# Restoration, Acquisition, and Combination Project Proposal

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| **Project Number** | 15-1321 |
| **Project Name** | Asotin IMW Restoration and Maintenance |
| **Sponsor** | Dave Karl, WDFW |

List all related projects previously funded or reviewed by RCO:

|  |  |  |
| --- | --- | --- |
| Project # or Name | Status | Status of Prior Phase Deliverables and Relationship to Current Proposal? |
| South Fork Restoration | Completed | Completed. Part of the Asotin IMW restoration phase |
| Charley and North Fork Restoration  | In progress | In progress. Part of the Asotin IMW restoration phase |
|  | Choose a status |  |

1. **Project Location.**

Upper Asotin Creek including Charley Creek, North Fork Asotin Creek, and South Fork Asotin Creek

1. **Brief Project Summary.**

The proposal has two restoration components. The first component is to perform maintenance on three restoration treatments completed in the Asotin Creek IWM between 2012 and 2014. Small large woody debris (LWD) structures were built using post driven into the stream to hold hand placed LWD in place (we call these post assisted log structures or PALS). We propose to add some more LWD where need to maintain the function of the PALS. We also want to keep the LWD loading high in the treatment sections as this project is part of an ongoing ongoing Intensively Monitored Watershed to assess the effectiveness of large woody debris restoration and has been ongoing for 8 years. The second component of the proposal is to add an addition 100-150 PALS to rkm 2-4 in South Fork Asotin Creek. This site is directly downstream of the existing treatment section on the South Fork and will effectively increase the size of the treatment section by 50%. The intent of the new restoration is to increase the overall treatment size in Asotin Creek to increase the likelihood of detecting a fish response.

1. **Problems Statement.**

This is a request for additional restoration funds to maintain and enhance existing restoration actions and conduct an additional treatment to increase the likelihood we can detect a fish response at the population level.

* 1. **Describe the problem including the source and scale.**

Asotin Creek and its major tributaries including the Asotin IMW study streams (Charley, North Fork Asotin Creek and South Fork Asotin Creek) generally have low habitat complexity, lack deep pools, and have very little LWD compared to reference conditions. We have conducted over 36 km of stream surveys in the Asotin IMW study area and other assessments have been conducted throughout the entire mainstem of Asotin Creek and have confirmed that low habitat complexity is likely a major limiting factor for steelhead.

* 1. **List the fish resources present at the site and targeted by your** **project.**

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| --- | --- | --- | --- |
| Species | Life History Present (egg, juvenile, adult) | Current Population Trend (decline, stable, rising) | Endangered Species Act Coverage (Y/N) |
| Steelhead | all | unknown | Y |
| Chinook | all | unknown | Y |
| Bull trout | All | unknown | Y |
|  |  |  |  |

* 1. **Describe the limiting factors, and limiting life stages (by fish species) that your project expects to address.**

Poor habitat diversity, poor floodplain connection, and reduced riparian function limit freshwater survival and production of juvenile steelhead and chinook.

1. **Project Goals and Objectives.**
	1. **What are your project’s goals**?

Enhance and maintain restoration structures that were built between 2012-2014 and expand the restoration to one more treatment section as per our restoration plan. All actions will be within the IMW study area as described in our original restoration plan (Wheaton et al. 2012).

* 1. **What are your project’s objectives**?.

*Objective examples:*

Maintenance Objectives

- Add a total of 200-300 pieces of LWD (single pine seed trees 0.1-0.3 m diameter and 3-6 m long) to the South Fork restoration treatment implemented in 2012 and the other treatments in Charley and Norht Fork Creeks to increase effectiveness of existing structures (this is essentially seeding LWD into the treatment areas)

New Treatment Objectives

- Implement 2-4km of more restoration using the HDLWD approach that has been used in 12 km of Asotin Creek to date. Build approximately 100-150 new post-assisted log structures in section 1 of South Fork (formally a control section)

* 1. **What are the assumptions and constraints that could impact whether you achieve your objectives?**

Extremely large floods could reduce the effectiveness of previous treatments if a significant proportion of the structures are damaged or washed away.

1. **Project Details.**
	1. **Provide a narrative description of your proposed project.**

The proposal is to 1) perform maintenance on all existing treatments implemented between 2012-2014 and 2) to add an additional treatment section to South Fork Asotin Creek (approximately 100-200 structures). The Asotin Creek IMW is located in southeast Washington in the Snake River Basin just upstream of Clarkston, WA (Figure 1). The goal of the IMW is to measure the effectiveness of large woody debris (LWD) additions to increasing the production of wild steelhead. Three tributaries in the upper watershed were selected for the IMW study area. Each has one 4 km long treatment section and two 4 km control sections. Treatments have been staggered with one section restored each year starting in 2012. The overall restoration goal is to add enough high density, low cost LWD structures to increase instream habitat diversity and kick start hydraulic and geomorphic processes (i.e., scour pools and reworking of sediment and LWD) that will maintain and create instream diversity. To date ~ 550 LWD structures have been installed (200 per treatment section). Baseline monitoring of stream temperature, discharge, instream and riparian habitat, and juvenile steelhead abundance began in the tributaries in 2008 and will continue through 2019 (assuming adequate funding). We have also devoted substantial resources to identifying the casual mechanisms of fish response to restoration by sampling fish throughout the year and modeling the bioenergetics and net rate of energy intake in treatment and control areas. The IMW monitoring is further enhanced by the Washington Department of Fish and Wildlife (WDFW) effort to monitor “fish in-fish out” near the mouth of Asotin Creek that has been ongoing since 2004. Preliminary results indicate there have been increases in fish abundance and decreases in growth (density dependent growth) in the treatment sections compared to the control sections. These changes were despite low spring runoff in 2013 and 2014 that limited the effectiveness of the LWD structures (i.e., very little scour or reworking of sediments and LWD). With a diverse and extensive monitoring infrastructure, strong experimental design, and a focused and large treatment, **the Asotin IMW is poised to provide detailed effectiveness monitoring of one of the most commonly used stream restoration methods** **– however, continued monitoring is paramount to achieving these objectives.**

* 1. **Provide a scope of work.**

1) Enhance and maintain 4 km of South Fork restoration already implemented (wood source for the original implementation was not optimal and some wood has been lost). And also enhance/maintain Charley and Norht Fork treatments by adding more LWD. Single pine seed trees will be added to existing structures and in between existing structures to ensure high densities of LWD in all treatments for the remainder of the post-treatment monitoring phase. 2) Complete an additional 2-4km of treatment in the lower South Fork Creek that is currently a control section to increase the overall treatment area in the IMW to ~ 40% This will potentially increase the response of habitat and fish improve our ability detect these changes.

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| **Task** | **Start Date – End Date** | **Responsible Party** |
| Planning and design (acquiring LWD and posts, selecting sites to add LWD for maintenance and build new structures | January 1, 2016 – July 15, 2016 | Eco Logical Research Inc. |
| Maintenance (adding LWD to existing treatment section – South Fork Section 2) | July 15, 2016-September 15, 2016 | Eco Logical Resrach Inc. |
| Restoration of new treatment section (South Fork Section 1)  | July 15, 2016-September 15, 2016 | Eco Logical Resrach Inc. |
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* 1. **Explain how you determined your cost estimates**.*.*

Same fees for labor and equipment we charged for the last 3 years of restoration implementation in Asotin Creek.

* 1. **Describe the design or acquisition alternatives that you considered to achieve your project’s objectives.**

Alternative is no maintenance or additional restoration which could make detecting a fish response difficult due to the large amount of variation in fish and habitat data.

* 1. **How have lessons learned from completed projects or monitoring studies informed your project**?

Yes. We have incorporated literature and lessons learned from ongoing IMWs and our own IMW. After three years of developing and refining a new low cost method for installing LWD to streams we feel we have a much better and effective approach

* 1. **Describe the long-term stewardship and maintenance obligations for the project or acquired land**.

There is no required maintenance of these structures as they are made of all natural materials. We are only proposing adding additional LWD because our primary goal is to determine if LWD restoration can increase fish production and we do not want to run a > 10 year long project and not use a large enough restoration treatment to detect an effect.

1. **Context within the Local Recovery Plan.**
	1. **Discuss how this project fits within your regional recovery plan** **and/or local lead entity’s strategy to restore or protect salmonid habitat** (*i.e., addresses a priority action, occurs in a priority area, or targets a priority fish species*).

IMWs are part of recovery planning

* 1. **Explain why it is important to do this project now instead of later.** (*Consider its sequence relative to other needs in the watershed and the current level and imminence of risk to habitat).*

The IMW is not likely to be funded much longer than 2019 therefore we need to implement a restoration treatment and conduct maintenance in 2016 to provide time to detect a fish response.

* 1. **If your project is a part of a larger overall project or strategy, describe the goal of the overall strategy, explain individual sequencing steps, and which of these steps is included in this application for funding.** *Attach a map in PRISM that illustrates how this project fits into the overall strategy, if relevant.*

Yes – several IMWs are operating in WA and other parts of PNW with the same goals.

1. **Project Proponents and Partners.** *Please answer the following questions about your organization and others involved in the project.*
	1. **Describe your experience managing this type of project**. *Please describe other projects where you have successfully used a similar approach.*

We have been managing this IMW for 8 years. We also work with ISMEP and mange or provide assistance to three other IMWs (Bridge Creek – OR, Lemhi River – ID, Entiat River –WA).

* 1. **List all landowner names**.

WDFW and USFS

* 1. **List project partners and their role and contribution to the project**. *Attach a Partner Contribution Form (Manual 18, Appendix G) from each partner in PRISM. Refer to Manual 18, Section 3 for when this is required.*

SRSRB and RTT – oversight and technical review

WDFW – collect data and provide logistical support

USFS – donate LWD and logistical support

* 1. **Stakeholder Outreach**. *Discuss whether this project has any opposition or barriers to completion, besides funding. Describe your public outreach and feedback you have received. Are there any public safety concerns with the project? How will you address those concerns?*

We have conducted numerous outreach activities over the past 8 years, presented the IMW results at numerous professional meetings and provide regular updates to SRSRB and RTT. Probably over 50 different meetings. Presented to ACCD, SRSRB, RTT, WDFW, U of I, WSU, American Fisheries Society, Joint Aquatic Sciences Society, ISMEP, and BPA.

## Supplemental Questions

### Restoration Project Supplemental Questions

Answer the following supplemental questions:

1. **Will you complete, or have you already completed, a preliminary design, final design, and design report (per Appendix D) before construction?
No**
2. If no, please describe your design process and list all pre-construction deliverables you will submit to RCO for review. *Including riparian planting plans.*

Our design process is to design post-assisted log structures in the field using a custom IPad application. We build many small structures and it would be impractical and extremely costly to develop engineering designs for each structure. We have developed a series of different PALS designs that are intended to perform certain functions depending on the stream character at a particular site. For example, we use bank attached PALS where we want to constrict the stream channel and promote bed scour and the creation of a pool. We use mid channel PLAS where the channel is wide and shallow and we want to split the flow and create two deeper channels. For each PALS type we have also developed a series of hypothesized responses that we test as part of the IMW project. All the design types and hypotheses are described in greater detail in our Restoration Plan (Wheaton et al. 2012) and recent assessments of the effectiveness of the PLAS (Camp 2015). All the design and construction details of each PALS are described in the field using the IPad app including the structure type, intended response, amount of LWD added, photos of the structure, and GPS coordinates. A detailed report of the construction activities as well as a database of all PALS will be submitted as deliverables for this project.

1. **Will your project be designed by a licensed professional engineer?
Choose an answer**
2. If not, please describe the qualifications of your design team.

Built 550 post-assisted log structures already in Asotin IMW. Project team has over 50 years working in Watershed Sciences and Fisheries Biology. We have a professional fluvial geomorphologist that teaches stream restoration all over the country that helps with all design aspects.

1. **If this project includes measures to stabilize an eroding stream bank, explain why bank stabilization there is necessary to accomplish habitat recovery.** *Bank stabilization criteria required to be met for SRFB eligibility are on page 15 of Manual 18.*

NA

1. **Describe the steps you will take to minimize the introduction and spread of invasive species during construction and restoration.** *Specifically consider how you will use un-infested materials and clean equipment entering and leaving the project area*.

Both the USFS and ACCD work with the IMW to control weeds in the IMW study area. We carry all the materials on to the site to minimize the transport of non-natives. Ultimate goal is to have a healthy riparian area that limits spread of non-natives. ACCD is currently conducting a SRFB riparian planting project in conjunction with IMW.

# Comments

Use this section to respond to the comments you will receive after your initial site visits, and then again after you submit your final application.

Response to Site Visit Comments

Please describe how you’ve responded to the review panel’s initial site visit comments. *We recommend that you list each of the review panel’s comments and questions and identify how you have responded. You also may use this space to respond directly to their comments.*

**Draft Application / Site Visit REVIEW PANEL comments**

**Date:** June 18, 2015 **Project Site Visit?** **[x]  Yes** **[ ]  No Review Panel Member(s):** Slocum and Tyler

1. **Recommended improvements to make this a technically sound project according to the SRFB’s criteria:**

Add detail to the scope of work. Identify a schedule and responsible party for each specific task.

***Response: Schedule***

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| --- | --- | --- |
| **Task** | **Start Date – End Date** | **Responsible Party** |
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| Maintenance (adding LWD to existing treatment sections) | July 15, 2016-September 15, 2016 | Eco Logical Resrach Inc. |
| Restoration of new treatment section (South Fork Section 1)  | July 15, 2016-September 15, 2016 | Eco Logical Resrach Inc. |
|  |  |  |

Clarify the objectives as they relate to the number and type of structures anticipated for this treatment. In the South Fork Asotin, 200 pieces of LWD will be added to the structures installed in 2012. Is this over a single 4-km treatment reach? Will these be single logs or the addition of whole structures? The second objective states:

“Implement 2-4km of more restoration using the HD LWD approach that has been used in 12 km of Asotin Creek to date. Build approximately 100-150 post-assisted log structures”

Is this an addition of new PALs in the area formerly identified as a control reach? Provide clear objectives on the maintenance effort, specifying if you will replace only single logs that washed away, or replace whole structures.

***Response:***

**Maintenance Objectives -**

**- Single logs added to existing structures and in between structures (seeding)**

**New Treatment Objectives –**

**- add 2-4 km of new post-assisted log structures (PALS) in Section 1 of South Fork; increases portion of study area treated from 33% to ~ 40% …**

**- this was a control area and we are converting it to a treatment area (still have 5 control areas left compared to 4 treatments)** **We conferred with our statistician who helped design the original Hierarchical-Staircase design (Thomas M. Loughin, P.Stat. (SSC), PStat® (ASA Professor and Chair, Statistics and Actuarial Science, Simon Fraser University, Burnaby, BC) stated that adding another treatment (i.e., changing a control to treatment) would likely be a net benefit (increase balance between trt and ctrl sections) and would likely improve the study design.**

Will the structures installed in the proposed treatment be maintained over the post-restoration treatment monitoring period or allowed to deteriorate? If the structures will be maintained, specify if a funding source has been identified for the maintenance.

**Response:**

**- we do not plan to maintain structures beyond 2016 but would not rule that out if a large flood caused many structures to be washed away (we cannot predict these type of events)**

The proposal indicates that the treatment areas are all within the IMW study area as identified in the original restoration treatment plan (Wheaton et al, 2012). However, this is misleading, because supporting documentation (Attachment 07 Map- Area of Potential Effect (APE)) depicts the treatment in the area that was identified as a control reach in the 2012 restoration plan. While this is within the overall area of the IMW study, it is a departure from the restoration treatment plan. Please justify in the proposal 1) why additional treatments are being pursued after the treatments originally proposed have already been completed, and 2) why these treatments will extend into the control reach rather than enlarging the originally installed structures in the treatment reach. The project already has measured a geomorphic response in the treatment reaches, as compared to the control reaches. Wonlt shifting treatments into the South Fork control reach muddy the evaluation of the treatment’s effectiveness?

**Response:**

**1) We are converting a control section to a treatment section. All current treatment sections were controls from 2008-2012, and then three sections were converted to treatments over three years (2012-2014). We are simply proposing to convert another control to treatment. This is exactly how a staircase design works and what it is intended to do – assess the effectiveness of treatments implemented in different years. The staircase model can tease apart the effect of treat location (section), year treated, and years after treatment. IMWs are supposed to use large treatments and intensive monitoring to determine the effectiveness of restoration actions. We think that at this stage in the IMW, it would be prudent to increase the size of treatment because we will likely not have a chance to increase it at a later date and have time to monitor the effect.**

**2) We want to stick to our original philosophy which is that more structures are better than fewer larger structures. Treating another section is more appropriate and if we see another positive response in habitat and fish it strengthens the conclusions that the treatment is effective.**

**Yes, we have seen some treatment effects, but these have been in relatively simple metrics like abundance and growth and pool frequency. What will be much harder is to determine is changes in smolts/spawner and production because these variables are a synthesis of many metrics which increases the variance greatly. We want to increase the treatment to over-come the variance in these synthesis metrics as best we can.**

 In the field it was explained that the original structures in the S Fork Asotin were considered to be too small and the possibility for detecting a fish response would be enhanced if larger structures were installed–structures comparable in size to those in the North Fork Asotin– however this is not well explained in the proposal. Furthermore, the 2012 restoration plan emphasizes that number, not size, is more important in affecting in-stream habitat, so further rationale is needed to justify this change in approach. Likewise, the restoration treatment plan indicates that a structure failing or washing out is relatively insignificant, thus the proposal would be strengthened by explaining the need for structure maintenance included in this request. The proposal also does not explain why and how the decision was made to move to larger structures than were originally specified in the restoration treatment plan. Nor does the proposal detail the prescribed changes in material size. The restoration plan identified 12-18” logs 4-6’ in length. What size materials are being proposed now? Include a discussion of how the type of structure to be used is identified—excerpting a sentence from the restoration plan (p. 63) would be very helpful for reviewers unfamiliar with the treatment plan.

**Response:**

**The explanation given in the field for the maintenance was not completely accurate. We had a different source for LWD in 2012 compared to the 2013 and 2014 treatments. In 2012, we had large diameter Douglas-fir (0.3 – 0.5 cm diameter) as a source and in 2013-2014 we had smaller diameter (0.1 to 0.3) ponderosa pine trees from thinned seedtree orchards. The LWD in 2012 needed to be cut into smaller pieces to be able to carry it to the structure location and the Douglas-fir had less branches – so they resemble “logs” more than complex trees when cut in 2-4 m lengths. Because of the less complex LWD in 2012 more of it moved than we would have liked (although much of it is being trapped at downstream structures). We want to maintain the South Treatment by adding more of the pine with branches so the three treatments are more similar. We also want to add more wood to all treatments in a final “maintenance” because as the project has progressed we have realized that the planned wood treatments were a minimum – essentially more LWD can easily be accommodated in the sections and we want to have a large positive effect on stream habitat. More LWD is better!**

1. **Missing Pre-application information:**

**Response: This application was submitted after the pre-application phase as part of the SRFB IMW funding which is a new program.**

1. **General Comments:**

Principal Investigators indicate that this is the last scoped restoration treatment in this IMW. If the treatment is completed, this would be the first SRFB-funded IMW poised to begin post-restoration monitoring.

1. **Staff Comments:**

Please be sure to address all comments I provided when I reviewed the application in May/June (if you haven’t already done so), along with completing all other final application requirements listed in Section 3 of RCO Manual 18 [http://www.rco.wa.gov/documents/manuals&forms/Manual\_18.pdf](http://www.rco.wa.gov/documents/manuals%26forms/Manual_18.pdf). All changes to your proposal should be made using “Track Changes” in Word.

Response to Post-Application Comments

Please describe how you’ve responded to the review panel’s post-application comments. *We recommend that you list each of the review panel’s comments and questions and identify how you have responded. You also may use this space to respond directly to their comments.*