



# Nez Perce Tribe



## Department of Fisheries Resource Management

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Project #2007-092-00  
Protect and Restore Selway River Watershed

### Response to December 9, 2010 ISRP Comments

**1) Clarify the proposed actions in the O'Hara Creek watershed regarding cattle and water temperatures.**

Restoration efforts within O'Hara Creek will focus in part on riparian re-vegetation to restore streamside cover and reduce water temperatures. The impacts from cattle grazing in O'Hara Creek are minimal, as only 25 head of cattle are grazed in the watershed from June to October annually. The Nez Perce National Forest (NPNF) Range Manager stated that these cattle spend most of their time on the clearcuts and roads of the Hanby drainage with little impact on the riparian zone of O'Hara. Cattle are not expected to have an impact on the success of riparian re-vegetation efforts proposed for O'Hara; however, the restoration area will be monitored frequently on an annual basis until the plants are of sufficient size and if isolated areas are shown to be impacted they will be addressed by working with the NPNF and the grazing permittee to revise grazing management plans to minimize riparian impacts, purchasing or leasing the grazing allotments to remove the cattle, providing off site watering and corral facilities, and/or exclusion fencing of trouble spots.

Water temperatures have increased above historical conditions due to a decrease in riparian vegetation along streams and road encroachment. Thermograph data for O'Hara Creek shows peak summer temperatures from 2001 through 2009 in excess of 20°C, with a high of 24°C recorded in 2006. These peak values are well above the EPA recommended biological threshold of impact for steelhead (incubation- 13°C, smoltification- 14°C, juvenile rearing- 16°C).

The higher water temperatures are substantiated by the recommendations for O'Hara Creek and other lower Selway tributaries found in the Assessment:<sup>1</sup> "Integrated Area Recommendations for O'Hara include continuing temperature monitoring, restoring riparian vegetation where roads and timber harvest have encroached on riparian areas, planting trees and shrubs for shade in the lower three miles of O'Hara Creek, planting shrubs and trees on restored stream crossings on decommissioned roads and landings, and planting shrubs and trees along streams in clearcuts. This is a very high priority;

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<sup>1</sup> Selway and Middle Fork Clearwater Rivers Subbasin Assessment, USDA Forest Service, March 2001 available at [Nez Perce National Forest- Planning](#) .

habitat potential is high in O'Hara Creek for steelhead trout/redband trout and westslope cutthroat trout. Habitat potential is moderate in O'Hara Creek for spring chinook salmon and bull trout.”

This project will begin this process by instituting stream habitat surveys to assess current riparian condition and causes of degradation, completing a detailed riparian restoration plan, establishing monitoring sites for stream temperatures and sediment in O'Hara Creek, and begin a riparian planting effort to restore stream side cover and reduce temperatures. Future funding, if available, would enable further development of meaningful historical data on temperature and sediment and allow in depth inventory and prioritization of riparian conditions. The positive effects of this planting proposal will be compounded by joining efforts with a proposed NPNF funded project that aims to restore riparian plant species in O'Hara Creek through eliminating invasive plant species and hand planting up to 35 acres of native trees and shrubs within the lower three miles of O'Hara Creek. Effecting stream temperatures in O'Hara Creek will be a long term process, but by establishing a monitoring base line for temperatures we will be able to assess progress and adapt or revise strategies as needed.

**2) *Provide an overview of the criteria and methods for assessing and prioritizing roads and stream crossings.***

***Road Assessment***

The road inventories completed under this proposal will be an on the ground physical assessment of selected road segments. All available GPS, GIS, and aerial photograph resources will be used to document road segment and stream locations. This assessment will include road location relative to streams, road lengths, road widths, surface conditions, vegetative cover, existing erosion, number and types of stream crossings, and occurrences of road failures. The field data is gathered electronically and spatially referenced for transfer to existing GIS data layers and photos for further analysis. Additional modeling techniques will be employed as conditions warrant to determine the sediment contributions and conditions of critical road segments. Sediment modeling programs used on past projects include Water Erosion Prediction Potential (WEPP) Road and the Geomorphic Road Analysis and Inventory Package (GRAIP, <http://www.fs.fed.us/GRAIP>). WEPP is a process-based, distributed parameter, continuous simulation, erosion prediction modeling tool to evaluate road decommissioning and best management practices (BMP) upgrades. The GRAIP model combines a detailed road inventory with a powerful GIS analysis tool set to predict road sediment production and delivery, mass wasting risk from gullies and landslides, and road hydrologic connectivity.

***Road Prioritization***

Road decommissioning and improvement projects will be prioritized by the highest risk in our highest value fisheries, based on the species present, potential habitat available, and potential for restoration. The Nez Perce Tribe (NPT) and the NPNF will use an interdisciplinary team to update the Roads Analysis and Transportation Plan in order to determine which roads are candidates for road improvement or decommissioning

projects.<sup>2</sup> During road analysis, roads are assessed by each functional group and then integrated into management recommendations for each road segment. The aquatic and wildlife functional groups assess the level of concern each road segment poses to their resource while the cultural, recreation, and transportation functional groups assess the level of need for each road segment. Once each functional group rates the roads/trail system by road segment the individual outcomes are combined to determine a level of concern and need for each road using a Road Analysis Matrix. For example a road segment having a high concern and low need would be recommended for decommissioning, while a road segment with a high concern and high need would be recommended for improvement. Priorities for decommissioning and improvement will then be determined combining the analysis and assessment data with the road need and use data to target those road segments that higher in risk and/or in the higher value watersheds.

Target Road Densities play an important part in transportation planning and reducing chronic sediment input sources to aquatic habitat. The Selway Middle Fork Clearwater Subbasin Assessment reports that the highest road density of any sub-watershed in the Selway is in O'Hara Creek with a total of 185.3 miles and a density of 1.84 miles per square mile. The USFS characterizes road density levels of greater than 1.7 miles per square mile as high. The goal of the Nez Perce Tribe Watershed Division is to reduce road densities to 1 mile per square mile. This project will implement decommissioning to reduce road densities in an effort to meet these objectives.

### ***Passage Barrier Assessment***

Field surveys will be used to collect passage and condition information on stream crossings that potentially block passage to target species. Initial course screening will be done based on species presence, miles of habitat upstream from the crossing, and known passage barriers. Surveys will be conducted using the guidelines of the National Inventory and Assessment Procedure for Identifying Barriers to Aquatic Organism Passage at Road-Stream Crossings (Clarkin et al. 2003). Data collected with the survey include: crossing shape, crossing dimensions, inlet/outlet configuration, structure stream bed material, stream channel longitudinal profiles, stream channel cross-section(s), and stream bankfull widths. The data collected for the longitudinal profile provides information to calculate culvert slope, upstream/downstream slopes, residual inlet depth, and outlet drops. A decision matrix based primarily on velocities, jump heights, and substrate conditions will be used as a filter (screen) to determine fish passage for both adult and juvenile salmonids. The screen will indicate if a structure passes fish (green) or is a barrier to upstream movement (red).<sup>3</sup>

### ***Passage Barrier Prioritization***

The goal of our fish passage program is to provide unimpeded passage to all life stages (spawning and rearing) for target species. A NPNF/NPT interdisciplinary team of fish

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<sup>2</sup> Nez Perce National Forest ROADS ANALYSIS REPORT, March 2006 available at [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fsm91\\_055105.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm91_055105.pdf)

<sup>3</sup> Assessment of Aquatic Organism Passage at Road/Stream Crossings for the Northern Region of the USDA Forest , March 2008 available at [http://www.fs.fed.us/r1/projects/engineering/fish\\_passage\\_web.pdf](http://www.fs.fed.us/r1/projects/engineering/fish_passage_web.pdf) .

biologists, hydrologists and engineers will complete a prioritization strategy for fish passage improvements. Priorities will be based on target fish species blocked and the life stage type (spawning, rearing or both), amount, and quality of habitat above the barrier. Additional criteria include culvert failure risk, partnership opportunities, and available funding. The life stage type and amount of habitat is determined by NOAA Salmon Recovery ICTRT (Inter Columbia Technical Recovery Team) maps and historic fish surveys. The quality of habitat is based on stream gradient, amount of land use above the barrier, and riparian condition. The potential habitat below and above the crossing will be assessed and those with the highest habitat potential are given priority. Stream gradient, condition, and proximity to other barriers are examples of factors considered. Information from this assessment allows a more strategic approach to prioritization at a watershed scale and allows for more effective use of available funding.

In this Selway proposal, Objective 1 will begin to implement the assessment and prioritization for roads. Based on increased sediment loading (see Question 3), assessment will begin in the high priority areas including O'Hara Creek, Goddard Creek, and the Lower mainstem Selway. The passage barrier assessment and prioritization for the lower Selway River has already been initiated and 3 barriers are prioritized for replacement in this proposal (see Objective 2).

**3) *Provide additional information regarding the role of sediment in project streams.***

Sediment yield for the Selway and Middle Fork Clearwater River was modeled using NEZSED, a computer model tiered to a set of guidelines developed by hydrologists and soil scientists from the Intermountain Research Station and the Forest Service Northern and Intermountain Regions.<sup>4</sup> This model estimates the average annual natural or base rate of sediment yield and surface erosion sediment yield produced from roads, logging, and fire. The sediment level shown for O'Hara Creek watershed for the year 2000 was 8 percent over base. Thirty sub-watersheds were modeled for the analysis and only three showed sediment over the base percent. O'Hara, Swiftwater and Goddard ranged from 6.7 to 15 percent over base sediment yield. All of these are highly roaded, highly logged, lower basin sub-watersheds. Therefore, road decommissioning becomes a high priority restoration activity that will move the sediment regime to a more natural state within the drainage. This proposed project will begin by decommissioning 5 miles of road within the O'Hara Creek drainage.

Historically in the Selway, the main disturbances were pulse disturbances such as fires and floods. In general the pulse of sediment from wildfire or flood events shows sediment increases with recovery in a few years. In the lower Selway subbasin below the wilderness boundary, roads and timber harvest have been a source of wide-scale press disturbance resulting in sediment regimes that have affected aquatic integrity, mostly in tributary streams. The model also predicts a continuing sediment production from roads as long as they remain on the landscape.

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<sup>4</sup> Selway Subbasin Assessment, USDA Forest Service.

The development-related pattern for O'Hara Creek watershed starts around 1960. The development of roads and timber harvest in O'Hara Creek watershed results in sediment peaks that are similar to the wildfire peaks, but recovery to sediment base levels does not occur and chronic long-term sediment remains in O'Hara Creek watershed, mainly from roads, until the present time. When the curves for Meadow Creek watershed (a large non-roaded sub-watershed in the upper Selway) and O'Hara Creek watershed are compared from 1960 to 2000, the pattern of quick recovery of sediment to base level from wildfire in Meadow Creek watershed can be seen, and the chronic sediment interspersed with peaks from timber harvest and roads in O'Hara Creek watershed is apparent. This is a good comparison of pulse versus press disturbance between the two watersheds.

Surface erosion rates from roads are typically at least an order of magnitude greater than rates from harvested areas, and three orders of magnitude greater than erosion rates from undisturbed forest soils.<sup>5</sup> Although a wide range of erosion rates and sediment yields are reported in the literature, all sources agree that these rates are considerably higher in forests containing roads in comparison to areas without roads.<sup>6</sup> Scientists looking at large scale physical variables relating to fish abundance have noted that increased road density yields lower fish abundance and occurrence. This evidence supports a strategy of reducing road mileage in heavily roaded basins, and restricting development of new roads in unroaded areas.<sup>7</sup>

Initial road decommissioning for this project is proposed in the O'Hara Creek watershed in the lower Selway. The Lower Selway River Subbasin Assessment prepared by the Idaho Division of Environmental Quality in December 2000 reports that the existing salmonid fish data for O'Hara Creek shows juvenile fish and juveniles present with other age classes, indicating that successful spawning and rearing occurs in the stream. These data further demonstrate that the subbasin water quality provides for protection maintenance, and propagation of an indigenous fish population. A summary of the chinook and steelhead data for O'Hara Creek shows both juveniles and adults of both species in numerous surveys conducted from 1993 to 1999. This is further substantiated by the USFS biological assessment that states "In the Selway subbasin, all streams with sufficient size and gradient which are accessible to fish in the mainstem river support steelhead juvenile rearing or spawning or both. Deposited sediment may have lowered the carrying capacity for juvenile rearing and the quantity and quality of spawning habitat in streams with high road densities."<sup>8</sup>

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<sup>5</sup> Selway Subbasin Assessment, USDA Forest Service.

<sup>6</sup> National Level Assessment of Water Quality Impairments Related to Forest Roads and Their Prevention by Best Management Practices Final Report Prepared by: Great Lakes Environmental Center for U.S. Environmental Protection Agency.

<sup>7</sup> Incentives for National Forest Roads, Randal O'Toole, AMERICAN WATER RESOURCES ASSOCIATION, May 2001 available at <http://www.awra.org/impact/issues/0105impact.pdf#page=9>.

<sup>8</sup> USDA Forest Service, 1999. Biological assessment, Selway River. Nez Perce National Forest.

Initial efforts under this proposal will decommission 5 miles of road in O'Hara Creek. This would reduce the total miles in O'Hara by 2.6% reducing densities towards the goal of properly functioning watershed at 1.0 miles per square mile or lower. No estimates of sediment production resulting from roads in the Selway are available but recent modeling efforts can provide some insight. The GRAIP model was used to estimate sediment from 45 miles of forest roads in Lolo Creek in 2008; results of that study estimate that sediment production from roads is in the range of 2977 kg/mi/yr to 414,406 kg/mi/yr. Using the conservative end of the range, the decommissioning of 5 miles of road will reduce sediment production substantially, and the proposed inventory and assessment coupled with the adaptive management framework would guide future decommissioning efforts.

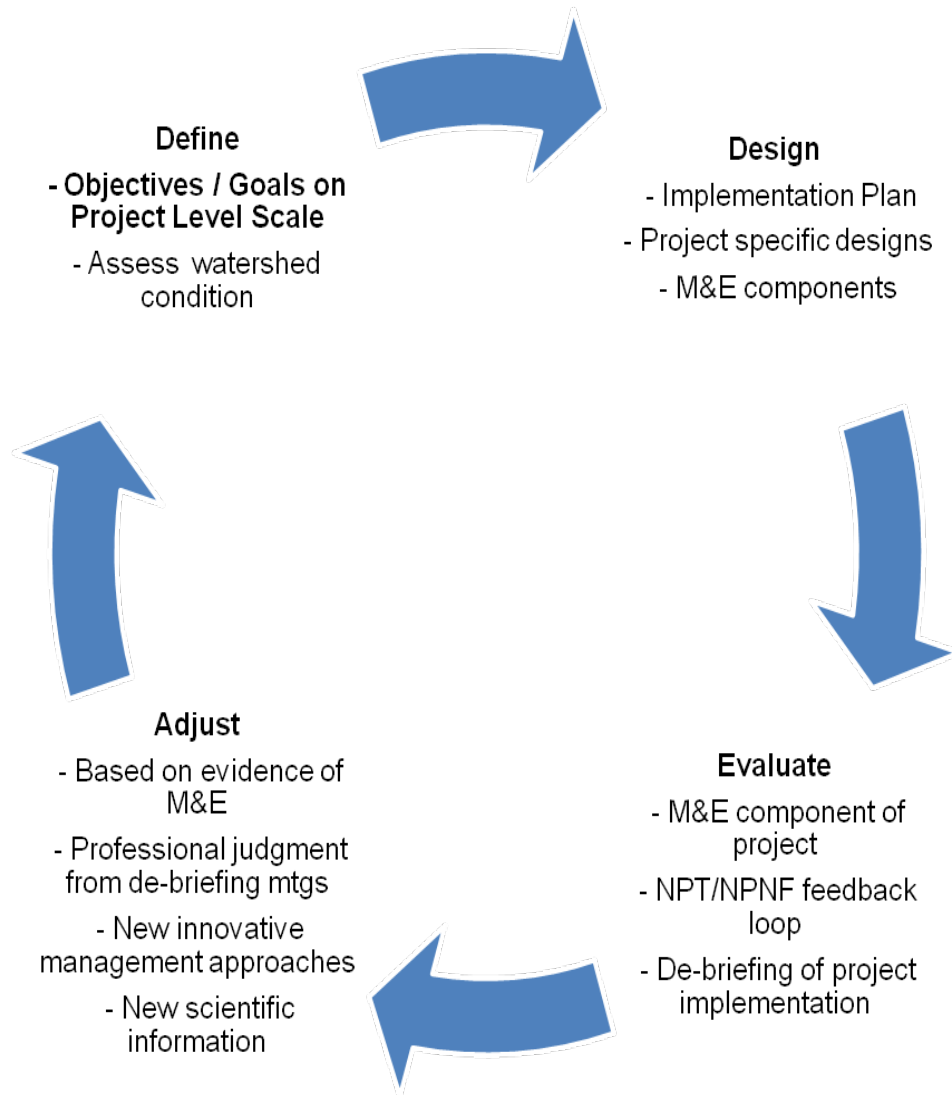
**4) *Discuss how adaptive management will be implemented.***

Outcomes of the Selway project actions will be monitored to ascertain whether they are effective in meeting stated goals and objectives. Based on this evaluation, the work plan and scope of work will be adapted (modified) in a process of continuous learning and refining. The adaptive management process will follow a simple repeated framework: assess, design, implement, monitor, evaluate, adjust, and then repeat.<sup>9</sup> The adaptive management strategy shown below will be implemented to follow the 2000 Fish and Wildlife Plan's Principle 7 which implies the adoption of passive adaptive management and as recommended by the ISRP in its Retrospective Report 2007 (ISRP 2008-4, April 11, 2008).

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<sup>9</sup> Adaptive Management: A Spoonful of Rigor Helps Uncertainty Go Down, Submitted to the 16th International Annual Meeting of the Society for Ecological Restoration, Victoria, British Columbia, Canada – August 23rd to 27th, 2004 by Carol Murray and David R. Marmorek available at [http://www.essa.com/documents/Murray\\_Marmorek\\_adaptive\\_management\\_SER\\_conference.pdf](http://www.essa.com/documents/Murray_Marmorek_adaptive_management_SER_conference.pdf).

## NPT Watershed Restoration Adaptive Management Strategy



Objectives and goals for this Selway proposal are centered on addressing the limiting factors, primarily sedimentation, stream temperature, large woody debris recruitment, noxious weed infestation, and passage. Initial efforts include **assessment** of these factors (passage barriers, road/trail systems, noxious weed conditions). Analysis of these assessments will produce priorities which will be then **designed** for implementation (three priority passage barriers have already been designed). The results of the designs will be implemented on the ground (four barrier replacements, road decommissioning, and riparian re-vegetation are proposed). A **monitoring plan** will be instituted to measure the success of restoration (see Question 5). Results of the implementation projects will be **evaluated** through analysis of monitoring data and reports both as generated from this project as well as from other ongoing restoration/monitoring efforts in the Selway. Through our collaborative partnership we will **adjust** objectives, techniques, and priorities to meet the identified needs and goals.

The adaptive management process is implemented real time annually through an on-going collaborative partnership with the Nez Perce National Forest (NPNF). The NPNF and the Nez Perce Tribe (NPT) have been partnering in a successful watershed restoration program in the basin for more than 10 years. During this time period we have developed an effective project management framework that includes all aspects of the adaptive management process described above. As a result of this partnership we have access to several experienced fish biologists, hydrologists, engineers, and others to aid in the assessment, design, evaluation, and adjustment elements. Additionally the NPNF has been conducting on the ground monitoring for temperature and habitat conditions in the Selway watershed for several years; their data, as well as the data generated from this proposal, and other agency data (IDFG, BLM), will be used to aid in evaluating projects and goals and evolving new strategies.

The Clearwater Basin Collaborative (CBC) was recently awarded funding to restore and maintain ecological conditions within the 1.4-million-acre Selway-Middle Fork ecosystem in Idaho. Their emphasis will be on habitat connectivity, reduction of sedimentation, and control of invasive species, mechanical fuel reduction treatments, road decommissioning, weed treatments, landscape burns and culvert replacements. The CBC is composed of interested stake holders including private landholders, forest industries, the United States Forest Service (USFS), and other government agencies. They are currently forming steering committees specifically to organize restoration priorities and develop a biological monitoring plan. Key members of our proposal also are working closely with the CBC and the results of their implementation and monitoring efforts will be a key component used in the assessment, monitoring, evaluation and adjustment that will occur under this Selway proposal.<sup>10</sup>

**5) *Explicitly define and differentiate the implementation, status and trends, and effectiveness monitoring components of this project with at least an overview of study design, metrics, and methods of measurement. How does the Habitat Status and Trend monitoring program proposed by the Nez Perce Tribe in collaboration with ISEMP and CHaMP relate specifically to this project?***

Implementation and compliance, effectiveness, and status and trend monitoring have been identified and discussed in the ISRP 2006 and 2007 Retrospective Reports and the draft NPPC MERR document. With implementation of each type of monitoring there are funding and staff resources, which can be substantial. In the 2006 ISRP Retrospective Report, ISRP has stated that “some type of monitoring and evaluation should accompany fish and wildlife restoration projects to demonstrate accountability as well as the ecological effectiveness of the restoration action(s).” In the last NPPC

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<sup>10</sup> Final Selway-Middle Fork Clearwater Collaborative Forest Landscape Restoration Program (CFLRA) Proposal available at [Nez Perce National Forest- Planning](#) .

provincial review in 2007, the NPPC limited monitoring and evaluation to implementation and compliance and to 5% of the total budget. BPA's guidance has been to focus habitat projects to complete on-the-ground restoration projects with priority placed on those that contribute to FCRPS BiOp habitat improvement targets (for example, table 5 of RPA 35 requires a 16% Habitat Quality Improvement by 2018 for the Snake River Steelhead, Clearwater River, Lochsa River Population). Accordingly, this proposal emphasizes on the ground implementation of habitat improvements. Elements of both 1) implementation and compliance and, 2) project effectiveness monitoring are proposed for the Selway.

The ISRP has always advocated for more, not less M&E to ensure that projects are achieving their intended purpose. The NPT DFRM Watershed Division fully understands the need and importance of monitoring and evaluation in facilitating the adaptive management process (see Question 4) and is why we submitted the Habitat Status and Trend monitoring proposal in the current M&E NPPC Provincial Review (project number 2002-068). In developing this proposal, we have coordinated with and reviewed many documents, in which many are still draft, such as the NPPC MERR document and NOAA's Guidance for Monitoring Recovery of Pacific Northwest Salmon and Steelhead. We have participated in meetings with PNAMP and other regional forums and the appropriate level and amount of M&E for habitat restoration projects has not been clear and a moving target. It is our understanding that the NPPC Provincial Review for Habitat is to begin sometime in the fall/winter of 2011. It is our intention in the upcoming months before this review to engage with our regional partners, NPPC, BPA, PNAMP, and hopefully ISRP as to what this appropriate level and amount should be for our NPT DFRM Watershed Division Restoration and Protection Program as a whole and for all the projects and population watersheds we do restoration within.

### ***Implementation and Compliance Monitoring***

Implementation and Compliance monitoring will be conducted on all project actions following the framework set up by the Northwest Power and Conservation Council in it's "Monitoring, Evaluation, Research and Reporting (MERR) Plan"<sup>11</sup> and by the ISRP in it's "Metrics Review: Review of Project Reporting Metrics for the Columbia River Basin Fish and Wildlife Program".<sup>12</sup>

Implementation monitoring will consist of gathering project-specific metrics to verify that projects were completed and implemented properly. This information will be reported as stipulated in our contract with the Bonneville Power Administration (BPA) in BPA's PISCES database. Selected metrics include items such as target species, location, number or crossings, stream miles, acres, and others as defined by the PISCES project management software and by the type of project action.

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<sup>11</sup> Draft Columbia River Basin Monitoring, Evaluation, Research and Reporting (MERR) Plan Version: 4 November 2010 available at <http://www.nwcouncil.org/library/2010/2010-17.pdf>.

<sup>12</sup> Metrics Review: Review of Project Reporting Metrics for the Columbia River Basin Fish and Wildlife Program, ISRP 2008-7, July 10, 2008 available at <http://www.nwcouncil.org/library/isrp/isrp2008-7.pdf>.

Compliance monitoring will be conducted as post-monitoring of implemented projects to see if they are still functioning as they were designed or intended. Compliance monitoring is also known as post-implementation monitoring. The study design will vary depending upon the type of project action following a defined written protocol.

Fish Barrier Replacements- A monitoring plan has been developed to gauge the success of culvert replacements. At each barrier replacement data is collected upon installation (year 0), one year after installation (year 1), five years later (year 5), and 10 years later (year 10) in order to determine successes and changes that are occurring with culvert replacements and removals. Biological and physical habitat parameter data to be collected include Site Description, Culvert Information, Inlet/Outlet Condition, Photographs, Internal Structures/Substrate, Bank Dimensions, Channel Condition, Longitudinal Profile, and Fish Presence/absence. The data will be analyzed to determine if the crossing structure is functioning to pass aquatic species as it was designed. Information from the analysis will be used to refine and adjust future barrier replacement projects to continue to improve connectivity and access. The full protocol and assessment procedure can be found in "Assessment of Aquatic Organism Passage at Road/Stream Crossings for the Northern Region of the USDA Forest", March 2008 available at [http://www.fs.fed.us/r1/projects/engineering/fish\\_passage\\_web.pdf](http://www.fs.fed.us/r1/projects/engineering/fish_passage_web.pdf).

Road Decommissioning- A monitoring plan has been developed to gauge the success of road improvement and decommissioning. For each decommissioning project sample sites are randomly selected at rate of 1 site per 10 miles of decommissioning. Data is collected at the sample sites upon implementation (year 0), one year after implementation (year 1), two years after implementation (year 2), five years later (year 5), and 10 years later (year 10) in order to determine successes and changes that are occurring. Data collected for Road Obliteration Monitoring and Evaluation includes locating and evaluating new mass failures, recording and evaluating points of surface erosion evaluating re-vegetation coverage and succession to native plants, measuring stream channel restoration and adjustment, photographs, and evaluating whether the treatment applied was appropriate for the land type. The data will be analyzed to determine if the decommissioning/improvement is functioning as it was designed. Information from the analysis will be used to refine and adjust future projects to continue to reduce sediment delivery to streams. The full protocol and assessment procedure can be found in "2002 Clearwater National Forest Road Decommissioning Monitoring Program", revised December 2002. Additional information and results are available at [http://www.fs.fed.us/r1/clearwater/ResourceProg/me\\_03/pdfs/roads\\_scenic.pdf](http://www.fs.fed.us/r1/clearwater/ResourceProg/me_03/pdfs/roads_scenic.pdf).

Riparian Zone Revegetation- Data collection efforts are directed at determining the rate and degree of recovery of the riparian system following restoration. Annually two circle plot surveys will be conducted for each reach where revegetation projects have taken place. Woody vegetation that falls along the transects will be photographed and inventoried by genus, height, condition rating score, and distance from the centerpoint. Notes will include any disease, insect damage, browsing, drought stress, or other condition that affects the plants. In the data analysis the total number of trees and shrubs per reach will be calculated, including an individual tally for each genus. Plant

height and condition will be evaluated for each genus to determine which plants achieve faster growth and are more resistant to adverse conditions. Future revegetation projects can then be adapted to include higher percentages of the more successful plants, which in turn should increase the rate of revegetation. Additional information and results are available in “Monitoring Reach Effectiveness”, Nez Perce Tribe, Department of Fisheries Resource Management, Division of Watershed Management, revised February 2005.

### ***Effectiveness Monitoring***

In addition to the monitoring listed above effectiveness monitoring will be conducted on a limited basis and will monitor the effects of implementation projects that are aimed at improving the limiting factors in the watershed, specifically sediment and temperature. Metrics chosen for monitoring are project type specific and selected from a table of ISRP recommended metrics for effectiveness monitoring.<sup>13</sup> For riparian vegetation management projects this includes changes in ground cover over time and temperature, for road decommissioning projects this would include measures of stream sedimentation.

Three selected locations in O'Hara will be selected for sediment and temperature monitoring under existing established protocols. These monitoring reaches will be specifically located to determine trends in the data from the top of the watershed down to its confluence with the Selway River. The protocols used will be from the Aquatic and Riparian Effectiveness Monitoring Program (AREMP) (Regional Interagency Monitoring for the Northwest Forest Plan). Per the AREMP protocol, the lower reach will be located at the lower most accessible reach on USFS land; one will be located in the central watershed, and one near the top. Placement of the monitoring sites in these locations will allow analysis of data to show changes in temperature and sediment from the top to the bottom of the watershed as well as above and below the proposed implementation sites. The complete AREMP protocol can be found at Field Protocol Manual Aquatic and Riparian Effectiveness Monitoring Program Regional Interagency Monitoring for the Northwest Forest Plan, 2010 Field Season available at <http://www.reo.gov/monitoring/reports/watershed/2010.FieldProtocol.Final.pdf>

The following is a brief description of the survey and analysis of each of these metrics:  
Ground Cover- Changes will be measured through the survey methods identified above for implementation and compliance monitoring as well as the use of benchmarked photo points for a subjective visual comparison of changes in the riparian vegetation over time.

Temperature- Per the AREMP protocol, temperature data will be collected hourly from June 1 through September 15. Data will be cross walked to any other available temperature data from other agencies (USFS, IDFG, IDEQ) and analyzed to detect significant changes in temperatures within the watershed and below implementation sites. This information will be used in the adaptive management process to assess project success/failure and adjustment as needed to achieve desired conditions.

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<sup>13</sup> Metrics Review, ISRP 2008-7, July 10, 2008

Sediment- Annually pebble counts and surface fines data will be collected at each survey reach annually. The pebble count procedure is designed to quantify streambed substrate without having to collect substrate samples and take them back to the lab for sieve analysis. The procedure requires taking measurements of substrate at increments along the main channel and side channels transects within bankfull constraints. We will quantify the percentage of fine sediments on the surface of pool tail substrate and collect measurements in the pools of each site beginning at the downstream end. Data will be cross walked to any other available any other available sediment data from other agencies (USFS, IDFG, IDEQ) and analyzed to detect significant changes in surface conditions within the watershed and below implementation sites.

### ***Status and Trend Monitoring***

The NPT DFRM Watershed Division has recently submitted a Habitat Status and Trend monitoring proposal in the current NPPC M&E/Artificial Production Provincial Review under project number 2002-068-00, which was completed in close collaboration with the Integrated Status and Effectiveness Monitoring Program (ISEMP) and the new Columbia Habitat Monitoring Program (CHaMP). The proposal is for the SF Clearwater, Lolo Creek, and Lochsa River populations in the Clearwater River and the Imnaha River population in Northeast Oregon. Lolo Creek (14%) and the Imnaha River were identified for habitat status and trend monitoring in the May 2010 Recommendations for Implementing Research, Monitoring and Evaluation for the 2008 NOAA Fisheries FCRPS BiOp document. The SF Clearwater and Lochsa River were proposed due to their large habitat restoration programs and the large habitat improvement targets in the FCRPS BiOp (14% and 16%). Although the Selway River population was not proposed for this monitoring, the May 2010 Recommendations document proposes fish-in/fish-out and Habitat Status and Trend monitoring in the future. Due to large portions of the Selway being wilderness, habitat status and trend monitoring within this basin can be important for reference conditions and will be proposed by the NPT in the future.

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