

# Wallowa Falls Hydroelectric Project

**FERC No. P-308**

## **Initial Study Report**

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***For Public Review***

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## **1.0 INTRODUCTION**

On February 23, 2011, PacifiCorp Energy (PacifiCorp) filed a Notice of Intent and Pre Application Document (PAD) to relicense the Wallowa Falls Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC or Commission) Project No. 308, on the East Fork Wallowa River, West Fork Wallowa River and Royal Purple Creek in Wallowa County, Oregon. The current license will expire on February 28, 2016. The Project has a generation capacity of 1,100 kilowatts (kW) and is located on private land owned by PacifiCorp and federal lands managed by the Wallowa-Whitman National Forest. PacifiCorp has elected to use the FERC Integrated Licensing Process (ILP) to provide the framework for Project relicensing.

### **1.1 Document Purpose and Content**

In accordance with the process plan and schedule established for the Project in the FERC Scoping Document I, resource agencies, tribes and other stakeholders were given until June 23, 2011, to file comments on the PAD and request studies.

In August 2011, PacifiCorp submitted its Proposed Study Plans to the FERC and stakeholders for review and comment. During the ensuing three months, the Proposed Study Plans were revised based on discussions and agreements reached during continuing stakeholder consultations. Revised Study Plans reflecting the understandings and agreements reached on the studies to be conducted and the methodologies to be used were filed with FERC and the stakeholders in December 2011. FERC issued a Study Plan Determination on January 3, 2012 approving eleven of the Revised Study Plans as filed and approving five with modifications.

In a comment letter on PacifiCorp's Revised Study Plans, submitted to the FERC on December 21, 2011, the US Fish and Wildlife Service (USFWS) asked FERC to include ten additional data collection requests to the Water Resources Study Plan. The additional data requested related to substrate and sediment transport within the bypassed portion of the East Fork Wallowa River that may be affected by proposed forebay flushing. Prior to the December 21, 2011 letter, these studies had not been proposed by PacifiCorp or requested by either project stakeholders or FERC.

Although the additional data requests were not included in the FERC Study Plan Determination, in an effort to be responsive to the USFWS request, PacifiCorp collected sediment, substrate and water quality data during the 2012 field season. The objective of this data collection was to determine baseline sediment, substrate, and water quality conditions and obtain information to help assess potential effects of forebay flushing within the bypass reach. PacifiCorp believes the study results will provide information necessary for consultation under Section 7 of the ESA for potential effects to bull trout and their designated Critical Habitat under a new license. Therefore, PacifiCorp has added the Sediment and Substrate Characterization Study to the suite of studies being conducted for the ILP.

The majority of these studies were initiated during the spring and summer of 2012 and several are still underway. A Study Progress Report or technical memo was made available for review

and comment on PacifiCorp's website on December 17, 2012. The reports provide a detailed description of study objectives, methods, data collected, and results to date. The Study Progress Reports and Sediment and Substrate Characterization Technical Memo can be viewed on PacifiCorp's web site at (<http://www.pacificorp.com/wallowafalls>) under the "relicensing documents" tab.

This Initial Study Report was prepared in accordance with 18 CFR § 5.15(c)(1). The report is presented in the form of individual bulletized summaries, by study, of the overall progress made in conducting the study, schedule for completion, and an explanation of any variances from the agreed-upon study plan. For consistency, each study is presented in the same order and under the same study name as Appendix A of the FERC Study Plan Determination. The table below lists the studies underway, whether fieldwork is proposed for 2013, and the dates Final Technical Reports are anticipated to be available.

**List of Studies Underway, Fieldwork Proposed in 2013, and Final Technical Report Completion Date**

<b>Studies</b>	<b>Fieldwork Proposed for Calendar Year 2013</b>	<b>Estimated Final Technical Report Completion Date</b>
Geology and Soils	No	June 2013
Water Resources: Hydrology	No	June 2013
Water Resources: Water Quality	No	June 2013
Aquatics: Fish Abundance, Composition, and Distribution	No	June 2013
Aquatics: Bull Trout Evaluation	Yes	December 2013
Aquatics: Macroinvertebrate Abundance and Composition	No	June 2013
Instream Flow and Habitat	No	June 2013
Terrestrial: Special Status Plants	No	June 2013
Terrestrial: Noxious Weeds	No	June 2013
Terrestrial: Riparian and Wetlands	No	June 2013
Terrestrial: Vegetation Cover	No	June 2013
Terrestrial: Wildlife	No	June 2013
Recreation	No	June 2013
Land Use	No	June 2013
Aesthetics and Visual Resources	No	June 2013
Cultural Resources	Yes	October 2013
Sediment and Substrate Characterization	Yes	November 2013

## 2.0 GEOLOGY AND SOILS

**Objectives:** The objectives of the Geology and Soils Study are to characterize existing geology, identify long-term surficial erosion, mass wasting, and slumping potential in study area, and identify remediation measures as necessary.

**Study Area:** The study area includes lands within and adjacent to the proposed Project boundary including the forebay access road, penstock and tailrace.

### Methods:

- A desktop analysis of existing resource maps and publications to develop knowledge concerning project operations and history, local geology, and known geologic hazards.
- A field reconnaissance visit to identify geologic hazards, slope stability concerns (cuts and fills), and erosion potential.
- An assessment of the risk (likelihood and consequence) from geologic hazards, slope stability issues, and erosion.
- Development of conceptual options and cost estimates for remedial assessment.

### Field Work Conducted to Date and Study Status:

- The desktop analysis was completed in August, 2012.
- A three-day walking field reconnaissance was conducted on September 17- 19, 2012 by an engineering geologist and a geotechnical engineer.
- Work included assessment of: geomorphology, surficial geology, potential geologic hazards, slope stability and erosion concerns within the study area.
- Areas observed include the slopes adjacent to the forebay, access road, penstock, bypass reach and tail race.

**Variance to Study Plan:** There were no variances from the FERC Study Plan Determination during the course of this study.

### Discussion of Data Collected and Preliminary Results:

- Detailed preliminary results of the risk and needs assessment are provided in the Soils and Geology Study Progress Report, currently available at <http://www.pacificorp.com/wallowafalls>.

### Geology:

- The northern portion of project (tailrace, powerhouse, and lower penstock section) consists of glacial deposits and alluvium, characterized by thicker overburden materials and granular soils.
- The southern portion of project (middle and upper penstock sections and forebay) consists of volcanic and metavolcanic rocks (principally pyroclastics and andesite), characterized by relatively thin soils and talus deposits.

### **Geologic Hazards:**

- There is no history of large translational or rotational slides (ancient landslides) in the study area.
- There is a history of debris flows in the drainages of the W. Fork of the Wallowa River.
- Evidence of a recent debris flow (circa 2006) was observed in the field. This debris flow impacted the East Fork of the Wallowa River by blocking the channel from the west side. It did not cross the penstock alignment.

### **Slope Stability, Erosion, and Other Concerns:**

- The Penstock is located upslope of the access road for the majority of its length making it less vulnerable to mass wasting events.
- In general, the Project includes relatively minor cuts and fills (mainly associated with the access road).
- Minor sloughing and erosion (localized) is occurring in the Project boundary.
- There is a need for an ongoing program of hazard tree identification (particularly near trestle locations) and removal.

### **Additional Work Proposed:**

- No study modifications are proposed at this time.
- The results and remedial assessment recommendations will be developed in the winter/spring of 2013. Preliminary results have been presented in the Study Progress Report posted at <http://www.pacificorp.com/wallowafalls>.
- Responses to stakeholder comments, final study results, and recommendations will be presented in the Final Technical Report in June 2013.

### 3.0 WATER RESOURCES

**Objectives:** The objectives of the Water Resources Study are to characterize and assess hydrology in the Project area, and monitor and evaluate key water quality parameters in the Project area.

**Study Area:** The study area includes the following waters:

- East Fork Wallowa River and Royal Purple Creek inflows.
- East Fork Wallowa River bypass reach Project tailrace.
- West Fork Wallowa River into which tailrace waters discharge.

**Methods:**

- Five key parameters were monitored: flow, water temperature, dissolved oxygen, total dissolved gas, and turbidity.
- Monitoring was conducted using electronic instrumentation (i.e., parameter-specific probes and dataloggers) commonly employed for water resource studies.
- Additional parameters are unnecessary because they are not a concern in this pristine watershed and have no specific nexus to Project operations.

**Field Work Conducted to Date and Study Status:**

- *Flow:* continuous hourly sampling all year (East Fork Inflow, Bypass Upper, Bypass Lower, and Powerhouse Tailrace) was completed per plan for 2012.
- *Water Temperature:* continuous hourly sampling all year (All Sites) was completed per plan for 2012.
- *Dissolved Oxygen:* continuous hourly sampling for 3-day periods in August, September, and October (East Fork Inflow, Bypass Upper, and Bypass Lower) was completed per plan during 2012.
- *Total Dissolved Gas:* discrete (twice-daily) sampling for two-day periods each month from June-September (Powerhouse Tailrace) was completed per plan during 2012.
- *Turbidity:* continuous hourly sampling for multi-day periods was planned during routine forebay flushing (East Fork Inflow, Bypass Lower, and Powerhouse Tailrace). However, no routine forebay flushing occurred in 2012. A forebay drawdown did occur in August 2012, which included sampling that is described in the Sediment and Substrate Characterization discussion (Section 17).

**Variance to Study Plan:** Routine forebay maintenance flushing did not occur during 2012. Consequently, turbidity sampling as proposed under the Water Resources Revised Study Plan did not occur in 2012.

In 2011, PacifiCorp initiated discussions with the U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (USACE) and DEQ regarding necessary permitting and consultation for future forebay flushing under the current FERC license. In 2012, field activities (outside of the Water Resources Study reported herein) were conducted to support these anticipated



permitting needs. These activities included a volumetric survey and sediment sampling in the forebay, and additional substrate characterization and water sampling in the bypassed reach as described in the Sediment and Substrate Characterization discussion (Section 17 of this document).

**Discussion of Data Collected and Preliminary Results:** As expected and as previously documented (e.g., Nowak and Kuchenbecker 2004), the water quality data collected in 2012 confirm that overall water quality in the Project area is excellent, due to the relatively pristine location and physical characteristics of the watershed areas, most of which lie within the Eagle Cap Wilderness Area. The Water Resources Study Progress Report (Draft Technical Report), currently posted at (<http://www.pacificorp.com/wallowafalls>), presents the detailed preliminary results of flow, water temperature, dissolved oxygen, and total dissolved gas monitoring during 2012 to characterize hydrology and water quality conditions in the Project area.

**Additional Work Proposed:**

- Pending acquisition and analysis of data from the fourth quarter of 2012, assessment of potential Project-related effects on hydrology and water quality will be provided in the Water Resources Final Technical Report to be issued in June 2013.
- The Water Resources Final Technical Report also will include a specific assessment of compliance of the study parameters relative to State of Oregon water quality standards.
- No actions or adjustments regarding the Water Resources Study are recommended at this time.
- No additional data collection in 2013 is recommended at this time.

**References:**

- Nowak, M.C. and L. Kuchenbecker. 2004. Grande Ronde Subbasin Plan. Prepared for the Northwest Power and Conservation Council. Prepared by Cat Tracks Wildlife Consulting and the Grande Ronde Model Watershed Program. May 28, 2004.

## **4.0 AQUATICS: FISH ABUNDANCE, COMPOSITION, AND DISTRIBUTION**

**Objectives:** The objective of the study is to determine the relative abundance, composition, temporal and spatial distribution of fish species inhabiting waters within the Project area.

**Study Area:** Surveys were conducted within the East Fork Wallowa River bypass reach, Project tailrace, Project forebay and a small portion of the West Fork Wallowa River between the Project tailrace discharge and East Fork/West Fork confluence.

### **Methods:**

- Electrofishing was conducted in streams.
- Seine and snorkel surveys were proposed in the Project forebay.

**Field Work Conducted to Date and Study Status:** All tasks required in the FERC Study Plan Determination were completed by the end of September 2012.

**Variance to Study Plan:** Variances to the FERC Study Plan Determination consisted of the following.

- Due to high flows, the “spring” sampling period was not attempted.
- The electrofishing survey of the bypass reach scheduled for July per the FERC Determination was postponed and conducted in August due to high flows not conducive to the setting of block-nets.
- Due to the presence of spawning kokanee, presence/absence electrofishing surveys of the margins of the West Fork Wallowa River between the Project tailrace and the East Fork Wallowa River were halted and not completed.
- The “fall” time-frame seining survey of the Project forebay was not completed after a snorkel survey prior to the seining work identified zero fish presence. Bathymetry of the forebay is not conducive to seining.

### **Discussion of Data Collected and Preliminary Results:**

- All captured fish were identified to genus and species.
- Relative abundance of all captured species was quantified in catch per unit of effort.
- Geographic spatial distribution of all captured species was qualified by stream of capture as well as location within the stream.
- The bathymetry of the forebay is not conducive to seining.
- In the East Fork Wallowa River Bypass Reach, 479 total fish were captured, biologically assessed, and then released back to point of capture.
- Species recorded in the bypass reach include whitefish (16%), sculpin (27%), bull trout (10%), brook trout (8%), and rainbow trout (39%).
- In the Project tailrace, 42 total fish were captured, biologically assessed, and then released either into the West Fork Wallowa River or at the point of capture.
- Species recorded in the tailrace include whitefish (21%), sculpin (17%), kokanee (10%),

bull/brook hybrids (7%), bull trout (7%), brook trout (9%), and rainbow trout (29%).

- Detailed preliminary study results are currently posted at <http://www.pacificorp.com/wallowafalls>, in the Aquatics Study Progress Report.

**Additional Work Proposed:**

- No additional field work is proposed at this time.
- Responses to stakeholder comments, final study results, and recommendations will be presented in the Final Technical Report in June 2013.

## **5.0 AQUATICS: BULL TROUT EVALUATION**

**Objectives:** The objectives of the bull trout evaluation are to develop a better understanding of the current Wallowa River bull trout population upstream of Wallowa Lake, specifically with concern to the Project tailrace and bypassed East Fork Wallowa River. It is anticipated this study will shed light on the current distribution of bull trout in waters around the Project; specifically, spatial and temporal distribution within the lower East Fork Wallowa River bypass and Project tailrace.

### **Study Area:**

- Collection efforts to capture and tag bull trout targeted areas within Wallowa Lake, East Fork Wallowa River bypass reach, and the Project tailrace.
- Passive Integrated Transponder (PIT) tag antennas were installed in the Project tailrace and East Fork Wallowa River bypass reach.

### **Methods:**

- Identified streams were electrofished to capture bull trout in riverine habitats. Bull trout inhabiting lacustrine areas were captured via passively set tangle nets.
- Passive Integrated Transponder (PIT) tag antennas were set up to record each tag interrogation and were downloaded at least once a month.

### **Field Work Conducted to Date and Study Status:**

- Bull trout capture events were completed in September 2012.
- Fixed PIT antennas were installed in July 2012.
- The East Fork Wallowa River natural channel PIT antenna was turned off and taken out of the stream on November 18, 2012.
- The Project tailrace channel antenna remained in operation and will be removed on December 31, 2012.
- The East Fork Wallowa River natural channel antenna experienced no power loss and ran continuously throughout the study period (July 12 – November 18).
- Except for two days of power loss in September and three days of power loss in November, the Project tailrace antenna also ran continuously throughout the study period (July 12 – December 31).

**Variance to Study Plan:** No variances from the FERC Study Plan Determination were made during the course of this Study.

**Discussion of Data Collected and Preliminary Results:**

- Field work portion of the Study Plan with concern to capturing and tagging bull trout is complete. Completion of the main goal and objective (bull trout use of Project tailrace and bypass reach) is as yet incomplete as the Study is still on-going.
- 16 bull trout tagged during 2012 activities. 11 from the EF Wallowa River, 4 from the Project tailrace, and 1 from Wallowa Lake.
- To date, 55 bull trout have been captured by PacifiCorp employees above the Wallowa Lake Irrigation Dam.
- One bull trout hybrid and two pure bull trout were detected in the Project tailrace.
- Detailed preliminary study results are currently posted at <http://www.pacificorp.com/wallowafalls>, in the Aquatics Study Progress Report.

**Additional Work Proposed:**

- Electrofishing surveys are planned for late July 2013 in the upper portions of the East Fork Wallowa River below the anadromous fish barrier. Surveys will focus on the recapture of 2012 PIT tagged bull trout to assess differences (if any) in spatial distribution.
- Collection of additional migration data past fixed PIT tag antennas in the East Fork Wallowa River bypass and Project tailrace is planned for summer/fall 2013.
- Responses to stakeholder comments, final study results, and recommendations will be presented in the Final Technical Report in December 2013.

## **6.0 AQUATICS: MACROINVERTEBRATES ABUNDANCE AND COMPOSITION**

**Objectives:** The objective of the study is to determine the relative abundance and composition of macroinvertebrate species residing in waters in and around the Project.

**Study Area:** Surveys were conducted within the Upper East Fork Wallowa River Bypass Reach, Lower East Fork Wallowa River Bypass Reach, and East Fork Wallowa River above the Project forebay.

### **Methods:**

- A Surber Sampler type dip net was used to collect macroinvertebrate samples.
- Each sample was sent to the Aquatic Biology Associates lab in Corvallis, OR for analysis.
- Analysis consisted of identifying all macroinvertebrate species present in each sample to Genus.
- All macroinvertebrate species within each sample were enumerated.

**Field Work Conducted to Date and Study Status:** All tasks required in the FERC Study Plan Determination were completed by the end of November 2012.

**Variance to Study Plan:** There were no variances from the FERC Study Plan Determination during the course of this study.

### **Discussion of Data Collected and Preliminary Results:**

- Tolerant taxon increased in samples taken from lower in the bypass reach.
- All three samples collected were dominated by moderate to highly intolerant aquatic macroinvertebrate species, indicative of high water quality.
- Ninety three percent of the upper sample, 69 percent of the middle sample, and 52 percent of the lower sample consisted of caddisflies, mayflies, or stoneflies known to have stringent habitat requirements in terms of low water temperatures and high dissolved oxygen content (Lillehammer 1988 and Whitney 1939).
- Detailed preliminary study results are currently posted at <http://www.pacificorp.com/wallowafalls>, in the Aquatics Study Progress Report.

### **Additional Work Proposed:**

- No additional field work is proposed at this time.
- Responses to stakeholder comments, final study results, and recommendations will be presented in the Final Technical Report in June 2013.

### **References**

- Lillehammer, A. (1988) Stoneflies (Plecoptera) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica* 21: 1–165.

- Whitney, R. J. 1939: The Thermal Resistance of Mayfly Nymphs from Ponds and Streams. *Journal of Experimental Biology* 16: 374-385.

## 7.0 INSTREAM FLOW AND HABITAT

**Objectives:** The objectives of the Instream Flow and Habitat Study are to simulate hydraulic conditions and salmonid habitat over a range of flows in project-affected waters to support a biologically sound decision for establishing minimum flows in the East Fork Wallowa River bypass reach.

**Study Area:** The study area includes the East Fork Wallowa River bypass reach.

### Methods:

- Conduct a Meso-habitat survey in the East Fork Wallowa River bypass reach.
- Develop habitat suitability criteria, transect locations, and hydraulic model parameters in consultation with stakeholders.
- Conduct hydraulic survey at 14 transects in the East Fork Wallowa River bypass reach.
- Utilize Physical Habitat Simulation Model (PHABSIM) to model habitat at various flows.

### Field Work Conducted to Date and Study Status:

- All fieldwork required in the FERC Study Plan Determination is complete.
- PHABSIM model runs are currently ongoing.

### Variance to Study Plan:

- Field work was generally consistent with the requirements of the FERC Study Plan Determination.
- Study target flows were within  $\pm 1.5$  cfs to gaged flows:

Study Plan Target Q		Gaged Flows
High Flow:	16 cfs	15cfs
Medium Flow:	8 cfs	7.5 cfs
Low Flow:	4 cfs	5.3 cfs

### Discussion of Data Collected and Preliminary Results:

- The East Fork Wallowa River is a velocity-driven system.
- Depth increases only slightly with significant flow volume increase.
- Detailed preliminary study results are currently posted at <http://www.pacificorp.com/wallowafalls>, in the Instream Flow and Habitat Study Progress Report.

### Additional Work Proposed:

- No additional field work is proposed at this time.
- Additional discussion with stakeholders regarding modeling results and recommendations are



planned for March 2013.

- Responses to stakeholder comments, final study results, and recommendations will be presented in the Final Technical Report in June 2013.

## 8.0 TERRESTRIAL: SPECIAL STATUS PLANT STUDY

**Objectives:** The objectives of the special status plant are to identify and map populations of special status plants within the Study Area. Special status plants include any plants that are on the following lists:

- United States Fish and Wildlife Service (USFWS) status that is Listed Endangered, Listed Threatened, Proposed Endangered, Proposed Threatened, Candidate, Species of Concern, and Partial Status.
- Oregon Department of Agriculture status that is Listed Endangered, Listed Threatened, Proposed Endangered, Proposed Threatened, and Candidate.
- Oregon Biodiversity Information Center (ORBIC) List 1 or 2.
- Regional Forester's Special Status Species Lists for Sensitive Non-Vascular and Vascular plants on the Wallowa-Whitman National Forest.
- Wallowa-Whitman National Forest Strategic Plant Species List.

**Study Area:** The study area includes all lands owned by PacifiCorp or USFS that are within 100-meters of a PacifiCorp facility.

### Methods:

- Pre-field review to update current special status plant lists and evaluate any existing data.
- Conduct field surveys using an intuitive-controlled methodology as described in Whiteaker et al. 1998.
- Survey results documented using USFS guidelines and standards.

### Field Work Conducted to Date and Study Status:

- Pre-field review was completed May 30.
- Field surveys were completed June 13 and July 31.
- Documentation completed August 20.

**Variance to Study Plan:** No variances from the study plan have occurred to date.

### Discussion of Data Collected and Preliminary Results:

- No special status plant species were observed.
- Field data collected is sufficient to meet study objectives.
- Because no special status plant species were detected within the study area, it is assumed that project operations and routine maintenance have no effect on special status plant species.
- Detailed preliminary results of the study are provided in the Terrestrial Resources Study Progress Report, currently available at <http://www.pacificorp.com/wallowafalls>.

**Additional Work Proposed:**

- No additional field work or study modifications are proposed at this time.
- Responses to stakeholder comments, final study results, and recommendations will be presented in the Final Technical Report in June 2013.

## **9.0 TERRESTRIAL: NOXIOUS WEED STUDY**

**Objectives:** The study objectives are to identify and map noxious weed populations on lands and aquatic areas within the Study Area.

**Study Area:** The study area includes all lands owned by PacifiCorp or USFS that are within 100- meters of a PacifiCorp facility.

### **Methods:**

- Update current state and county noxious weed lists.
- Evaluate any existing data on known noxious weed locations within the Study Area.
- Produce a map of high, medium, and low potential noxious weed areas within the Study Area.
- Conduct field surveys simultaneously with special status plant surveys using the same intuitive-controlled methodology.
- Develop map of existing noxious weed locations and document results.

### **Field Work Conducted to Date and Study Status:**

- Pre-field review was completed May 30.
- Field surveys were completed June 13 and July 31.
- Maps and documentation were completed August 20.

**Variance to Study Plan:** To date no variances from the study plan have occurred.

### **Discussion of Data Collected and Preliminary Results:**

- Populations of noxious weeds were located within the project area.
- The field data collected is sufficient to meet study objectives.
- Detailed preliminary results of the study are provided in the Terrestrial Resources Study Progress Report, currently available at <http://www.pacificorp.com/wallowafalls>.

### **Additional Work Proposed:**

- No additional field work or study modifications are proposed at this time.
- Responses to stakeholder comments, final study results, and recommendations will be presented in the Final Technical Report in June 2013.

## 10.0 TERRESTRIAL: RIPARIAN AND WETLAND STUDIES

### Objectives:

- To identify and map the estimated boundary of wetlands and ordinary high water mark for rivers and streams within the Study Area.
- Describe the existing riparian and wetland habitat location, extent, and conditions.
- Assess the Project's operational effects on the riparian and wetland function in the Study Area.
- Identify any potential management measures or opportunities to protect and improve wetland or riparian habitat condition.

**Study Area:** The study area includes all lands and aquatic areas that are owned by PacifiCorp or USFS that are within 100-meters of a Project facility.

### Methods:

- Pre-field review of information (topography, existing GIS datasets).
- Field surveys for wetlands and riparian areas were conducted simultaneously.
- Riparian and wetland perimeters were determined by the obvious signs of hydrology, vegetation, and soil indicators.

### Field Work Conducted to Date and Study Status:

- Field surveys were completed in July 2012.

### Variance to Study Plan:

- Most of the East Fork Wallowa River banks within the Study Area are inaccessible, so points were collected where accessible and then corrected, as needed, on aerial imagery.

### Discussion of Data Collected and Preliminary Results:

- A few small wetlands and tributaries were located and mapped.
- The field data collected is sufficient to meet study objectives.
- Detailed preliminary results of the study are provided in the Terrestrial Resources Study Progress Report, currently available at <http://www.pacificorp.com/wallowafalls>.

### Additional Work Proposed:

- No additional field work or study modifications are proposed at this time.
- Responses to stakeholder comments, final study results, and recommendations will be presented in the Final Technical Report in June 2013.

## 11.0 TERRESTRIAL: VEGETATION COVER STUDY

**Objectives:** To identify and classify vegetation cover types within the Study Area.

**Study Area:** All lands owned by PacifiCorp or USFS that are within 100-meters of a Project facility.

### Methods:

- Produce a map that delineates the distinct plant communities into vegetation cover type polygons using aerial imagery, topography, streams, roads, and existing GIS datasets.
- Conduct field surveys to ground-truth and correct the vegetation cover type boundaries and to determine appropriate plant association group (PAG) for each polygon.

**Field Work Conducted to Date and Study Status:** Field surveys were conducted in June and July 2012.

### Variance to Study Plan:

- Several areas were inaccessible and had to be assessed from vantage points.
- Because there are no PAG that accurately described the talus slopes, three PAGs had to be created to capture this information.
- Talus slopes were divided into 3 categories:
  - Talus (TALU) for areas that were bare rock with less than 25% vegetation cover.
  - Talus-shrub (TALU-SHRU) are talus slopes with mixed shrub cover that  $\geq$  25%.
  - Talus slopes that had quacking aspen tree (*Populus tremuloides*) cover that is  $\geq$  25 percent as Talus/Aspen (TALU-POTR).

### Discussion of Data Collected and Preliminary Results:

- Major vegetation cover types included grand fir and subalpine fir series, talus slopes, and rock outcrops.
- The field data collected is sufficient to meet study objectives.
- Detailed preliminary results of the study are provided in the Terrestrial Resources Study Progress Report, currently available at <http://www.pacificorp.com/wallowafalls>.

### Additional Work Proposed:

- No additional field work or study modifications are proposed at this time.
- Responses to stakeholder comments, final study results, and recommendations will be presented in the Final Technical Report in June 2013.

## 12.0 TERRESTRIAL: WILDLIFE STUDY

**Objectives:** To document baseline information on the occurrence, distributions, and relative abundance of terrestrial species and with special emphasis on the following species:

- USFWS status that is Listed Endangered, Listed Threatened, Proposed Endangered, Proposed Threatened, Candidate, Species of Concern, and Partial Status;
- Oregon Department of Fish and Wildlife List of Threatened, Endangered and Sensitive Species ORBIC List 1 or 2;
- Regional Forester's Special Status Species Lists for Sensitive Vertebrates and Federally Threatened, Endangered, and Proposed (TE&P);
- Management Indicator Species for the Wallowa Whitman National Forest.

**Study Area:** All lands and aquatic areas that are owned by PacifiCorp or USFS and are within 100-meters of a Project facility.

### Methods:

- Update current special status wildlife species lists.
- Evaluate any existing data.
- Conduct field surveys to document wildlife observations.
- Conduct dip net surveys to document amphibian use in the Study Area.

**Field Work Conducted to Date and Study Status:** All Tasks prescribed in the FERC Study Plan Determination are complete.

**Variance to Study Plan:** No variances from the study plan occurred.

### Discussion of Data Collected and Preliminary Results:

- Surveys confirmed the presence of the Rocky Mountain tailed frog (*Ascaphus montanus*), which is a Federal species of concern and state Sensitive-Vulnerable species, in the waters upstream of the fore bay.
- Two State Sensitive Vulnerable avian species were detected within the Study Area, the Olive-sided flycatcher and pileated woodpecker. Neither of these species is likely to be affected by project operations.
- The field data collected is sufficient to meet study objectives.
- Detailed preliminary results of the study are provided in the Terrestrial Resources Study Progress Report, currently available at <http://www.pacificcorp.com/wallowafalls>.

### Additional Work Proposed

- No additional field work or study modifications are proposed at this time.
- Responses to stakeholder comments, final study results, and recommendations will be presented in the Final Technical Report in June 2013.

## 13.0 RECREATION

### Objectives:

- Characterize existing recreation opportunities and use levels within the study area.
- Identify both existing and future recreation needs related to the Project over the term of the new license.

**Study Area:** The study area is an approximate one mile radius around the Project boundary.

### Methods:

- Recreation Supply Analysis: will inventory recreation facilities and use areas in the study area and their condition.
- Recreation Use and Demand Analysis: will identify existing recreational demand in the study area and estimate future demand for various activities of interest.
- Recreation Needs Analysis: will synthesize, compile and analyze the results of all of the above analyses into one synthesis study report. This analysis will identify existing and future recreation needs over the potential term of the new license (30 to 50 years).

### Field Work Conducted to Date and Study Status:

- All field work prescribed in the FERC Study Plan Determination is complete.
- Recreation Supply Analysis – is essentially complete. Need to discuss accessibility needs & opportunities in the study area with Oregon Department of Parks and Recreation (OPRD) and Wallowa-Whitman National Forest (WWNF).
- Recreation Use and Demand Analysis
  - Have vehicle traffic counts from OPRD – need visitation data for Wallowa Lake State Park and Little Alps day use area (if available).
  - Need Wallowa Lake Trailhead data from WWNF.
  - Have three years of Pacific Park campground use data.
  - Have winter trail count use on Project maintenance road.
  - Have summer/fall count of social trail between Pacific Park campground and ridge\National Forest lands.
  - Need input from WWNF and ODPR to help identify future (out to 30 – 50 years) demand of Wallowa Lake State Park and activities/interests/needs related to using or accessing Eagle Cap Wilderness Area via study area.
- Recreation Needs Analysis
  - Need to synthesize, compile, and analyze results of above analyses into one synthesis study report to help identify existing and future recreation needs.

**Variance to Study Plan:** There were no variances from the FERC Study Plan Determination during the course of this study.



## **Discussion of Data Collected and Preliminary Results:**

- Detailed preliminary results of the recreation study are provided in the Study Progress Report, currently available at <http://www.pacificorp.com/wallowafalls>. A portion of the results and preliminary recommendations included in the report is provided below.
- The Pacific Park Campground is popular during July and August and provides a more rustic camping experience than other campgrounds the Study Area.
- Better site definition of campsites at Pacific Park Campground may be warranted as well as providing better Americans with Disabilities Act (ADA) accessibility to facilities (particularly one or both of the vault toilets).
- Improved and more consistent management of the campground is warranted.
- Opportunities are available to partner with OPRD to better integrate the campground with the Little Alps Day Use Area. ADA improvements that would be of value to recreationists using either or both facilities should be considered.
- User-created trails west of the campground need to be controlled (some eliminated and some hardened) and linked (via signage) to WWNF trails.
- Winter recreationist use of the dam spillway catwalk to access the East Fork Trail needs to be addressed.
- The dam spillway catwalk has a locked gate.
- During high snowpack conditions, the forebay access road is the safest and most efficient way to reach the forebay area.
- Make minor improvements to Pacific Park Campground related to better site definition for parking vehicles, campsites, privacy, ADA ramps to vault toilets, etc.
- Consider joint management of the campground and Little Alps Day Use Area (perhaps a campground host) with OPRD.
- Harden and improve one or more of the user-created trails that provide access from the campground to the top of the adjacent ridge and to the WWNF.

## **Additional Work Proposed:**

- No additional field studies are proposed.
- Detailed recommendations will be developed in consultation with stakeholders after the Study Progress Report is reviewed and comments received.
- A complete recreation needs analysis will be developed in consultation with stakeholders after the Study Progress Report is reviewed and comments received.
- Responses to stakeholder comments, final study results, and recommendations will be presented in the Final Technical Report in June 2013.

## 14.0 LAND USE

### Objectives:

- Document the existing land uses in the Project Area.
- Evaluate Project features and operations for consistency with applicable federal, state and local land use plans.

**Study Area:** The study area consists of lands and waters within and adjacent to the proposed Project boundary.

### Methods:

- Conduct an inventory of applicable federal, state, and local plans.
- Conduct a general inventory of existing land uses.
- Conduct a review of potential conflicts with existing land uses and land use and management plans including consultation with applicable agencies.

### Field Work Conducted to Date and Study Status:

- All field work is complete.
- All required data has been collected with the exception of some agency geographic information system mapping data.
- Maps developed have been reviewed by Wallowa County for accuracy.
- Existing land uses and relevant parts of Wallowa County Comprehensive Plan, WWNF Forest Plan, and Eagle Cap Wilderness Stewardship Plan have been identified and described in Draft Study.

**Variance to Study Plan:** There were no variances from the FERC Study Plan Determination during the course of this study.

### Discussion of Data Collected and Preliminary Results:

- No conflicts between Project features and operations and applicable federal, state and local land use plans have been identified.
- Detailed preliminary study results are currently posted at <http://www.pacificorp.com/wallowafalls>, in the Land Use Study Progress Report.

### Additional Work Proposed:

- No additional field work is proposed at this time.
- Collect additional WWNF mapping data and have WWNF review for accuracy.
- Final results and recommendations will be presented in the Final Technical Report June 2013.
- Responses to stakeholder comments, final study results, and recommendations will be presented in the Final Technical Report in June 2013.

## 15.0 AESTHETICS AND VISUAL RESOURCES

### Objectives:

- Document the existing aesthetic and visual character of the assessment area, Project facilities, and operations (noise and flows in bypass reach).
- Evaluate how/if changes to Project facilities and operations related to relicensing would impact aesthetic and visual character.
- Determine if changes to Project facilities and operations related to relicensing would be consistent with applicable land management planning goals for aesthetic and visual resources.

**Study Area:** The Study Area consists of lands, Project facilities, and waters within and adjacent to the Project boundary including the East Fork Wallowa River bypass reach.

### Methods:

- Document and describe the aesthetic characteristics of the study area.
- Identify existing aesthetic/management goals and requirements.
- Review potential conflicts with existing aesthetic/visual management goals contained in the WWNF Forest Plan, Eagle Cap Wilderness Stewardship Plan, and Wallowa County Comprehensive Plan and associated ordinances.

**Field Work Conducted to Date and Study Status:** All tasks required in the FERC Study Plan Determination were completed by the end of November 2012.

**Variance to Study Plan:** There were no variances from the FERC Study Plan Determination during the course of this study.

### Discussion of Data Collected and Preliminary Results:

- Detailed preliminary results and recommendations are provided in the Study Progress Report, currently available at <http://www.pacificorp.com/wallowafalls>. A portion of the results and preliminary recommendations included in the report is provided below.
- Two agencies in the Study Area have developed resource management or land use plans that address aesthetic or visual resources. They are the U.S. Forest Service, which is in charge of managing the Wallowa-Whitman National Forest (WWNF), and Wallowa County, which is responsible for planning and managing lands and resources within the nonfederal unincorporated parts of Wallowa County.
- The very mountainous Study Area is visually spectacular and the rugged terrain in which most of the Project is located, combined with thick vegetation, screens much of the Project from general public view.
- The Project dam, spillway, catwalks, laydown area, storage yard, and upper penstock trestle are inconsistent with the WWNF Land and Resource Management Plan and have been since the Plan was adopted in 1990.
- The Project is consistent with the Wallowa County Comprehensive Plan.

- Measures to blend and/or screen the project facilities in the surrounding environment will be explored with the appropriate agencies.

**Additional Work Proposed:**

- No additional field studies are proposed.
- Detailed recommendations will be developed in consultation with stakeholders after the Study Progress Report is reviewed and comments received.
- Visual and aesthetic enhancement measures will be developed in consultation with stakeholders after the Study Progress Report is reviewed and comments received.
- Responses to stakeholder comments, final study results, and recommendations will be presented in the Final Technical Report in June 2013.

## 16.0 CULTURAL RESOURCES STUDY

### Objectives:

- Identify an Area of Potential Effect (APE) based upon potential direct and indirect effects from Project development and operation.
- Identify cultural resources within the APE.
- Assess identified resources for National Register of Historic Places (NRHP) -eligibility.
- Describe any potential effects from Project development and operation to NRHP-eligible resources.
- Develop protection measures for NRHP-eligible resources.

**Study Area:** The study area for cultural resources will include the Project's direct Area of Potential Effect (APE) for archaeological, architectural and the indirect APE for Traditional Cultural Properties/Historic Properties of Religious and Cultural Significance.

### Methods for Archaeological and Architectural Resources:

- Conduct a desktop analysis of existing resource maps and publications to identify areas of concern.
- Review previous studies within the APE.
- Conduct field reconnaissance to collect site data and record conditions.
- Conduct archival research using PacifiCorp files and resources at Wallowa County Museum.
- Develop preliminary NRHP eligibility evaluations.

### Field Work Conducted to Date and Study Status for Archaeological and Architectural Resources:

- The desktop analysis was completed in July 2012 for the APE for direct effects.
- Archival research was completed in August 2012 for the APE for direct effects.
- A one-day field reconnaissance was conducted on July 25, 2012 within the APE for direct effects.
- Architectural historians performed a field inspection of the dam, forebay, powerhouse, penstocks, and other features within the APE for direct effects..
- Archaeologists conducted a pedestrian survey of all accessible areas using 15-meter intervals within the APE for direct effects.

**Variance to Study Plan for Archaeological and Architectural Resources:** No variances from the study plan occurred.

### Discussion of Data Collected and Preliminary Results for Archaeological and Architectural Resources:

- No archaeological sites were recorded as a result of the pedestrian survey.
- Project facilities are recommended as not NRHP-eligible.

- The field data collected is sufficient to meet study objectives within the APE for direct effects.
- Detailed preliminary study results have been provided to Cultural Resources Working Group members in the form of a confidential Cultural Resources Study Progress Report.

**Additional Work Proposed for Archaeological and Architectural Resources :**

- No additional field work is proposed for Archaeological and Architectural Resources.
- Responses to stakeholder comments, final study results, and recommendations for Archaeological and Architectural Resources will be presented in the Final Technical Report in October 2013.

**Methods for Traditional Cultural Properties and Historic Properties of Religious and Cultural Significance:**

- The Traditional Use Study will utilize National Register Bulletin No. 38 (*Guidelines for Evaluating and Documenting TCPs* (Parker and King 1990) as a means for taking into consideration the information collected during any background research, during oral histories, and during any field investigations.
- Each tribe will conduct a review of existing tribal records, and conduct oral histories via interviews of tribal elders and appropriate community members. Informants may be compensated for their time. These oral histories will be recorded, transcribed, and entered into a tribal oral history database.
- The Traditional Use Study will include site visit(s) with cultural resource technicians and/or elders or community members as appropriate. Fieldwork may occur within the direct and/or indirect APE for the Project provided the area being visited is accessible.
- If during field visits potential Project effects are observed, field personnel will note the location of the effects and attempt to identify any TCP/HPRCSs within the area (if accessible).
- Site visits will be coordinated with the appropriate land owners prior to the conducting of fieldwork.
- PacifiCorp will assist the tribe in identifying the appropriate landowner and gaining access (if possible).
- If access to property owned by PacifiCorp is necessary, the Company will conduct site specific safety training to alert field workers of any potential hazards associated with the property.
- The Tribe will also coordinate their fieldwork with the USFS as appropriate.

**Field Work Conducted to Date and Study Status for Traditional Cultural Properties and Historic Properties of Religious and Cultural Significance:**

- Individual scopes of work are finalized with each tribe.
- Individual tribal contracts have been signed by the Nez Perce Tribe and the Confederated Tribes of the Colville Reservation, and are under final review by PacifiCorp.

- A signed and effective contract is in place with the Confederated Tribes of the Umatilla Indian Reservation.

**Discussion of Data Collected and Preliminary Results for Traditional Cultural Properties and Historic Properties of Religious and Cultural Significance:** No data has been collected to date.

**Additional Work Proposed for Traditional Cultural Properties and Historic Properties of Religious and Cultural Significance:**

- Interviews, site visits and individual tribal report development will take place during the spring\summer of 2013.
- The results of the TCP studies will be incorporated into the Final Technical Report and the license application.
- Each individual tribal TCP report will be attached to the Cultural Resources Final Technical Report as an appendix.
- Responses to stakeholder comments, final study results, and recommendations for Traditional Cultural Properties and Historic Properties of Religious and Cultural Significance will be presented in the Final Technical Report in October 2013.

## 17.0 SEDIMENT AND SUBSTRATE CHARACTERIZATION

**Objectives:** The purpose of the sediment and substrate characterization is to anticipate and monitor potential changes in water quality and substrate composition in the bypass reach related to the planned activity of flushing sediment from the forebay. Data was collected to meet the following objectives:

- Determine volume of sediment material entrained in the project forebay.
- Characterize sediment in the forebay – particularly grain size and metals content.
- Obtain baseline sediment and water quality conditions within the forebay and within the bypass reach, downstream of the dam, during spring high flow.
- Characterize surface and subsurface grain size distribution in the lower bypass reach using standard geomorphic characterization techniques after sediment release from the forebay.

**Study Area:** The study area includes the East Fork Wallowa River bypass reach from the diversion dam to the confluence with the West Fork Wallowa River and the Project forebay.

**Methods:** Field methods included a volumetric survey, sediment, and substrate sampling and characterization, and water sampling as described below.

- A professional survey of the surface and thickness of the fine grain sediment deposit in the drained forebay was conducted to calculate sediment volume.
- Bulk metal concentration samples were collected from the forebay and analyzed at a Test America laboratory.
- Sediment particle size samples were collected from the forebay and analyzed at a Test America laboratory.
- Suspended sediment surface water samples were collected in the lower bypass reach in June 2012; and analyzed at a Test America laboratory.
- Continuous turbidity monitoring was conducted for the entire month of June 2012 in the lower bypass reach.
- Streambed grain size analyses using surface pebble counts were conducted using the Wolman pebble count method and analyzed at a Test America laboratory.

**Field Work Conducted to Date and Study Status:** Data was collected for all of the parameters described above in April through October 2012.

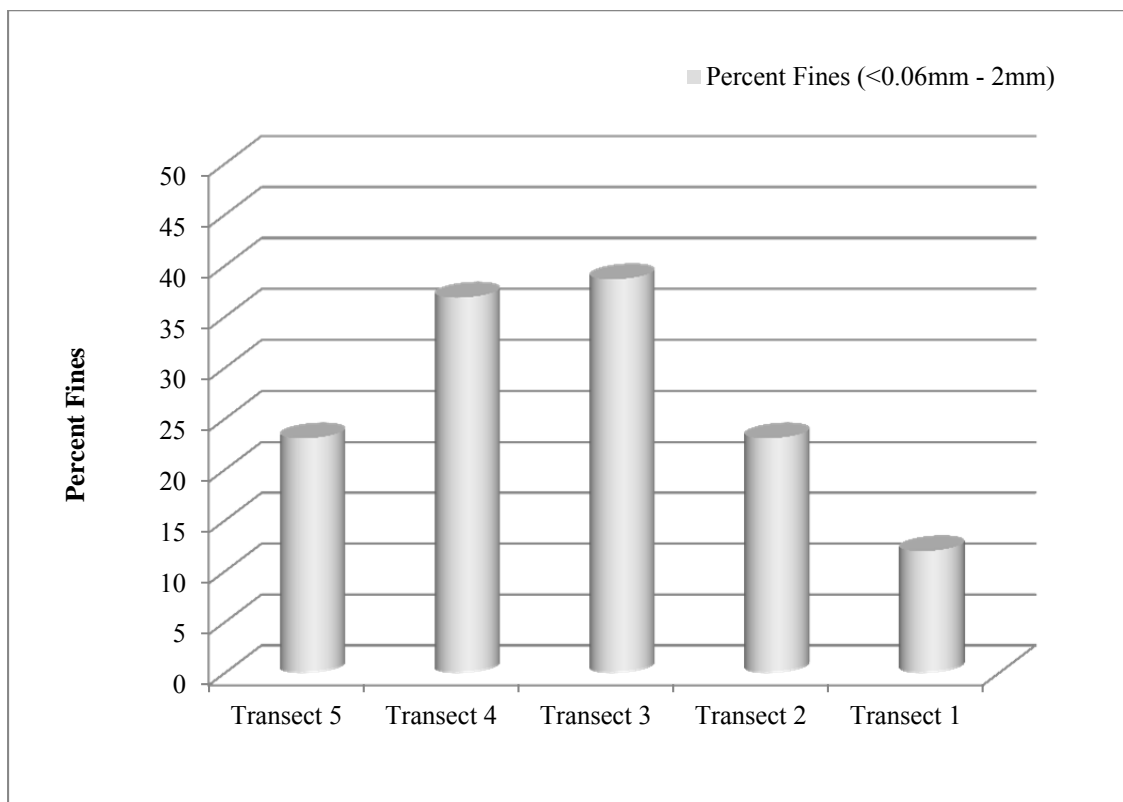
**Variance to Study Plan:** A FERC approved study plan has not been prepared for this study. Therefore, no variances have occurred to date.

### **Discussion of Data Collected and Preliminary Results:**

- Detailed preliminary results of the study are provided in the Sediment and Substrate Characterization Technical Memorandum, currently available at <http://www.pacificorp.com/wallowafalls>.
- On the day of the sediment volumetric survey, there were 560 cubic yards of sediment deposited on the forebay floor.



- During the draining of the forebay approximately 316 cubic yards of sediment was unintentionally evacuated from the forebay through the low level outlet pipe.
- Sediment samples collected in the forebay were analyzed for total metals and sediment grain size.
  - The following metals were detected:
    - Chromium - 9.7 mg/Kg
    - Copper - 32.6 mg/Kg
    - Zinc - 32.6 mg/Kg
    - Mercury - 0.14 mg/Kg (only detected in one of three samples)
  - Sediment grain sizes for the forebay:
    - 10.5% gravel
    - 79.9% sand
    - 5.9% silt
    - 0.7% clay
- Continuous background turbidity was measured at the lower staff gage site in the East Fork Wallowa River during June 2012. Turbidity during this period ranged from 3.5 to 29.7 nephelometric turbidity unit (NTU) with an average of 5.4 NTU.
- All four suspended sediment samples collected in the East Fork Wallowa River were below the laboratory reporting limit of 34 mg/L.
- Wolman pebble counts were completed at five transects in the lower bypass reach.



***Cumulative percent of Wolman pebble count samples, per transect, with particles  $\leq 2\text{mm}$ .***

- Quantitative sampling of the subarmor layer of river substrates was conducted at three of the Wolman pebble count transects sites. Sample results indicated that the subarmor layers are predominantly sand and gravel.

### **Additional Work Proposed**

In order to assess sediment transport through the bypass reach over time, PacifiCorp proposes to repeat Wolman pebble counts and photo documentation of site conditions at the five transect locations visited in 2012. One site visit is proposed after spring high flows in 2013. PacifiCorp will attempt to schedule the 2013 pebble counts when instream flow conditions are similar to those during the October 2012 surveys. Depending on the results of those pebble counts, a second site visit and set of pebble counts in the late summer or early fall may be conducted. Additionally, during the month of June 2013, background turbidity levels of the East Fork Wallowa River will be continuously monitored at the upper staff gage site above the Project forebay and at the lowest staff gage site in the bypass reach below the road bridge.

A final technical report will be issued following completion of the 2013 field studies (no later than November 30, 2013). The report will describe study objectives, methods, and results in a manner and format suitable to support consultation under Section 7 of the ESA for potential effects to bull trout.