

MONITORING AND EVALUATION PROGRESS REPORT

Lower Snake River Compensation Plan  
Nez Perce Tribe Hatchery Evaluation Studies

Fiscal Year 2017

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## INTRODUCTION

The Lower Snake River Compensation Plan (LSRCP) was conceived in 1976 to mitigate for steelhead and spring, summer and fall Chinook salmon losses to streams in the Snake River basin due to construction of the Lower Snake River hydro-power facilities. In 1985 the Nez Perce Tribe (NPT) became involved in the program. The Nez Perce have historically managed and fished throughout the Snake River basin.

The Nez Perce Tribe's long range goals for the LSRCP are:

1. To reestablish and/or enhance production in all anadromous fish streams within the reservation, in the ceded area of the NPT, throughout the Snake River Drainage, and other historic areas of use and influence where feasible;
2. To reestablish and/or establish tribal fisheries when and where opportunities exist and to assist in establishing sport fisheries;
3. To monitor LSRCP hatchery facilities in an effort to maintain a quality production program which will meet LSRCP goals; and,
4. To demonstrate at what point in time the LSRCP meets the identified adult return mitigation goals.

The LSRCP program presently supports 11 hatchery programs in three states. This program is one approach to attempt to preserve and recover anadromous fish populations in the Snake River basin.

### **Discussion of Major Goals**

- 1. To reestablish and/or enhance production in all anadromous fish streams within the reservation, in the ceded area of the Nez Perce, throughout the Snake River Drainage, and other historic areas of use and influence where feasible.**

The Nez Perce culture and society revolved around fish and water (DFRM Strategic Plan Ad Hoc Team, 2013). Consistent with Nez Perce treaty-reserved rights, goals should provide direction that will restore a balance with nature, bring fish populations and their habitats to healthy conditions and provide harvest opportunities for tribal members throughout the Snake River drainage including all anadromous fish streams within the reservation, ceded territory (Figure 1), and other historic areas of use and influence where feasible. As stated by the Nez Perce Tribe Executive Committee (NPTEC) in resolution (86-38), the NPT has interests in restoring the historical population of salmon and steelhead in the Snake River basin.

The LSRCP mandates the restoration and/or enhancement of fish populations within the Snake River drainage as mitigation for the loss and damage to fish and wildlife resources resulting from the construction of the four lower Snake River dams (LSRCP Special Report, 1975). Enhancement is important to the NPT because many of these populations were located in usual and accustomed fishing areas and would enhance natural production of native salmon populations and allow for additional harvest opportunities within the ceded territory.

It is recognized that restoration of fish populations to historic numbers is probably not feasible under present conditions and in all areas. When historic natural conditions are not achievable, altered ecosystems should function adequately enough to maintain harvest opportunities. In addition, the importance of natural reproduction cannot be replaced, but where it is compromised it may be enhanced with measures of artificial production (DFRM Strategic Plan Ad Hoc Team, 2013).

**2. Establish and/or reestablish Tribal fisheries when and where opportunities exist and to assist in establishing sport fisheries.**

Harvest management goals include; 1) achieving harvest of 50% of harvestable hatchery fish and an annual level of natural-origin fish considered acceptable and sustainable; 2) achieve tribal harvest in all areas using traditional gear types and fishing methods and practices; 3) protecting and enhancing all currently available harvest opportunities and; 4) attaining all anadromous fish mitigation goals (DFRM Strategic Plan Ad Hoc Team, 2013). The Tribe's major emphasis under this objective is to reestablish tribal fisheries within the ceded territory and in usual and accustomed sites as fish populations allow. As a co-manager of the fisheries resource with the states of Oregon, Washington and Idaho, the NPT also must participate with the individual states on a technical and policy level in the establishment of harvest shares.

**3. Monitor LSRCP hatchery facilities in an effort to maintain a quality production program that will meet LSRCP goals.**

The Tribe's third major goal is to monitor the program's hatchery facilities in an effort to maintain a quality production program. The long-term goal is to develop an integrated and coordinated M&E effort for all LSRCP hatchery programs, with particular emphasis on the Clearwater River basin and the integration of NPT and the United States Fish and Wildlife Service, Fisheries Research Office (USFWS FRO) M&E efforts. This collaborative M&E effort would utilize the resources of all co-managers to produce consistent data and summary reports critical to the evaluation of the LSRCP program.

**4. To demonstrate at what point in time the LSRCP meets its mitigation goals.**

The Tribe's fourth long term goal is to demonstrate the point where LSRCP attains its mitigation goals of returning hatchery fish and total adult return goal in terms of rebuilding natural returns. As part of this process the LSRCP program is mandated to complete reviews of all programs every 10 years. Recently completed program reviews

included the spring/summer Chinook program in 2010, the steelhead program in 2012 and the fall Chinook salmon program in 2013. The NPT participated in these processes and worked collaboratively to evaluate program performance and the identification of additional steps required to maximize the program effectiveness.

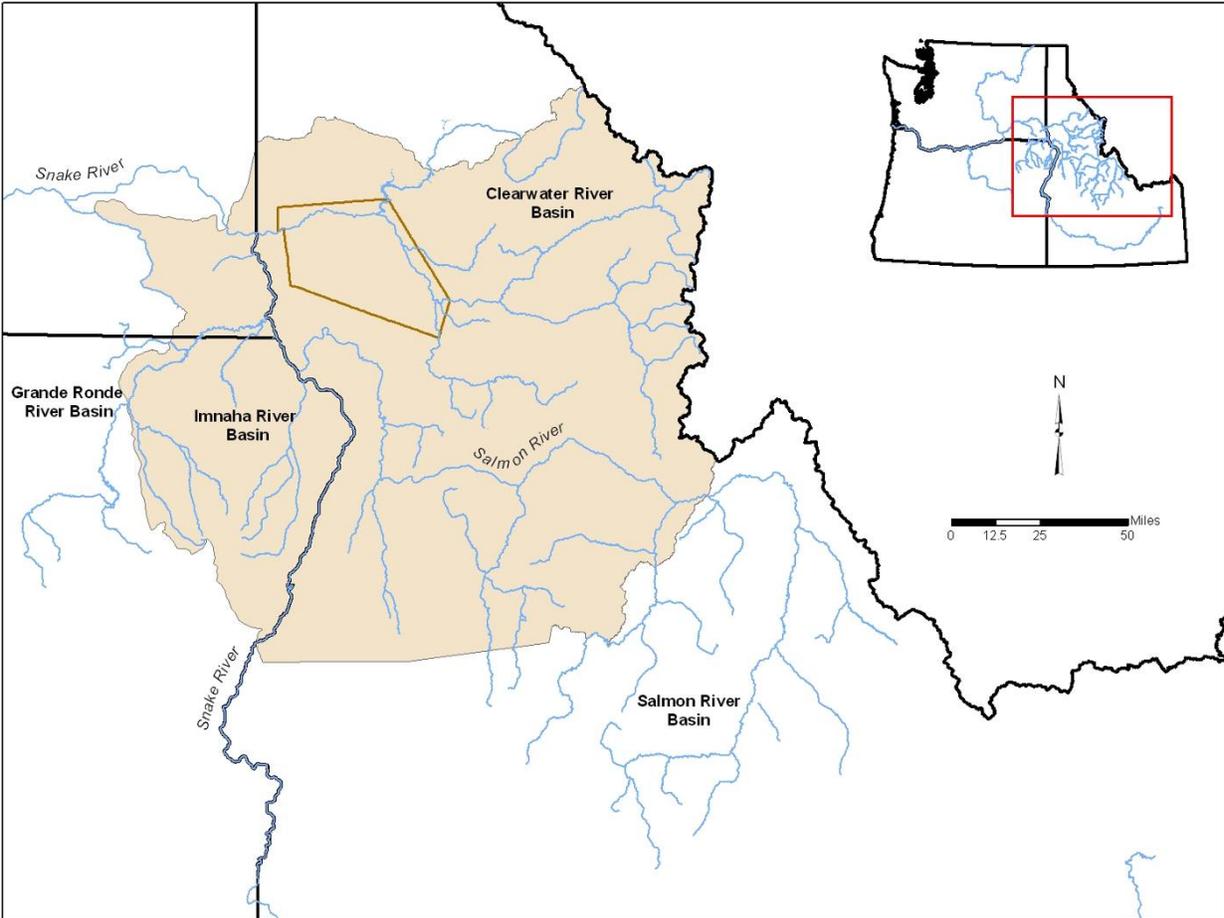


Figure 1. A map of the Snake River drainage showing the Clearwater, Grande Ronde, Imnaha and Salmon River basins. The shaded area represents the territory ceded to the Nez Perce Tribe in the treaty of 1855 and the gold outline represents the present day reservation determined by the treaty of 1863.

## 2017 EVALUATION STUDY PLAN

### 1. Objectives

#### A. General

The NPT LSRCP Monitoring and Evaluations Project (LSRCP M&E) will coordinate LSRCP hatchery production planning and evaluations and provide information and recommendations for the Nez Perce Tribe Executive Committee (NPTEC). LSRCP M&E personnel will also attend coordination, marking and tagging and all other pertinent LSRCP meetings and activities with the states of Idaho, Oregon, and Washington and with the U.S. Fish and Wildlife Service. Particular emphasis will be given to coordination of an integrating hatchery monitoring and evaluation effort in the Clearwater River basin, including collaboration with the USFWS Fish Research Office at Dworshak National Fish Hatchery. Project activities will be coordinated with regional Tribal, State and Federal co-managers to maximize cooperation in monitored streams in the Clearwater, Salmon, Grande Ronde, Imnaha and Tucannon Rivers within the Snake River basin in order to establish baseline data for determining the relative success and effects of releasing hatchery-reared fish in these streams.

The initial goal of the LSRCP program is mitigation and compensation for loss of fisheries resources resulting from the construction and operation of the four lower Snake River dams. Since the listing of Snake River basin spring/summer (sp/su) Chinook salmon and steelhead under the Endangered Species Act (ESA), the focus of the LSRCP program has transitioned to also include conservation and preservation of these species in the Snake River basin. Operation of the LSCRCP program in a conservation context requires the program to expand its focus beyond the performance of the hatchery product and to include assessment of the status of naturally produced population segments as well as evaluating the contribution of hatchery produced fish towards increasing natural production. As such, a coordinated effort by funding agencies, including LSRCP and Bonneville Power Administration (BPA), to monitor several key parameters to determine status of and the impacts of hatchery-origin fish on natural-origin fish populations. Evaluating the effectiveness of management actions can be accomplished through monitoring abundance, growth rate, spatial structure, and diversity parameters (McElhany et al. 2000).

In addition to contributing to the co-management of the LSRCP program, the NPT LSRCP M&E project is structured to monitor and evaluate LSRCP hatchery production performance and natural production status and performance. The Northwest Power Planning Council's Artificial Production Review (NPPC 1999) recommended a comprehensive set of performance measures to guide independent reviews of artificial propagation programs. Essential performance measures include the monitoring of natural- and hatchery-origin adult escapement, pre-release sampling of LSRCP hatchery-produced fish, monitoring of life stage survival and the identification of the genetic stock structure. Specific activities completed by this project include; 1) the monitoring and evaluation of downstream emigrating juvenile sp/su Chinook salmon and steelhead in the Imnaha River; 2) evaluation and monitoring of naturally-spawning hatchery and natural sp/su Chinook salmon in the SFSR; 3) adult accounting and run reconstruction of hatchery sp/su

Chinook salmon released from the Nez Perce Tribal Hatchery; 4) monitoring of adult returns and juvenile emigration of sp/su Chinook salmon to the South Fork Salmon River (SFSR) using a flat panel PIT tag array and; 5) coordination and planning for LSRCP Snake River sp/su and fall Chinook salmon and steelhead releases. In addition, coordination of Chinook salmon and steelhead cryopreservation activities, including assistance with the use of cryopreserved milt and additional collections where warranted, will continue at LSRCP hatchery facilities and in tributary streams in an effort to and maintain a germplasm repository for adult male salmon and steelhead gametes.

### ***Category 1. Fish Culture and Production Activities***

#### **Project 1a – Production Monitoring**

##### **Objective 1. Ensure Nez Perce Tribe participation in the LSRCP program.**

###### Approach:

To achieve broad tribal involvement in the LSRCP program and foster positive interactions among co-managers, NPT M&E Project staff will participate in regional coordination activities and planning meetings with State and Federal co-managers.

Task 1.1 - Participate in planning processes through assisting in the development of Clearwater, Salmon, Grande Ronde and Lyons Ferry Annual Operating Plans (AOPs) for the culture, ponding, rearing, and release of steelhead and Chinook salmon in the Snake River.

*Completed*

Task 1.2 - Participate in the bi-annual fall Chinook salmon coordination meeting.

*Completed*

Task 1.3 – Participate in ad-hoc meetings discussing related LSRCP programs with other co-managers and cooperators.

*Completed*

#### **Project 1b – Disease Monitoring, Prevention, and Treatment**

No Monitoring and Evaluation Activities Planned

#### **Project 1c – Optimum Production Strategies**

No Monitoring and Evaluation Activities Planned

##### **Objective 2: Determine the emigration timing of hatchery reared spring/summer Chinook**

## **salmon and steelhead and estimate the post-release survival of hatchery reared Chinook salmon and steelhead smolts released in the Imnaha River.**

### General:

All juvenile trapping activities are coordinated with the Bonneville Power Administration funded Smolt Monitoring Project (SMP). Staff from both LSRCP and SMP work collaboratively to install, operate and maintain the lower Imnaha River rotary screw trap (RST). LSRCP benefits through the monitoring and evaluation of LSRCP hatchery Chinook salmon released from the Gumboot Acclimation Facility and hatchery steelhead released from the Little Sheep Creek Acclimation Facility and estimate post-release survival from the release facilities to the trap located 6.6 river kilometers (rkm) above the confluence with the Snake River and juvenile objectives described in the Northeast Oregon Hatchery M&E plan (Hesse et al. 2006). The SMP project directly supports the Collaborative Survival Study (CSS) by tagging natural-origin Chinook salmon and steelhead for survival evaluations and life cycle monitoring.

The information collected under this objective will provide several measures of post release performance of hatchery reared Chinook salmon and steelhead smolts and determination of how closely they mimic the life history characteristics of naturally produced fish. Mimicking the life history characteristics of the natural population into which hatchery fish are planted is an important aspect of a successful supplementation program. Failure to mimic the natural fish can result in depressing, rather than enhancing, the naturally spawning population (Chilcote et al. 1986, Nickelson et al. 1986). This information may also provide further insight, and direct future research into the causes of downstream migrant mortality.

### Approach:

Emigration timing and post-release survival is estimated using passive integrated transponder (PIT) tagged smolts from the production release groups. Survival from release to the RST is estimated using the Survival Using Proportional Hazards (SURPH.2) model (Smith et al. 1994). Fish lengths and weights will also be collected to determine size and condition factors of emigrating fish. Weekly smolt trap catch information will be shared with the Fish Passage Center (FPC) and will be used to manage hydrosystem operations in near real-time. Interrogating PIT tagged hatchery fish at the lower Imnaha River RST provide a consistent location and time to compare travel time and survival to Lower Granite Dam (LGR) estimates from natural-origin fish captured at the RST (see Objective 2 below). Activities will be in coordination with the Bonneville Power Administration funded Smolt Monitoring Project (SMP).

Task 2.1 – Install and maintain a rotary screw trap in the lower Imnaha River.

### *Completed*

Task 2.2 – Operate the rotary screw trap to trap and tag juvenile Chinook salmon and steelhead and estimate timing of emigration.

*Completed*

Task 2.3 – Collect length, weight, and condition (health/physiology) information from a subsample of juvenile hatchery Chinook salmon and steelhead.

*Completed*

Task 2.4 – Estimate abundance, post-release survival and travel time for hatchery Chinook salmon and steelhead at the lower Imnaha River juvenile trap using PIT tag interrogations.

*Completed*

Task 2.5 - Share weekly Imnaha River natural- and hatchery-origin spring/summer Chinook salmon and steelhead smolt emigration catch information with the Fish Passage Center.

*Completed*

**Objective 3. Determine and compare the emigration characteristics of juvenile natural- and hatchery-origin Chinook salmon and steelhead from the Imnaha River trap to Lower Granite Dam and McNary Dam and investigate the relationships between these factors and temperature and flow.**

General:

Juvenile hatchery- and natural-origin Chinook salmon and steelhead trapped and tagged in the lower Imnaha River will be used to generate estimates for a suite of life history performance measures including juvenile emigrant abundance, smolt abundance, age at emigration, size at emigration, condition at emigration, emigration timing and mainstem arrival timing. In addition, the survival and productivity performance measures juvenile survival to LGR juvenile survival to all mainstem dams and smolt to adult returns (SAR). Status and trends and effectiveness monitoring methods will be applied to compare the performance of hatchery- and natural-origin populations over time. These parameters will identify differences between hatchery- and natural-origin populations important for identifying factors leading to reduced hatchery success and inform of adaptive management decisions and habitat improvement projects in the Snake River basin.

PIT tagged Imnaha River natural- and hatchery-origin Chinook salmon and steelhead smolts become part of the Snake River aggregate group used by the Comparative Survival Study (CSS) for juvenile survival modeling and Chinook salmon in the life cycle models. Understanding the relationship between physical factors such as flow and temperature and biological metrics such as emigration timing, travel time and survival can identify environmental conditions that optimize hatchery performance and can inform decisions regarding flow and spill management through the hydroelectric corridor.

Approach:

All activities will be in coordination with the Bonneville Power Administration funded Smolt Monitoring Project (SMP). The juvenile screw trap will be operated continuously from October 1 through June 30, when conditions allow. Trap operations are generally not possible during periods of extreme cold from mid-December to mid-January and during periods of high flows in the spring. Captured natural Chinook salmon and steelhead will be enumerated at the trap and PIT tagged. All fish are scanned for PIT tags and CWT and biological samples are collected including fork length, weight and general health (disease, descaling, abnormal appearance). Tasks 1.1 and 1.2 are to continue a collection of time series information on arrival timing, travel time and estimated survival analysis at the dams (Ashe et al. 1995, Blenden et al. 1996, Blenden et al. 1997, Blenden et al. 1998, Cleary et al. 2000, 2002, 2003, 2004, Michaels et al. 2006, Michaels and Espinosa 2007) and to allow for survival estimation of weekly PIT tag release groups.

In addition to estimating smolt performance characteristics and estimating smolt survival to the various Snake River dams, we also propose to estimate the SAR of spring emigrating natural-origin Chinook salmon and steelhead smolts from the Imnaha River trap to LGR and LGR to LGR. Survival will be estimated by the Cormack, Jolly- Seber methodology, using the SURPH program (Smith et al. 1994). The data files for release groups will be created using the program CAPTHIST (Westhagen and Skalski 1997).

Arrival timing, travel time, and survival at Snake and Columbia River dams will be obtained by PIT tagging juvenile fish in the Imnaha River and retrieving mainstem dam interrogation data from PTAGIS (<http://www.ptagis.org/>). The tagging goal for natural Chinook salmon is 10,000 with spring and fall tag allotments based on past estimates of fall and spring emigration (Kucera and Blenden 1998). PIT tag goals of 3,600 fall- and 6,400 spring-emigrating natural-origin Chinook salmon are necessary to maintain survival estimates to McNary Dam and to estimate SAR's of Imnaha River natural Chinook salmon (Richard Townsend – University of Washington, personal communication).

Steelhead juveniles are tagged as a priority of the SMP Project. Objectives are to tag 5,000 natural-origin steelhead smolts to collect survival information through the Snake River hydroelectric system to McNary Dam (if possible). Ideally, we would like to provide natural steelhead SAR information for the Imnaha River subpopulation. However, additional juvenile emigrant trapping facilities would be necessary to allow for representative sampling, abundance determination and PIT tagging adequate sample sizes.

Total Imnaha River natural-origin juvenile Chinook salmon and steelhead population abundance estimates will be determined using weekly estimates of screw trap efficiencies. Trap efficiencies are determined by releasing PIT tagged fish approximately 3.0 km above the screw trap. A daily goal of 50 natural-origin Chinook salmon and steelhead will be released upstream to estimate efficiency when available. Total PIT tags interrogated at the trap will be used to estimate the proportion of fish passing the trap that were captured each week and this will be expanded to provide a total population abundance estimate. To achieve marking objectives a total of 15,000 PIT tags are required, including 10,000 provided by LSRCP and 5,000 provided by the SMP.

Task 3.1 –PIT tag up to 10,000 emigrating natural-origin Chinook salmon representatively across the entire emigration period (fall – spring).

*Completed*

Task 3.2 – Assist in the PIT tagging of up to 5,000 natural-origin steelhead juveniles representatively across the entire emigration period (generally all spring smolts to avoid tagging non-migratory individuals).

*Completed*

Task 3.3 –Estimate weekly screw trap efficiencies for each species by releasing 50 natural-origin Chinook salmon and 50 natural-origin steelhead approximately 3.0 km above the screw trap each day when available.

*Completed*

Task 3.4 - Estimate juvenile Chinook salmon and steelhead population emigrant abundance in the Imnaha River. Abundance will be estimated by expanding the number of fish trapped by the trap efficiency rate by week or the shortest possible strata.

*Completed*

Task 3.5 – Use the SURPH.2 model to estimate survival of natural- and hatchery-origin Chinook salmon and steelhead smolts to LGR and through the Snake River to McNary Dam (if possible).

*Completed*

Task 3.6 - Interrogate previously PIT tagged hatchery-origin Chinook salmon smolts at the Imnaha River trap and use these fish as a release group to compare with natural-origin Chinook salmon smolts.

*Completed*

Task 3.7 - Determine the emigration timing, arrival time and travel time of emigrating natural- and hatchery-origin Chinook salmon and natural steelhead smolts from the Imnaha River to LGR and if possible, McNary and Bonneville Dams.

*Completed*

Task 3.8 - Monitor USGS staff gauge information.

*Completed*

Task 3.9 - Monitor daily water temperature with a constant recording thermograph at the lower Innaha River emigrant trap site. Download thermographs on a regularly scheduled basis.

*Completed*

Task 3.10 - Examine relationships between smolt emigration/survival and stream temperature and river discharge.

*Completed*

Task 3.11 - Statistically compare the variables under Task 3.6 for natural and hatchery steelhead smolts.

*Completed*

Task 3.12 - Coordinate with Ptaxis and the Fish Passage Center to upload tags to databases and query PIT tag databases for interrogation data on both juvenile and adult life stages at LGR and other Snake and Columbia River dams.

*Completed*

Task 3.13 - Estimate and compare smolt-to-adult return (SAR) rates from release at the Innaha River screw trap to LGR and from LGR to LGR for natural-origin Chinook salmon and steelhead and for PIT tagged hatchery-origin Chinook salmon and steelhead groups released into the Innaha River.

*Completed*

## *Category 2 – Estimating Adult Returns*

### **Project 2a – Catch Accounting**

#### **Objective 4. Marking and Tagging**

Marking and tagging activities include LSRCP staff assisting ODFW with PIT tagging steelhead reared at Irrigon Hatchery and Chinook salmon at Lookingglass Hatchery (see Objective 7.2).

#### **Objective 5. CWT Recovery and reading**

The Nez Perce Tribe processes adult CWT recoveries from Chinook salmon spawning ground carcass recovery efforts. NPT LSRCP efforts include recoveries from the SFSR below the LSRCP adult weir. All tags are extracted, read, and uploaded to the Regional Mark Processing Center (RMIS) database system.

#### **Objective 6. Fishery Catch Estimation and Sampling**

No Monitoring and Evaluation Activities Planned, See Harvest Monitoring Statement of Work.

## **Project 2b – Estimating Project Area Escapement**

### **Objective 7.1. Assess adult Chinook salmon abundance and monitor trends in population status.**

#### Approach:

Enumeration of adult salmon escapement is a critical status metric (McElhany et al. 2000) that is best assessed by direct or census enumeration of adult escapement. In cases where this is not possible either physically or financially, redd counts are the preferred metric. Although redd counts do not provide an accurate or precise estimate of salmon abundance (Beamesderfer et al. 1998, Dunham et al. 2001, Faurot and Kucera 2003, Kucera et al, 2005, Kucera and Orme 2006), they do provide estimates of multiple performance measures (Beasely et al. 2008) including index of relative abundance, spawn timing and adult spawner distribution. Biological information recovered from salmon carcass recoveries provides estimates of adult Chinook salmon performance measures (Beasely et al. 2008) including, age class structure, age-at-return, adult spawner sex ratio, hatchery fraction, female prespawner mortality, stray rate and size at return. In addition, combining information from index of spawner abundance, hatchery fraction and age structure can provide estimates of natural-origin progeny per parent ratio ( $\lambda$ ) over complete brood years as a measure of natural productivity in the spawning aggregate.

Chinook salmon spawning ground surveys will be conducted from late July to mid-September in the South Fork Salmon River (SFSR) below the McCall Hatchery Trap (MHT). Spawning ground surveys and carcass recoveries in the SFSR will contribute to the evaluation of the McCall Fish Hatchery Chinook salmon through an assessment of the relative abundance of hatchery origin fish spawning below the adult weir through the collection of mark/tag data and the recovery of CWTs. Surveys will also provide effectiveness monitoring of the natural-origin Chinook salmon spawning aggregate below the MHT and assess the impacts of hatchery interactions. Four index area stream reaches will be surveyed at least three times. Redds will be enumerated, live fish counted, and biological information will be collected from carcasses (Figure 2). This biological information will be examined along with that from salmon carcass recovery in Johnson Creek, Secesh River and Lake Creek to determine dispersion of McCall Hatchery reared adults in other South Fork Salmon River tributaries.

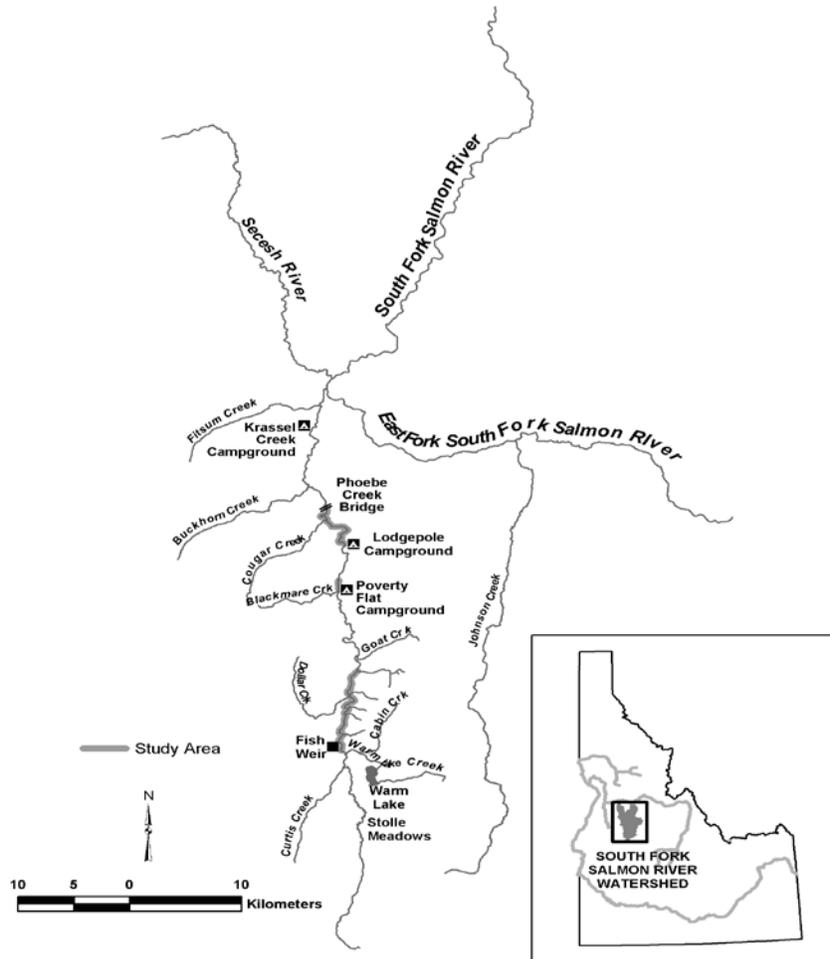


Figure 2. Stream sections (shaded in gray) in the South Fork Salmon River where multiple pass spawning/carcass surveys are conducted.

Excess adult Chinook salmon returning to the MHT are outplanted to other locations within the SFSR basin, including locations in the upper SFSR below the MHT and to the East Fork South Fork Salmon River (EFSFSR). Adult outplants to the SFSR are for harvest augmentation and to supplement natural spawning. Adult outplants to the EFSFSR are to augment natural spawning both above and below a heavily mined section in the upper sections of the watershed. The upper EFSFSR above the mined section is currently inaccessible to anadromous fish but was rehabilitated by the United States Forest Service (USFS) and contains high quality spawning habitat. LSRCP crews will lead the evaluation of Chinook salmon spawning ground surveys in the rehabilitated section and assist with spawning ground surveys below. This evaluation provides an assessment of spawner success in these regions as it relates to the success of the outplanting activities.

In 2008 a remote flat-panel PIT tag antennae array (identified as KRS) was installed in the SFSR to estimate anadromous fish passage into the SFSR. The array is located approximately 2.3 km upstream from the confluence with the East Fork South Fork Salmon River and is below nearly

the entire suitable Chinook salmon spawning habitat. Flat panel arrays are very efficient at interrogating PIT tagged adult salmon and steelhead. Although not designed to interrogate emigrating juvenile Chinook salmon, PIT tag detections may be useful for estimating survival from the release a Knox Bridge to the array and to Lower Granite Dam. Evaluations will include recording and categorizing all PIT tag detections. Although we have not yet determined how the detections will be used, the plan is to use detections of hatchery and natural adult Chinook salmon at KRS and at the MHT ladder to estimate the number of fish that spawn below the MHT. This will provide a better estimate of natural Chinook salmon abundance in the spawning aggregate below the MHT and an estimate of the total number of LSRCP McCall Hatchery fish that escape to the SFSR.

Task 7.1.1 - Conduct multiple-pass ground count Chinook salmon spawning ground surveys in the SFSR below the MHT (Figure 2). The index area stream survey sections in the SFSR include: the MHT to Dime Creek (5.1 km), Dime Creek to the unnamed tributary 500 m above Roaring Creek (5.6 km), Poverty Flat (1.1 km), and Lodgepole Campground to Phoebe Creek (6.1 km).

*Completed*

Task 7.1.2 - Collect biological information from all adult Chinook salmon carcasses encountered on the South Fork Salmon River downstream of the MHT. Biological information collected from salmon carcasses will include measuring fork length, internal examination for sex and percent spawned, recording marks, tags and fin clips, scanning for and recovering coded-wire-tags and interrogating PIT tags, collection of tissue for DNA analysis and scale or fin ray collection age structure determination.

*Completed*

Task 7.1.3 - Determine hatchery:natural adult composition on the spawning grounds in the South Fork Salmon River below the MHT using known hatchery adipose fin clip marks and/or the presence of cwt's.

*Completed*

Task 7.1.4 - Calculate age structure and sex composition of the spawning population for application in determining adult spawner to spawner ratios by brood year.

*Completed*

Task 7.1.5 – Conduct multiple pass ground count surveys in the EFSFSR to assess the spawning success of McCall Hatchery adult outplants.

*Completed*

Task 7.1.6 – Assist with the operation of the remote PIT tag array in the lower SFSR. The

Integrated Status and Effectiveness Monitoring (ISEMP) Project will lead the operation and maintenance of the array and coordinate data transfers to the Ptagis website (<http://www.ptagis.org/>).

*Completed*

Task 7.1.7 - Coordinate South Fork Salmon River spawning ground survey information with IDFG co-managers to evaluate the abundance of production and integrated hatchery adults below the MHT.

*Completed*

Task 7.1.8 - Maintain constant recording thermographs in the SFSR to characterize water temperatures and evaluate the effects of temperature on spawn timing and prespawn mortality. Temperature data will also be sent to the Regional NorWest streamtemp database.

*Completed*

Task 7.1.9 - Prepare reports summarizing adult salmon spawning ground surveys.

*Completed*

**Objective 7.2. Assist IDFG, USFWS and ODFW with ongoing LSRCP evaluation studies to achieve Nez Perce Tribe participation in the LSRCP program.**

Approach:

To achieve more tribal participation in the LSRCP program and foster positive interactions among co-manager personnel, the Nez Perce Tribe will work with the respective federal and state agency personnel at LSRCP hatchery facilities and with field activities. Assistance will be provided in the PIT tagging of hatchery reared Chinook salmon and steelhead trout as needed at DNFH, Kooskia Fish Hatchery, Lookingglass Fish Hatchery (LFH) and Irrigon Fish Hatchery. Staff will also participate in spawning ground surveys lead by other co-managing agencies.

Task 7.2.1 - Provide available staff to assist ODFW with Chinook salmon spawning ground surveys in Oregon on the Imnaha River, Big Sheep Creek and Lick Creek to evaluate the LSRCP stocking program, and in the Lostine River, Minam River, and Wenaha River. Carcass and tag data and biological samples are processed and managed by ODFW.

*Completed*

Task 7.2.2 - Coordinate and assist with marking efficiency evaluation for production release Chinook salmon at Lookingglass Fish Hatchery.

*Completed*

Task 7.2.3 - Coordinate and assist ODFW in PIT tagging of Imnaha River juvenile Chinook salmon at Lookingglass Fish Hatchery and juvenile steelhead at Irrigon Fish Hatchery and collection of biological information on Imnaha River juvenile Chinook salmon and Little Sheep Creek steelhead prior to release and adult returns to Oregon facilities if needed.

*Completed*

Task 7.2.4 – Participate in the Grande Ronde and Imnaha Management and Evaluation (GRIMEOC) Oversight Committee to promote best hatchery practices for Northeast Oregon Hatchery programs.

*Completed*

**Objective 8. Coordinate a comprehensive Monitoring and Evaluations plan for the Clearwater River basin hatchery programs through the collaboration of NPT, IDFG and USFWS Fisheries Conservation Office (FCO).**

#### General

Currently the coordination of hatchery M&E efforts of the Clearwater River basin hatchery programs is not consistently applied to all programs and some have little or no evaluations completed (Nez Perce Tribal Hatchery on-station release and Kooski National Fish Hatchery releases). Developing a coordinated effort through the collaboration of the co-managers working in the Clearwater River basin would provide consistent data, data rollups and other evaluation metrics and annual reports that address issues critical to the LSRCP goals. The objectives described here will focus on the coordination, development and application of consistent methods for M&E data collection, management and reporting. The NPT M&E staff will focus on the coordination between the NPT and USFWS FCO and providing monitoring and evaluation of the NPTH on-station Chinook salmon releases. Future collaboration will need to include Idaho Fish and Game in order to fully evaluate hatchery programs in the Clearwater River basin.

The main objective of the Nez Perce Tribal Hatchery (NPTH) program is to use supplementation (RASP, 1992) as a tool to increase natural spawning populations of Chinook salmon in the Clearwater Subbasin and provide Tribal harvest opportunities. Initially the program utilized natural broodstock and pre-smolt and parr releases to boost natural spawning in the Clearwater River basin with monitoring and evaluation studies completed by the BPA-funded NPTH spring/summer Chinook Salmon Monitoring and Evaluations Project. In 2008, a spring Chinook smolt program that released fish directly from the NPTH facility was added to the project. This smolt program is a cooperative effort with the Idaho Department of Fish and Game (IDFG) and is designed to return broodstock to NPTH for the productions of the Meadow Creek parr releases. However, evaluations of these fish were not included the NPTH M&E study design. Because the adipose fin clipped adults returning from the NPTH smolt releases will contribute to the LSRCP mitigation goals, monitoring and evaluations will occur under this project.

The smolt program set a goal of rearing and releasing 200,000 spring/summer Chinook salmon directly from the NPTH facility. Marking and tagging objects include approximately 36% CWT and adipose fin clipped and 64% CWT only. In addition, approximately 400 - 700 are PIT tagged for survival evaluations to LGR.

Approach:

Tasks described here will focus on the evaluation of juvenile survival and adult return metrics. Juvenile survival to LGR will be evaluated using the SURPH model and PIT tag interrogations at the LGR juvenile bypass facility and detection sites downstream. The current PIT tag allocation of 400 – 600 should be adequate for this task. Total adult abundance, including estimation of ocean and Columbia River harvest, will be accomplished using CWT recovery records obtained from the Regional Mark Information System (RMIS) and recoveries at hatchery racks. In addition, age structure, size at return and final disposition will be determined using CWT information and run reconstructions. Together this information will provide estimates of adult returns that will be used to determine the success of the NPTH smolt releases and how they contribute to the overall LSRCP mitigation goals for the Snake River basin.

Currently it is not possible to estimate adult returns to the Snake River prior to hatchery spawning. Improved hatchery evaluations, including near real-time estimates of adult abundance, would be possible with an additional 4000 – 6000 PIT tagged juveniles. This would allow greater confidence in setting sport and Tribal harvest share allocations in the Clearwater River.

Task 8.1 – Obtain 600 PIT tags for PIT tagging the NPTH on-station smolts prior to acclimation and release.

*Completed*

Task 8.2 – Use the SURPH model to evaluate juvenile survival from release to LGR.

*Completed*

Task 8.3 – Query RMIS to obtain CWT recoveries from ocean and Columbia River sport, commercial and Tribal harvest. Determine if existing CWT levels for associated programs are adequate.

*Completed*

Task 8.4 – Obtain CWT recovery records from NPTH, Clearwater Hatchery, Dworshak National Fish Hatchery and Kooskia National Fish Hatchery to evaluate adult returns to the Clearwater River of the NPTH smolts.

*Completed*

Task 8.5 – Complete a run reconstruction of the NPTH smolt program to evaluate the success of the program and estimate its contribution to LSRCPO mitigation goals. Provide summary information to the LSRCPO annually to estimate NPT programs contribution to mitigation goals in the summary spreadsheet developed by the cooperators. This information will be due at the end of the calendar year

*Completed*

Task 8.6 – Participate in the Dworshak Hatchery Evaluation Team (HET) to develop consistent and scientifically sound monitoring and evaluation methods for the NPT/USFWS Chinook salmon hatchery programs.

*Completed*

Task 8.7 – Review and identify the NPT production programs that contribute to the LSRCPO mitigation goals and develop annual reporting requirements.

*Completed*

### **Project 2c – Smolt to Adult Survival**

Approach: Smolt-to-adult survival is calculated using PIT-tag recoveries through the Snake River dams and estimating adult run sizes utilizing the individual adult weir sites, and through adult run reconstruction efforts from spawning ground surveys (see Objectives 2 & 3).

### *Category 3 – Legal Obligations*

#### **Project 3a – Endangered Species Act coordination and reporting**

**Objective 9. Coordinate Nez Perce Tribe evaluation studies with the National Marine Fisheries Service and U.S. Fish and Wildlife Service. Participate in planning activities associated anadromous fish production and management in the South Fork Salmon, Grande Ronde, and Imnaha river basins.**

Approach:

The NPT does not recognize that the Endangered Species Act takes precedence over or precludes Tribal sovereignty or rights in any manner. However, the Tribe does recognize that Chinook salmon, steelhead and bull trout are listed as threatened species, and strongly believes in coordination efforts to conserve, protect and recover populations at low levels of abundance and high risk of extirpation. In that regard the Columbia River Inter-Tribal Fish Commission maintains Section 10 permits, by and through the Bureau of Indian Affairs, coordinating Tribal

activities relative to listed salmon and trout populations. The following activities are thus undertaken to coordinate with the NOAA-Fisheries and the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act.

Task 9.1 - Provide technical assistance describing NPT LSRCP M&E studies for HGMPs through Section 7 or 10 permits.

*Completed*

Task 9.2 - Provide updated evaluation activities to modify Section 10 permits as necessary.

*Completed*

Task 9.3 - Provide annual reports to NOAA and the USFWS which summarize project activities relating to listed Chinook salmon, steelhead and bull trout subpopulations under the Endangered Species Act. Provide annual bull trout take levels, as requested by LSRCP. Coordinate directly with Mark Robertson ([mark\\_robertson@fws.gov](mailto:mark_robertson@fws.gov)) on that annual reporting.

*Completed*

Task 9.4 – Participate in planning and implementation activities for developing population specific management and recovery plans for the Salmon, Grande Ronde, and Imnaha populations as specified in the Snake River spring/summer Chinook salmon recovery plan.

*Completed*

Task 9.5 – Participate in recovery planning by assisting the USFWS and NOAA-Fisheries regarding status and limiting factors of spring/summer Chinook and steelhead populations.

*Completed*

Task 9.6 – Participate in coordination teams to account for all LSRCP fish that leave as juveniles and account for all fish returning as adults, to facilitate a review of the LSRCP programs and provide recommendations for future management of the LSRCP program.

*Completed*

#### ***Category 4 – Electronic Database Systems***

##### **Project 4a – Data management**

**Objective 10. Develop an accessible electronic database system incorporating performance measure data critical for hatchery evaluations, status and trends monitoring and recovery efforts.**

### General:

Data collected by the NPT LSRCP M&E project is entered, stored, and analyzed using Microsoft Excel and Access databases. Data associated with the use or PIT tags are uploaded to the Pacific States Marine Fisheries Commission (PSMFC) and Fish Passage Center (FPC) databases and the CWT data is uploaded to the Regional Mark Processing Center (RMIS) database. This objective will lead to a centralized database for all LSRCP data that is accessible by LSRCP cooperators and other agencies. This will facilitate more efficient use of project personnel time and also facilitate the overall goal of evaluation of the entire LSRCP program.

### Approach:

With requests from LSRCP to standardize, consolidate, and make readily assessable the NPT LSRCP data and results, a North Idaho Database Administrator position was funded by PSMFC and is located in the NPT Sweetwater DFRM office. This position is crucial to the success of accomplishing the larger LSRCP goals of data storage and security, standardization, summarization, and real time access and coordination of the LSRCP information. Funding support for this position has transitioned to a shared position among LSRCP and BPA-funded DFRM Research Division projects to support data collection, standardization and management. This position will work closely with the LSRCP FINs data manager and the Idaho Department of Fish & Game Data Administrator position (currently funded under LSRCP) to efficiently manage data and coordinate accessibility. In addition, products produced by this position will be accessible to the larger LSRCP program and should help standardize performance measures that will be critical for future management decisions.

This project acknowledges the need to share updated information on regionally accepted performance measures (ADSWG 2009), organized by the categories; abundance, survival-productivity, distribution, genetic, life history, habitat, and in-hatchery measures. The Tribe intends on providing information for these measures immediately following field data collections and then central database updates. In the past, this project used annual report submissions to the BPA web site (<http://www.efw.bpa.gov/searchpublications/>) thus making project information publicly available. Annual reports are now also available on the Tribe's web site (<http://www.nezperce.org/~dfrm/research>), which is currently undergoing changes to facilitate better information access and presentation.

The project also maintains an annual distribution list of managers, researchers, ICTRT members, and other recovery planners who receive hard copies of annual reports. The Department takes seriously the need to make primary data and metadata publically available. The end result of this project is the collection and storage of valuable data given society's monetary investment and the high level management questions to be answered. The data collection and storage will receive special attention due to the above two reasons.

In addition to annual progress reports posted to BPA website, the Nez Perce Tribe will utilize centralized region-wide databases that have been developed to unify data collection activities

currently involving multiple agencies and departments. The information will be collected following the same functional procedures developed across all departments within the tribe. It will then be stored in a central database applying unique set of attributes. The Nez Perce Tribe website ([www.nezperce.org/~dfm/research](http://www.nezperce.org/~dfm/research)) will link to stream data from a relational database for primary data, description of meta-data, various data summaries, and annual reports related to all projects. The department is currently working towards making this information available through the Tribe's website. The two stages of data dissemination will be the availability to download raw (not summarized) field collected data and summarized performance measures across single or multiple years.

Appropriate components of program data and results will also be provided to the following websites: The tribe is a partner on the Snake Basin Hatchery working group that currently houses much of the Tribe's adult trapping data ([Snake Basin Hatchery Data](#)); Pacific States Marine Fisheries Commission (PSMFC), including: PIT Tag Information System (PTAGIS), and the Regional Mark Information System (RMIS); StreamNet, and Northwest Environmental Data Network (NED; when functional); the Tribe currently is coordinating with the Columbia River Inter Tribal Fish Commission who is funded through the Accords to centralize and standardize all tribal data.

Task 10.1 - Design field data collection databases according to protocols established by the Research Division Technical Teams.

*Completed*

Task 10.2 - Coordinate and maintain databases so they are accessible to all NPT division employees.

*Completed*

Task 10.3 - Work with LSCRCP program to facilitate cooperator access and for use in LSCRCP workgroups to facilitate evaluation of overall LSCRCP program.

*Completed*

Task 10.4 – Provide pertinent products to the larger LSCRCP program as completed.

*Completed*

### ***Category 5 – Peer Review, Biometric Review, Analysis and Reporting***

#### **Project 5a – Project reporting**

#### **Objective 11. Reporting of summarized results of completed objectives.**

Task 9.1 – Submit following annual reports:

Title	Period Covered	Final Report Date
Nez Perce Tribe – SFSR and Big Creek Spawning Ground Survey Report, five year update	2009 - 2013	July 31, 2016
Nez Perce Tribe – 2015 Salmonid Gamete Preservation Project Annual Report	2015	July 31, 2016
Nez Perce Tribe – 2014 Juvenile trapping Imnaha River	2014	July 31, 2016
Nez Perce Tribe Annual LSRCF Progress Report	FY2016	December 31, 2016

***Category 6 – Participation in External Forums***

- No monitoring and evaluation activities planned

***Category 7 Regionally Significant Research***

-No regional/basin-wide significant research projects planned

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