Driscoll Island Cold Water Refuge - Design

12th Round Funding Cycle

June 30, 2011

Anticipated Request from Tributary Committee:	**$0**
Anticipated Request from SRFB:	**$42,500**
Anticipated Total Request:	**$42,500**
Anticipated Other Contributions/Match (Secured):	$0
Anticipated Other Contributions/Match (Pending):	$0
Anticipated TOTAL Project Budget:	$42,500

Summary of Project Changes Since the Pre-Proposal

Changes to the scope:

1. Based on initial technical feedback from the various committees we have decided to scale our project back to a data collection and a “design only” project. We are now proposing to collect sufficient data to produce a Preliminary (30%) Project Design as specified by the SRFB’s Appendix D.

Changes to the budget:

1. We have reduced our request from $607,000 ($300,000 from SRFB and $307,000 from Trib Comm), to $42,500 from the SRFB.

<u>RTT Comments as responses:</u>

- The CCT is interested in something similar to this downstream. How transferrable are the data from that project to this one?

Based on the discussion at the June 8th RTT/Tributary presentation it appears that the ground water and hydrologic information gathered on Driscoll Island will not correspond to other projects in the Okanogan Basin. There is an opportunity however to learn other design and implementation lessons to other off channel refuge project.

- Since baseflow is the targeted benefit period you need the monitoring data from late summer to early fall to understand the appropriate outcomes?

Yes, as part of our data collection effort we will be collecting this critical information beginning in 2011.

- What level of assurance do we have that cold water sources could effectively be routed all the way out to the river? Concern that there could be stranded pools.

We will have much greater certainty following the outcome of our feasibility investigation.

1. Project Overview
    A. Provide a brief summary of the project
        i. Location of the project in the watershed, including the name of the water bodies.

Driscoll Island is located one mile south of Oroville, Washington. (T39N, R27E, Sec. 3 and 4). The Island is bordered by the Okanogan River on the East and the Similkameen River on the west.

        ii. Overview of current project site conditions.

Since the arrival of Europeans, Driscoll and Eyhott Islands have been farmed and/or grazed. Prior to the Europeans, the islands were occasionally inhabited by Native Americans for camping and gathering of foods such as freshwater mussels and fish. Purchased in 1974 by WDFW, the 260-acre Driscoll Island Wildlife Area became the focal point of Canada goose management in the Oroville area. The primary objective was to provide goose nesting and foraging habitat. After purchasing Driscoll Island in 1974, WDFW continued grazing on the island to maintain short grazed grasses for Canada geese forage. Additionally farming of grains was continued to provide feed for upland game birds. Presently only farming for alfalfa and grass hay production occurs. Livestock grazing has been discontinued since 2001. Driscoll Island is managed by the Washington Department of Fish and Wildlife and is a part of the Similkameen Wildlife Unit.

        iii. Description of the proposed project and primary project objectives

The Driscoll Island project presents an opportunity to design cool water off-channel refuge for juvenile salmonids that would be available during a critical time of year when water temperatures in the mainstem Okanogan and Similkameen Rivers are not favorable to their growth and survival. High temperatures currently drive these fish to less favorable habitats, and can result in mortality. Our objective is to collect appropriate data to inform an alternatives analysis and 30% engineering design. The Driscoll Island Cold Water Refuge project proposes to address factors, such as decreased habitat refugia, loss of habitat diversity, and elevated water temperatures that have inhibited the productivity of juvenile salmon populations within the Similkameen and Okanogan Rivers.

Subsequent habitat improvements will be implemented through the following actions: 1) establish ground water sources that supply side channels and off-channel habitats, 2) develop side channels with ground water inputs to generate temperatures conducive to rearing juvenile salmon, 3) incorporate LWD into channels to provide shade, refuge, and channel complexity, and 4) establish riparian habitat to provide allochthonous inputs, bank stability, LWD recruitment, and shade. While this project does not solve the temperature issues of the Okanogan Basin, it will offer incremental improvements to critical habitat availability while Canada/US trans-boundary efforts and other in-stream flow projects are implemented throughout the basin.

B. Has any part of this project previously been reviewed or funded by the Salmon Recovery Funding Board?

No part of this proposal has been proposed or reviewed by the SRFB, however, a previous project (unrelated to ours) was submitted and withdrawn from consideration and eventually funded by the Colville Confederated Tribe. The previous project also addressed the intrusion of warm water inflows to the Similkameen River from the Okanogan River by diverting warmer outflows from Lake Osoyoos to the downstream confluence with the Similkameen, alleviating high temperatures in a several miles-long reach of the Similkameen.

2. Salmon Recovery Context

A. Describe the fish resources present at the site and targeted by this project.

Species	Life History Present (egg, juvenile, adult)	Current Population Trend (decline, stable, rising)	ESA Coverage (Y/N)	Life History Target (egg, juvenile, adult)
Summer Chinook	All	stable	N	juvenile
Steelhead	All	*rising	Y	juvenile
Sockeye	All	rising	N	juvenile

*State of Salmon in Watersheds – GSRO 2010

The current population trend for Upper Columbia spring Chinook and steelhead remains at high risk for viable salmonid parameters such as abundance, productivity, and diversity measures (UCRTT and Terraqua 2010). NOAA Fisheries is currently reviewing the status of the populations but that data is not available yet.

B. Describe the nature, source, and extent of the problem or gap in knowledge that the project will address.

Water temperatures frequently exceed salmonid preference and sometimes exceed survival thresholds in the Okanogan and Similkameen Rivers. Throughout the Okanogan Basin, significant efforts are underway to improve cool water tributary habitat for spawning and rearing, increase in-stream flows, and improve upstream water management through negotiations with Canada and the US co-managers. Gains have been made, but high water temperatures remain one of the most significant limiting factors in the Okanogan watershed, particularly from July through September.

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

The construction of side channel habitats on Driscoll Island and employing strategies (i.e., use of ground water, riparian planting, and installation of LWD) to create lower water temperatures within these channels:

- addresses Priority Actions for temperature and side channel habitat in the Upper Columbia Salmon Recovery Board (UCSRB) Plan's RTT Biological Strategy (p219), Priority Reaches and Actions Document (2008) under the side channel reconnection Habitat Action Class;
- occurs in the Upper US Okanogan (US Border to Similkameen Confluence) category two watershed (RTT Biological Strategy, Upper Okanogan Assessment Unit, Appendix G4 (UCSRB, 2008); and
- targets juvenile steelhead and other salmonids

D. Describe the consequences of not conducting this project at this time.

Without the appropriate survey and ground water data proposed through this application, we cannot develop a viable restoration project. This phase is critical to understanding and confirming the feasibility of developing cold water refuge channels on Driscoll Island.

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

4. Project Design
   A. Provide a detailed description of the project and how it will address the problem described in Section 2B (refer to Appendix D).

See response to question #6 below as this explicitly states the timeline and tasks associated with this proposal.

B. If the project will occur in phases, explain individual sequencing steps and which steps are included in this application.

This project will be conducted in at least two phases: data gathering and design (this proposal), and a subsequent implementation phase. We may implement a test project/channel, separately but concurrent to this proposal. The engineering scope of work will include:

1. **Data collection:** Geomorphic, hydrologic, and topographic data will be collected and reviewed**.**
2. **Design alternatives:** Channels (e.g., dimensions, gradient, etc.), water sources, incorporation of LWD (e.g., size, placement, positioning, etc.), and

planting plans will be designed. (Engineered designs will inform cost estimates and alternative construction options.)

3. **Stakeholder review**: Engineered designs and alternatives will be reviewed by funding entities (SRFB), RTT and Trib. Committee, WDFW, CCT, and CCFEG.
4. **Design refinement:** Final preferred alternative will be refined.

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

D. If your proposal includes an assessment or inventory
N/A

5. Project Development

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

The proposed project cost estimate was based on the labor costs to develop engineering plans for a phased channel implementation approach, including field data collection needed to determine initial viability of the concept. The first phase, as proposed, would include development of up to perhaps several alternative channel configurations to accept either gravity groundwater flow (the first preference) or pumped flow from wells on the Island. The concurrent groundwater field data collection program will determine availability of groundwater flow, its temperature regime over the critical summer and early fall period, and the relative gravity head available to drive flow from the groundwater source through any proposed channel and thence into the Okanogan or Similkameen River channels. Once the new groundwater information is obtained, a preferred alternative can be selected and refined.

The proposed project cost includes roughly 200 hours for the continuation of critical groundwater field data collection and reduction, which is based on an assumed effort of weekly field visits to download data over a 20 week period. Engineering costs include about 60 hours to develop several initial concept designs for the phased implementation approach, and about 100 hours to develop feasibility design and construction plans for the preferred alternative for the first phase of an implementation project. The first phase implementation (not funded by this proposal) would construct the first several hundred linear feet of channel to verify the concept, should the initial design and data collection prove the project viable. Future engineering to continue developing Phase 2 of the project would be dependent on success of the first Phase, but is not included in this proposal.

B. Describe other approaches and design alternatives that were considered to achieve the project's objectives.

Our initial approach in any cool water refugia project is to seek out and identify existing natural side channels that require only addition of flow to create the desired habitat conditions, or those that would require only minor improvement. We investigated available topographically favorable sites on Driscoll Island, and determined the two proposed locations would be most amenable to a groundwater-fed refugia channel project. We considered both pumped and gravity-fed channels at these locations, and also reviewed available groundwater data collected in the local vicinity in the recent past. The Driscoll Island location is one of many identified recently by the Colville Tribes as part of their larger program to enhance and create additional cool-water refuge areas throughout the Okanogan River basin, particularly in the immediate vicinity of the mainstem channel.

Initially CCFEG was proposing to design and implement this project; however, based on the technical feedback from the SRFB Review Panel and the Regional Technical Team we chose to break the project into a design-only project.

C. Include a Partner Contribution Form

N/A

D. List all landowner names

Washington Department of Fish and Wildlife – Landowner Acknowledgement form included.

E. Describe your experience managing this type of project.

Jason Lundgren (Executive Director, Cascade Columbia Fisheries Enhancement Group): Has five years of experience as a project manager for the South Puget Sound Salmon Enhancement Group managing habitat assessments, design/feasibility and restoration projects, four years as an Outdoor Grants Manager with the Salmon Recovery Funding Board, and one year as the Executive Director for CCFEG.

6. Tasks and Schedule

The proposed project tasks are as follows:

1) collect groundwater elevation and temperature data through the summer period to establish a baseline for the groundwater resource from the available wells and new test pit logger locations

2) develop preliminary designs for a phased implementation approach for prospective refugia channels at the two sites identified, assuming the most conservative groundwater availability data presently available until new data are included in the dataset

3) Determine the characteristics of the available groundwater resource and its availability for such proposed refugia channels (e.g. temperature, gravity flow gradient, discharge volume, seasonal variations in all of those characteristics, etc.).

4) Determine the necessary means of realizing groundwater flow into these two channel sites (e.g. either gravity inflow or pumped inflow), based on the results of the field data collection

5) Select a preferred alternative for delivering groundwater to a refugia channel and develop the design for a first-phase implementation (e.g. perhaps the first several hundred feet of a channel)

7. Constraints and Uncertainties

While the results of the initial ground water testing were encouraging (estimated 80-150 gallons per minute per 100’ of channel length), we recognize the need to collect information and understand the relationship of the ground water table and influence of the Okanogan and Similkameen river levels during the summer low flow periods. Ground water viability will dictate channel dimensions, and whether or not we will need to supplement the channels with water from existing wells located on the island.

8. Detailed project cost estimate.

The proposed project consists of field data collection and preliminary engineering to determine feasibility of a groundwater-fed channel or channels on Driscoll Island. The project costs consist of labor and materials to carry out these tasks:

Estimate - Driscoll Island - Design			
Task	unit	unit cost	sub total
Field Data Collection & Data Analysis	200 hrs	$75.00	$15,000.00
- Travel			$1,500.00
Conceptual Design	60 hrs	$125	$7,500.00
Feasibility Design	100 hrs	$125	$12,500.00
Coordination/Administration	150 hrs	$40	$6,000.00
		Total:	$42,500.00

Landowner Information

Name of Landowner: **WDFW**

Landowner Contact Information:

X Mr. ☐ Ms. Title: **Manager – Sinlahekin Wildlife Area**

First Name: **Dale** Last Name: **Swedberg**

Contact Mailing Address: **P.O. Box C Loomis, WA 98827**

Contact E-Mail Address: **Dale.Swedberg@dfw.wa.gov**

Property Address or Location: **1 mi. SE of Oroville, WA T40N R27E Sect. 33 & 34**

1. **Washington Department of Fish and Wildlife** 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.

______________________________ 0306 11

Landowner Signature Date

Project Sponsor Information

Project Name: Driscoll Island Cold Water Refuge

Project Applicant Contact Information: Cascade Columbia Fisheries Enhancement Group

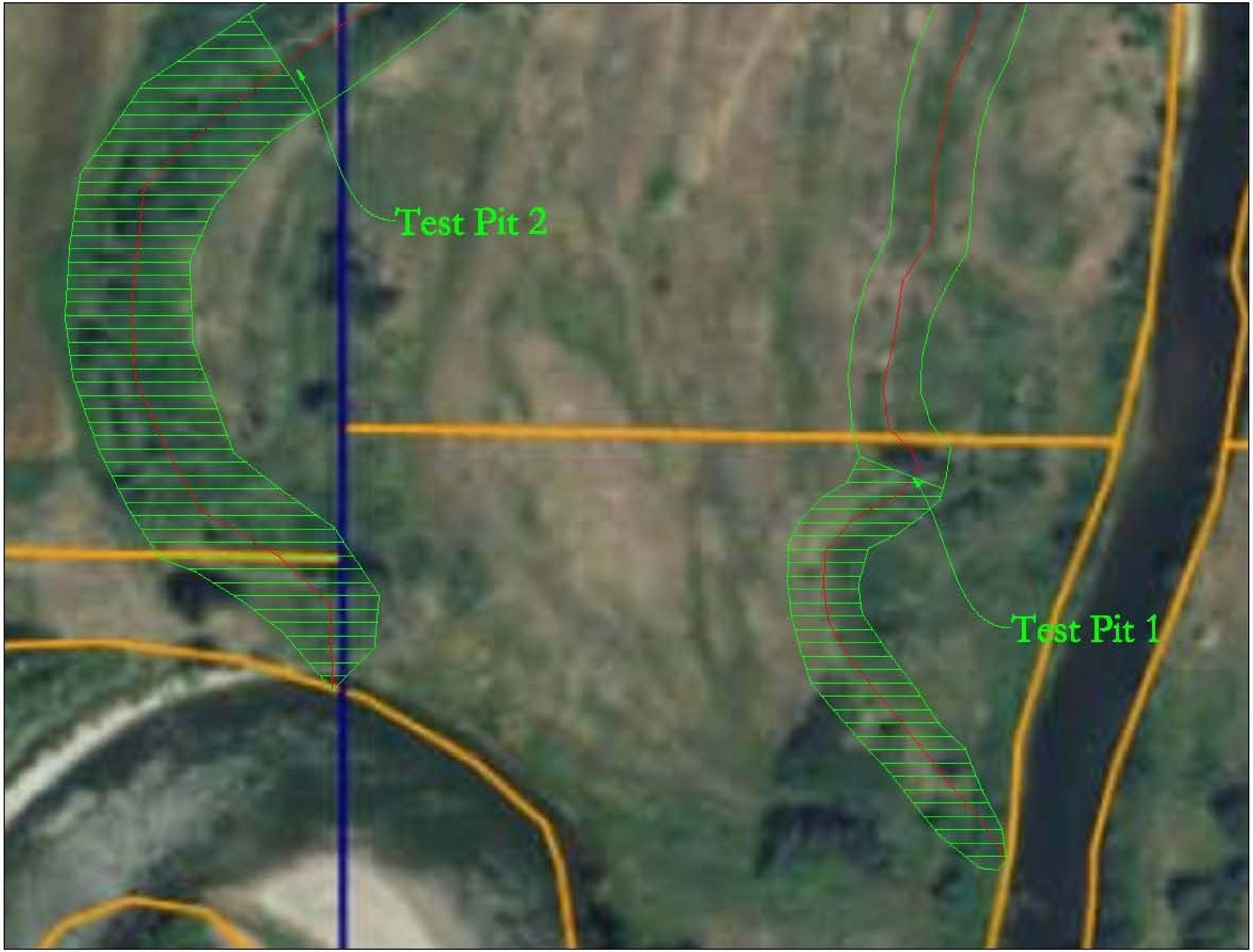
X Mr. ☐ Ms. Title Executive Director

First Name: Jason Last Name: Lundgren

Mailing Address: PO Box 3162 Wenatchee, WA 98807

E-Mail Address: jason@ucrfeg.org

Estimate - Driscoll Island - Design			
Task	unit	unit cost	sub total
Field Data Collection & Data Analysis	200 hrs	$75.00	$15,000.00
- Travel			$1,500.00
Conceptual Design	60 hrs	$125	$7,500.00
Feasibility Design	100 hrs	$125	$12,500.00
Coordination/Administration	150 hrs	$40	$6,000.00
		Total:	$42,500.00



Scale:

100 50 0 100 200 ft

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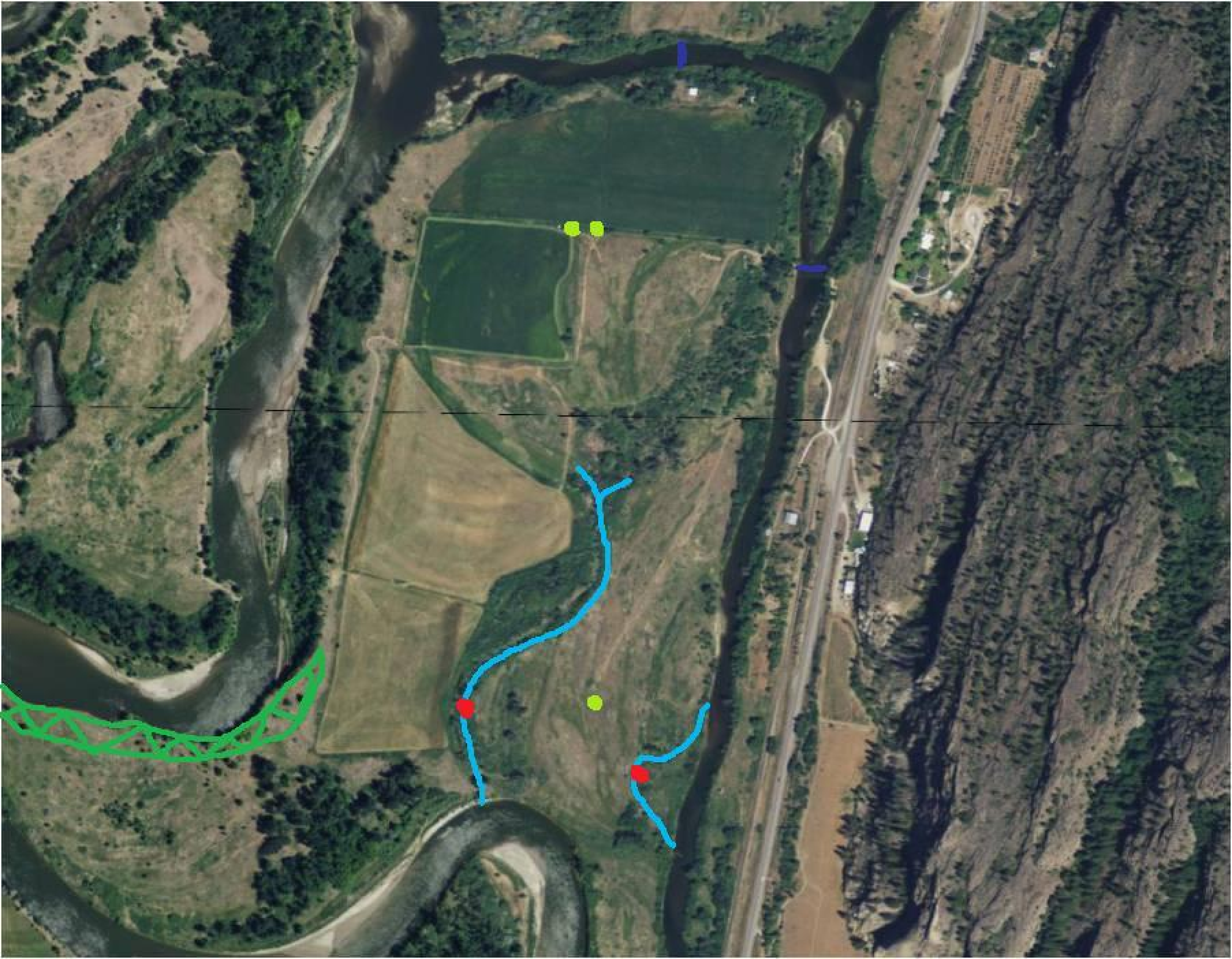
NOTE:
Image provided by Okanogan County ca. 2008
Test pits and pump tests conducted May 2011

Colville Confederated Tribes

Okanogan/Similkameen Thermal Refugia
Driscoll Island Cold Water Refugia Channels
Plan View

Pacific Hydraulic Engineers & Scientists, PLLC

Date:	5 June 2011	Figure	1



Driscoll Island Cold Water Refuge – Site Photos January 20, 2011

Existing swale through middle of Driscoll Island.

Ed standing in swale for scale (swale's ~ 6-8' deep).

Looking south near the confluence of the swale and Similikameen. (Notice groundwater in this low point)

Photo taken looking north. Ed is standing in swale at the same low point as the above photo.

Keith (in blue jacket) is standing next to the outlet of the swale and the confluence with the Similkameen River.

Photo taken looking south at second Okanogan “C” swale.

Driscoll Island

May 3, 2011

Test Well – Ground water exploration

Crossing new ford to Driscoll Island


CAT
NC

Excavation of first test well in east/Okanogan low swale

Cultural/Historic resource oversight


CAT

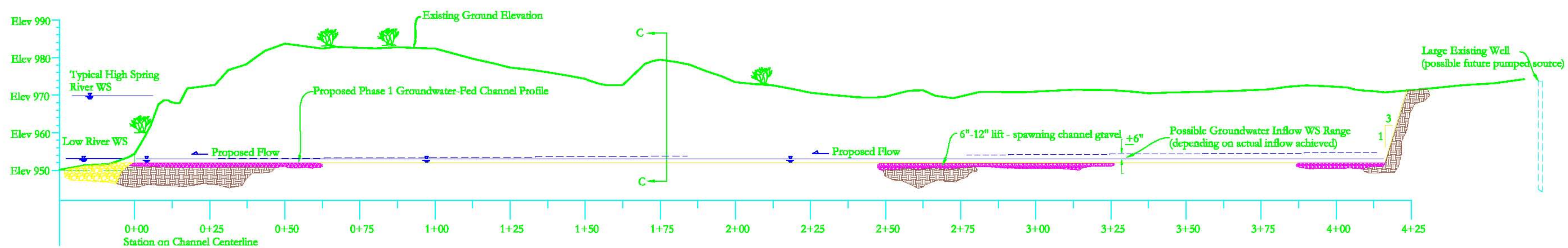
Draw-down and recharge testing in east/Okanogan channel. Preliminary results are positive.

Restored site #1 (east/Okanogan channel) with piezometer.

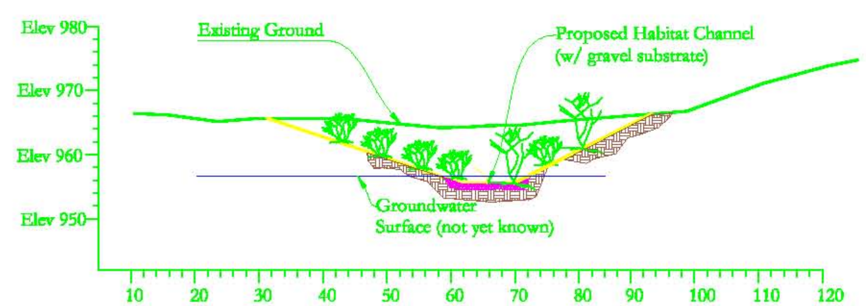
Draw-down/recharge ground water testing (west/Similkameen channel). Preliminary results are positive.


ACE

Restored west/Similkameen test well with piezometer.



Phase 1 Groundwater-Fed Channel Profile



Typical Section

NOTE:
1) Geologic strata estimated
2) Excavation limits estimated from surveyed topography
3) Constructed slopes may be modified to accomodate stability - estimated slopes shown
4) Plant species and planting configuration to be determined in final design
5) Final channel dimensions may change, depending on groundwater availability and freatic surface

Colville Confederated Tribes
Okanogan/Similkameen Thermal Refugia Driscoll Island Cold Water Refugia Channels Phase 1 - Typical Sections & Profile
Pacific Hydraulic Engineers & Scientists, PLLC
Date: 5 June 2011 Figure 2

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