

MONITORING AND EVALUATION STUDY PLAN ANNUAL PROGRESS REPORT

Lower Snake River Compensation Plan
Nez Perce Tribe Hatchery Evaluation Studies

Fiscal Year 2011

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2011 EVALUATION STUDY PLAN

1. Objectives

A. General

This report outlines the activities that were planned and completed in fiscal year 2011 (October 1, 2010 – September 30, 2011). The goal of the Nez Perce Tribes' LSRCP evaluations program was structured to monitor aspects of LSRCP hatchery production performance, natural production status and performance, promote genetic conservation, and to contribute to the co-management of the LSRCP program. Monitoring of the performance of hatchery production involved pre-release sampling, marking, estimating post-release survival, and estimating the percentage of LSRCP adult hatchery fish that contributed to spawning. Monitoring activities included adult escapement of both natural and hatchery origin Chinook salmon and steelhead in several key spawning aggregates, pre-release sampling of LSRCP hatchery-produced fish, monitoring of life stage survival of naturally and hatchery produced fish, and identification of the genetic stock structure. This included the investigation of downstream emigrating Chinook salmon and steelhead in the Imnaha River to document emigration timing through the Imnaha River and emigration timing, travel time and survival estimation to Snake River dams; estimation of adult steelhead spawner abundance in small tributary streams in the Imnaha River subbasin using picket and resistivity weirs; monitoring of adult returns of Chinook salmon to the South Fork Salmon River (SFSR) using spawning ground surveys in the SFSR and Big Creek (Middle Fork Salmon River tributary). In addition, coordination of Chinook salmon and steelhead cryopreservation activities will continue at LSRCP hatchery facilities and in tributary streams in an effort to develop and maintain a germplasm repository for adult male salmon and steelhead gametes.

Category 1. Fish Culture and Production Activities

Project 1a – Production Monitoring

- Participate in planning processes (Annual Operating Plan) for the culture, ponding, rearing, and ultimate release of all steelhead and Chinook salmon.

Project 1b – Disease Monitoring, Prevention, and Treatment

- No Monitoring and Evaluation Activities Planned

Project 1c – Optimum Production Strategies

Objective 1: Determine the emigration timing of natural and hatchery reared spring and summer Chinook salmon and estimate the post-release survival of hatchery reared Chinook salmon smolts in the Imnaha River.

Task 1.1. - Install and remove the rotary screw trap in the lower Imnaha River as necessary. Operate trap on a regular periodic schedule, generally from late February through November in coordination with the Smolt Monitoring Project funded by Bonneville Power Administration.

Completed: LSRCP personnel assisted with the installation and removal of the rotary screw trap in the lower Imnaha River.

Task 1.2. – Coordinate the initiation of remote monitoring of PIT tagged hatchery Chinook salmon volitional release behavior from the Gumboot Acclimation Facility (includes installation and operations).

Completed: The screw trap monitors volitional release behavior of fish released from the Gumboot acclimation Facility through the evaluation of captures.

Task 1.3. – Assist with the operation of the rotary screw trap to determine the relative timing of emigration (October – December and February – June).

Completed: LSRCP staff assisted with screw trap operation during this period, providing limited assistance from January – February, extensive assistance from March – June and again from October – November.

Task 1.4. - Conduct trap efficiency trials for hatchery reared Chinook salmon smolts (fin clips and PIT tags – 3,000 per year).

Completed: trap efficiencies were estimated for HOR Chinook salmon using previously PIT tagged smolts captured in the trap. Results will be presented in the 2011 Smolt Monitoring Project Report.

Task 1.5. – Sub-sample fish to collect length, weight, and condition (health/physiology) information.

Completed: Ten HOR Chinook salmon and steelhead were sampled for condition each day, when available. This is compared to information collected from NOR fish.

Task 1.6. - Compare the emigration timing of hatchery reared and natural Chinook salmon smolts.

Completed: emigration timing of HOR and NOR Chinook salmon was compared. Results will be presented in the 2011 Smolt Monitoring Project Report.

Task 1.7. - Estimate the post-release survival of hatchery Chinook salmon from the release point to the lower Imnaha River trap using PIT tag recoveries and the SURPH model. From this model the total estimated passage of hatchery Chinook salmon will be determined along with an estimated post-release survival in the Imnaha River.

Completed: Survival and abundance to the lower Imnaha River screw trap were estimated. Results will be presented in the 2011 Smolt Monitoring Project Report.

Task 1.8. - Share weekly Imnaha River natural and hatchery summer Chinook salmon and steelhead smolt emigration catch information with the Fish Passage Center.

Completed: Fish Passage Center was updated on a weekly basis from March – June.

Objective 1.2: Investigate the effect of water temperature and river discharge on emigration timing from the Imnaha River for natural and hatchery produced juvenile Chinook salmon and steelhead.

Task 1.2.1. - Monitor USGS staff gauge information.

Completed: Monitored daily to assess trapping conditions

Task 1.2.2. - Monitor daily water temperature with a constant recording thermograph at the lower Imnaha River emigrant trap site. Download thermographs on a regularly scheduled basis.

Completed: Thermograph was downloaded.

Task 1.2.3. - Examine relationships between smolt emigration and stream temperature and river discharge.

Completed: The relationship between stream flow and Smolt emigration patterns were examined. Results will be presented in the 2011 Smolt Monitoring Project Report. In addition, juveniles tagged by this project are used by the Fish Passage Center to evaluate survival through the hydrosystem as it relates to river flow and temperature.

Objective 2. Determine and compare the migration timing, travel time, emigration survival, and smolt-to-adult survival of natural and hatchery reared Chinook salmon and steelhead from the Imnaha River through the Snake River to Lower Granite Dam and to McNary Dam.

Task 2.1. - PIT tag 20,000 emigrating natural Chinook salmon representatively across the entire emigration period.

The goal was to tag 20,000 NOR Chinook in FY2012 (Oct 1, 2010 – Sept. 30, 2011). Total NOR Chinook salmon juveniles tagged over this period was 8,185. This was below our tagging goal, but representative tagging enable a population estimate of juvenile Chinook salmon emigrating from the Imnaha River and allowed for survival estimates and the calculation of smolt to adult survival estimates. Many more juveniles were captured and we are reviewing our tagging protocols which will allow us to tag a higher

proportion of juveniles in FY2012.

Task 2.2. - PIT tag 5,000 emigrating natural steelhead representatively across the entire emigration period (emphasis given to spring smolts due to multiple age emigration behavior).

The goal was to tag 5,000 NOR steelhead. We representatively tagged 2,593 NOR steelhead representatively across the emigration period that peaked in May. A failure to reach the tagging goal resulted from the inability to capture enough juveniles.

Task 2.3. - Estimate survival of natural and hatchery Chinook salmon and steelhead smolts, through use of the SURPH.2 model, to Lower Granite Dam and through the Snake River to McNary Dam (if possible).

Completed: Survival of NOR and HOR Chinook salmon and steelhead was estimated to LGD and McNary Dam. Results will be presented in the 2011 Smolt Monitoring Project Report.

Task 2.4. - Interrogate previously PIT tagged and released hatchery Chinook salmon smolts at the Imnaha River trap and use these fish as a release group to compare with natural Chinook salmon smolts.

Completed: Results will be presented in the 2011 Smolt Monitoring Project Report.

Task 2.5. - Determine the emigration timing, travel time and estimated survival of emigrating natural and hatchery Chinook salmon and natural steelhead smolts from the Imnaha River to Lower Granite Dam and other Snake and Columbia River dams.

Completed: Release groups were used to estimate emigration timing, travel time and survival to LGD and through the hydrosystem. Results will be presented in the 2011 Smolt Monitoring Project Report.

Task 2.6. - Statistically compare the variables under Task 1.6 for natural and hatchery steelhead smolts.

Completed. Results will be presented in the 2011 Smolt Monitoring Project Report.

Task 2.7. - Coordinate with the appropriate agencies to collect PIT tag passage data for both juvenile and adult life stages at Lower Granite Dam and other Snake and Columbia River dams.

Completed: PIT tag passage data was acquired from the Ptagis database.

Task 2.8. - Determine smolt-to-adult survival rates from release to Lower Granite Dam for natural Chinook salmon and steelhead PIT tagged in the lower Imnaha River and for PIT tagged Chinook salmon and steelhead groups released into the Imnaha River.

Completed: SAR rates were estimated when a large enough sample of adults returned to LGD. Results will be presented in the 2011 Smolt Monitoring Project Report.

Category 2 – Estimating Adult Returns

Project 2a – Catch Accounting

Task 1. Marking and Tagging:

- No Monitoring and Evaluation Activities Planned

Task 2. CWT Laboratory: The Nez Perce Tribe processes all adult CWT recoveries from all NPT spawning ground carcass recovery efforts. Efforts include all recoveries from the upper Big Creek and all recoveries below the LSRCP adult weir on the South Fork Salmon River and any adult steelhead mortalities captured from Horse, Cow and Lightning creek weirs in the Imnaha River drainage. All tags are extracted, read, and uploaded to the Regional Mark Processing Center (RMIS) database system.

Completed (partially): All CWTs collected in the SFSR and Big Creek were recovered and read. They have not yet been uploaded to RMIS.

Task 3. Fishery Catch Estimation and Sampling: No Monitoring and Evaluation Activities Planned, See Harvest Monitoring Statement of Work.

Project 2b – Estimating Project Area Escapement

Objective 3. Assess adult Chinook salmon abundance and monitor trends in population status.

Task 3.1. - Conduct multiple ground count Chinook salmon spawning ground surveys in Idaho in the SFSR (below the adult weir, Figure 2) and in upper Big Creek (Middle Fork Salmon River) in the Salmon River system. The stream reaches in the SFSR include: the adult weir to Dime Creek (5.1 km), Dime Creek to the unnamed tributary downstream of Mirror Creek (5.6 km), Poverty Flat (1.1 km), and Lodgepole Campground to Phoebe Creek (6.1 km). The stream reaches in Big Creek include Smith Creek to Logan Creek (5.6 km) and Logan Creek to Jacobs Ladder Creek (4.7 km).

Completed: four passes were completed in the SFSR and three passes were completed in Big Creek.

Redds by section and total redds counted in the South Fork Salmon River in 2011

<u>Section</u>	<u>Redds</u>
Weir to Dime Cr.	177
Dime Cr. To Unnamed tributary	115

Poverty Flat	126
Lodgepole C.G. to Phoebe Creek	131
Total	549

Redds by section and total redds counted in Big Creek in 2011

Section	Redds
Jacobs Ladder to Logan Cr.	75
Logan Cr. To Smith Cr.	12
Total	87

Task 3.2. - Collect biological information (length, scales, fin rays, percent spawned, marks/tags) from all adult Chinook salmon carcasses encountered on the South Fork Salmon River downstream of the adult weir and in Big Creek. Biological information collected from salmon carcasses will include measuring fork length, internal examination for sex and percent spawned, examination for marks, tags and fin clips, removal of snouts from coded-wire-tagged fish, and taking of scales or fin rays for age and growth analysis and age structure determination.

Completed:

Chinook salmon carcasses by section and total carcasses recovered in the South Fork Salmon River in 2011

Section	Carcasses
Weir to Dime Cr.	110
Dime Cr. To Unnamed tributary	83
Poverty Flat	154
Lodgepole C.G. to Phoebe Creek	54
Total	401

Chinook salmon carcasses by section and total carcasses recovered in Big Creek in 2011.

Section	Carcasses
Jacobs Ladder to Logan Cr.	20
Logan Cr. To Smith Cr.	3
Total	23

Task 3.3. - Determine hatchery:natural adult composition on the spawning grounds in the South Fork Salmon River, below the adult weir, using known hatchery adipose and ventral fin clip marks.

Completed: adult hatchery/natural composition was estimated from recovered carcasses.

Task 3.4. - Operate the remote PIT tag array in the lower SFSR. The array will be operational for the entire year to detect both returning adult Chinook salmon and steelhead and emigrating juvenile Chinook salmon and steelhead.

Completed: the remote PIT tag array was operational for the entire year.

Task 3.5 - Calculate age structure and sex composition of the spawning population for application in determining adult spawner to spawner ratios by brood year.

Completed: adult age and sex composition was calculated from recovered carcasses. Age composition was estimated by coded wire tag recoveries and length. Sex composition was estimated by internal examination of the gonads.

Task 3.6 - Coordinate spawning ground survey information with other ongoing projects in the South Fork Salmon River to examine dispersion of McCall Hatchery reared Chinook salmon into other tributary streams.

Completed: Coordinated with the Idaho Salmon Supplementation (ISS) Project, IDFG McCall Hatchery Trap crews and M&E personnel and Johnson Creek Artificial Propagation and Evaluation (JCAPE) Project.

Task 3.7 - Prepare reports summarizing adult salmon spawning ground surveys.

Completed: A comprehensive report covering all NPT spawning ground survey activities, including surveys conducted under this project, will be completed by the NPT Research Divisions' Adult Technical Team.

Subobjective 3.2. Assist IDFG, USFWS and ODFW with ongoing LSRCP evaluation studies to achieve Nez Perce Tribe participation in the LSRCP program.

Task 3.2.1. - If possible, assist ODFW in 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. Snouts from coded-wire-tagged Chinook carcasses will be provided to ODFW for wire tag interrogation.

Completed: LSRCP staff assisted with spawning ground surveys in the Lostine, Imnaha and Wenaha Rivers.

Task 3.2.2. - Coordinate and assist with marking efficiency evaluation for production release Chinook salmon at McCall Hatchery and Lookingglass Fish Hatchery.

Completed: LSRCP staff assisted with marking efficiency evaluation for production releases at Lookingglass Hatchery. Assistance at McCall Hatchery was not needed.

Task 3.2.3. - 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: LSRCP staff assisted ODFW with PIT tagging of Imnaha River Chinook salmon at Lookingglass FH and Irrigon FH.

Objective 4. Determine adult steelhead abundance and spatial structure in the Imnaha River subbasin.

Task 4.1. – Install and operate flat-panel floating weirs in Horse and Cow Creeks to evaluate adult steelhead spawner escapement, demographics and hatchery:natural composition.

Completed (partial): a flat-panel weir was installed in Horse Creek. A remote PIT tag array was installed in Cow Creek to enumerate adult steelhead abundance.

Task 4.2. – Install the resistivity weir in Camp Creek with video validation to get an adult steelhead escapement estimate by origin.

Not completed: we were evaluating the effectiveness of the resistivity weir in Camp Creek and did not install it in 2011. Following the evaluation it was determined that the resistivity counter was not effective due to the proximity of the weir in relation to suitable spawning habitat. Installation within area containing actively spawning fish resulted in a high number of up and down passages that significantly increased detection error, resulting in a high level of imprecision around the abundance estimate.

Task 4.3. – Use resistivity-enumerated adult escapement estimate and Oregon Department of Fish & Wildlife redd count surveys in Camp Creek to estimate fish per redd and other key parameters.

Not completed: see response to Task 4.2.

Task 4.4. - Maintain constant recording thermographs in Horse, Cow and Camp Creeks to characterize water temperatures.

Completed

Task 4.5. - Describe the adult steelhead spawner migration timing in relation to water temperature and stream discharge in Horse Creek and Camp Creek.

In progress: will be part of a multiyear report.

Task 4.6. - Prepare annual reports summarizing adult steelhead escapement monitoring activities.

Completed

Task 4.7. – Continue to coordinate the development of juvenile steelhead emigration trapping equipment and study design for the Little Sheep Creek Facility with ODFW.

Not Completed: Assistance was not needed.

Task 4.8. – Coordinate the implementation of systematic adult steelhead escapement sampling in key tributaries in the Imnaha River subbasin with the NPT Imnaha River Steelhead Escapement Project.

Coordination is continuing

Task 4.9. – Work with NOAA Fisheries to complete genetic stock structure analysis of steelhead in the Imnaha River subbasin. Utilize adult samples from Horse, Cow and Lightning Creeks to finalize study.

Samples are available for a NOAA steelhead genetic stock structure analysis.

Project 2c – Smolt to Adult Survival

Approach: (see Objectives 2 & 3).

Category 3 – Legal Obligations

Objective 5. 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.

Task 5.1. - Provide technical assistance describing Nez Perce Tribe LSRCP evaluation studies for HGMPs through Section 4 or 10 permits.

Completed

Task 5.2. - Provide updated evaluation activities to modify Section 10 permits as necessary.

Completed

Task 5.3. - 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.

Completed: ESA reports were completed

Task 5.4 – 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.

Ongoing

Task 5.5 – Participate in recovery planning by providing assistance as requested by ODFW, TRT, USFWS, and NOAA regarding status and limiting factors of spring/summer Chinook and steelhead populations.

Ongoing

Task 5.6 – Participate in coordination teams to account for all LSRCP fish that leave as juveniles and account for all fish as adults returning, to facilitate a review of the LSRCP program and provide recommendations for future management of the LSRCP program.

Completed: Assisted with spring/summer Chinook salmon and steelhead program reviews. Attended annual operation plan meetings for all LSRCP funded projects and provided comments and guidance. Annual operation plan meeting areas include: Northeast Oregon, Clearwater, Salmon, and Fall Chinook.

Category 4 – Electronic Database Systems

Objective 6. Develop electronic database system that will incorporate critical performance measure data that will be utilized in future recovery and planning efforts.

Task 6.1 - Design field data collection databases according to protocols established by the Research Division Technical Teams.

In progress: Database servers were purchased and network planning and development was initiated.

Task 6.2 - Coordinate and maintain databases so they are accessible to all NPT division employees.

In progress: Database servers were purchased and network planning and development was initiated.

Task 6.3 - Work with LSCRCP program to facilitate cooperator access and for use in LSRCP workgroups to facilitate evaluation of overall LSRCP program.

Completed: Coordinated with LSRCP office on program evaluations

Task 6.4 – Provide pertinent products to the larger LSRCP program as competed.

Completed: Assisted with spring/summer Chinook salmon and steelhead program reviews and database development.

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

Objective 7. Reporting of summarized results of completed objectives.

Task 7.2 – Submit following annual reports:

Title	Period Covered	Final Report Date	
Nez Perce Tribe – 2009 Salmonid Gamete Preservation Project- Annual Report	2009	June 30, 2010	<i>Completed</i>
Nez Perce Tribe – 2009 Juvenile Imnaha River Annual Report	2008	September 30, 2010	<i>In progress</i>
Nez Perce Tribe - 1996-2008 Adult Chinook spawning escapement of Upper Big Creek and South Fork Salmon Rivers.	1996-2008	June 30, 2010	<i>Completed</i>
Nez Perce Tribe – 2001-2007 Adult steelhead activities in the Imnaha River Basin.	2001-2007	September 30, 2010	<i>Final Policy review: will be submitted by 1/31/12</i>
Influences of hatchery supplementation, spawner distribution and habitat on genetic structure of Chinook salmon (<i>Oncorhynchus tshawytscha</i>) in the South Fork Salmon River, ID.		12/2011	<i>Accepted for publication in the 2012 North American Journal of Fisheries Management.</i>

Category 6 – Participation in External Forums

- No Monitoring and Evaluation Activities Planned