

WATER RESOURCES WATERSHED PLAN IMPLEMENTATION AND FLOW ACHIEVEMENT

Organization: Pomeroy Conservation District

WRPIFA-1517-PomeCD-00027

General Information

Project Title	Alpowa and Pataha Creeks Steelhead Flow and Habitat Restoration Project
Project Short Description	We will work with landowners to install low cost, large woody debris structures in Alpowa and Pataha Creeks with the goals of increasing base flows, restoring critical habitat for ESA summer steelhead, improving floodplain connection, and groundwater storage. To meet the project goals we will add large woody debris using post-assisted log structures (PALS) to simulate the benefits of natural wood loadings and construct beaver dam analogs (BDAs) to simulate the benefits of beaver dams.
Project Long Description	<p>We propose to address flow and habitat concerns in both Alpowa and Pataha Creeks using similar but different low cost, hand built, large woody debris structures. Both Alpowa and Pataha Creeks are used by ESA listed summer steelhead and are in major spawning areas. Pataha Creek is a large tributary to the lower Tucannon River and is dominated by loess soil deposits. The lower 30-40 km of the Pataha Creek is deeply incised and cutoff from its historic floodplain as a result of past landuse, loss of riparian vegetation, and its inherent susceptibility to incision. A small inset floodplain has developed but conditions for salmonids are considered poor because of high stream temperatures, low habitat complexity, and low base flows. Alpowa Creek flows directly into the Snake River west of the town of Clarkston. Alpowa Creek watershed is dominated by basalt and is naturally less prone to incision. However, Alpowa Creek has low habitat diversity, a straightened channel, and limited riparian cover. Bank erosion in some places threatens cobble embeddedness and the ability of the stream for future water storage. This proposal describes two different methods that will be used for improving habitat conditions for ESA listed species and increasing base flows in these two watersheds.</p> <p>In Pataha Creek we propose to use primarily beaver dam analogs (BDAs) to simulate beaver dams. Beavers are recognized as keystone species for their ability to create complex and dynamic stream habitats and to increase sediment retention and aggradation, groundwater recharge, floodplain connectivity, and the extent of riparian vegetation. Pataha Creek likely had numerous beaver dams that helped to prevent incision historically, but trapping of beavers likely reduced the population to critically low levels. Many of the benefits of beavers can be simulated by BDAs and in some cases beavers can use BDAs as foundation to build natural dams on. We will build BDAs in small groups (e.g., complexes of 3-5 structures) consisting of a primary dam, secondary dam, and one or more constriction dams. BDAs are built using wooden posts driven into the stream bottom perpendicular to the flow. Willows, sediment, and large woody debris are then used build a dam using the posts as a foundation.</p> <p>In Alpowa Creek we propose to use primarily post-assisted log structures (PALS) to simulate large woody debris in the stream. Large woody debris is recognized as an important element in natural streams and can increase habitat and flow diversity, pools, floodplain connection, sinuosity, groundwater recharge, and increase base flows. PALS are also built using wooden posts driven into the stream but they differ from BDAs in that they usually are not channel-spanning. We propose to build different types of PALS. Bank-attached PALS constrict the</p>

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flow to one side of the channel and can scour a pool, increase sinuosity, or reconnect an old side channel and spanner/debris jam PALS slow water velocities, pond water and connect floodplain areas.

Both Alpowa and Pataha Creeks are identified in existing watershed assessments and salmon recovery plans listing low summer stream flow and the need to increase ESA listed habitat to support the planning, design, implementation, and monitoring of these restoration actions. For example, the river styles of the Tucannon and Asotin Watersheds based on geology, ecoregions, valley setting, and channel character have been completed. We have also mapped out all the potential beaver habitat and current condition in the Tucannon and Alpowa watersheds using a tool we developed called the Beaver Dam Restoration Assessment Tool (BRAT - <http://etal.joewheaton.org/projects/past-projects/gct-pilot-study-testing-the-beaver-restoration-assessment-tool-brat>). This project is consistent with Middle Snake Watershed and Snake River Salmon Recovery Plans and the benefits are listed in the 2014 State of the Salmon Report for the Snake River Region.

Total Cost \$310,000.00* Total Eligible Cost \$310,000.00*

Effective Date 7/1/2015 Expiration Date 6/30/2017

Ecology Program Water Resources

Project Category* Infrastructure and Water Management Construction (Efficiency Improvements)
Surface and Sub Surface Storage Feasibility Study and Construction
Water Acquisition or Water Bank/Exchange Development
Water Measuring Devices
✓ Other

Will Environmental Monitoring Data be collected? Yes

Overall Goal The overall goal is similar to info that is in the 2014 Governors State of the Salmon Report for the Tucannon River where installing habitat structures for fish has increased summer base flows from 40 cfs to 80. We believe that these small streams will have increases in base flow and the monitoring will help us show these benefits. We plan to install 100-150 beaver dam analogs in Pataha Creek and 100-150 post assisted log structures in Alpowa Creek to improve flows and habitat for ESA listed steelhead in 5-10 km of stream. The goals of the proposed structures (BDAs and PALS) is to decrease flow velocities and water temperatures, and channel roughness which will lead to increased hydraulic diversity, floodplain connection, groundwater recharge, and summer base flows.

Recipient Contacts

Project Manager

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Other recipient signatures on printed agreement

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When done, click the **SAVE** button
After SAVE, a new row will appear

To Delete a Row

In the row you want to delete, remove the information in the
Name and Title textboxes
When done, click the **SAVE** button
After SAVE, the row will be deleted

Recipient Contacts

Name	Title
Duane Bartels	District Manager, Pomeroy CD
Bradley J Johnson	Grant Writer & Project Implementor, WRIA #35
Stephen Bennett	Eco Logical Research Inc., Grant Information Contributor/

WATER RESOURCES WATERSHED PLAN IMPLEMENTATION AND FLOW ACHIEVEMENT

Organization: Pomeroy Conservation District

WRPIFA-1517-PomeCD-00027

Location Information

Statewide * Yes No

Ecology Region * Eastern 100%
Click here to view map:

County * GARFIELD 100%
Click here to view map:

Congressional District * District 09 100%
Click here to view map:

Legislative District * District 09 100%
Click here to view map:

WRIA * 35 - Middle Snake 100%
Click here to view map:

Ecology Region Statewide 100%

County Statewide 100%

Congressional District Statewide 100%

Legislative District Statewide 100%

WRIA Statewide 100%

Latitude (expressed in decimals)

Longitude (expressed in decimals)

Facility Site ID

Facility Site Link

WATER RESOURCES WATERSHED PLAN IMPLEMENTATION AND FLOW ACHIEVEMENT

Organization: Pomeroy Conservation District

WRPIFA-1517-PomeCD-00027

Scope of Work - Task 1 Project Admin: 1

Task Number	1		
Task Title	Project Administration/Management	Task Cost	\$45,000.00
Task Description	<p>A. The RECIPIENT will administer the project. Responsibilities will include, but not be limited to: maintenance of project records; submittal of requests for reimbursement and corresponding backup documentation, progress reports and recipient closeout report (including photos); compliance with applicable procurement, contracting, and interlocal agreement requirements; application for, receipt of, and compliance with all required permits, licenses, easements, or property rights necessary for the project; and submittal of required performance items.</p> <p>B. The RECIPIENT must manage the project. Efforts will include: conducting, coordinating, and scheduling project activities and assuring quality control. Every effort will be made to maintain effective communication with the RECIPIENT's designees; the DEPARTMENT; all affected local, state, or federal jurisdictions; and any interested individuals or groups. The RECIPIENT must carry out this project in accordance with any completion dates outlined in this agreement.</p>		
Task Goal Statement	Properly managed project that meets agreement and Ecology administrative requirements.		
Task Expected Outcomes	<p>* Timely and complete submittal of requests for reimbursement, quarterly progress reports and recipient closeout report.</p> <p>* Properly maintained project documentation</p>		
Recipient Task Coordinator	Duane Bartels		

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Deliverable #	Description	Due Date	Received?	EIM Study ID	EIM System Link	Latitude	Longitude	Location Address
			(ECY Use					

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Scope of Work - Task 1 Project Admin: 1

		Only)
1.1	Progress Reports	1/15/2016
1.2	Recipient Closeout Report	6/30/2017
Task Number		2

Task Title	Assessment, Design and Restoration Plan	Task Cost	\$30,000.00*
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Task Description

We will assess existing watershed assessments, recovery plans, and other relevant data sources to better understand the watersheds and identify the highest priorities areas to implementing our proposed restoration. This will also involve contacting local landowners that want to support these efforts. Once an assessment is complete, we will develop a design for each section of stream in Pataha and Alpowa Creeks. The design will include the location and specific objectives of the restoration. We will then conduct extensive field visits to design each structure on site. We will do this with a custom iPad application to record all the structure design specifics (location, objectives, size, materials required, etc.) that is compatible with the Columbia Habitat Assessment Monitoring Protocol (CHaMP) and the Asotin Creek Intensively Monitored Watershed. All information collected will be consistent with Ecology and WDFW monitoring protocols. Once all the assessments and designs are completed we will document them in a water quality and salmon habitat restoration plan for each stream.

Task Goal Statement

The goal of this task are to develop a i) comprehensive understanding of the watershed setting, existing assessments and data for each stream, ii) design for each stream reach to be restored (i.e., based on watershed assessment and access to private property), iii) design for each structure to be built (note - this is done on site), and iv) document the assessment and design process in a final restoration plan for each stream (Alpowa and Pataha Creeks), iv) develop a QAPP for the monitoring plan listed below.

Task Expected Outcomes

The expected outcomes of this task are a summary of watershed assessments relevant to the proposed restoration, detailed design documents for each restoration treatment on a structure by structure basis, and a water quality and salmon habitat restoration plan for each stream (Alpowa and Pataha Creeks) and a QAPP for the monitoring listed below

Recipient Task Coordinator
06/30/17

Duane Bartels

Scope of Work - Additional Tasks: 2 - Assessment, Design and Restoration Plan

Deliverables

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 Repeat these steps for each deliverable

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Deliverable #	Description	Due Date	Received? (ECY Use Only)	EIM Study ID	EIM System Link	Latitude	Longitude	Location Address
2.1	Draft Restoration Plan	3/31/2016						
2.2	Final Restoration Plan	10/31/2016						

Scope of Work - Additional Tasks: 3 - Pataha Restoration Implementation

Task Number 3

Task Title Pataha Restoration Implementation Task Cost \$110,000.00*

Task Description Construct 100-150 beaver dam analogs (BDAs) in Pataha Creek as part of this task. The exact number of BDAs constructed will not be known until we complete the design and restoration plan (Task 2). Basic materials and supplies required for the construction of BDAs include 10-40 untreated, sharpened lodgepole fence posts /structure (7-15 cm diameter, 1.5-2.5 m long), willow stems to weave between the posts and create a mattress, and some sand, gravel, and cobble to make the dam less permeable and create a mattress. Some large piece of wood (branches and logs) may also be used to build the dam. The equipment needed to build BDAs are a chainsaw, hydraulic post driver, truck, and trailer. In general, the installation of BDA structures is a relatively simple, cost effective, and non-destructive restoration approach. Wooden fence posts are driven into the active channel and inset floodplain using the hydraulic post driver. Posts extend 1.0-1.5 m above the active channel bed, which is typical the height range of natural beaver dams. Posts are spaced 0.5 - 0.8 m apart, and driven to a depth of approximately 1 m into the streambed. Following installation of the post line, willow stems are generally woven in between the posts to create a semipermeable structure that closely resembles a natural beaver dam. The willow weaving acts as a dam, but is also designed to be passable to fish, and is consistent with the adult and juvenile fish passage criteria developed by NOAA and USFS. In addition to weaving willow among the post line, BDA structures will be reinforced by placing cobble, gravel, and fine sediment at the base of the structure, a technique very similar to the way beavers build natural dams. Reinforcing the base of BDA structures prevents flow from scouring under the dam, and speeds up pond formation and associated processes. BDAs should last until the pool behind the dam fills with sediment and is colonized by woody riparian vegetation (3-10 yr). BDAs will be built in complexes of 3-5 structures that are designed to act together similar to a natural beaver dam complex (see uploaded Appendix – Figure 1 for example of BDA complex). The spacing between BDAs will be consistent with the dam layout of a natural beaver colony, which is approximately 30-100 m, depending on stream gradient and width. There are four major BDA structure types: Primary Dams, Secondary Dams, Constriction Dams, and Reinforced Existing Dams. We also plan to plant 50-100 native willows around each BDA to increase shading on the stream, provide food for potential colonizing beavers, and to help shade out non-native reed canary grass.

Task Goal Statement The goals of this task are to construct 100-150 BDAs along the lower reaches of Pataha Creek from 2016-2017, increase habitat diversity, and increase base flows from Pataha Creek. We expect BDAs will increase aggradation and help to increase the diversity and health of the inset floodplain.

Scope of Work - Additional Tasks: 3 - Pataha Restoration Implementation

Task Expected Outcomes The expected outcomes are to improve the instream and floodplain conditions of a large section of Pataha Creek (3-6 km) with the construction of 100-150 BDAs. This should improve instream conditions for fish, floodplain conditions for fish and plants, riparian function, and improve water quality and quantity and base flow for steelhead. As an extra benefit, this restoration action will likely improve the conditions of lower Tucannon River downstream of the confluence with Pataha Creek which is an important area for Chinook salmon and steelhead.

Recipient Task Coordinator Duane Bartels
06/30/17

Deliverables

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Deliverable #	Description	Due Date	Received? (ECY Use Only)	EIM Study ID	EIM System Link	Latitude	Longitude	Location Address
3.1	Construction of 100-150 beaver dam analog structures in Pataha Cree	9/15/2016						

Task Number 4

Task Title Alpowa Restoration Implementation **Task Cost** \$90,000.00*

Task Description Construct 100-150 post-assisted log structures (PALS) in Alpowa Creek as part of this task. The exact number of PALS constructed will not be known until we complete the design and restoration plan (Task 2). Basic materials, supplies, and equipment required for the construction of PALS are similar to BDAs, but generally PALS are smaller structures and don't require willows mattresses. We expect each PALS will

Scope of Work - Additional Tasks: 4 - Alpowa Restoration Implementation

require 4-8 untreated, sharpened lodgepole fence posts /structure (7-15 cm diameter, 1.5-2.5 m long), branches (small woody debris) and large woody debris (logs and small trees 10-40 cm diameter and 2-5 m long). In general, the installation of PALS is a relatively simple, cost effective, and non-destructive restoration approach. Wooden fence posts are driven into the active channel and floodplain using a hydraulic post driver. Posts extend up to approximately the average annual flow height. For a single structure posts will be spaced approximately 0.5 - 1.0 m apart, and driven to a depth of approximately 1 m into the streambed (see uploaded Appendix – Figure 2 for example of several PALS). The posts are used to secure small and large woody debris in place. PALS are designed to be passable to fish, and are consistent with the adult and juvenile fish passage criteria developed by NOAA and USFS. PALS are expected to last 5-10 years and may promote the recruitment of natural LWD to the stream. The spacing between PALS will be consistent design criteria and the objectives of each structure but we expect for a stream the size of Alpowa (4-6 m bankfull width) that each PAL will be spaced 20-40 m apart on average. There are four major PALS types: bank attached, mid channel, debris jam, and erosion controls. We also plan to use PALS to reduce erosion in a few selected areas. We recognize that erosion of stream banks is a natural part of stream dynamics and only are proposing to use PALS as erosion controls to protect infrastructure and private property and allow for the planting of riparian vegetation. Willow and cottonwood trees will also be planted in and around PALS to increase riparian function and diversity.

Task Goal Statement

The goals of this task are to construct 100-150 PALS along Alpowa Creek from 2016-2017, increase habitat diversity, and increase base flows from Alpowa Creek. We expect PALS will increase instream habitat diversity and diversity and health of the inset floodplain, increase summer base flows and help recover riparian areas along the stream.

Task Expected Outcomes

The expected outcomes are to improve the instream and floodplain conditions of a large section of Alpowa Creek (1-2 km) with the construction of 100-150 PALS. This should improve instream conditions for fish, floodplain conditions for fish and plants, riparian function, and improve water quality and quantity and base flows for ESA listed wild steelhead (Alpowa Creek is managed a wild fish nursery, WDFW removes all hatchery steelhead at the adult weir at the mouth of Alpowa Creek, over 170 wild steelhead on average enter Alpowa Creek annually).

Recipient Task Coordinator
06/30/17

Duane Bartels

Deliverables

Scope of Work - Additional Tasks: 4 - Alpowa Restoration Implementation

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Deliverable #	Description	Due Date	Received? (ECY Use Only)	EIM Study ID	EIM System Link	Latitude	Longitude	Location Address
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4.1	Construction of 100-150 post assisted log structures in Alpowa Creek	9/15/2016						
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Task Number 5

Task Title Monitoring of Restoration Actions Task Cost \$35,000.00*

Task Description This task includes the materials, equipment, development and implementation of a monitoring program to document the response of the Pataha and Alpowa Creeks to the proposed restoration actions (Tasks 3 and 4). We propose to use several methods to assess how BDAs and PALS influence stream habitat, floodplain conditions, and water quality and quantity. Unless otherwise stated, the same monitoring methods will be used in both streams. First we use the same custom iPad application to conduct implementation and effectiveness monitoring at each structure (BDAs and PALS). Implementation monitoring will provide a detailed accounting of how many structures were built, their location (collected with GPS), dimensions, construction details, and expended responses (e.g., hypotheses about the changes each structure will produce). To determine effectiveness of the structures we will also use the application to collect data on habitat conditions pre- and post-restoration. The number and location of in channel habitat units (pools, runs, and bars) will be identified around each structure and the change in the number and arrangement of habitat units will be compared after restoration. Second, we will install a series of water temperature probes (20-40 in each stream) to assess how structures affect stream temperature. The placement of probes will be designed to assess how stream temperatures change over standard lengths of stream in sections with and without structures. Third, we will also install a series of simple groundwater well fields. Groundwater monitoring wells will be constructed of two-inch diameter PVC pipe,

Scope of Work - Additional Tasks: 5 - Monitoring of Restoration Actions

with 0.010 inch slots transecting the full pipe length. Each well will have a two-inch solid PVC cap on the bottom. Boreholes will be drilled using auger. The exact number of wells will be determined after the restoration plan is developed and we know the extent of the restoration area. However, there will be a minimum of three wells in each field and one set of wells will be located in a treatment and control area of each stream (Alpowa and Pataha). Wells will be situated perpendicular to the stream to determine the extent of the groundwater change after restoration. Throughout the monitoring period, water depth and temperature data will be recorded using HOBO Water Level Loggers (Onset Computer Corp., model U20-001-01) set to record data in one or two hour intervals. Each well field will also have one logger to measure atmospheric temperature and pressure to calibrate the water depths recorded in each well. Water stage height loggers will also be installed at upstream of the restoration, within the restoration and downstream of the restoration to assess changes in flow after restoration. Fourth, assess the success of all willow plantings with riparian survey. Fifth, drone flights will be conducted pre- and post-restoration at all restoration reaches and at control reaches to assess changes at the reach scale.

Task Goal Statement

The goals of this task is to develop a relatively simple monitoring plan for the proposed restoration actions in Alpowa and Pataha Creeks. The monitoring data will be used to assess how effective BDAs and PALS are at meeting the goals of Task 3 & 4 – namely increasing habitat diversity, floodplain connection, riparian function, and water quality and quantity and document any increases in summer base flows.

Task Expected Outcomes

The expected outcomes of this task will be a methodology and summary report of the monitoring results for 2016 and 2107. The report will present results from all of the monitoring methods and discussion of how effective the structures were at meeting the goals. The final report will include photo documentation and report of actions and results and what worked and what didn't work.

Recipient Task Coordinator

Duane Bartels

06/30/17

Deliverables

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Scope of Work - Additional Tasks: 5 - Monitoring of Restoration Actions

Deliverable #	Description	Due Date	Received? (ECY Use Only)	EIM Study ID	EIM System Link	Latitude	Longitude	Location Address
5.1	Draft Monitoring Plan	12/31/2015						
5.2	Final Monitoring Plan and Summary of Data	7/1/2016						

WATER RESOURCES WATERSHED PLAN IMPLEMENTATION AND FLOW ACHIEVEMENT

Organization: Pomeroy Conservation District

WRPIFA-1517-PomeCD-00027

Scope of Work Summary

Task Title	Task Cost
Project Administration/Management	\$45,000.00
Assessment, Design and Restoration Plan	\$30,000.00
Pataha Restoration Implementation	\$110,000.00
Alpowa Restoration Implementation	\$90,000.00
Monitoring of Restoration Actions	\$35,000.00
	\$310,000.00

Total Eligible Costs
(from the General Information Form)
\$310,000.00

WATER RESOURCES WATERSHED PLAN IMPLEMENTATION AND FLOW ACHIEVEMENT

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Budget Proposal

Estimate your proposal's total budget needs by task and by element for FY 16, FY17 and beyond.

FY 16 - July 1, 2015 to June 30, 2016

FY 17 - July 1, 2016 to June 30, 2017

Total Eligible Costs (from General Information form)
\$310,000.00

By Task

Task Title	Task Cost	*FY 16	*FY 17	Additional Fiscal Years	Total
Project Administration/Management	\$45,000.00	\$15,000.00	\$30,000.00		\$45,000.00
Assessment, Design and Restoration Plan	\$30,000.00	\$15,000.00	\$15,000.00		\$30,000.00
Pataha Restoration Implementation	\$110,000.00	\$55,000.00	\$55,000.00		\$110,000.00
Alpowa Restoration Implementation	\$90,000.00	\$45,000.00	\$45,000.00		\$90,000.00
Monitoring of Restoration Actions	\$35,000.00	\$25,000.00	\$10,000.00		\$35,000.00
Total	\$310,000.00	\$155,000.00	\$155,000.00	\$0	\$310,000.00

By Element

Element	*FY 16	FY 17	Additional Fiscal Years	Total
Salaries - 1				\$0
Benefits - 1				\$0
Salaries and Benefits Combined - 1	\$40,000.00	\$50,000.00		\$90,000.00
Contracts	\$103,800.00	\$103,800.00		\$207,600.00
Travel	\$1,200.00	\$1,200.00		\$2,400.00
Equipment - 2	\$10,000.00			\$10,000.00
Goods/services - 3				\$0
Overhead - 4				\$0
Total	\$155,000.00	\$155,000.00	\$0	\$310,000.00

If you receive a grant, you are responsible for procuring professional, personal, or other services using sound business judgment and good administrative procedures consistent with applicable state, and local laws, orders, regulations, and permits. This includes issuance of invitation of bids, requests for proposals, selection of contractors, award of sub-agreements, and other related procurement matters.

1 Fill in either the "Salaries" field and the "Benefits" field or fill in the "Salaries and Benefits Combined"

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Budget Proposal

field

- 2 Upload an itemized list of all equipment and explain why the equipment is needed. Equipment is defined as tangible property other than land, buildings, improvements other than buildings, or infrastructure, which is used in operations and with a useful life of more than one year. Examples are furnishings, equipment, and software.
- 3 Upload an itemized list of all Goods and Services
- 4 Overhead cannot exceed 25% of salaries/benefits

Upload Documents

Click the Browse button

Select your file

Click Save, your file will appear in the List of uploaded documents

Repeat for each file

To Delete a file, select the Delete checkbox next to the file and click SAVE

[_Upload/18015-EquipmentList2015.docx](#)

Additional Comments

This flow and habitat improvement project is consistent with the goals and objectives of the Middle Snake Watershed and Detailed Implementation Plan and the Snake River Salmon Recovery Plan. Instream fish habitat improvements that have been completed on the Tucannon River according to the Ecology streamflow gauge Tucannon at Marengo have helped to improve habitat for all freshwater lifestages as well as increase summer base flows at Morengo over the past 10 years. August base flows have gone from 40 cfs to over 80 cfs at this gauge and the major changes that have occurred in the watershed is large scale restoration activities in the upper reaches that have slowed run-off and connected side channel habitat, similarly we are interested in structures that will slow or pool the water and allow floodplain connectivity in the upper reaches of the Alpowa and the mid section of Pataha Creek.

Currently we have no way of identifying how much of an instream flow increase will come from these actions, but this project would give us the ability to implement projects on a large scale and conduct monitoring and evaluation and also document these changes. Having the ability to work in two smaller stream systems with ESA listed species and monitor the results is key for future actions. Most of the work that is completed doesn't have the ability for monitoring on this scale. We believe this is a great project for Ecology and also for salmonid restoration actions within the Snake River Region.

OTHER PROJECT TYPE INFORMATION

Instructions:

Please fill in the appropriate fields.
 Required fields are marked with an *.
 When done, click the **SAVE** button.

Project Location

* Stream reach mile or location: Upper Alpowa Creek (RM 10 - 12) and Lower Mid Pataha Creek (RM 5)

Funding Source Information

* Known (in-hand), estimated or potential funding that is or may be part of the total project provided by sources other than this program

Amount
 Percentage of project budget %

* Identify sources and type of funding other than through this grant. Include expected dates of participation. Upload letters of commitment, offer letters, application approvals or other supporting information.

Source and type of Funding

Amount	Percentage	Status	Known or expected date funds will be available
<input type="text" value="\$36,000.00"/>	<input type="text" value="10"/> %	<input type="text" value="In-Kind Mat"/>	<input type="text" value="USFS donating 300 large trees @ \$60/tree"/>
<input type="text"/>	<input type="text"/> %	<input type="text"/>	<input type="text"/>

Estimated Total Water Savings

* Estimate the water to be conserved through efficiency gains from this project. Provide engineering or technical analyses to support your estimates.

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT
QA (ACRE-FEET)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	0					
QI (CFS)	<input type="text" value="0.1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0.1"/>	<input type="text" value="0.1"/>	<input type="text" value="0.1"/>	<input type="text" value="0.1"/>	1					

Instream Flow or Habitat Benefits

* Briefly describe anticipated instream flow or habitat benefits as a result of funding this project proposal:

Both BDAs proposed for Pataha Creek and PALS proposed for Alpowa will have numerous in stream flow and habitat benefits. Both BDAs and PALS have been shown to increase floodplain connectivity, ponding of water upstream of the structures, and hydraulic and geomorphic diversity. These physical changes lead to increased hypoxic and groundwater exchange and a larger area of storage due to a widening of the active floodplain. These changes will lead to an increase in base flows due to increase water storage. Decreased water temperatures have also been shown to occur downstream of these structures because of this increased groundwater exchange. The increase in geomorphic diversity benefits fish because there is a greater variety of habitat types (pools, undercut banks, off-channel habitat, etc.) that are used by different life stages. The 2014 Governors State of the Salmon Report lists these benefits for the Tucannon where similar restoration has occurred.

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Resources currently committed to ensure long-term performance of the proposal

* Who will be responsible for long-term operations and maintenance of the project?

The Pomeroy CD will work with private landowner if any long-term operation and maintenance is needed. Based on projects that have been implemented for steelhead habitat restoration and the track record for the bio-engineering projects being proposed, we don't anticipate any maintenance funding. All structures being proposed are hand placed and very cost-effective, with this fact and the fact that this is a very small spring feed system we don't anticipate any need to identify long-term maintenance needs.

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* Have operations and maintenance costs been identified? Yes No

* Summarize the estimated costs on an annual basis below if possible at this time:

We don't believe there will be any short-term annual basis costs and based on previous instream restoration projects we don't anticipate any long-term annual costs. As stated above, if there are any maintenance issues these projects will rank out high for future instream restoration projects and there are options for applying for funding. The initial costs of these structures are very cost-effective and can be completed by hand, if there is any maintenance needs it will be very minimal in time and cost commitments. The budget does not reflect any estimated cost for future maintenance.