

Asotin Creek Intensively Monitored Watershed: Restoration & Maintenance Final Report**Stephen Bennett, Eco Logical Research Inc., Providence, Utah****Introduction**

The Asotin Creek Intensively Monitored Watershed (IMW) project is located in southeast Washington. The goal of the IMW is to determine the effectiveness restoration using large woody debris at increasing the productivity and capacity of Snake River Evolutionary Significant Unit (ESU) wild steelhead. We conducted pre-restoration monitoring of fish and habitat from 2008 to 2012. The experimental design has three 4 km long sections in three streams: Charley, North Fork, and South Fork (Figure 1). Fish and habitat monitoring takes place in each section. We initiated a trial of the restoration method in 2011 by installing five post-assisted log structures (PALS) in the three streams. After assessing the trial structures, full implementation of restoration began in 2012. We restored one 4 km treatment section in South Fork (2012), Charley Creek (2013), and North Fork Creek (2014). We installed 538 post-assisted log structures in the three treatment sections (Figure 2). In 2015, we proposed to maintain/enhance the existing treatments sections by adding more large woody debris to the PALS, and restore another section to the South Fork. Funding was provided by the Salmon Recovery Funding Board (SRFB) in 2016 to implement the new restoration and maintenance. This report details the work completed for the SRFB funding from 2016-2017. We expect to continue the effectiveness monitoring for the IMW until at least 2021 through Pacific States Marine Fisheries Commission (PSMFC) and SRFB funds.

Restoration Activity Summary

July 15 – August 31, 2016

- Completed installation of South Fork Section 1 restoration treatment (116 total structures within a 2 km treatment section (Figure 1-3))
- Site cleanup and equipment maintenance

September – December 31, 2016

- PRISM updates and progress reports
- Administration and site visit with SRFB staff
- Began implementation monitoring/ as-built surveys

January 1, - December 31, 2017

- Completed as-built surveys of new treatment sections
- Viewed the structures during high flow event in 2017
- Completed maintenance and addition of LWD to previous treatment sections in Asotin IMW (added 1000 pieces of wood to existing treatments sections and fell 50 trees)
- PRISM updates and progress reports

Summary

We constructed 116 post-assisted log structures in 2016 to extend the treated section of South Fork Asotin Creek by 2 km (Figure 1-3). In 2017, with remaining funds, we added more wood to the sections of the IMW project that had been previously treated in order to maintain high levels of large woody debris (LWD) in treatment sites compared to control sites (Figure 4). We also acquired a permit from WDFW to fell live trees along each treatment section to increase wood densities (Figure 5). We added approximately 400 pieces of LWD to both North Fork and South Fork Asotin Creek and 200 pieces of LWD to Chalrey Creek. Monitoring funded by the IMW shows that the existing and new restoration structures are producing positive habitat responses. The structures are forcing floodplain connection, creating pools, backwaters, sediment deposition, gravel bars, and recruiting trees as the channel increases in sinuosity (Figure 6-9). We will continue to monitor and analyze fish and habitat responses of these restoration actions as part of the Asotin Creek IMW.

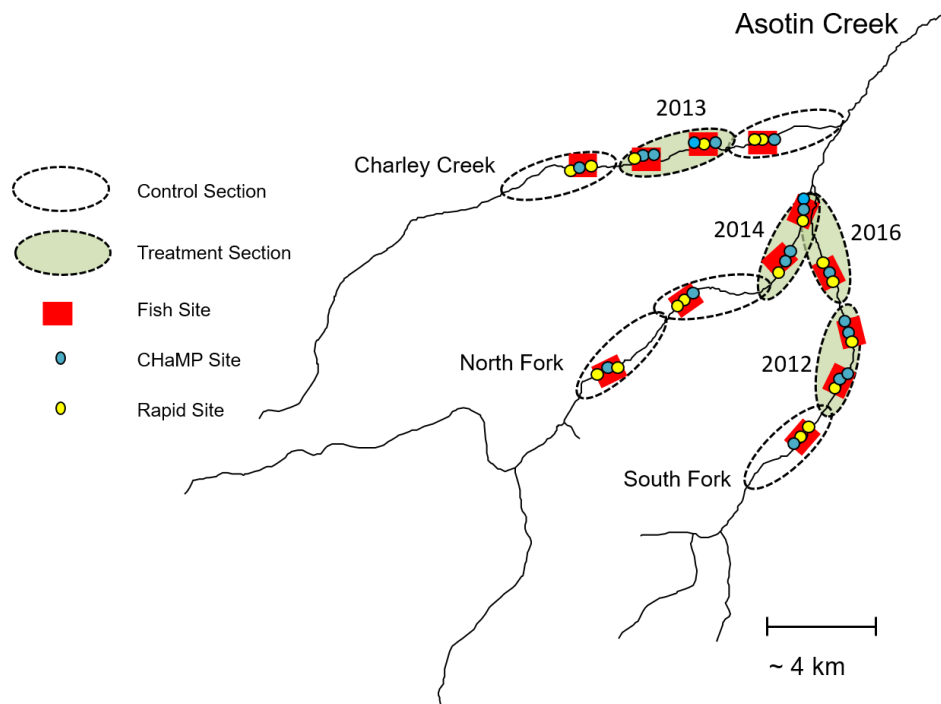


Figure 1. Experimental design of Asotin Creek Intensively Monitored Watershed. Each study stream has three 4 km sections. We restored one section in each stream with previous Salmon Recovery Funding Board funds: 2012-2014. The new section restored under current SRFB funding was the lower section of South Fork restored in 2016.

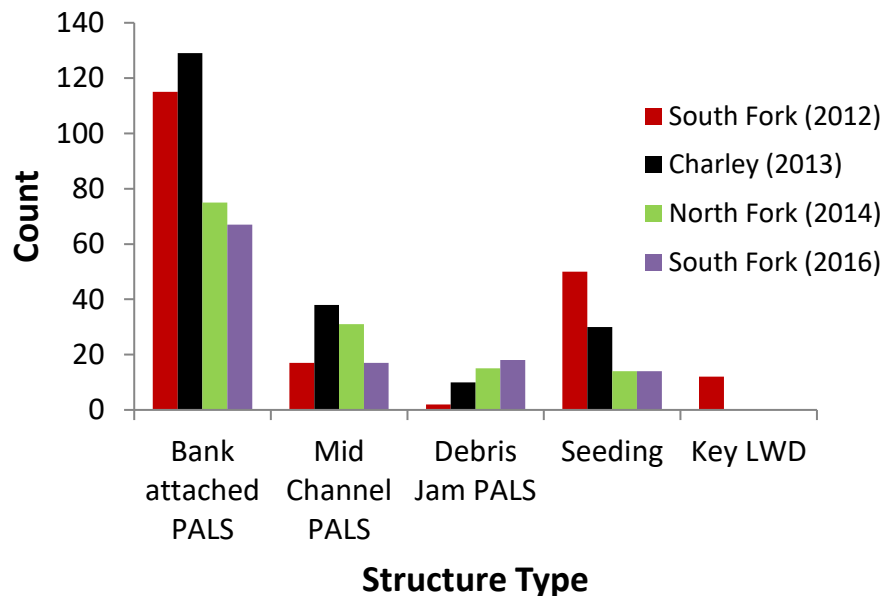


Figure 2. Number of post-assisted log structures (PALS) that were built for all the restoration treatments funded by the SRFB 2012-2014 and 2016 (n = 654). Bank = bank attached, Debris Jam = channel spanning, Mid = mid-channel, Seeding = large wood added with no posts, and Key LWD = large trees with root wads (too big to carry).



Figure 3. Example of the three most common post-assisted log structure (PALS) built in the new treatment section of the South Fork Asotin Creek in summer of 2016. Top left = series of Bank-attached PALS, top right = Mid-channel PALS, and bottom picture = Debris Jam PALS.



Figure 4. Example of felling a tree and adding large woody debris to an existing structure in North Fork Asotin Creek treatment section 1 to maintain high large woody debris density.



Figure 5. Example of felling a tree on an existing structure in North Fork Asotin Creek treatment section 1 to maintain high large woody debris density.



Figure 6. Aerial view of South Fork section 1 in spring 2017. We constructed this section in 2016. Water has been forced out of the main channel onto the floodplain on river right and river left.



a)



b)

Figure 7. a) Debris jam built in 2016 and viewed in summer of 2017. Note large dam pool upstream. b) Upstream of debris jam large sediment deposit covered with cottonwood seeds.



Figure 8. Example of post-assisted log structure built in 2016 in South Fork section 1 creating a large gravel and cobble bar downstream of the structure.



Figure 9. Example of trees that have been recruited into the stream by the strategic design of a post-assisted log structure.