are taken to isolate/quarantine this group from the captive population. *Doug Munson*

4.1.3 Adult outplanting/marking

Returning adults will be incorporated into the spawning matrix at Eagle FH and/or released with captive reared adults to Redfish Lake. *Dan Baker/Mike Peterson*

4.1.4 Adult monitoring and evaluation

All adults released are monitored after release to determine spawning behavior information (spawn timing, spawning locations, number of redds developed, etc.). This information is collected using radio transmitters, visual observations and snorkeling over spawning areas. Adults released to Redfish Lake may receive radio transmitters to monitor their activities after release. Visual observation and snorkeling over known spawning areas will also be used to evaluate spawning behavior. *Mike Peterson*

4.1.5 Spawning/egg take plans, mating protocol

Returning anadromous adults that are not released will be incorporated into the captive broodstock spawning matrix at Eagle FH. The spawning matrix used at Eagle FH is a 1 x 3 matrix. Crosses are made based on least related individuals determined from micro

satellite analysis. Every attempt is made to represent all males in the population equally. *Dan Baker*

4.1.6 Carcass disposition

All carcasses as a result of spawning or pre-spawn mortalities will be disposed of at the local rendering plant. *Dan Baker*

4.1.7 Egg incubation

Eggs will be incubated at 8 degrees Celsius until the eyed-stage. Survival to eye will be calculated and eyed –eggs will be used in a variety of release strategies (depending on pathology results of the males and females used in the spawn crosses). *Dan Baker*

4.1.8 Juvenile fish health

Due to the relatively low number of fish reared annually, pre-transfer fish health sampling does not occur prior to transporting juveniles from Eagle FH to Manchester or adult sockeye from Manchester back to Idaho. However, all fish that die in the program during the course of any rearing year are assayed for typical viral and bacterial pathogens. To date, sockeye salmon have remained relatively disease free. *Doug Munson/Mark Peterson*

4.1.9 Communication

Eagle FH produces monthly updates provided to IDFG Fisheries Bureau. Stanley Basin Sockeye Technical Oversight Committee (SBSTOC) meets quarterly providing program updates to participating agencies. *Dan Baker/Mike Peterson/Carlin McAuley*

4.2 Oxbow (Oregon) Fish Hatchery

Oxbow FH is operated by Oregon Department of Fish and Wildlife (ODFW). Oxbow FH was identified by SBSTOC members as a facility that could rear an additional 80,000 sockeye to the smolt stage. With modifications to the facility, the smolt production goal would be 150,000 smolts annually. Eyed-eggs are currently transferred to the facility in November/December to meet production goals. After an 18 month rearing cycle the juveniles will be transferred to Idaho and released in the Salmon River Basin.

4.2.1 Fish health

Fish that die in the program during the course of any rearing year are assayed for typical viral and bacterial pathogens. To date, sockeye salmon have remained disease free. Two, 60 fish samples will be tested during culture for viral and bacterial pathogens. All pathology guidelines will be met before juveniles are transferred back to Idaho. *Doug Munson/Tony Amandi*

4.2.2 Monitoring and evaluation

All smolts have been CWT tagged and 11,000 will be PIT tagged before release. Survival to Lower Granite Dam will be evaluated as well as smolt to adult survival from different release strategies. *Mike Peterson*

4.2.3 Communication

Eagle FH produces monthly updates provided to IDFG Fisheries Bureau. Stanley Basin Sockeye Technical Oversight Committee (SBSTOC) meets quarterly providing program updates to participating agencies. *Dan Baker/Mike Peterson*

4.3 Sawtooth Fish Hatchery

Sawtooth FH is used as a rearing station for the sockeye pre-smolt and smolt production. Eyed-eggs are transferred to Sawtooth in November and December to meet production goals. Current production goals at Sawtooth are 75,000 pre-smolts for Salmon River Basin Lakes in October and up to 100,000 smolts for Salmon River Basin released in May.

4.3.1 Fish health

Fish that die in the program during the course of any rearing year are assayed or typical viral and bacterial pathogens. To date, sockeye salmon have remained disease free. A 60 fish sample will be tested before release for viral and bacterial pathogens. All pathology guidelines will be met before pre-smolts are released. *Doug Munson*

4.3.2 Monitoring and evaluation

All smolts have been CWT tagged and 53,000 will be PIT tagged before release. Survival to Lower Granite Dam will be evaluated as well as smolt to adult survival from different release strategies. *Mike Peterson*

4.3.3 Communication

Eagle FH produces monthly updates provided to IDFG Fisheries Bureau. Stanley Basin Sockeye Technical Oversight Committee (SBSTOC) meets quarterly providing program updates to participating agencies. *Dan Baker/Mike Peterson*