Nason Creek Upper White Pine Reconnection
Chelan County Natural Resource Department
10th Round Funding Cycle
August 28th, 2009

Anticipated Request from Tributary Committee:	**$ 62,316**
Anticipated Request from the SRFB	**$ 62,316**
Anticipated TOTAL Project Budget	**$ 124,632**
Anticipated Other Contributions/Matches:	**$0**
Anticipated TOTAL Project Budget:	$**124,632**

Proposal Changes

Summary of changes since the June 5, 2009 Pre-proposal.

1) To ensure Chelan PUD's ability to perform maintenance within the transmission line corridor the plan now includes: 1) The construction of a rocked work pad surrounding one of the PUD transmission line structures. Due to the levee breach the structure is expected to experience inundation from flood flows. This rock work pad will ensure a stable work area for crews and equipment during flooded conditions. 2) The installation of quarry spalls to ensure vehicle access across the proposed swales at the 2 levee breach locations. The swales cross the existing PUD access road. The quarry spalls will ensure vehicle access to the PUD transmission line structures during wet conditions.
2) Unit costs for excavation now assume hauling from site to remove materials from the floodplain.

SRFB/TRIB Proposal Checklist

Project Title: _ **Nason Creek Upper White Pine Reconnection**____

Proposal Contents	✓ **Received**
A) Title Page: includes sponsor, project title, and funding request	
B) Proposal Changes Page	
C) Scope of Work (project description) (1) Restoration and acquisition projects (excluding fish passage);	
D) Maps (general vicinity and work site)	
E) Project Photos (included in Reclamation Subreach Unit profile)	
F) Reports (CCNRD Site Reconnaissance and Feasibility Analysis)	
G) Landowner Acknowledgement Form	
H) Other Materials (optional) Cost Estimate	

Reviewer: Please confirm all the sections of the proposal are in the packet in the following order and check received.

Sponsor: Please change content titles to match the titles in your proposal (e.g. Design Report would be changed to read "*BOR 2009 Fir Creek Design Report*"). Label attachments alphabetically in Prism so they coincide with the proposal checklist.

PROJECT PROPOSAL – RESTORATION, ACQUISITION, AND COMBINATION RESTORATION/ACQUISITION PROJECTS

INSTRUCTIONS: Salmon Recovery Funding Board applicants must respond to the following items. Please respond to each question individually -- do not summarize your answers collectively in essay format). Local citizen and technical advisory groups will use this information to evaluate your project. Contact your lead entity for additional information that may be required. Limit your response to eight pages.

Submit information via the PRISM attachment process. Application checklists and attachment forms may be downloaded off the SRFB Web site at http://www.rco.wa.gov/srfb/docs.htm.

NOTE: Acquisition, Combination, Fish Passage, and Diversions and Screening projects have supplemental questions embedded within this worksheet. Please answer the questions below and all pertinent supplemental questions.

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1) PROJECT OVERVIEW

Explain your project overall and include the following elements:

a) List your primary project objectives, such as how this project will improve or maintain habitat conditions and habitat forming processes.

Breach a levee to reconnect 25 acres of off-channel habitat and floodplain to lead to increased refuge and rearing habitat and improve the river's ability to recruit LWD within Upper White Pine Reach of Nason Creek.

b) State the nature, source, and extent of the problem that the project will address, including the primary causes of the problem, not just the symptoms. Explain how achieving the project objectives will help solve the problem.

The primary habitat-limiting factors within Nason Creek are riparian condition, streambank condition, channel function, flood plain connectivity, water quality, habitat diversity, and large woody debris (Andonaegui 2001; UCSRB 2007; UCRTT 2008). Past human activities that have most notably impacted river processes include beaver trapping, highway and railroad construction, logging of riparian forest, clearing of log jams, continued development, and flood protection (small levees, bridges, riprap, and roads). Ecosystem processes in the Upper White Pine reach (RM 12.0 – 14.25) are in a degraded state as a result of the removal of the floodplain by the BNSF Railroad grade and Highway 2 and the hardening of the banks with riprap (USBR 2009). The result is a diminished capacity to dissipate stream power; a reduced ability to migrate, and very little off-channel habitat for fish rearing. At low flow, only about 1 percent of the habitat area consists of side channels and off-channel habitat (USBR 2009).

The project objectives are to reconnect historic floodplain and off-channel habitats. The Upper Columbia Region Biological Strategy (UCRTT 2008) and the Recovery Plan (UCSRB 2007) have identified Nason Creek is as the top priority for habitat restoration in the Wenatchee subbasin. Nason Creek has a high potential to increase salmonid abundance and productivity, therefore, the restoration of ecosystem

function through the reconnection of off-channel habitats and floodplain is a priority. Within Nason Creek, side-channel and/or off-channel reconnection is a Tier 1 action and top priority for addressing limiting habitat factors and the recovery and long-term viability of salmonids in Nason Creek.

The Upper Columbia Regional Technical Team (UCRTT 2008) advises that habitat restoration and protection should focus on the active management of the main channel and address salmonid limiting factors at the reach scale. Within the Nason Creek drainage, habitat restoration projects aimed at improving floodplain functions, especially the reconnection of off-channel habitat to the extent it is determined to cumulatively show an appreciable improvement in channel function, have been given a high priority (USBR 2009).

c) Describe the fish resources (species and life history stages present, unique populations), the habitat conditions, and other current and historic factors important to understanding this project. Be specific--avoid general statements. Which salmonid species and life cycle stage(s) are targeted to benefit by this project?

Nason Creek is a Category 2 watershed in the Wenatchee Subbasin, which contains major spawning areas for ESA-listed spring Chinook salmon and steelhead, and is a bull trout core area (UCRTT 2007). The Nason Creek drainage supports the second strongest population of spawning spring Chinook in the Wenatchee subbasin (Andonaegui, 2001). Spring Chinook salmon spawning occurs from mid-August through mid-September, with the majority of spring Chinook redds located in the lower 15.8 river miles. A 2005 survey identified 186 redds in Nason Creek. Eggs remain in the gravel until hatching in December, and fry emerge in January/February. Juveniles spend about 1 year in fresh water before smolting and ocean emigration between April and June (Raekes 2008).

Steelhead enter and begin to ascend the Columbia River in June and July. Upstream migration near the Wenatchee River peaks in early September; most adult steelhead have moved into tributary streams by November. Nason Creek steelhead counts averaged 152 redds per year from 2001 to 2005. Juvenile rearing lasts about 2 to 7 years prior to ocean emigration (Raekes 2008).

Bull trout typically overwinter from December to May, migrate upstream to spawning grounds from May to mid-October, and adult bull trout migrate back to overwintering habitat from October to December. The Nason Creek bull trout population is depressed and typically has less than 15 redds each year. Spawning occurs within the upper reaches of the watershed, but not at the project reach (Raekes 2008).

The Nason Creek Tributary Assessment (Reclamation 2008) categorized the reach adjacent to the project site as high quality (functioning habitat). Good spawning habitat exists adjacent to the project site for Chinook salmon and steelhead in riffles and glide habitat. Substrate embeddedness is low, and fine sediment does not appear to be affecting spawning areas (USFS 2007). Juvenile Chinook salmon and steelhead and bull trout occur in Nason Creek year-round. Overall, fish rearing habitat is limited in the project area due to the lack of off-channel habitat, lack of side channels, and lack of fish hiding cover (e.g., wood) (USFS 2007).

The removal or partial breaching of the levee will reconnect historic channel and floodplain habitats on Nason Creek. This addresses Tier 1 habitat restoration as recommended in the Biological Strategy

(UCRTT 2008) and Recovery Plan (UCSRB 2007) for Nason Creek. The levee has disconnected approximately 25 acres of off-channel habitat and floodplain area, labeled as UWP-DOZ-1 (See attached Map). The levee prevents channel migration into this historic floodplain which has resulted in the loss of habitat, and impoundment of runoff and groundwater (USBR 2009a). The reconnection of the historic channel and floodplain habitats will lead to increased refuge and rearing habitat and improve the river's ability to recruit LWD. This project should lead to improved salmonid abundance and productivity for multiple ESA-listed species. This project is the first restoration action that should be completed in the Upper White Pine Reach of Nason Creek (USBR 2009a).

Table 1. This project will impact the following life-history stages:

a)

Species	Rearing	Spawning	Migration	Passage	High-water refugia
Chinook salmon	x				x
steelhead	x				x
Bull Trout	x				x

Discuss how this project fits within your regional recovery plan or local lead entity strategy (i.e., does the project address a priority action, occur in a priority area, or target priority fish species?).

Restoration of Nason Creek habitat is identified as one of the top priorities in the Upper Columbia Salmon Recovery Plan (UCSRB 2007) and in the Wenatchee Watershed Plan. The Wenatchee Watershed Implementation Schedule identifies this project site (NC-1886) as a priority channel reconnection project. Within Nason Creek, side-channel and/or off-channel reconnection is a Tier 1 action and top priority for addressing limiting habitat factors and the recovery and long-term viability of salmonids in Nason Creek (UCRTT 2008, UCSRB 2007). Nason Creek is a Category 2 watershed in the Wenatchee Subbasin, which contains major spawning areas for ESA-listed spring Chinook salmon and steelhead, and is a bull trout core area (UCRTT 2007).

d) Has any part of this project been previously reviewed and/or funded by the Salmon Recovery Funding Board? If yes, please provide the project name and SRFB project number (or year of application if a project number is not available). If the project was later withdrawn for funding consideration or was not awarded SRFB funding, please describe how the current proposal differs from the original.

No.

When possible, list your sources of information by citing specific studies, reports, and other documents.

2) PROJECT DESIGN

a) Describe the location of the project in the watershed, including the name of the water body(ies), upper and lower extent of the project (if only a portion of the watershed is targeted), and whether the project occurs in the nearshore, estuary, main stem, tributary, off channel, or other location.

The Nason Creek UWP Floodplain Reconnection Project study area encompasses a 0.5-mile-long segment of Nason Creek between river mile (RM) 13.8 and RM 13.3 in Township 26 North, Range 16 East, Sections 4 and 5, Willamette Meridian. This project is identified as project UWP-DOZ-1 in the Upper White Pine Reach Assessment (USBR 2009a).

b) Describe the project design and how it will be implemented. Describe the extent of the project. Describe specific restoration methods and design elements you plan to employ. If restoration will occur in phases, explain individual sequencing steps, and which of these steps is included in this application.

The CCNRD conducted a site reconnaissance and feasibility study of the project site in February 2009. Background data was provided by Reclamation, most of which was generated and presented within the Nason Creek Tributary Assessment (NCTA) (USBR 2008). A site visit was conducted on February 12, 2009 to verify and complement the data resources provided by Reclamation. The existing conditions were identified and recorded in the field using the Nason Creek Tributary Assessment Map Atlas (USBR 2008), light detecting and ranging (LiDAR) generated topographic maps (Watershed Sciences 2007), recent aerial photography (NRCS 2006), and hydraulic model (2D) output maps at 2,500 cfs and 5,000 cfs (USBR 2008) as references.

The construction of the BNSF Railway prism moved 2,000 linear feet of the Nason Creek main channel to the north side of the railroad. The construction of this channel included 2,000 linear feet of levee on the north side of the new channel which restricts the migration of the channel and partially disconnects the floodplain to the north. This disconnected floodplain is bounded to the north by the US 2 road prism and a US Forest Service road (White Pine) to the west. A Chelan PUD powerline corridor also parallels the river and levee immediately to the north of the levee. The levee tapers out at the downstream end of the site, allowing a small area of connection between the creek and the wetland at the downstream end of the site. The levee appears to be a result of spoiling/stockpiling soil when the channel realignment was excavated, rather than an intentionally constructed levee for flood protection.

The UWP Reach Assessment (USBR 2009a) presents 11 rehabilitation options at the UWP Floodplain Reconnection Project site. The CCNRD proposes to follow the USBR-recommended highest priority habitat action 1 as follows:

Reconnect Isolated Habitat: Remove or modify levee, in combination with re-sloping of the left bank to reconnect existing wetlands and floodplain and reinitiate habitat-forming processes. Protect and maintain resulting levels of rehabilitated geomorphic, hydrologic, and riparian function.

The project will result in a breaching of the existing levee and provides an excellent opportunity to reconnect floodplain habitat and meet the goals of the Recovery Plan (UCSRB 2008) and the Biological

Strategy (UCRTT 2007). This project can be completed without interfering with potential future BNSF reconnection projects or future instream complexity projects. The UWP Floodplain Reconnection Project is a high priority project within Nason Creek, a top-ranked Wenatchee River subbasin for salmon recovery.

c) Describe the scale and size of the project or property(s) to be acquired, and its proximity to protected, functioning, or restored habitats. (Fish Passage only projects and Diversions and Screening only projects [i.e., not a combination] need not respond to this question.)

The reconnection of UWP-DOZ-1 will connect 25 acres of off-channel habitat and to Nason Creek.

This project will address limiting factors through the reconnection of 48% of the disconnected floodplain and off-channel area in the Upper White Pine Reach (USBR 2009a).

The UCRTT took a qualitative look at the intrinsic potential maps for spring Chinook and steelhead to determine which reaches had the most intrinsic potential on Nason Creek. From this analysis, it was evident that the lower 4.6 miles and reaches 1 (RM 4.6 to 8.9) and 3 (RM 9.4 to 14.3) all had similar high levels of intrinsic potential. Both project sites fall within reach 3 as identified by the UCRTT (UCRTT 2008b).

d) Describe the long-term stewardship and maintenance obligations for the project or acquired land. For acquisition and combination projects, identify any planned use of the property, including upland areas.

The CCNRD will develop a long-term stewardship and maintenance plan in collaboration with the Wenatchee River Ranger District. Monitoring of the project will consist of standard implementation and Level 1 effectiveness monitoring protocols using methods developed by the Upper Columbia Salmon Recovery Board (UCSRB) (Hillman 2005). The monitoring will verify that project was constructed as designed and to track physical changes to the site over time.

3) PROJECT DEVELOPMENT

a) List the individuals and methods used to identify the project and its location.

Since 2007 Nason Creek has been the focus of the U.S. Bureau of Reclamation's technical work in the Wenatchee Watershed, as well as the focus of CCNRD's coordination efforts with the USFS. This work includes the completion of the U.S. Bureau of Reclamation's Nason Creek Tributary Assessment (2008) and multiple Reach Assessments (2008-2009). The completed Nason Creek Reach Assessments (USBR 2009 a, b, c) evaluated Nason Creek's fluvial system at a reach scale from RM 14 to 4 and identified habitat restoration project sites based on ecosystem functionality pathways including water quality, bank stabilization, and riparian condition. The Upper White Pine Reach Assessment (USBR 2009a) provides the technical foundation for selecting and implementing habitat restoration actions. The USFS has also completed the Nason Focused Watershed Action Plan (2008) which further builds on these efforts to identify projects. Based on the results of the USBR's reach assessments, the CCNRD worked closely with the USBR, Habitat Sub-Committee (HSC), and UCRTT to prioritize projects and select high-

priority projects for implementation. The USBR recommends a "dual-track" restoration approach to reestablish geomorphic potential with healthy stream conditions. This approach recommends first reconnecting disconnected or relict floodplain habitats, while concurrently focusing on protecting and rehabilitating connected habitats that are currently in a diminished condition (USBR 2009 b).

This work has concluded that the highest priority restoration project on Nason Creek involve the reconnection of floodplain and habitat reconnection. In May 2009 the CCNRD in coordination with the Wenatchee Habitat Subcommittee completed a prioritization of all of the Reclamation-identified projects in the Nason Creek study area (ICF Jones & Stokes 2009a). Through this prioritization study the Nason Creek UWP Floodplain Reconnection Project highest priority floodplain reconnection project that does not involve require alteration to the Burlington Northern-Santa Fe Railway (BNSF) rail prism. All reconnection projects associated with the BNSF Railway are being explored by the CCNRD but are considered more-complicated, high-priority projects, with planning and implementation will likely take 3 to 10 years. The Nason Creek UWP Reconnection Project represents an immediate, high priority project that can be completed without interfering with potential future BNSF reconnection projects or instream complexity projects.

The CCNRD met with representatives from the USFS and Chelan County PUD on April 24, 2009 at the project site. All parties agreed to work together through the Wenatchee Watershed Habitat Subcommittee to refine the proposed design to ensure that the biological goals of the project are met while protecting the existing PUD powerline corridor.

b) Explain how the project's cost estimates were determined.

The cost estimate (Attached) reflects the conceptual design described above and shown on the attached figures. The construction costs are based on engineers estimates of time and materials to construct the conceptual plan using rates typical to bids for similar projects in the Wenatchee Watershed from 2006 – 2008. Costs include all costs to conduct the stakeholder coordination. Stakeholder coordination will be conducted by staff within the CCNRD. Personnel estimates involve using the hourly rates for each staff person and the percentage of their time that is anticipated for that person per project.

c) Describe other approaches, opportunities, and design alternatives that were considered to achieve the project's objectives.

The reconnection of the floodplain at the project site will require the partial or full removal of the existing levee. The CCNRD conducted a Site Reconnaissance and Feasibility Analysis in February 2009 to examine the rehabilitation options presented by Reclamation (ICF Jones & Stokes 2009b). Full levee removal was examined as a project alternative along with partial removal. Onsite discussions with the Chelan PUD and USFS indicated that moving the PUD transmission line to allow full levee removal is not feasible due to the narrow corridor between the BNSF railway, BPA powerlines, and US 2. Through the field examination and based on the existing hydrologic data provided by Reclamation. A partial reconnection will allow fish access to the existing beaver pond and wetland habitats during high flows but the remaining levee will not allow full channel migration back into the reconnected floodplain. With

minor construction effort, a large area of high quality floodplain habitat can be reconnected to the creek channel.

d) Describe the consequences of not conducting this project at this time. Consider the current level and imminence of risk to habitat in your discussion.

This project has been identified as the highest priority project for floodplain reconnection on Nason Creek that isn't associated with the BNSF Railway. The consequences for not implementing this particular project would be to maintain existing conditions and degraded habitats, which will continue to limit the productivity of listed salmonids within Nason Creek. Excellent habitat exists just downstream of the site in a set of meanders. A rapidly eroding bank within the powerline corridor has already resulted in movement of a set of power poles and is degrading the habitat qualities with silt. Allowing flood flows to spill into the wetland complex upstream will take some pressure off this eroding bank.

e) Describe any concerns about the project raised from the community, recreational user groups, or adjacent land owners, and how you addressed them.

The primary design concern is the continued protection of the Chelan PUD powerline poles and the retention of access for vegetation maintenance and repair. These concerns are being incorporated into the project design: 1) Partial levee breaching will ensure that river migration does not put PUD structures in jeopardy. 2) The CCNRD is working with the PUD to ensure that future vehicle and equipment access is maintained.

f) Include a Partner Contribution Form, when required, from each partner outlining its role and contribution to the project. This form may be downloaded off the SRFB Web site. State agencies are required to have a local partner that is independently eligible to be a project sponsor. A Partner Contribution Form is also required from partners providing third-party match.

No Partner Contribution Form is required.

g) List all landowner names. Include a signed Landowner Acknowledgement Form (available on the SRFB Web site) from each landowner acknowledging their property is proposed for SRFB funding consideration. If a restoration project covers a large area and encompasses numerous properties, Landowner Acknowledgement Forms are not required. For sponsors proposing work on their own property, this form is not required. For multi-site acquisition projects involving a relatively large group of landowners, include, at a minimum, signed Landowner Acknowledgement Forms for all known priority parcels.

The United States Forest Service is the land manager. The Chelan County PUD maintains a 150kV transmission line through the project parcel.

h) Describe your experience managing this type of project. List the names, qualifications, roles, and responsibilities for all known staff, consultants, and subcontractors who will be implementing the project. If unknown, describe the selection process.

Chelan County Natural Resource Department – Project Lead Sponsor. The CCNRD will be responsible for advertising and selecting a construction contractor as well as construction inspection and pre/post

project monitoring. Mike Kane and Alan Schmidt from the CCNRD will be the primary contacts during contractor selection and construction.

Bureau of Reclamation – Identification of the Project Sites and Preparer of Technical Design Concepts

US Forest Service – Land Manager and Technical Review

Chelan PUD – Responsible for maintenance of the transmission line. Technical Review.

Wenatchee Watershed Habitat Sub-Committee – Technical Review

Upper Columbia Regional Technical Team – Technical Review

Citations

Hillman, Tracy W. 2005. Project Monitoring: A Guide for Sponsors in the Upper Columbia Basin. Draft Report. November 1. Prepared for Upper Columbia Salmon Recovery Board and the HCP Tributary Committees.

ICF Jones & Stokes. 2009a. Final Report. Nason Creek Subreach Unit Prioritization. June. Prepared for the Chelan County Natural Resources Department. (ICF J&S 00224.09) Bellingham, WA.

ICF Jones & Stokes. 2009b. Nason Creek Upper White Pine Floodplain Reconnection Project – Site Reconnaissance and Feasibility Analysis. March 4, 2009. Prepared for the Chelan County Natural Resources Department. Bellingham, WA.

(Raekes 2008) Email communication from Cindy L. Raekes, U.S. Forest Service, Leavenworth Ranger Station, Washington. May 23, 2008. Included as an attachment to this application.

(UCRTT 2008) A Biological Strategy to Protect and Restore Salmonid Habitat in the Upper Columbia Region. April 30, 2008. Available online at http://www.ucsrb.com/resources.asp.

(UCRTT 2008b) Nason Creek Biological Benefit Assessment. April 11, 2008. Prepared for the Wenatchee Habitat Subcommittee. 8 p.

(UCSRB 2007) Upper Columbia Salmon Recovery Board's Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan. August 2007. Available online at http://www.ucsrb.com/plan.asp or http://www.ucsrb.com/UCSRP%20Final%209-13-2007.pdf.

U.S. Bureau of Reclamation (USBR). 2008. Nason Creek Tributary Assessment, Chelan County, Washington. Technical Service Center, Denver, CO. and Pacific Northwest Regional Office, Boise, ID. July 2008

U.S. Bureau of Reclamation (USBR). 2009a. Nason Creek Lower White Pine Reach Assessment, Chelan County, Washington. March 2009.

U.S. Forest Service (USFS). 1996. Nason Creek Watershed Analysis. Wenatchee National Forest, Lake Wenatchee Ranger District. Wenatchee, Washington.

U.S. Forest Service (USFS). 2007. Nason Creek Habitat Assessment, From the Bend at RM 4.6 to the Railroad Bridge Crossing at RM 14.2. Okanogan-Wenatchee National Forest.

U.S. Forest Service (USFS). 2008. Nason Creek Focused Watershed Action Plan (Draft). Wenatchee River Ranger District. Okanogan-Wenatchee National Forest.

4) TASKS AND SCHEDULE

List and describe the major tasks and time schedule you will use to complete the project.

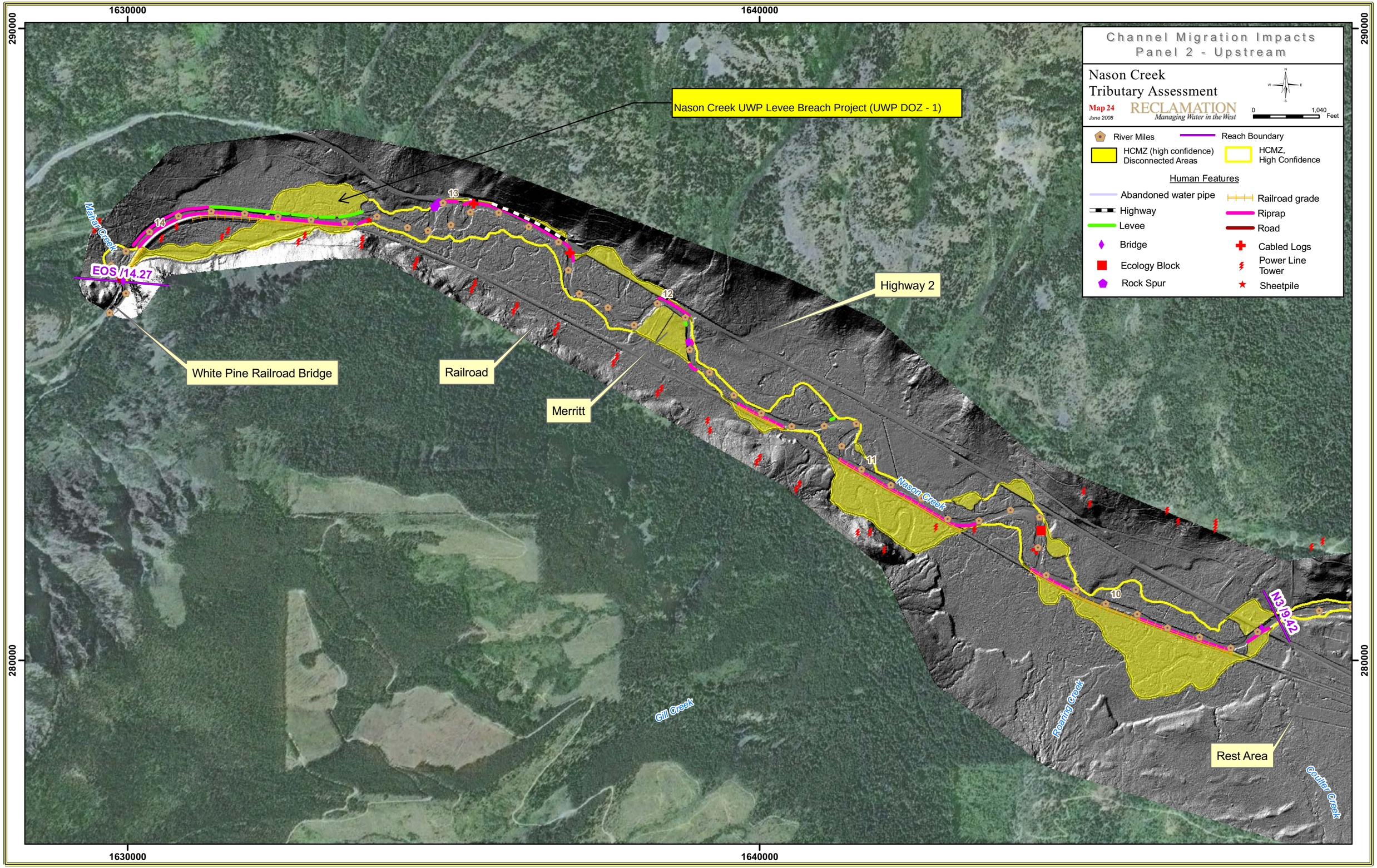
Item/Milestone	Outcome	Target Date (Month/Year)
Prepare permit ready 70% plan set	Submit plans and JARPA package	September 2009
Receive permits	Obtain all permits for construction	April 2010
Prepare 100% bid package	CCNRD sends project to bid - Specifications of construction requirements available for prospective contractors	May 2010
Select Contractor	CCNRD awards contract	June 2010
Begin Construction	Excavate pond and channel connections	July – September 2010
Planting	Revegetate disturbed areas and improve riparian zone	October 2010
Finish Construction	Final CCNRD inspection	October 2010

CONSTRAINTS AND UNCERTAINTIES

Each project should include an adaptive management approach that provides for contingency planning. State any constraints, uncertainties, possible problems, delays, or unanticipated expenses

that may hinder completion of the project. Explain how you will address these issues as they arise and their likely impact on the project.

The overall project budget reflects the draft design of the project alternative. There may be changes to the project during the upcoming (fall 2009) permit process that result in increases or decrease in estimated construction cost. The CCNRD expects to work with the local Tributary Fund to address changes (increases) in project cost as needed. With the early cooperation between the CCNRD, the landowners (USFS, Chelan PUD), all parties are aware of the project schedule and committed to meeting the timeline.


Channel Migration Impacts
Panel 2 - Upstream
Nason Creek
Tributary Assessment
Map 24
June 2008
RECLAMATION
Managing Water in the West
0
1,040
Feet
River Miles
Reach Boundary
HCMZ (high confidence) Disconnected Areas
HCMZ, High Confidence
Human Features
Abandoned water pipe
Railroad grade
Highway
Riprap
Levee
Road
Bridge
Cabled Logs
Ecology Block
Power Line Tower
Rock Spur
Sheetpile
Nason Creek UWP Levee Breach Project (UWP DOZ - 1)
Highway 2
White Pine Railroad Bridge
Railroad
Merritt
Rest Area
Maher Creek
Nason Creek
Gill Creek
Roaring Creek
Coulter Creek
EOS /14.27
N3/9.42
14
13
12
11
10
1630000
1640000
290000
280000

Wenatchee Subbasin, Washington
Nason Creek Initial Site Assessment
UWP DOZ-1

Personnel: PNRO Geologist E. Lyon, R. McAffee, D. Bennett

Purpose: Photo graphic documentation of baseline conditions and geologic mapping of anthropogenic features associated with floodplain connectivity. The location of the subreach is shown in figure 1.

Observations:

- 2,044 feet of hardened levee disconnects the subreach from the active channel (Photographs 1, 2and 4).
- Additional human features include 1,515 feet of transmission line and 1,037 feet of unimproved road.
- The subreach contains 5 acres of wetlands (Photographs 3 and 5).
- Impacts to vegetation from anthropogenic features total 2 acres or about 10 percent of the subreach.

Summary Table: Features used in the Reach-based Ecosystem Indicators (REI)

Pathway:	**Indicator:**	**Feature:**
Habitat Access	Physical Barriers (mainstem)	Levee (Lateral)
Habitat elements	Wetlands	5 Acres
	Off-channel habitat	Historic overflow channels
	Refugia	Inundated at higher flows
Channel condition and floodplain dynamics	Floodplain connectivity	Disconnected
Watershed conditions	Road Density & Location (Floodplain)	1.6 mi/0.2 mi^2
	Riparian corridor	Small diameter/young seral stage, 23% disturbed.
	Protection Area	5 Acres
	Total Area	20 Acres

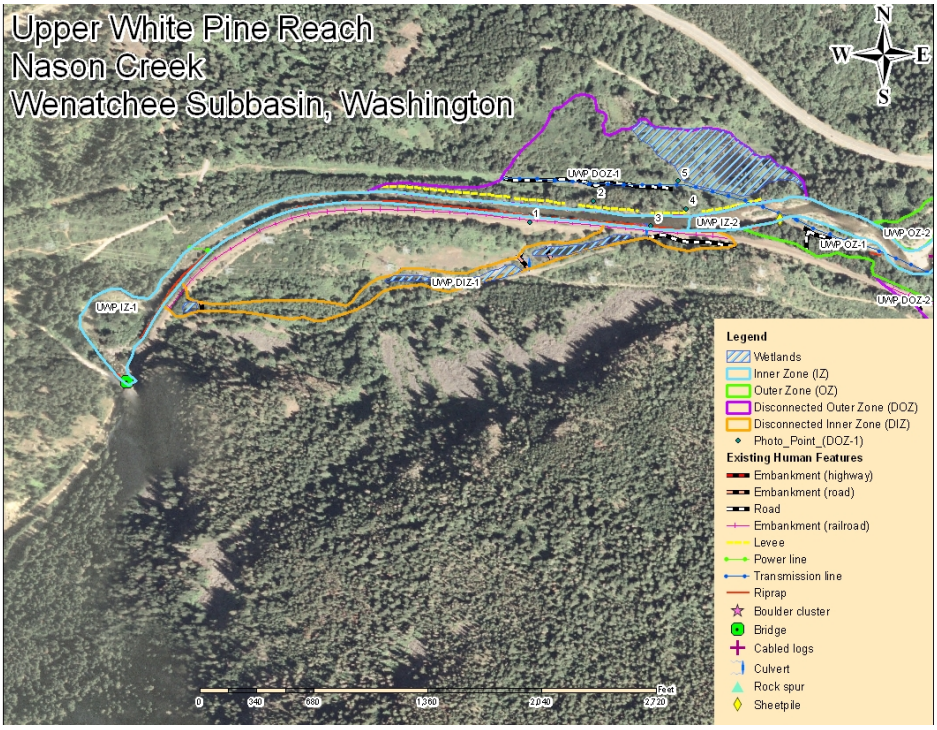


Figure 1. Image showing the location of subreach UWP DOZ-1 and associated human features, in addition to adjacent subreaches.

Photograph No. 1. View to the north of the levee and riprap that defines the left bank. Upper White Pine Reach; Subreach DOZ-1, Nason Creek - Wenatchee Subbasin, Washington. Bureau of Reclamation Photograph by R. McAffee, May 2, 2007

Photograph No. 2. View to the north of the lower levee on the left bank. Upper White Pine Reach; Subreach DOZ-1, Nason Creek - Wenatchee Subbasin, Washington. Bureau of Reclamation Photograph by R. McAffee, May 2, 2007

Photograph No. 3. View to the northeast of a wetlands area with return to river blocked impeded by a beaver dam. Upper White Pine Reach; Subreach DOZ-1, Nason Creek - Wenatchee Subbasin, Washington. Bureau of Reclamation Photograph by E. Lyon, May 3, 2007.

Photograph No.4. View looking to the south from the floodplain at the levee on the left bank. Upper White Pine Reach; Subreach DOZ-1, Nason Creek - Wenatchee Subbasin, Washington. Bureau of Reclamation Photograph by R. McAffee, May 3, 2007.

Photograph No. 5. View to the east of a wetlands complex. N Upper White Pine Reach; Subreach DOZ-1, Nason Creek - Wenatchee Subbasin, Washington. Bureau of Reclamation Photograph by R. McAffee, May 3, 2007.

Technical Memorandum

Date: March 4, 2009

To: Mike Kane

From: John Soden, Martin Fisher, Chris Soncarty

cc: Alan Schmidt

Subject: Nason Creek Upper White Pine Floodplain Reconnection Project – Site Reconnaissance and Feasibility Analysis

On February 12, 2009, ICF Jones & Stokes and the Chelan County Natural Resource Department conducted an initial site reconnaissance to assess the feasibility of the Upper White Pine (UWP) Floodplain Reconnection Project. The Nason Creek UWP Floodplain Reconnection Project study area encompasses a 0.5-mile-long segment of Nason Creek between river mile (RM) 13.8 and RM 13.3 in Township 26 North, Range 16 East, Sections 4 and 5, Willamette Meridian. This project is identified as project UWP-DOZ-1 in the Upper White Pine Reach Assessment (USBR 2009a).

This technical memorandum presents the findings of our field reconnaissance and outlines the project data needs.

Project Selection

Upper Columbia Region Biological Strategy (Upper Columbia Regional Technical Team [UCRTT] 2008a) and Recovery Plan (UCSRB 2007) have identified Nason Creek is as the top priority for habitat restoration in the Wenatchee subbasin. Within Nason Creek, side-channel and/or off-channel reconnection is a Tier 1 action and top priority for addressing limiting habitat factors and the recovery and long-term viability of salmonids in Nason Creek.

Several agencies, through cooperative efforts, analyzed baseline geomorphic, hydraulic, and hydrologic data; habitat; and site stability conditions. The completed Nason Creek Reach Assessments (USBR 2009 a, b, c) evaluated Nason Creek's fluvial system at a reach scale from RM 14 to 4 and identified habitat restoration project sites based on ecosystem functionality pathways including water quality, bank stabilization, and riparian condition. Based on the results of the assessments, analyses, and biological benefit, CCNRD is working closely with the USBR, Habitat Sub-Committee (HSC), and UCRTT to prioritize projects and select high-priority projects for implementation. The USBR recommends a "dual-track" restoration approach to reestablish geomorphic potential with healthy stream conditions. This approach recommends first

reconnecting disconnected or relict floodplain habitats, while concurrently focusing on protecting and rehabilitating connected habitats that are currently in a diminished condition (USBR 2009 b).

Based on relationships between salmon spawner densities and gradient, stream width, valley width, and confinement, the UCRTT determined that RM 14.3 to 9.4, RM 8.9 to 4.6, and the lower 4.6 miles of Nason Creek all have similar high levels of intrinsic potential for biological benefits (UCRTT 2008b). The Nason Creek UWP Floodplain Reconnection Project (UWP DOZ-1) falls within RM 14.3-9.4, and is the furthest upstream floodplain reconnection project that does not involve working with the Burlington Northern-Santa Fe Railway (BNSF). All reconnection projects associated with the BNSF Railway are being explored by the CCNRD but are considered more-complicated, high-priority projects, with planning and implementation will likely take 3 to 10 years. The UWP DOZ-1 reconnection project represents an immediate, high priority project that can be completed without interfering with potential future BNSF reconnection projects or instream complexity projects.

Project Site Overview

The construction of the BNSF Railway prism moved 2,000 linear feet of the Nason Creek main channel to the north side of the railroad. The construction of this channel included 2,000 linear feet of levee on the north side of the new channel which restricts the migration of the channel and partially disconnects the floodplain to the north. This disconnected floodplain is bounded to the north by the US 2 road prism and a US Forest Service road (White Pine) to the west. A Chelan PUD powerline corridor also parallels the river and levee immediately to the north of the levee.

The UWP Reach Assessment (USBR 2009a) presents 11 rehabilitation options at the UWP Floodplain Reconnection Project site. The highest priority habitat action is represented by Option 1 as follows:

> Reconnect Isolated Habitat: Remove or modify levee, in combination with re-sloping of the left bank to reconnect existing wetlands and floodplain and reinitiate habitat-forming processes. Combine with riparian rehabilitation at 10-meter, 30-meter, and floodplain width to provide adequate composition, canopy cover, and large wood recruitment potential within the rehabilitated floodplain. Protect and maintain resulting levels of rehabilitated geomorphic, hydrologic, and riparian function.

Site Assessment

Background data was provided by Reclamation, most of which was generated and presented within the Nason Creek Tributary Assessment (NCTA) (Reclamation 2008). A site visit was conducted on February 12, 2009 to verify and complement the data resources provided by Reclamation. The existing conditions were identified and recorded in the field using the Nason Creek Tributary Assessment Map Atlas (Reclamation 2008), light detecting and ranging (LiDAR) generated topographic maps (Watershed Sciences 2007), recent aerial photography (NRCS 2006), and hydraulic model (2D) output maps at 2,500 cfs and 5,000 cfs (Reclamation 2008) as references.

The primary conclusions from the examination of background data and the field reconnaissance are:

- A large 25 acre wetland complex is located in the disconnected floodplain area. This wetland supports permanently ponded and inundated habitats, as well as Palustrine Scrub-Shrub, and Palustrine Emergent (Cowardin et al 1979) habitats. Several beaver dams control pond depth. The ponds drain to the river at the downstream end of the project site.
- The existing levee runs 2,000 feet, is 4 to 6-feet higher than the floodplain, and is approximately 30 feet in width. The levee tapers out at the downstream end of the site, allowing a small area of connection between the creek and the wetland at the downstream end of the site. The levee appears to be a result of spoiling/stockpiling soil when the channel realignment was excavated, rather than an intentionally constructed levee for flood protection.
- The hydraulic model predicts backwater flooding of the site at 2,500 cfs (5-year event). The flooding would occur only at the downstream end of the site. The levee effectively blocks flows up to a 50-year event.
- Reconnecting flows at the upstream end of the floodplain would provide excellent flow-through hydraulic connectivity and fish access to the disconnected habitat.
- Several low swales at the upstream end of the site provide excellent opportunities to breach the levee and connect the creek channel to the greater wetland and floodplain habitats with minimal effort.
- Levee breach locations must consider the effects to Chelan PUD power poles.
- Construction access is good from US 2, to Upper White Pine Road and to the Chelan PUD corridor. All work could be done with mid-sized equipment such as excavators, loaders, and dump trucks.
- Landownership is US Forest Service. The USFS has been a cooperative partner working with the Wenatchee Watershed Habitat Subcommittee to facilitate and implement salmon recovery projects within USFS lands.

Data Needs

Breaching the levee at a few locations would be a relatively simple project and much of the necessary data has already been collected by Reclamation (Reclamation 2008). The following data is needed to supplement the existing data to improve the quality and reliability of the project design:

- Topographic mapping of the floodplain in the area of the large wetland complex using traditional ground survey methods. Comparing the LiDAR generated topo to visual observation of the site indicates that the LiDAR may be showing the ground surface at a higher elevation than the ground is. This could be caused by the LiDAR picking up dense grass or a ponded water surface instead of the real ground. Traditional survey methods would identify the actual ground surface elevation. Planimetric features such as

power line towers, guy wires, access roads, and vegetation to be preserved will also be located with this survey.

- Topographic mapping of potential floodplain swales that could be used for floodplain reconnection using traditional ground survey methods. Selecting which swales to use for floodplain reconnection will depend on the elevation of the swale and related point at which flows in the creek channel enter the swale when the levee is breached. Knowing these elevations to the nearest half foot could be critical in selecting where to locate levee breaches so the LiDAR data should be supplemented with more precise measurements using traditional survey equipment.

- Cross sections or topographic mapping of the underwater portion of the main creek channel. LiDAR cannot obtain ground elevations underwater. The hydraulic model will need to be refined to identify the best locations for levee breaches and to understand the extent of floodplain inundation during various flows in the creek. To refine the hydraulic model, accurate underwater ground elevations will need to be obtained and traditional survey methods provide the best way to accomplish this.

- Refinement of the existing hydraulic model developed by Reclamation, or development of a new hydraulic model using the site specific survey data discussed in the previous three bullet items. The existing hydraulic model developed by Reclamation provides a good overall assessment of the creek and floodplain interaction, but for designing floodplain reconnection (e.g., determining best locations for levee breaches) and assessing future habitat improvements, a more refined model is necessary.

- Identify restrictions and requirements Chelan PUD will place on construction within their easement and around their power poles. Also identify restrictions and requirements Chelan PUD will have related to increasing flow and inundation around their power poles in the reconnected floodplain area.

Additional project needs to support project permitting are:

- Delineation and evaluation of wetland and stream resources.

- Cultural resource site evaluation.

- Coordination with US Forest Service staff. Project concepts should be presented to the USFS for early feedback on design.

Conclusions

The UWP Floodplain Reconnection Project (UWP DOZ-1) is a high priority project within Nason Creek, a top-ranked Wenatchee River subbasin for salmon recovery. The project thus provides an excellent opportunity to reconnect floodplain habitat and meet the goals of the Recovery Plan (UCSRB 2008) and the Nason Creek Tributary Assessment (USBR 2008). This project can be completed without interfering with potential future BNSF reconnection projects or future instream complexity projects. The floodplain reconnection will be accomplished through

removing portions of an existing levee. With minimal design work and minor construction, a large area of high quality floodplain habitat can be reconnected to the creek channel.

Moving this project forward should be accomplished through discussions with the two primary landowners, the USFS and Chelan PUD. Their interests can then be incorporated into determining the location and extent of levee removal. Project design will take advantage of the considerable hydrogeomorphological data and analysis provided by Reclamation for Nason Creek. The data gaps are few, but by addressing these data gaps early in 2009, and through early landowner coordination, the potential for project construction in 2010 is high.

References

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U.S. Bureau of Reclamation (USBR). 2009c. Draft Nason Creek Kahler Reach Assessment, Chelan County, Washington. February 2009.

Watershed Sciences. 2007. LiDAR Remote Sensing Data Collection: Upper and Lower Okanogan River, Methow River, Lake Roosevelt, Wenatchee River, and John Day River Study Areas. April 18, 2007.

Source: Puget Sound LiDAR Consortium (2006)
Natural Resource Conservation Service (2006)

- River Miles
- Chelan Co. PUD Utility Poles
- BPA Transmission Towers
- Major contours (10 ft)
- Minor contours (2 ft)
- Existing Levee to Remain
- Existing Levee to be Removed
- Approximate Wetland Boundary (25 ac)
- Restored Floodplain Connection

ICF Jones & Stokes
an ICF International Company

N

200 100 0 200
Feet

Concept Plan

Upper White Pine Floodplain Reconnection Site
UWP-DOZ-1

LANDOWNER ACKNOWLEDGEMENT FORM

Landowner Information:

Name of Landowner: Wenatchee River Ranger District, United States Forest Service

Landowner Contact Information:

x☐ Mr. ☐ Ms. Title District Ranger

First Name: Vaughan Last Name: Marable

Contact Mailing Address:

Wenatchee River Ranger District
600 Sherbourne
Leavenworth, WA 98826

Contact E-Mail Address:

Property Address or Location: Nason Creek RM 13.3-13.8, T26N, R16 E Sections 4 and 5.

I certify that US Forest Service is the legal owner of property described in this grant
(landowner or organization)
application to the Salmon Recovery Funding Board I am aware the project is being proposed on my property. My signature authorizes the applicant listed below to seek funding for project implementation, however, does not represent authorization of project implementation.

Vaughan D. Marable
Landowner Signature

01 June 2009
Date

Project Applicant Information

CCNRD Nason Creek UWP Reconnection - Cost Estimate Jaugust 28, 2009

ITEM NO.	TOTAL QUANTITY	UNITS	ITEM	UNIT COST	ITEM COST
1	LUMP SUM	L.S.	MOBILIZATION	$7,048.00	$7,048
2	0.50	ACRE	CLEARING & GRUBBING	2,500.00	$1,250
3	LUMP SUM	L.S.	TEMPORARY EROSION / WATER POLLUTION CONTROL	5,000.00	$5,000
4	1200.00	C.Y.	LEVEE EXCAVATION (2 @ 200' LONG EACH)	30.00	$36,000
5	300.00	C.Y.	SWALE EXCAVATION (2 @ 100' LONG 20' WIDE 2' DEEP)	30.00	$9,000
6	12.00	C.Y.	QUARRY SPALL MAINTENANCE PAD AT POWER POLES	50.00	$600
7	25.00	C.Y.	COBBLE SWALE LINING AT MAINT. ACCESS ROAD	50.00	$1,250
8	2.00	EACH	ELJ STRUCTURES AT LEVEE CUTS	10,000.00	$20,000
9	1.00	ACRE	SEEDING	2,000.00	$2,000
10	LUMP SUM	L.S.	PLANTING (WILLOW STAKES, CONTAINER PLANTS)	10,000.00	$10,000
11	LUMP SUM	L.S.	SURVEYING	1,000.00	$1,000
12	LUMP SUM	L.S.	SITE CLEANUP AND REPAIR	2,000.00	$2,000

CONSTRUCTION SUBTOTAL =	$95,148
CONTINGENCY (15%) =	$14,272
CCNRD STAKEHOLDER COORDINATION	$15,212

TOTAL = $124,632