Skinney Creek
Floodplain Restoration Design
May 2, 2014

Chelan County Natural Resources Department (and US Forest Service)
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PRISM #14-1732

Anticipated Request - SRFB/BPA:	$107,000
Anticipated TOTAL Project Budget:	**$107,000**

Confluence of Skinney Creek and Chiwaukum Creek, April 2014

Skinney Creek Floodplain Restoration Design Pre-Proposal Checklist		
	UC Region Application Section :	Title page, final proposal checklist, UC Region Supplemental Application/Resource
	Salmon Project Proposal: Planning and Combination Planning/Acquisition Projects including project cost estimate	Pages 1-10
	Maps: • Figure 1: Project Area Overview • Figure 2: Spring Chinook Distribution and Spawning • Figure 3: Steelhead Distribution and Spawning	Attached 9 pages
	Project Photographs: Photos 1-4	
	Design Materials WSDOT Sheets 55-57	
	Landowner Acknowledgement Form	
	Other PTAGIS data output (improved graphic with final proposal)	

Upper Columbia Region Supplemental Application/Resource			
✓	**Questions**	**Answers**	**RCO Application Location**
All Projects (Mandatory) Fill in below			
1	What Upper Columbia subbasin is the project in?	Wenatchee	Section 3A page 2
2	What project category is your project?	Design Only	Page 1 planning type
3	What Assessment Unit is the project in?	Upper Wenatchee which includes the lower Chiwaukum and 1.3 miles of Skinney Creek	Section 3C page 3
4	What restoration and/or protection priority is the assessment unit the project is located in?	The Upper Wenatchee Assessment Unit is the number 2 priority for implementation of restoration actions in the Wenatchee basin.	Section 3C page 3
5	What is the primary species the project will target?	Steelhead	Section 3C page 4
6	What secondary species will the project will target?	Spring Chinook	Section 3C page 4
7	What PCSRF Metrics will be implemented with this project?	Activity Type – Instream Habitat Project 7-10 acres of floodplain reconnected and 0.5 mile of instream habitat treated	Section 2B page 2
8	What Primary Ecological Concern does the Project Address?	Channel Structure and Form	Section 3C pages 3-4
9	What other Ecological Concerns does the Project Address (not required for protection projects?	Peripheral and Transitional Habitat – floodplain reconnection	Section 3C pages 3-4
10	What is the priority of the primary ecological concern this project addresses in the assessment unit it occurs (not required for protection projects)	Channel Structure and Form and Peripheral and Transitional Habitat are the number one and two priority ecological concerns to be addressed in the Upper Wenatchee assessment unit	See additional info in Section 3C pages 3-4

Regional Technical Team Scoring Criteria Summary Information			
1	What are the overarching goals and quantified objectives of the project?	Goal: Restore natural channel and floodplain processes such as stream channel function and floodplain interaction/inundation in lower Skinney Creek to improve spawning and rearing habitat for spring Chinook and steelhead. Quantified Objectives: -Remove 2,000 linear feet of levee adjacent to Skinney Creek. -Re-construct >2,000 linear feet of Skinney Creek -Construct a new valley with 7-10 acres of floodplain/floodprone area and associated riparian habitat. -Improve 0.5 mile of juvenile and adult rearing and migratory habitat for spring Chinook -Improve fish access to the upper Skinney Creek watershed which provides up to 3 miles of critical habitat for steelhead. -Create 0.5 mile of steelhead spawning habitat	Section 3B pages 1- 2
2	Location of the Restoration Project	The application describes how this project is sited within an important spawning/rearing area and/or provides access to habitat that would function as important spawning/rearing habitat~~. so please read the text; it seems silly to re-paste 3 pages of information here. Plus the attachments are cool so you should look at them~~.	Sections 3B and C pages 2-4 Attachments: Figures 2-3 and PTAGIS data
3	Methodology, Location, and Scale of the Restoration Project	~~I'm not really sure how to describe how this restoration project is appropriately scaled and scoped in terms of the objectives described above, but you can bet that I will have a really good answer written here for the final proposal scoring.~~The project scope and scale has been designed to restore stream channel and floodplain function while minimizing impacts to existing riparian areas. Please see the additional information about design alternatives that will be considered and additional language about use of reference sites for project design.	See project description in Section 4A pages 5-6
4	Temporal effects of the proposed project	The Skinney Creek floodplain restoration design will be consistent with the fluvial-geomorphology of the stream. You will even have an opportunity to review proposed designs through NEPA and the WHSC. Construction is slated to start in 2017 and floodplain re-connection processes will be restored immediately, however, it will take longer to restore riparian vegetation cover. The cool thing about this project is that it restores natural stream channel processes which will persist throughout time because the project will be designed to allow channel migration within the floodplain. Restoring floodplain connections is an action consistent with amelioration of the effects of climate change.	N/A
5	Benefits to Freshwater Survival or Capacity	This restoration project will increase capacity for steelhead by improving access to Upper Skinney Creek spawning areas and providing 0.5 mile of spawning habitat. This restoration project will improve freshwater survival by providing improved rearing and refuge habitat for spring Chinook and steelhead juveniles through improved floodplain connection and in-stream complexity.	

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Project Number	14-1732
Project Name	Skinney Creek Floodplain Restoration Design
Sponsor	Chelan County Natural Resources Department
Planning Type	Preliminary design

2014 Project Proposal for Planning Projects

1. **Problem Statement - Provide an overview of fish resources, current habitat conditions, site or reach conditions, gaps in knowledge, and other key salmon recovery problem(s) in the watershed that this project is intended to address.**

Railroad construction and subsequent construction of Highway 2, re-aligned Skinney Creek into its current channel configuration. The lower 2,000 feet of Skinney Creek is narrow and confined between two remnant berms or levees. This project proposes to re-construct the stream channel into it's former floodplain area. Figure 1 depicts the project location and it provides an overview of recent WSDOT Hwy 2 re-alignment and associated work in Skinney Creek. A more detailed description of the WSDOT project and fish barrier removals in Skinney Creek is included in Sections 3D and 4C below.

Photos 1 and 2 depict the current conditions in Skinney Creek documenting the channel constriction during high flows. The primary habitat-limiting factors within the Skinney Creek are artificial obstructions, riparian condition, channel entrenchment, water quality (fine sediment), off-channel habitat, and large woody debris (Andonaegui 2001). All fish passage barriers (artificial obstructions) have now been removed from Skinney Creek (See Section 4C below). However, highway and railroad construction have impacted stream processes such as hydro-geomorphic processes, woody debris recruitment, channel migration, instream habitat complexity, and gravel recruitment. Today, Skinney Creek within the project area is characterized by an entrenched channel with little habitat complexity, a lack of large wood and pools, and no floodplain access due to the levees that border the channel (USFS 1999).

Skinney Creek does provide habitat for spring Chinook and steelhead (Figures 2 and 3). However, there is likely limited use by both species under current conditions. The project goal is to restore natural stream processes such as stream channel function, channel complexity, and floodplain connectivity. This will increase habitat diversity and improve rearing and spawning potential in Skinney Creek for spring Chinook and steelhead.

2. **Project Purpose**

A. **State the project goal(s).**

Goal:

Restore natural channel and floodplain processes such as stream channel function and floodplain interaction/inundation in lower Skinney Creek to improve spawning and rearing habitat for spring Chinook and steelhead.

B. **List the project's objectives.**

Quantified objectives such as number and depth of pools and number of redds per reach will be developed as part of the preliminary project design.

Pre-design Objectives include:

- Remove 2,000 linear feet of levee adjacent to Skinney Creek.
- Re-construct >2,000 linear feet of Skinney Creek
- Construct a new valley with 7-10 acres of floodplain/floodprone area and associated riparian habitat.
- Improve 0.5 mile of juvenile and adult rearing and migratory habitat for spring Chinook.
- Improve fish access to the upper Skinney Creek watershed which provides up to 3 miles of critical habitat for steelhead.
- Create 0.5 mile of steelhead spawning habitat
- ~~-~~Increasing the number of pools in this reach

3. Project Context

A. **Describe the location of the project in the watershed**,

The Skinney Creek floodplain restoration project is located approximately 9 miles northwest of Leavenworth, WA on Highway 2 (Figure 1). The site is managed by the US Forest Service (25 North 17 E Section 4 Tax lot 000050 and Longitude 47 41' 36" N and Latitude 120 44' 27" W upstream end).

Skinney Creek is a 6,925 acre watershed area located in the Upper Wenatchee watershed. Skinney Creek is a perennial stream that flows into Chiwaukum Creek which is a tributary to the Wenatchee River. Over half of the watershed is USFS management and the remainder is primarily private timberlands. USGS operated a gage on Skinney Creek from 1954 – 1973 and the average peak flow measured was 31 cfs and the maximum peak flow recorded was 75 cfs. WSDOT modeling indicates that the 2 year event on Skinney Creek is 98 cfs and the 100 year event is 313 cfs (WSDOT 2009). Low flows range from 1-3 cfs in late summer (USFS 1999). Stream gradient within the project area ranges from 0.6% at the upstream end to 3% near the confluence; See Table 1 below which divides the project area into three areas to calculate the stream gradient using elevations and distances from the WSDOT plans (attached).

Table 1. Calculation of Stream Gradient within the project area

Area		Upstream	Downstream	Change	Gradient
Upstream	Elevation	1810.21	1807.66	2.55	0.57%
	Station	4423.77	4872.59	448.82	
Channelized	Elevation	1807.66	1771.4	36.26	2.05%
	Station	4872.59	6640	1767.41	
Confluence	Elevation	1771.4	1752.3	19.1	3.38%
	Station	6640	7204.36	564.36	

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This project will occur in the mainstem of Skinney Creek starting approximately 600 feet upstream of the confluence with the Chiwaukum. Floodplain restoration will extend approximately 2,000 linear feet upstream and ending near the new entrance to Wenatchee River Road and the Hwy 2 crossing over Skinney Creek.

B. List the fish resources present at the site and targeted by this project.

Figures 2 (updated) and 3 depict nearby spawning and distribution of spring Chinook and steelhead. Skinney Creek is known to support steelhead spawning and rearing based on spawning surveys and Forest Service stream surveys (ISEMP 2006 and 2007; USFS 1999). It was one of only two small tributaries where steelhead spawning was found to occur in the Wenatchee subbasin during random ISEMP spawning surveys.

A May 6, 2014 survey by USFS staff Cindy Raekes documented 7 steelhead (4 with adipose fins) in Skinney Creek and 3 redds. This was a quick one day survey that started at the mouth of Chiwaukum Creek and continued up Skinney Creek to the box culvert near the entrance to River road. The three spawning redds found appeared to be in areas where spawning gravel was recently placed; namely in the box culvert and in two areas in the downstream portion of the WSDOT re-construction area. This project design would incorporate more areas of appropriate sized spawning gravel that are currently lacking in this reach.

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Skinney Creek is in a unique location just upstream from Tumwater Canyon and the confluence of Chiwaukum Creek and the mainstem Wenatchee. PTAGIS data indicates ~~large numbers of steelhead are entering Chiwaukum Creek (see attached). Since fall 2013,~~ 25 adult tagged steelhead have entered Chiwaukum Creek between fall 2013-April 2014 which indicates a run number of approximately ~~X~~ 250-325 steelhead entering Chiwaukum Creek ~~(# included in final proposal)~~. Because of the proximity of Skinney Creek to the Chiwaukum-Wenatchee confluence, it is likely a key area for juvenile refuge and rearing and could be a unique spawning area. It is the only tributary to Chiwaukum Creek known to support anadromous fish (USFS 1999).

This project will create 0.5 mile of steelhead spawning habitat. It will also improve migratory and rearing habitat for spring Chinook and steelhead. By improving the migratory corridor for adult steelhead, this will also provide improved access to existing steelhead spawning habitat in upper Skinney Creek.

Species	Life History Present	Current Population Trend	ESA (Y/N)	Life History Target
Spring Chinook	juvenile	Stable to declining	Y	juvenile, adult
steelhead	Egg, juvenile, adult	Stable	Y	Egg, juvenile, adult
Bull Trout	Potentially migratory juveniles	Stable	Y	Juvenile

C. Discuss how this project fits within your regional recovery plan and local lead entity's strategy to restore or protect salmonid habitat in the watershed

This project was identified as a recommended habitat action in the Wenatchee Watershed Management Plan (WRIA 45 Planning Unit 2006). Specifically, Chiwaukum action # H-1 describes a need to "increase connectivity along Skinney Creek."

Priority Area
Lower Skinney Creek (RM 0-1.3) is considered a tertiary sub-watershed within the mainstem Upper Wenatchee Assessment unit (UCRTT 2013 Appendix E p. 21). When compared to all of the assessment units in the Wenatchee basin, the Upper Wenatchee Assessment unit is the number 2 priority area for restoration actions in the Wenatchee basin (Table 7 page 25 Biological Strategy 2013).

Priority Action
Improving channel structure and form and providing peripheral and transitional habitat are the number one and two priority ecological concerns to be addressed within the mainstem Upper Wenatchee assessment unit. Consistent with Table 5 in the Biological Strategy (UCRTT 2013), this project will implement Tier 1 actions to improve channel structure and form such as, levee removal to improve bed and channel form and installing structures to capture large wood.

This project will also implement a Tier 1 action to remove the levee to restore the connection between Skinney Creek and floodplain (peripheral and transitional) habitat. Note: the Biological Strategy recommended action is for side channel and wetland (peripheral and transitional) habitat. That said, given the Skinney Creek channel size and form, reconnecting wetland, side channel, and/or floodplain peripheral and transitional habitat in Skinney Creek may provide similar geomorphic, hydrologic, and fish use benefits.

Target priority fish species
This project primarily targets improved spawning and rearing habitat for steelhead, however, lower Skinney Creek is also used by spring Chinook.

D. Explain why it is important to do this project now instead of at a later date.

In 2013, WSDOT re-located Hwy 2 which involved replacing the bridge over Chiwaukum creek and restoring the historic confluence between Skinney Creek and Chiwaukum Creek (Photo 3). As part of this project, they also re-aligned the lower 570 linear feet of stream channel and further upstream, they re-aligned another 500' of Skinney Creek adjacent to the new Hwy crossing and intersection with Wenatchee River road. In between these two work areas in Skinney Creek, WSDOT removed the asphalt from the old Hwy bed. The old Hwy bed was the former Skinney Creek floodplain prior to railroad and Hwy 2 construction in the early 1900's. This project aims to restore Skinney Creek to its historic floodplain which may result in some changes in the recent WSDOT work areas within Skinney Creek. It would be best to do this work now before these recent work areas have mature vegetation re-established. USFS tried to seek funds

in previous years to time this restoration at the same time as WSDOT, however the restoration project was not funded at that time (see Section 3E below).

E. If any part or phase of this project has previously been reviewed or funded by the SRFB, please fill in the table below.

Project # or Name	Status	Status of Prior Phase Deliverables and Relationship to Current Proposal?
2010-1811	Not Funded	See description below
2012-1616	Not Funded	See description below

In 2010, CCNRD partnered with USFS to apply for restoration design funds for this same section of Skinney Creek (PRISM # 10-1811). CCNRD did not submit a final proposal for this project because USFS was still negotiating mitigation actions with WSDOT and the outcomes were anticipated to change proposed actions in Skinney Creek. In 2012, CCNRD partnered with USFS to apply for restoration design funds for this same section of Skinney Creek (PRISM # 12-1616). The project was not funded because it was deemed out of sequence; see 2012 RTT comments below:

The RTT has concerns regarding the DOT design. The DOT design could essentially reset the environmental baseline; therefore, there are concerns that the design produced under this proposal would need major revisions after the DOT project is completed. Therefore, the RTT suggested that this project could be out of sequence because of the timing of the DOT project. This project should be re-evaluated once the DOT project ic completed.

The DOT Hwy re-location and work within Skinney Creek is now completed. See the project overview in Figure 1, the as-built Sheets 55 and 57 of the WSDOT plans (attached), and Photos 2-4.

4. Project Description

A. **Provide a detailed description of the proposed project and how it will address the problem described above**.

The lower 2,000 feet of Skinney Creek is narrow and confined between two remnant berms or levees (Photo 1). This project proposes to re-construct the stream channel into it's former floodplain area which is visible in Photos 2 and 4. WSDOT has already restored the lower 570' and the confluence of Skinney Creek and Chiwaukum Creek (Photos 3-4 and Sheet 57). This project will design the floodplain restoration for ~2,000 linear feet of channel. Restoration design will start just upstream from the confluence and continue up to the Skinney Creek crossing under Hwy 2 near the intersection with Wenatchee River Road.

USFS staff will use existing WSDOT site survey plus they will conduct site surveys to verify as-built elevations. USFS staff will review hydrologic and hydraulic modeling and use them to model proposed conditions to evaluate design alternatives. USFS will develop a restoration plan that describes existing and desired conditions, generates restoration goals and objectives, and evaluates alternative methods for restoration. USFS will then document modeling, design criteria, and design methods in a preliminary design report. Conceptual

designs will be presented to stakeholders including the Wenatchee Habitat Subcommittee. All stakeholder review will be documented and included in the preliminary design report. Preliminary designs will be prepared in AutoCad and meet the criteria outlined in Appendix D of Manual 18. The preliminary design report will also describe the proposed design and the biological benefit.

Part of the project design will be to survey existing reference reaches with similar reach characteristics and use that information to guide project design. Information from the reference reach surveys will be used to establish target depths, velocity, low flow channel width, anticipated floodplain width, and stream sinuosity appropriate for stream channel flows and floodplain function in lower Skinney Creek.

Project development will also include soil sampling and testing within the historic BNSF prism to document conditions as part of a Phase 1 Environmental Assessment.

Project design will also include plans for re-vegetation of the entire historic road bed to minimize sediment deposition into Skinney Creek.

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This floodplain reconnection project will address the limiting factors of riparian condition, large woody material, and channel entrenchment as identified in Andonaegui (2001). The restored channel and floodplain will lead to increased migration, refuge, spawning and rearing habitat, improved floodplain and channel structure and function, and restoration of natural channel processes in 0.5 mile of lower Skinney Creek. The completion of this channel reconstruction project should lead to improved salmonid abundance and productivity for multiple ESA-listed species. Depending upon the design, it is estimated that this project will lead to reconnection of 7-10 acres of floodplain to Skinney Creek and up to 0.5 mile of restored critical habitat for spring Chinook and steelhead.

B. **Clearly list and describe all products that will be produced (i.e., project deliverables).**

As described above, this design project will result in the following deliverables consistent with Appendix D of Manual 18:

- Restoration Plan with the following elements:
  - Description of site conditions and salmon recovery context
  - Biologically-based goals and objectives
  - Evaluation of design alternatives
- Stakeholder comments on restoration plan and conceptual design alternatives
- Description of design considerations and preliminary analysis
- Description of permits needed, process, and preliminary regulatory feedback
- Preliminary design drawings (in AutoCad and meeting standards in Manual 18)
- Construction quantities and cost estimates for the proposed alternative.

C. **If the project will occur in phases or is part of a larger recovery strategy, describe the goal of the overall strategy, explain individual sequencing steps and which steps are included in this application.**

The overall goal of restoration actions in Skinney Creek is to provide fish passage and access to up to 3 miles of steelhead rearing and spawning habitat. This proposal will fund Phase 3 of a multi-year project implemented by the County, USFS, and WSDOT. All project phases are described below:

Phase 1 - Fish Barrier Removal

In 2006, CCNRD removed a fish passage barrier at RM 1.5 on Skinney Creek. WSDOT has also removed 3 fish passage barriers above RM 2 on Skinney Creek. In 2013, WSDOT removed the last remaining fish passage barrier in Skinney Creek at USFS Road 7908, or Chiwaukum Creek Road. We were standing on this fish passage barrier during the June 2012 SRFB project tour and the location is depicted on Figure 1. There are no additional fish passage barriers on Skinney Creek that need to be addressed.

Phase 2 – Skinney Creek confluence restoration

WSDOT replaced the Highway 2 bridge over Chiwakum Creek as part of the Tumwater bridge replacement project which also re-aligns a section of the highway (Figure 1). WSDOT mitigation actions included re-alignment of the lower 570 feet of Skinney Creek into the location of the original confluence with Chiwaukum creek (Sheet 57 and Photo 3).

Phase 3 - USFS Levee Removal and Floodplain Reconnection

CCNRD and USFS are seeking funding to design the lower Skinney Creek floodplain reconnection. CCNRD will work with USFS staff and consulting engineers to design the 2,000 feet levee removal and stream restoration.

This floodplain reconnection project is the final step in restoration of lower Skinney Creek. Once Phase 3 is completed, fish will have un-impeded access to the upper Skinney Creek watershed and up to 3 miles of critical habitat for steelhead.

D. If your proposal includes an assessment or inventory (NOTE: project may extend across a wide area and cover multiple properties): N/A

E. If your proposal includes developing a design:

i. **Will the project design be developed by a licensed professional engineer?**

The project will ~~not~~ be designed by a licensed professional engineer, however, the following USFS staff ~~and sub-contracted consultants~~ will provide design and design oversight:

~~**Greg Kuyumjian** is a retired Forest Hydrologist from the Okanogan-Wenatchee National Forest. Greg has over 30 years of experience in stream restoration design and forest hydrology. Greg received his B.S. at the University of Connecticut in 1977. Greg will be sub-contracted as the lead for stream restoration project design.~~

Richard Vacirca has been a Fisheries Biologist with the US Forest Service for 16 years. During his career he has been a project leader and part of various stream channel and floodplain design teams in the Western US. Restoration projects for which he has been a part of include: channel reconstruction through meadow ecosystems and in other valley types, channel realignment and floodplain restoration where roads have adversely interacted with streams during floods, designing and building new stream channels for aquatic organism passage projects, and other aquatic habitat enhancement. In addition, Richard has managed large aquatic monitoring programs which has included aquatic habitat and other hydrologic and geomorphic assessment. He is currently the Forest Fisheries Program Leader for the Okanogan-Wenatchee National Forest in Wenatchee, WA.

Matt Karrer is the acting Forest Hydrologist with the Okanogan-Wenatchee National Forest and the Wenatchee River Ranger District Hydrologist. Matt has over 20 years of experience in all aspects of forest hydrology. Matt received his B.S. from the Ohio State University in 1990.

Cindy Raekes has been a Fisheries Technician with the Forest Service for 20 years, with experience in stream/riparian inventory and monitoring, and small restoration project management. Cindy has an A.A.S. in Forestry and is currently enrolled in the fisheries science program at Oregon State University.

ii. **For final design projects, if you do not intend to apply for permits as part of this project's scope of work, please explain why and when permit applications will be submitted.**

iii. **Has Washington Department of Natural Resources confirmed that your project is or is not on state-owned aquatic lands?** *N/A*

F. If your proposal includes a fish passage or screening design: N/A

G. Describe other approaches and design alternatives that were considered to achieve the project's objectives and why the proposed alternative was selected.

~~The 2012 pre-proposal was to design the levee removal project with full stream restoration and floodplain reconnection. However, based upon stakeholder feedback during the project tour, the 2012 final proposal outlined the development of three alternatives to ensure that there is a cost effective design that maximizes biological benefit:~~Figure 4 attached depicts the three design concepts that will be evaluated as part of this proposal.

1. North l~~L~~evee removal only.
2. North l~~L~~evee removal and partial restoration of the stream channel with the historic floodplain (e.g. extended floodplain bench, grade control in the existing Skinney Creek).
3. Levee removal and full reconstruction of a stream channel within the historic

floodplain.

This restoration design will evaluate the alternatives listed above as part of the development of a restoration plan. There will be opportunity for stakeholder review and feedback on selection of the preferred alternative through the WHSC and the NEPA process.

Option 1 would remove the anthropogenic influence of the north levee without stream channel or floodplain re-construction. This restoration option would be the least expensive and it would allow Skinney Creek to re-establish floodplain reconnection through natural stream channel processes (coupled with floodplain re-vegetation).

Option 2 would remove the north levee and construct an inset floodplain. This may provide the best balance between minimizing short term riparian impacts and providing long term restoration of floodplain connection functions. Option 2 would leave the south bank of the stream with intact existing riparian to provide interim stream shading while the riparian vegetation on the north side is restored. Any trees removed from the north levee would remain on site and be incorporated into the restoration project. Option 2 would be much less expensive that Option 3. Options 1 and 2 aim to maintain existing habitat features such as mature trees in the riparian area along the south levee and existing instream features.

Option 3 would maximize floodplain re-connection through stream channel re-location. While this option may be too expensive to pursue given the biological gain, a rough analysis will be explored to estimate the cost benefit prior to selection of the preferred alternative.

H. Describe your experience managing this type of project.

CCNRD has managed project design for small and large restoration projects within the Wenatchee Watershed. CCNRD will assist USFS with stakeholder coordination with WSDOT and the WHSC. CCNRD will also ensure that design deliverables meet Manual 18 requirements and that design alternatives maximize biological benefit at a reasonable cost. USFS staff have extensive experience managing this type of project. As noted above, they have designed and implemented many similar restoration projects over the past several decades.

I. Explain how the project's cost estimates were determined.

The design cost estimate for the final~~is pre~~ proposal ~~assumes that the USFS Restoration Team is able to provide site survey as matching costs in 2014. It also assumes that retired USFS hydrologist Greg Kuyumjian is able to provide design as a sub-contracted consultant. These assumptions need to further evaluated in May and any changes in project design cost will be reflected in the final proposal.~~is based upon an engineering design consultant cost estimate based upon their experience with the number of hours it takes for each task to meet the deliverables outlined in SRFB Manual 18 Appendix D.

The cost estimate is attached at the end of this proposal. A more detailed cost estimate with the number of hours per task and rates will be provided with the final proposal.

J. List Project Partners and their role and contribution to the project.

The USFS signed landowner agreement documents their partner contribution to this project

K.J. **List all landowner names***)*

USFS is the landowner within the proposed project area. The signed landowner acknowledgement form is attached to this proposal.

L.K. Contingency Planning: State any constraints, uncertainties, possible problems, delays, or additional 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 most cost effective way to complete the engineering design is to use the USFS Restoration Team for survey, Greg Kuyumijan to design the project, and USFS staff time as design oversight. However, this staffing needs to be further evaluated and if projectthe current cost proposal assumes that design will be sub-contracted to an engineering design firm, then that change will be reflected in the final proposal.. CCNRD will work with USFS staff and the engineering design consultant to ensure that project design stays on schedule and design deliverables are met. If needed, certain tasks could be sub-contracted to minimize costs and keep the project on schedule.

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

Item/Milestone	Outcome	Target Date (Month/Year)
WSDOT Asphalt removal from the floodplain and restoration of the confluence with Skinney Creek		Completed 2013
Survey and existing conditions modeling	Survey data	December 2014
Field data collection to support design such as development of channel profile, cross sections, bed material classification, sub-surface soil sampling, riparian vegetation classification, etc	Existing conditions documentation	October 2015
Develop restoration plan, WHSC review and selection of alternative	Recommended Conceptual Alternative	Spring 2016

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Preliminary (60% or permit ready) design	Preliminary Design	September 2016
NEPA and permitting*	Authorizations	Spring 2017
Construction*	Floodplain connection	Summer-Fall 2017

*Future phases not funded by this proposal

2014 Cost Estimate

Item	Trib. Fund Request	SRFB Request	Match	Total
Preliminary surveys of existing conditions (USFS Restoration Team)	-	-	$10,000	$10,000
Develop conceptual alternative designs, hydrologic and hydraulic modeling of proposed designs, develop construction cost estimates, stakeholder review and selection of proposed alternative (through WHSC), 60% stream restoration design (permit ready plans and design report) (USFS design oversight plus	$16,000	$56,000	-	$72,000

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~~consultant)~~				
~~CCNRD stakeholder coordination, contracting, project management, and project administration~~	~~$4,000~~	~~$4,000~~	~~-~~	~~$8,000~~
~~Total project cost~~	~~$20,000~~	~~$60,000~~	~~$10,000~~	~~$90,000~~

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References:

Andonaegui, C. 2001. Salmon, Steelhead and Bull Trout Habitat Limiting Factors for the Wenatchee Subbasin (WRIA 45) and Portions of WRIA 40 within Chelan County (Squilchuck, Stemilt and Colockum Drainages). Washington State Conservation Commission.

ISEMP. 2006. Annual Report of the Integrated Status and Effectiveness Monitoring Program: Fiscal Year 2007. Prepared by Terraqua, Inc. and funded for and by Bonneville Power Administration's Integrated Status and Effectiveness Monitoring Program. April 2008.

ISEMP. 2007. Annual Report of the Integrated Status and Effectiveness Monitoring Program: Fiscal Year 2008. Prepared by Terraqua, Inc. and funded for and by Bonneville Power Administration's Integrated Status and Effectiveness Monitoring Program. April 2009.

UCRTT. 2013. A Biological Strategy to Protect and Restore Salmonid Habitat in the Upper Columbia Region

UCSRB 2007. Upper Columbia Salmon Recovery Board's Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan. Available online http://www.ucsrb.com/plan.asp

USFS. 1999. Upper Wenatchee Watershed Assessment. USDA Forest Service. Wenatchee River Ranger District. Leavenworth, WA.

WRIA 45 Planning Unit (2006). Wenatchee Watershed Management Plan.

WSDOT 2009. Site and Reach Assessment Skinney Creek at US 2.

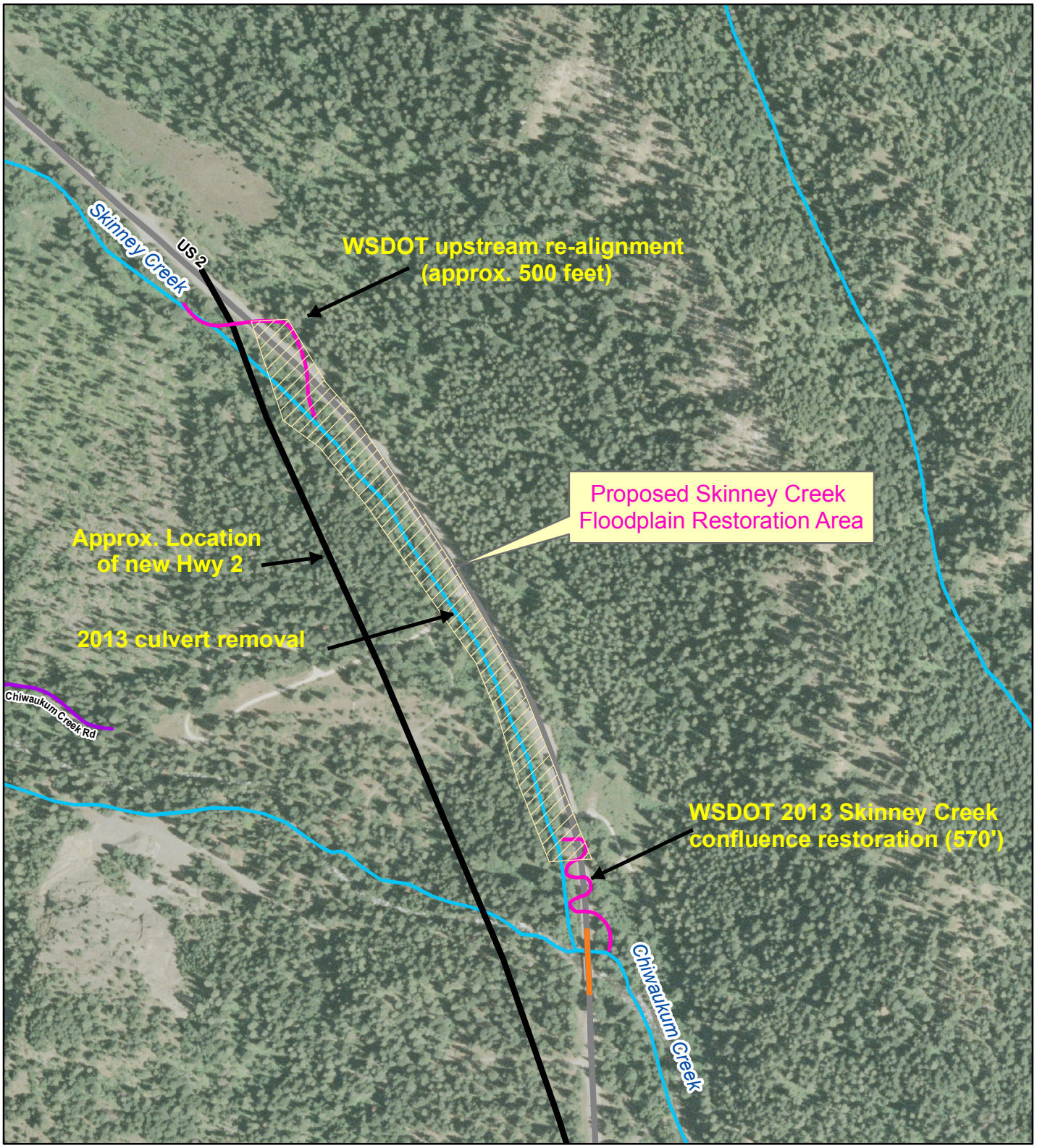
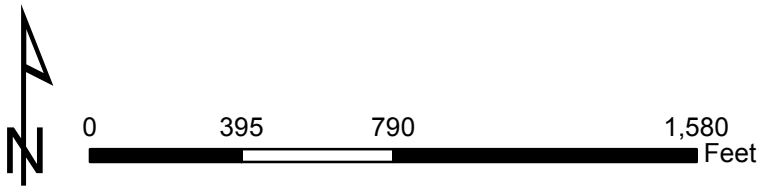


Figure 1: Project Area Overview on 2006 aerial photograph



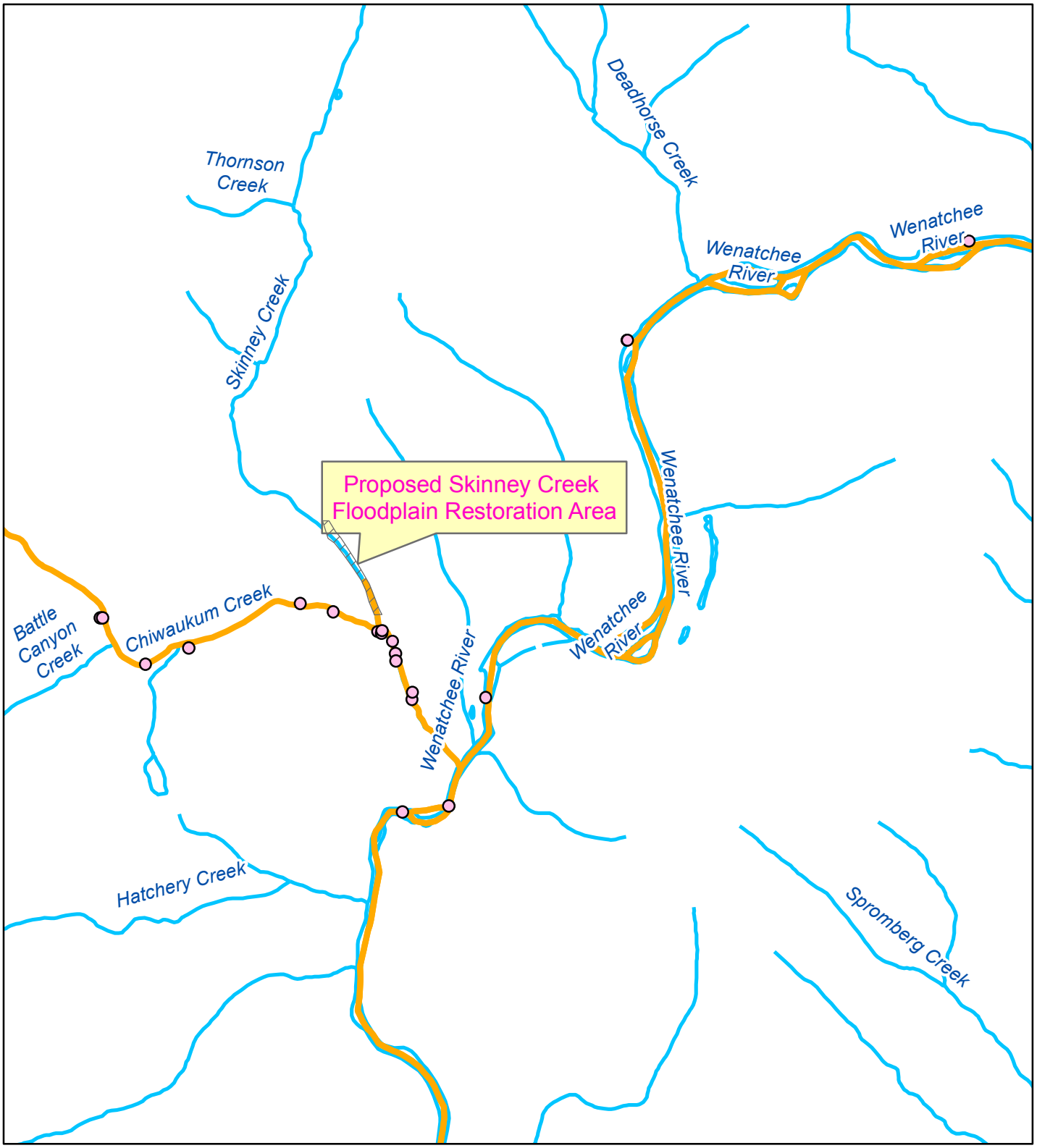


Figure 2: Spring Chinook Distribution and Spawning Redds (2003-2012)
Data source UCSRB GIS shapefiles downloaded June 2013

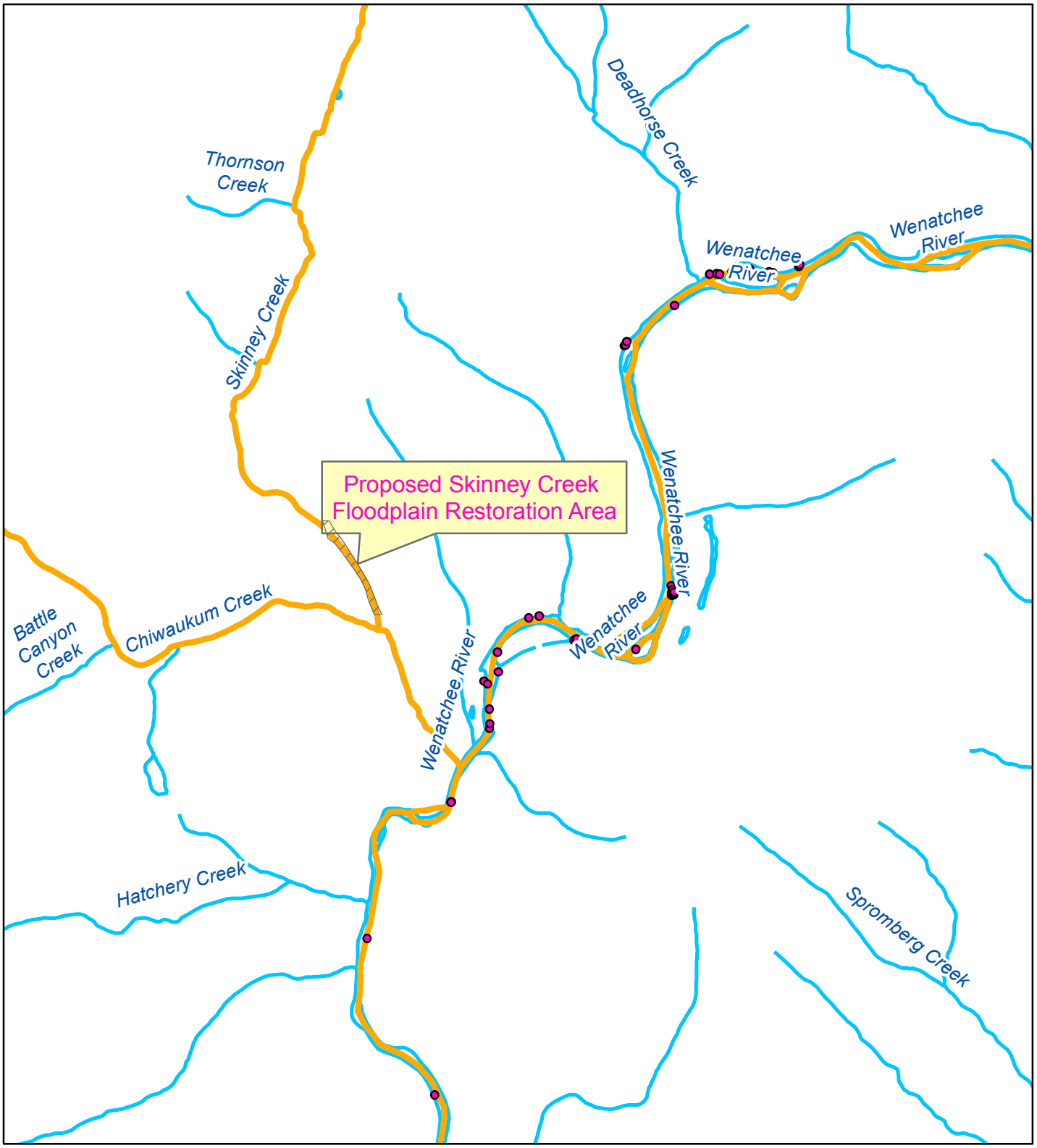


Figure 3: Steelhead Distribution and Spawning Redds (2005-2012)
Data source UCSRB web site GIS files downloaded June 2013;
need to verify lack of redds in tributaries in this data source

Legend

- Steelhead Redds
- Steelhead Distribution

N

0 2,250 4,500 9,000 Feet

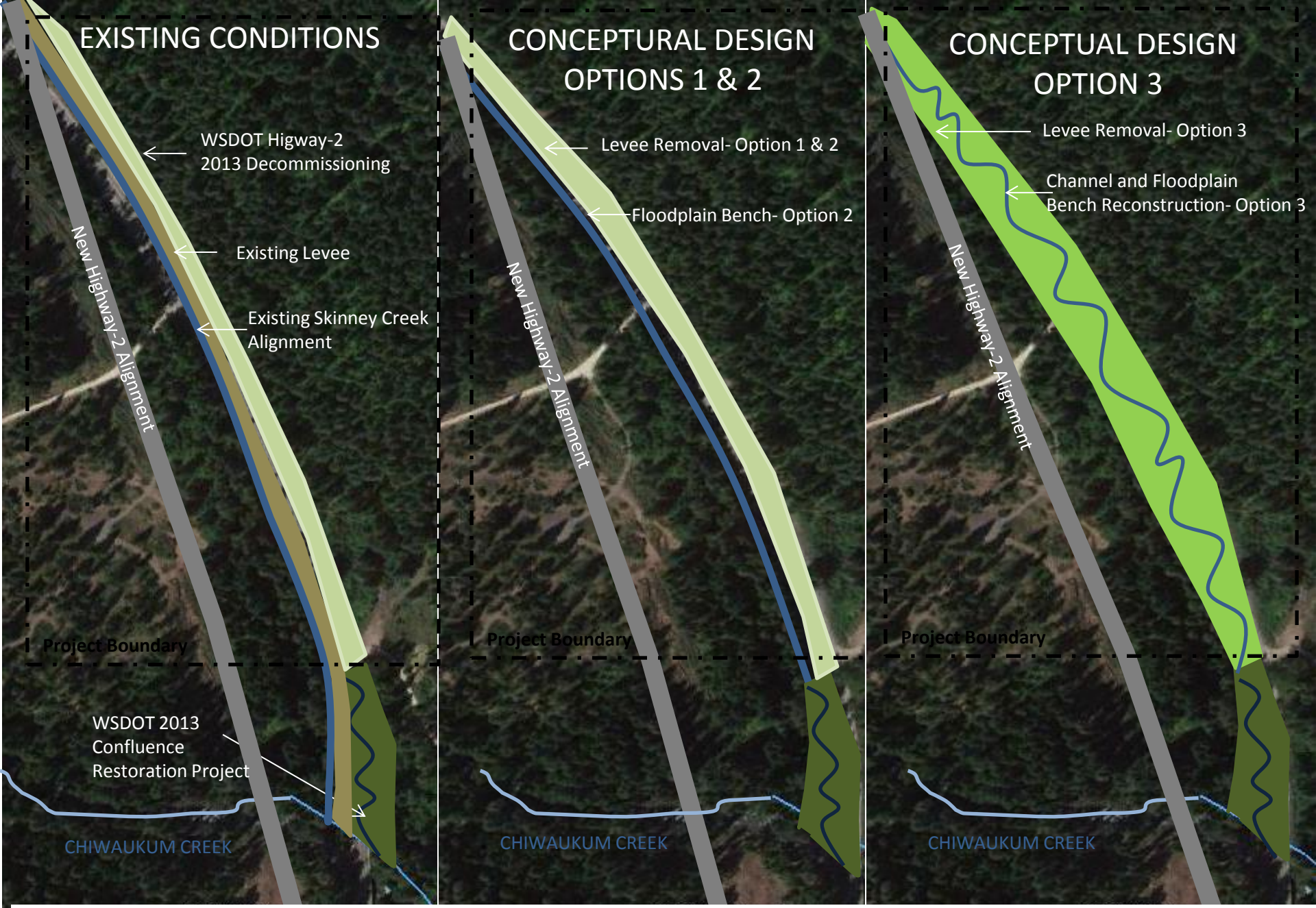


Figure 4: Existing Conditions and Three Conceptual Design Options

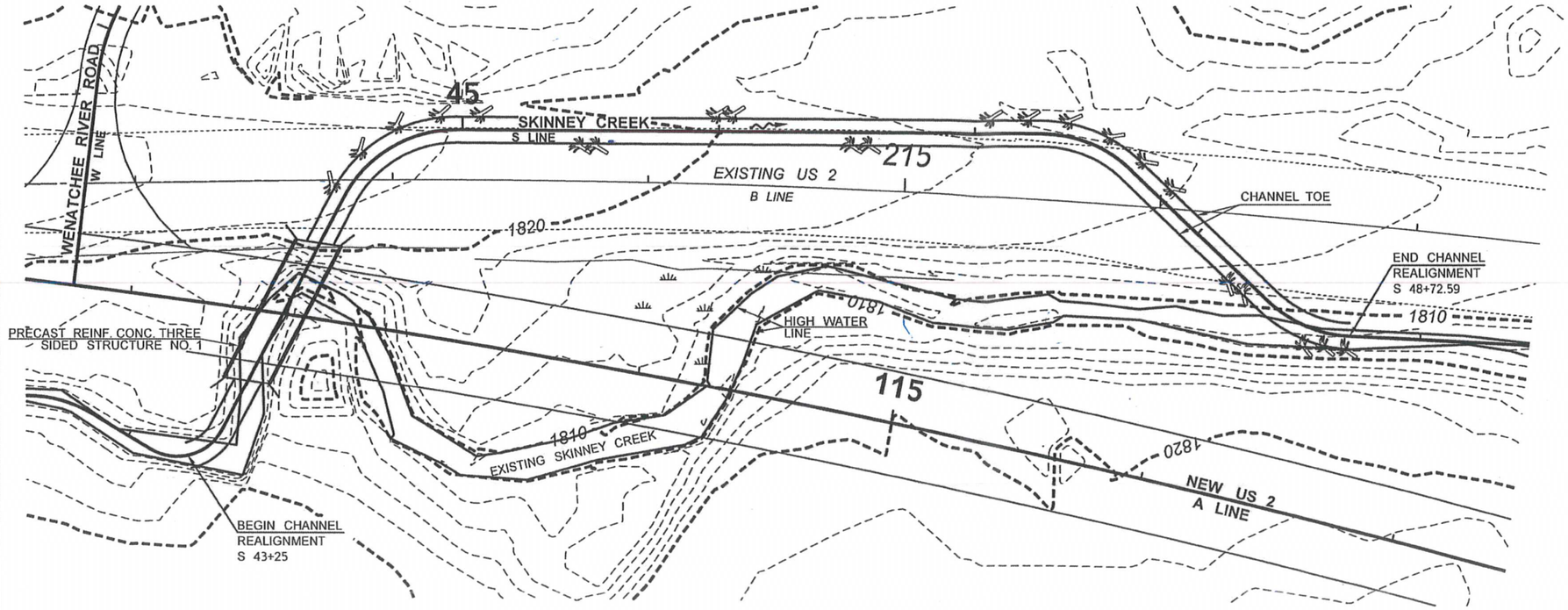
Photo 1: Existing conditions in Skinney Creek. Note the channel confinement and lack of floodplain area.

Photo 2: Existing conditions in Skinney Creek. Note the channel confinement. This photo depicts the Chiwaukum road culvert removal area. In the top of the photo is the historic Skinney Creek floodplain (the old Hwy 2 alignment). This project will remove floodplain fill and re-align Skinney Creek back into the historic floodplain area.

Photo 3: Skinney Creek confluence with Chiwaukum Creek, April 2014.

Note the historic Skinney Creek floodplain area depicted in the top end of this photo (former Hwy 2 alignment). The remainder of the channel will be re-constructed into this area.

Photo 4: WSDOT re-alignment of Skinney Creek.

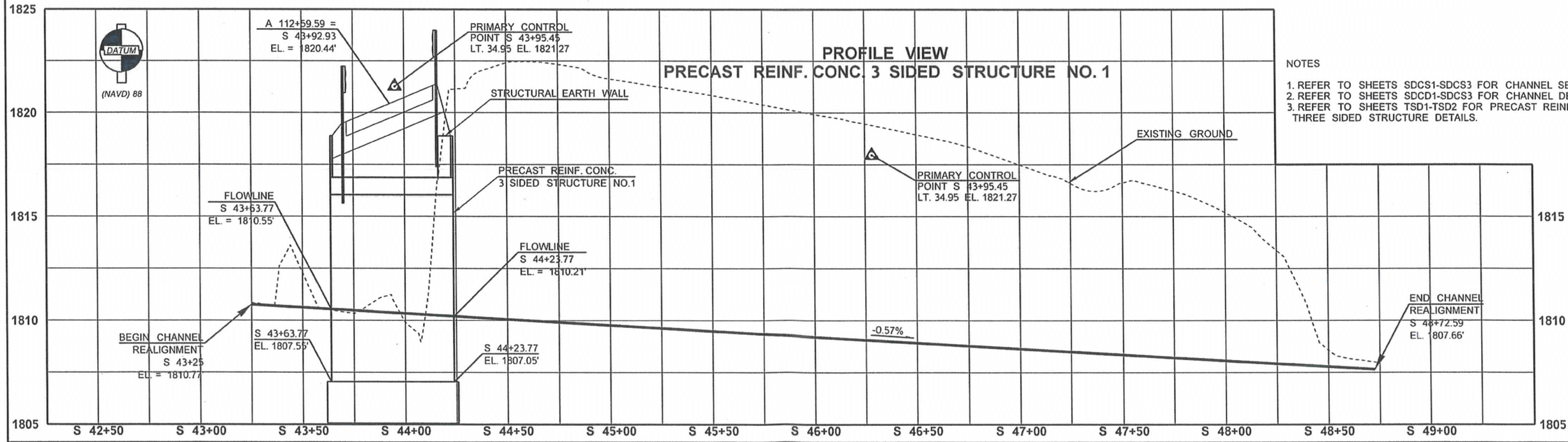


PLAN VIEW
PRECAST REINF. CONC.
THREE SIDED STRUCTURE NO. 1

0 25 50
SCALE IN FEET

LEGEND

- ALIGNMENT (NEW)
- EXISTING ALIGNMENT
- EXISTING EDGE OF PAVEMENT
- EDGE OF PAVEMENT (NEW)
- EXISTING WETLANDS
- ROOT WAD (NEW)



PROFILE VIEW
PRECAST REINF. CONC. 3 SIDED STRUCTURE NO. 1

NOTES

1. REFER TO SHEETS SDCS1-SDCS3 FOR CHANNEL SECTIONS.
2. REFER TO SHEETS SDCD1-SDCS3 FOR CHANNEL DETAILS.
3. REFER TO SHEETS TSD1-TSD2 FOR PRECAST REINF. CONC. THREE SIDED STRUCTURE DETAILS.

FILE NAME	G:\Engineering\PE305\PROJECTS\US 2\US 2 Tumwater Canyon Bridge Replacements\C8139\As Builts\CADD\XL2793_PS_SKINNEY_CREEK.dgn
TIME	8:30:02 AM
DATE	3/18/2014
PLOTTED BY	RoyM
DESIGNED BY	S. HONEYCUTT
ENTERED BY	M. ROY
CHECKED BY	S. HONEYCUTT
PROJ. ENGR.	R. ROMINE
REGIONAL ADM.	D. SARLES

REVISION | DATE | BY

REGION NO. 10 | STATE WASH | FED.AID PROJ.NO.

JOB NUMBER 11B015

CONTRACT NO. | LOCATION NO. XL2793

ROBERT T. ROMINE STATE OF WASHINGTON 30332 REGISTERED PROFESSIONAL ENGINEER

DATE

P.E. STAMP BOX

DATE

P.E. STAMP BOX

Washington State Department of Transportation

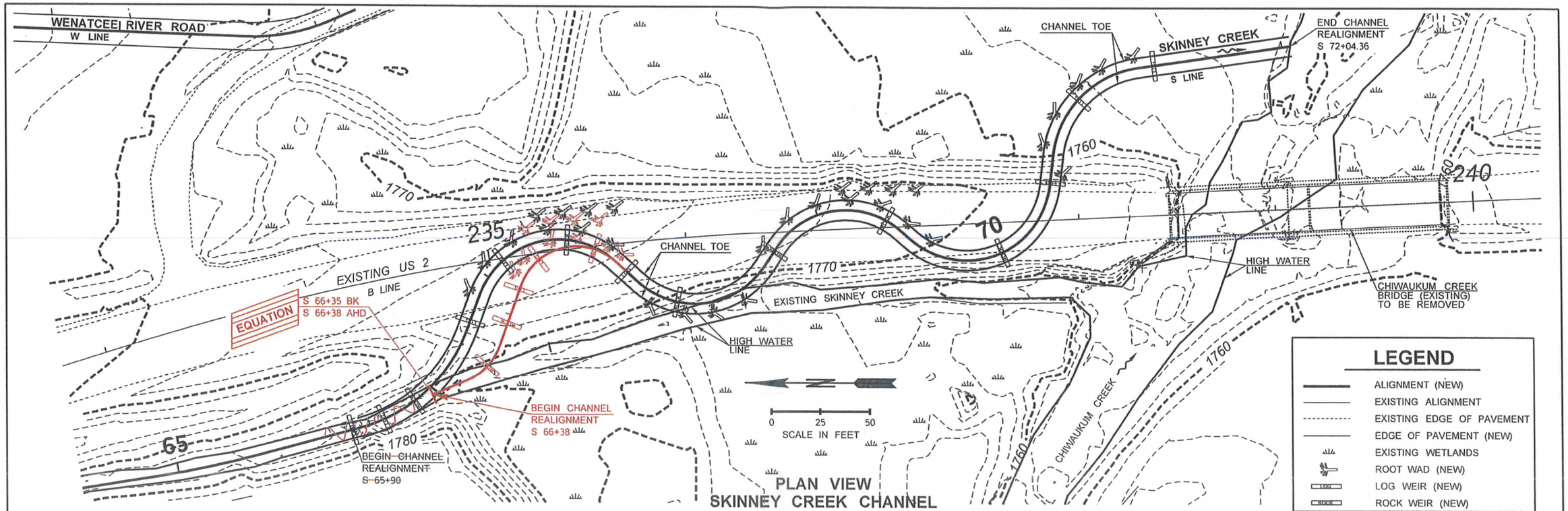
US 2
TUMWATER CANYON
BRIDGE REPLACEMENTS

SKINNEY CREEK PLAN AND PROFILE

Plot 2

PLAN REF NO SCP1

SHEET 55 OF 228 SHEETS



NOTES

1. REFER TO SHEETS SDCS1-3 FOR CHANNEL SECTIONS.
2. REFER TO SHEETS SDCD1-3 FOR CHANNEL DETAILS.

FILE NAME	G:\Engineering\PE305\PROJECTS\US 2\US 2 Tumwater Canyon Bridge Replacements\C8139\As Builts\CADD\XL2793_PS_SKINNEY_CREEK.dgn
TIME	8:30:24 AM
DATE	3/18/2014
PLOTTED BY	RoyM
DESIGNED BY	S. HONEYCUTT
ENTERED BY	M. ROY
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PROJ. ENGR.	R. ROMINE
REGIONAL ADM.	D. SARLES

REVISION | DATE | BY

REGION NO. 10 | STATE WASH
JOB NUMBER 11B015
CONTRACT NO.
FED.AID PROJ.NO.
LOCATION NO. XL2793

ROBERT T. ROMINE STATE OF WASHINGTON 30322 REGISTERED PROFESSIONAL ENGINEER
DATE
P.E. STAMP BOX

DATE
P.E. STAMP BOX

Washington State Department of Transportation

US 2
TUMWATER CANYON
BRIDGE REPLACEMENTS

SKINNEY CREEK PLAN AND PROFILE

Plot 4
PLAN REF NO SCP3
SHEET 57 OF 228 SHEETS

Appendix F: Landowner Acknowledgement Form

Landowner Information

Name of Landowner: US Forest Service
Landowner Contact Information:
☒ Mr. ☐ Ms. Title: District Ranger
First Name: Jeff Last Name: Rivera
Contact Mailing Address: 600 Sherbourne, Leavenworth, WA 98826
Contact E-Mail Address: jrivera02@fs.fed.us

Property Address or Location:
Skinney Creek Legal Description 25 North 17 E Section 4 Tax lot 000050

1. US Forest Service (Landowner or Organization) is the legal owner of property described in this grant application.
2. I am aware that the project is being proposed on my property.
3. If the grant is successfully awarded, I will be contacted and asked to engage in negotiations.
4. My signature does not represent authorization of project implementation.
5. If I am affiliated with the project sponsor, I will recuse myself from decisions made by the project sponsor to work on or purchase my property.

Landowner Signature

30APR14
Date

Project Sponsor Information

Project Name: Skinney Creek Floodplain Restoration
Project Applicant Contact Information:
☐ Mr. ☒ Ms. Title: Natural Resource Specialist, Chelan County Natural Resources Dept.

First Name: Jennifer Last Name: Goodridge Hadersberger
Mailing Address: 316 Washington St, Suite 401, Wenatchee, WA 98826
E-Mail Address: Jennifer.goodridge@co.chelan.wa.us

Chiwaukum PTAGIS Data – Exciting!!! Real!!! Recent!!!

Tag Code	Mark File Name	Site Name	First Time Value	Last Time Value	First Antenna Group Name	Last Antenna Group Name	Release Date MMDDYYYY	Species Code	Species Name	Run Code	Run Name	ear	Type Co	Rear Type Name	Release Site Name	Count
3D9.1BF197DF51	CFM13060.TUM	CHW - Chiwaukum Creek	3/27/2014 22:22	4/19/2014 1:59	DOWNSTREAM ARRAY	DOWNSTREAM ARRAY	7/11/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	TUMFBY - TUM - Release into the Forebay within 0.5 km up	1
3D9.1BF1AC68E2	TLM13276.TUM	CHW - Chiwaukum Creek	4/25/2014 20:20	4/26/2014 21:54	DOWNSTREAM ARRAY	DOWNSTREAM ARRAY	10/4/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	TUMFBY - TUM - Release into the Forebay within 0.5 km up	1
3D9.1BF1986CB9	CFM13217.TUM	CHW - Chiwaukum Creek	4/25/2014 0:13	4/25/2014 0:14	DOWNSTREAM ARRAY	UPSTREAM ARRAY	8/23/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	TUMFBY - TUM - Release into the Forebay within 0.5 km up	1
3D9.1C2D983E7D	CEJ11256.298	CHW - Chiwaukum Creek	4/24/2014 4:02	4/24/2014 4:02	UPSTREAM ARRAY	UPSTREAM ARRAY	9/13/2011	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	CHIWAC - Chiwaukum Creek, tributary to Wenatchee River	1
3D9.1C2D0C2ADB	BGK11117.AAZ	CHW - Chiwaukum Creek	4/23/2014 22:41	4/23/2014 22:44	DOWNSTREAM ARRAY	UPSTREAM ARRAY	4/27/2011	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	CHIWAT - Chiwawa River Trap, 0.5 km below CHIP acclimati	1
3D9.1C2D96094F	WEN12242.298	CHW - Chiwaukum Creek	4/22/2014 23:54	4/22/2014 23:54	UPSTREAM ARRAY	UPSTREAM ARRAY	8/29/2012	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	CHIWAC - Chiwaukum Creek, tributary to Wenatchee River	1
3D9.1C2DF77764	TLM13276.TUM	CHW - Chiwaukum Creek	4/17/2014 7:01	4/19/2014 6:15	DOWNSTREAM ARRAY	DOWNSTREAM ARRAY	10/24/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	TUMFBY - TUM - Release into the Forebay within 0.5 km up	1
3D9.1C2DF76CCC	NBD14085.TUM	CHW - Chiwaukum Creek	4/17/2014 6:15	4/17/2014 6:16	DOWNSTREAM ARRAY	UPSTREAM ARRAY	4/3/2014	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	TUMFBY - TUM - Release into the Forebay within 0.5 km up	1
3D9.1C2DD018E5	CME11249.BKB	CHW - Chiwaukum Creek	4/16/2014 0:35	4/16/2014 12:21	DOWNSTREAM ARRAY	DOWNSTREAM ARRAY	4/10/2012	3	Steelhead	2	Summer		H	Hatchery Reared	WENATR - Wenatchee River	1
3D9.1C2DDB63E0	CMK13171.BAD	CHW - Chiwaukum Creek	4/13/2014 17:13	4/13/2014 17:13	UPSTREAM ARRAY	UPSTREAM ARRAY	6/23/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	NASONC - Nason Creek (tributary to Wenatchee River)	1
3D9.1C2DF7AAF4	TLM13189.PRD	CHW - Chiwaukum Creek	4/10/2014 0:21	4/15/2014 4:58	DOWNSTREAM ARRAY	DOWNSTREAM ARRAY	8/6/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	PRDLD1 - PRD - Release into the Left Bank (facing downstre	1
3D9.1BF197FEE7	TLM13276.TUM	CHW - Chiwaukum Creek	4/9/2014 12:59	4/23/2014 21:37	DOWNSTREAM ARRAY	UPSTREAM ARRAY	10/3/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	TUMFBY - TUM - Release into the Forebay within 0.5 km up	1
3D9.1C2D8CC93F	CMK13259.DDR	CHW - Chiwaukum Creek	4/1/2014 21:59	4/2/2014 5:05	DOWNSTREAM ARRAY	DOWNSTREAM ARRAY	9/19/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	DRYFBY - DRY - Release into the Forebay within 0.5 km upst	1
3D9.1C2D79C919	TQI13231.98M	CHW - Chiwaukum Creek	4/1/2014 15:15	4/1/2014 15:15	UPSTREAM ARRAY	DOWNSTREAM ARRAY	8/19/2013	3	Steelhead	5	Unknown		W	Wild Fish or Natural Productic	CHIWAC - Chiwaukum Creek, tributary to Wenatchee River	1
3D9.1C2DF79398	TLM13276.TUM	CHW - Chiwaukum Creek	4/1/2014 2:39	4/21/2014 23:55	DOWNSTREAM ARRAY	DOWNSTREAM ARRAY	10/13/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	TUMFBY - TUM - Release into the Forebay within 0.5 km up	1
3D9.1C2DCCBE02	CME11263.WR6	CHW - Chiwaukum Creek	3/23/2014 6:34	3/23/2014 19:56	DOWNSTREAM ARRAY	DOWNSTREAM ARRAY	5/15/2012	3	Steelhead	2	Summer		H	Hatchery Reared	WENATR - Wenatchee River	1
3D9.1C2D6F6758	TQI13231.98M	CHW - Chiwaukum Creek	3/22/2014 20:40	3/22/2014 20:41	UPSTREAM ARRAY	DOWNSTREAM ARRAY	8/19/2013	3	Steelhead	5	Unknown		W	Wild Fish or Natural Productic	CHIWAC - Chiwaukum Creek, tributary to Wenatchee River	1
3D9.1BF1987E9A	CFM13060.TUM	CHW - Chiwaukum Creek	3/14/2014 6:05	3/14/2014 6:06	DOWNSTREAM ARRAY	UPSTREAM ARRAY	7/10/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	TUMFBY - TUM - Release into the Forebay within 0.5 km up	1
3D9.1C2D6DC3EA	TQI13231.98R	CHW - Chiwaukum Creek	3/13/2014 8:19	3/13/2014 8:26	UPSTREAM ARRAY	DOWNSTREAM ARRAY	8/19/2013	3	Steelhead	5	Unknown		W	Wild Fish or Natural Productic	CHIWAC - Chiwaukum Creek, tributary to Wenatchee River	1
3D9.1C2DF7A3CB	TLM13276.TUM	CHW - Chiwaukum Creek	3/11/2014 22:41	4/17/2014 0:35	DOWNSTREAM ARRAY	UPSTREAM ARRAY	10/13/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	TUMFBY - TUM - Release into the Forebay within 0.5 km up	1
3D9.1BF19871EE	CFM13060.TUM	CHW - Chiwaukum Creek	2/14/2014 17:53	2/14/2014 17:54	DOWNSTREAM ARRAY	UPSTREAM ARRAY	7/10/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	TUMFBY - TUM - Release into the Forebay within 0.5 km up	1
3D9.1C2DD9F44B	TLM13250.AAZ	CHW - Chiwaukum Creek	9/14/2013 15:29	4/24/2014 19:13	DOWNSTREAM ARRAY	DOWNSTREAM ARRAY	9/7/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	CHIWAT - Chiwawa River Trap, 0.5 km below CHIP acclimati	1
3D9.1C2DDB2F82	TLM13253.AAZ	CHW - Chiwaukum Creek	9/13/2013 13:38	4/10/2014 2:17	DOWNSTREAM ARRAY	DOWNSTREAM ARRAY	9/10/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	CHIWAT - Chiwawa River Trap, 0.5 km below CHIP acclimati	1
3D9.1C2DF7AE2F	TLM13189.PRD	CHW - Chiwaukum Creek	9/6/2013 1:34	4/16/2014 15:33	DOWNSTREAM ARRAY	DOWNSTREAM ARRAY	8/6/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	PRDLD1 - PRD - Release into the Left Bank (facing downstre	1
3D9.1C2DD93AAA	TLM13188.AAZ	CHW - Chiwaukum Creek	8/3/2013 16:55	2/28/2014 20:38	DOWNSTREAM ARRAY	DOWNSTREAM ARRAY	7/7/2013	3	Steelhead	2	Summer		W	Wild Fish or Natural Productic	CHIWAT - Chiwawa River Trap, 0.5 km below CHIP acclimati	1
															Total	25

Fall 2013 - April 2014

25 adult tagged steelhead entering Chiwaukum Creek Fall 2013 - April 2014

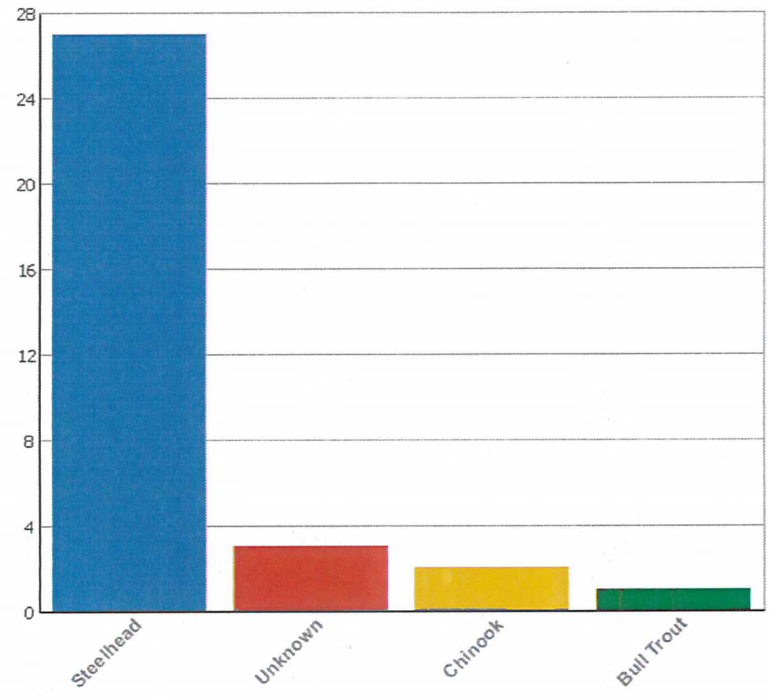
Interrogation Site Type: Instream Remote Detection System

Interrogation Site: CHW - Chiwaukum Creek

First Detected: This Calendar Y

By Species | By Verbose Species | By Mark & Rel Sites | By Sites & Dates

Species	Tags Detected
Steelhead	27
Unknown	3
Chinook	2
Bull Trout	1



All species tagged entering Chiwaukum Creek 2014

Species
- (All)
- Chinook
- Coho
- Other
- Sockeye
- Steelhead
- Unknown

Run
- (All)
- Fall
- Resident
- Spring
- Summer
- Unknown
- Winter

Rear Type
- (All)
- Hatchery
- Unknown
- Wild

Skinney Creek Restoration Design Cost Estimate

			Design Consultant		CCNRD		USFS Tech Review		Total
Project Phase Requirements			Hrs	Rate	Hrs	Rate*	Hrs	Rate	
Conceptual Design	Conceptual Design								
		Project description of site and salmon recovery context	20	160	8	50	20	50	4600
		Goals and objectives	16	160	8	50	12	50	3560
		Designs	90	160	4	50	16	50	15400
		Stakeholder comments on design alternatives	12	160	24	50	4	50	3320
		Selection of preferred alternative	12	160	12	50	16	50	3320
		Construction cost estimate for preferred alternative	12	160	5	50	8	50	2570
Preliminary Design	Preliminary Design Report								
		Introduction with goals and objectives	8	160	8	50	16	50	2480
		Characterize existing conditions	8	160	8	50	16	50	2480
		Preliminary Design Alternatives	40	160	4	50	20	50	7600
		Preferred Alternative	40	160	8	50	24	50	8000
		Design Considerations and Preliminary Analysis	60	160	4	50	20	50	10800
		Permitting and Stakeholder Consultation	10	160	24	50	4	50	3000
		Preliminary Design Drawings	120	160	4	50	12	50	20000
		Construction Quantities and cost estimates	20	160	5	50	8	50	3850
	Cultural Resources		4	100	2	50	40	50	2500
Project Management and Administration			10	65	32	50	20	50	3250
Environmental Assessment (soil sampling in BNSF prism)									10,000
								Total	**106730**

*Ave. staff rate that includes staff time plus benefits and indirect rate