

# Pataha Creek – PALS and BDAs

Pataha Creek is deeply incised and disconnected from the floodplain likely due to a loss of riparian function, historic channelization, removal of large woody debris, and a reduction of beaver populations. Although some streams in this area are incision-prone, the extent and rapidity of incision in Pataha is likely unnatural. The goals of this project were to increase sediment deposition, increase habitat complexity, recover woody vegetation, and improve water retention during summer base flows.

## Project Area Overview:

**Watershed Area:** 185 mi<sup>2</sup>

**Project Length & Avg. Gradient:** 2.5 miles; 1%

**Project Implementation:** 2016-17

**Confinement:** Partly Confined

**Reach Type:** Entrenched Low to Moderate  
Sinuosity Gravel/Sand Bed

**Species of Concern:** Snake River steelhead

## Goals:

- 1) Increase sediment deposition, habitat complexity, and woody vegetation
- 2) Improve summer flows and temperature

## Accomplishments:

- 1) Installed 140 PALS and BDAs
- 2) Planted >10,000 tree whips
- 3) Increased sediment deposition

**Results:** During the high flows of winter 2017, several structures were lost, primarily in the lower treatment section. The majority of LWD from these structures accumulated on downstream structures or on LWD spanners creating complex debris jams. Structures that resisted the high flows show evidence of bed aggradation upstream of structures, LWD accumulation on structures, and pool forming scour downstream of structures creating more of a step-pool character compared to the plane-bed character the channel exhibited prior to PALS installation.



**Figure 1.** Two BDA structures on Pataha Creek during receding high flows. Note A) activated side channel and B) ponding upstream of BDA. Areas such as these were heavily planted with willow and cottonwood whips and poles to take advantage of increased water retention and fresh fine sediment deposits.

**Partners:** Salmon Recovery Funding Board, Snake River Salmon Recover Board, Pomeroy Conservation District, USFS-Pomeroy Ranger District, Washington Department of Fish and Wildlife, Eco Logical Research, Inc.



# Tucannon River – Project Area 10

In 2005, the upper Tucannon Watershed experienced a major forest fire that burned large areas in and around the Tucannon River. The results were devastating. One beneficial outcome has been a major LWD recruitment event to the river that has increased instream habitat complexity in portions of the river. But some reaches of the river remain generally lacking in habitat complexity (i.e. pool frequency, floodplain connection, and off channel habitat). Project Area 10 was conceptualized in the Conceptual Restoration Plan Tucannon River Phase I and was prioritized for early restoration action under the Tucannon River Habitat Programmatic funded by BPA.

## Project Area Overview:

**Project Length:** 1.6 miles

**Project Implementation:** 2012

**Confinement:** Partly Confined

**River Style:** Low to Moderate Sinuosity,  
Wandering Gravel/Cobble Bed

**Species of Concern:** Snake River Spring Chinook,  
Snake River steelhead, Columbia River Bull Trout

## Goals:

- 1) Increase LWD frequencies to meet Restoration Goals (>1 key piece/channel width)
- 2) Increase channel complexity
- 3) Reduce channel confinement and incision

## Accomplishments:

- 1) Constructed 5 ELJs
- 2) Added 300 large (>12" diameter) and 500 small (<12" diameter) trees via helicopter
- 3) Breached 2 levees
- 4) Created 0.75 miles of new side channel habitat and reconnected 0.5 miles



**Results:** Monitoring results at the CHaMP site show an increase in key (>.3m D, >6m L) LWD pieces as well as pool frequency and percent pools compared to pre-treatment results. After high flows in winter 2017, one new side channel formed and another became reconnected. Pre and post treatment comparisons are shown in the table to the right.

Metric	Pre-Treatment (2012)	Post Treatment (2017)
Key LWD Pieces/Channel Width	0.23	1.35
Pool Frequency (Count/100m)	2.1	3.3
Pool Percent	13.4	28.9
Side Channel Lgth (m)	65	101

**Partners:** Salmon Recovery Funding Board, Bonneville Power Administration, Snake River Salmon Recover Board, Washington Department of Fish and Wildlife, USFS-Pomeroy Ranger District, Confederated Tribes of the Umatilla Indian Reservation, Tri-State Steelheaders



# Little Tucannon River – Post Assisted Log Structures

In the Little Tucannon River watershed, past management practices, recent wildfires, and uncharacteristic high flow events have led to a simplification of the stream channel due in part to a limited amount of large woody debris (LWD) in the channel. The objectives of this project were to restore ecologically based stream processes by adding LWD structures to improve in-stream habitat complexity (i.e., pools, cover) and floodplain connectivity.

## Project Area Overview:

**Watershed Area:** 8.4 mi<sup>2</sup>

**Project Length & Avg. Gradient:** 1.2 miles; 5%

**Project Implementation:** 2016

**Confinement:** Partly Confined

**River Style:** Low to Moderate Sinuosity, Planform  
Controlled with Discontinuous Floodplain

**Species of Concern:** Snake River steelhead,  
Columbia River Bull Trout

## Goals:

- 1) Increase LWD frequency to levels of nearby, restored streams
- 2) Increase pool frequency by 25 percent

## Accomplishments:

- 1) Installed 50 Post Assisted Log Structures
- 2) Increased LWD frequency from 22.6 pieces/100m to 43.13 pieces/100m

**Results:** During the high flows of winter 2017, several structures were lost, primarily in the lower treatment section. The majority of LWD from these structures accumulated on downstream structures or on LWD spanners creating complex debris jams. Structures that resisted the high flows show evidence of bed aggradation upstream of structures, LWD accumulation on structures, and pool forming scour downstream of structures creating more of a step-pool character compared to the plane-bed character the channel exhibited prior to PALS installation.



**Figure 1.** Pre (Feb. 2017; left photo) and post (March 2017; right photo) high flow images of PALS 48. In the post high flow photo, note A) debris accumulation on the original PALS, B) debris from failed upstream PALS on the upstream large wood spanner, C) pool formed upstream of structure/downstream of debris jam, and D) activated side channel in the far background.

**Partners:** Salmon Recovery Funding Board, Snake River Salmon Recover Board, Columbia Conservation District, USFS-Pomeroy Ranger District, Washington Department of Fish and Wildlife, Eco Logical Research, Inc.

## Post Assisted Log Structures (PALS) and Beaver Dam Analogues (BDAs)

