

Restoring Functional, Sustainable Floodplain and Watershed Processes: Grande Ronde Subbasin Bird Track Springs Project

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Introduction

Northeast Oregon's Grande Ronde River and many of its tributaries historically supported viable and productive native fishery resources. Anthropogenic alteration of the watershed has decreased habitat quality, quantity, and fishery productivity.

The Bird Track Springs Fish Habitat Enhancement Projects was identified as having high potential for fishery productivity. Planning and design teams focused project development to address habitat limiting factors using the CTUIR's River Vision (Figure 1) as a guide to restoring watershed process and function that support aquatic First Foods (Figure 2).

Project goals and objectives focused on decreasing summer stream temperatures, increasing winter refuge, and increasing habitat suitability for all life stages of salmon and steelhead. Actions included habitat protection, streamflow conservation, improved passage, restored floodplain connectivity, and natural channel morphology. Additional actions included enhanced habitat complexity, side channels, and riparian/wetland communities. The Project was constructed over a 2-year time period (August 2018-December 2019).



Figure 2: CTUIR First Foods.

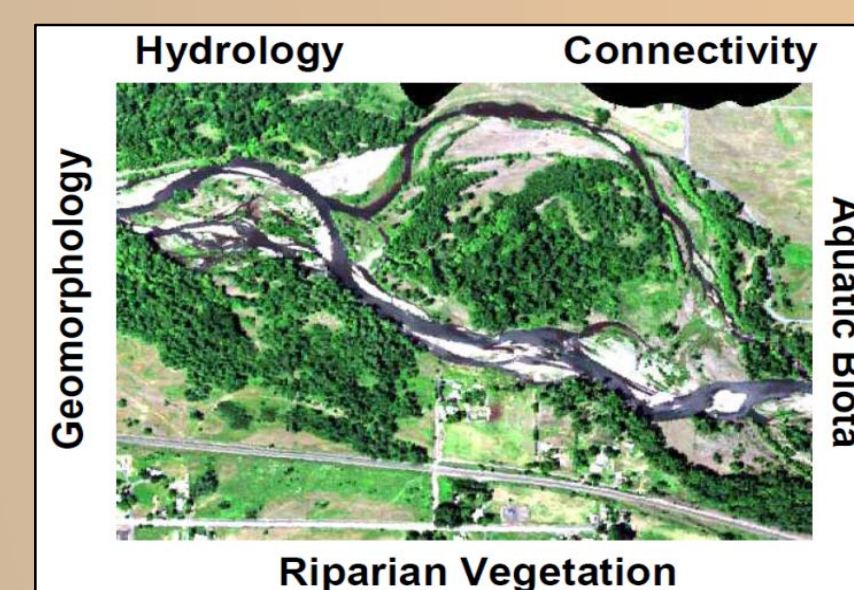
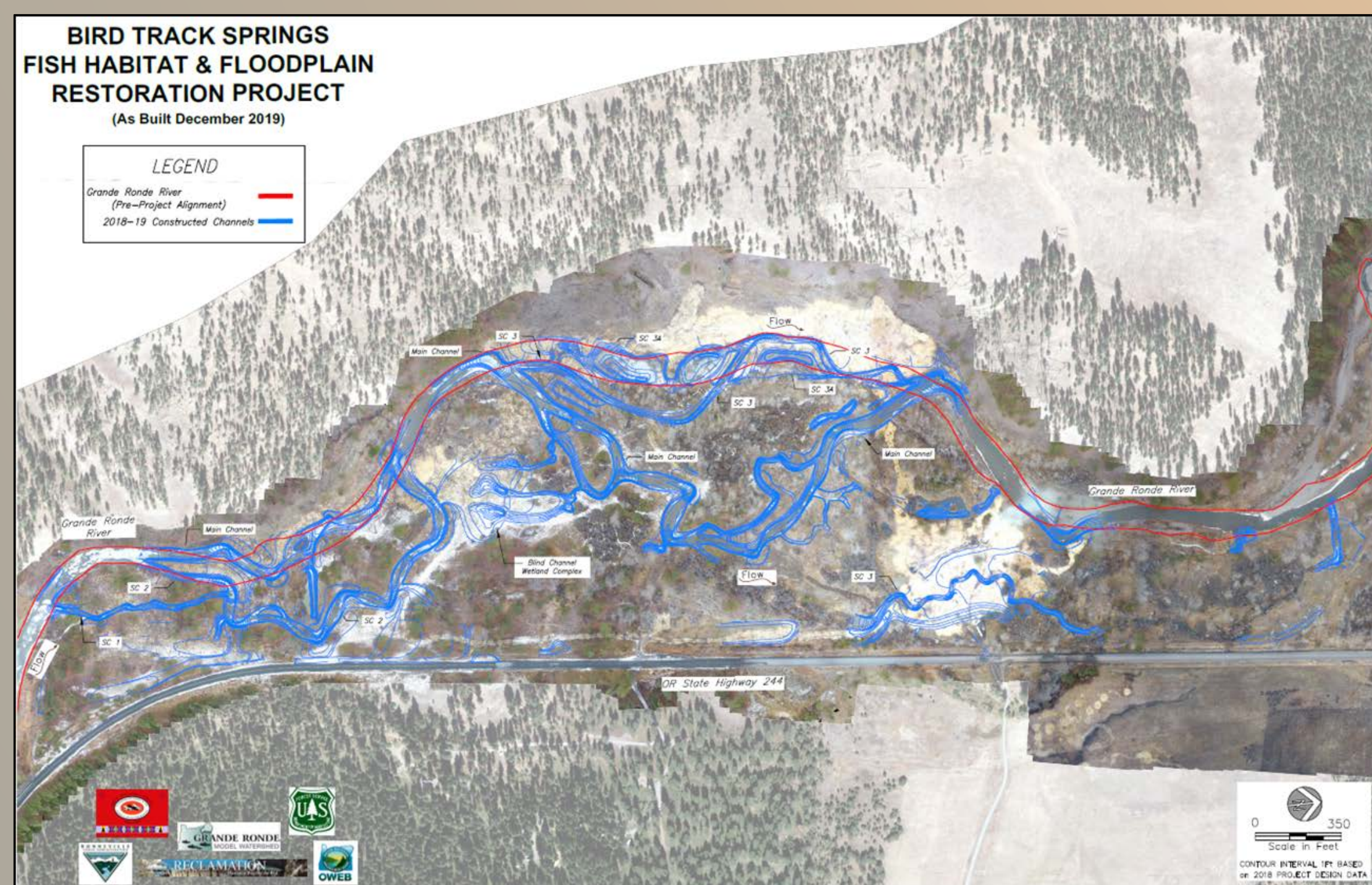


Figure 1: CTUIR's River Vision identifies physical and ecological processes of a highly functional and dynamic river system integral for providing water quality and fish habitat that supports aquatic First Foods.

Bird Track Springs Construction



Overview map showing as-built linework overlaid onto post-project aerial imagery.



Main channel pre-project, looking upstream



Main channel and side channel 5 post-project, looking upstream

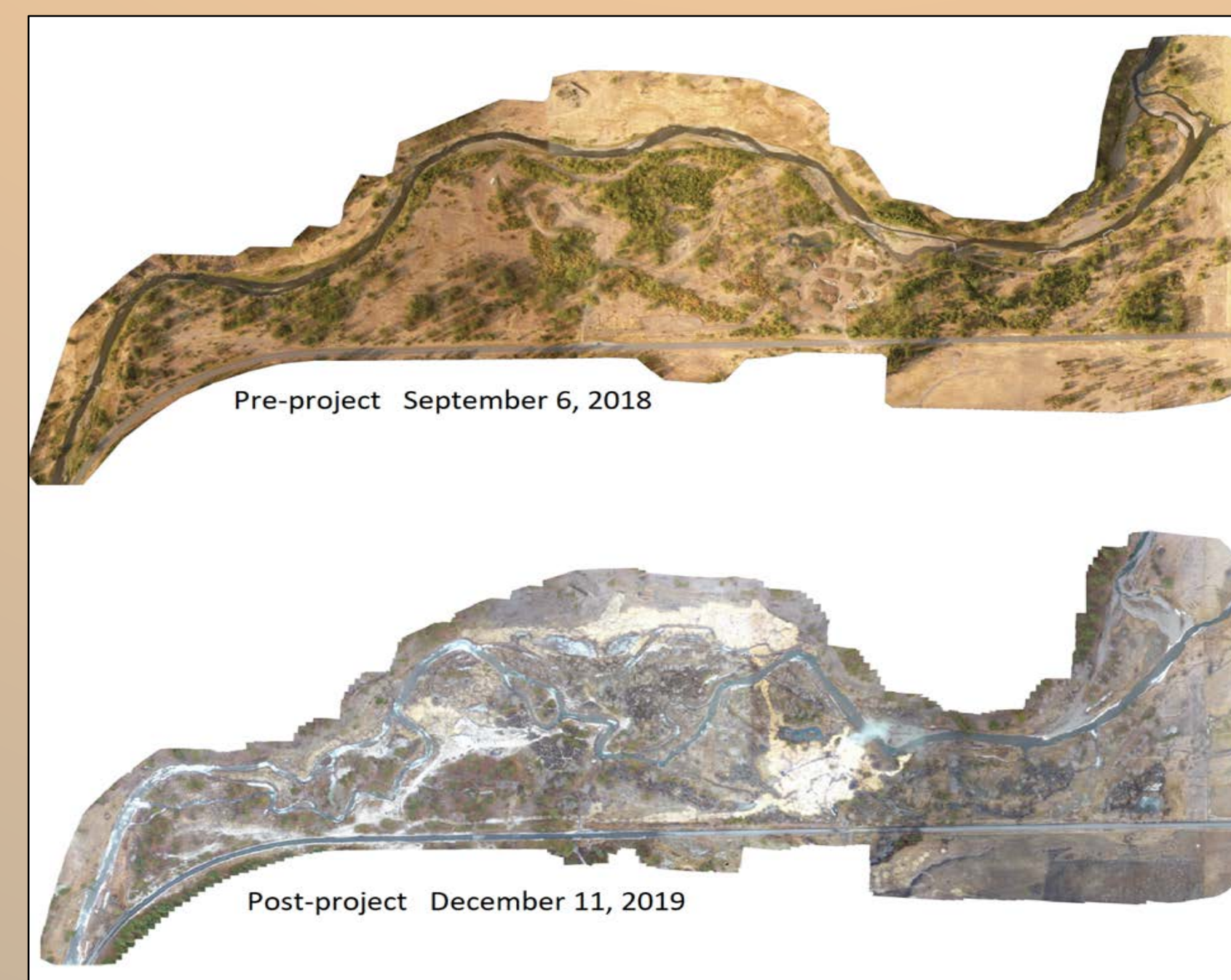


Large wood structure construction at station 42+00, August 23, 2019 (looking downstream).



Adult Steelhead (*O. mykiss*).

- 17 main channel pools created
- 47 side channel pools created
- 293 large wood structures installed
- 605 floodplain roughness structures
- 7,399 feet of bank treatments installed
- 46,150 trees planted
- 5,000 feet of main channel constructed
- 9,500 feet of side channel constructed
- 82,723 cubic yards of material excavated
- 125 acres of floodplain connected



Bird Track Springs pre and post-project.

2020 Bird Track Springs Flood Event

The Grande Ronde River through the Bird Track Springs Project sustained a 50-year (approximate) flood event on February 6, 2020. Recently constructed channels, swales, large wood structures, bank treatments, and floodplain structures withstood the high flows remarkably well, with minimal damage to constructed project components. Below are images of the event:



Floodplain activation at station ~80+00



Floodplain activation at station ~65+00

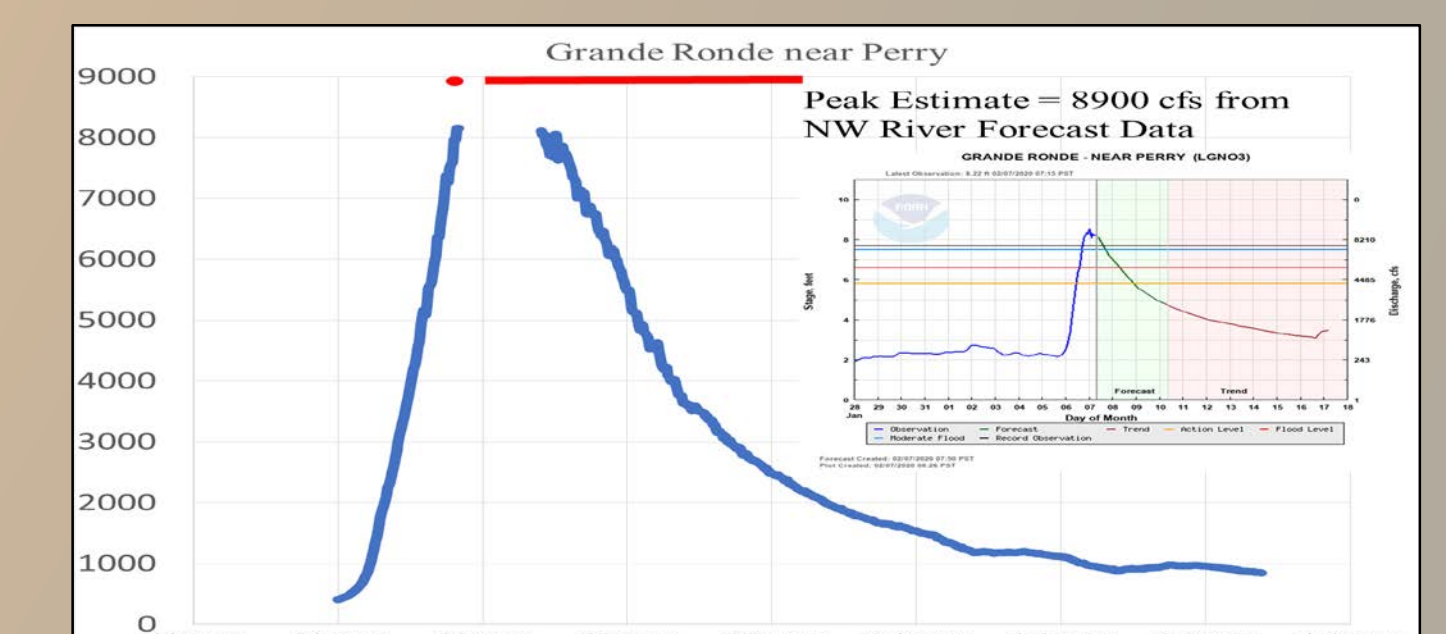


Large wood structures at station 42+00



Floodplain activation at station ~52+00

The Grande Ronde River at Perry sustained a record flow event of ~8,900 cfs. From hydrology data, it appears the project sustained ~5,500 cfs.



Discussion

- Connecting the floodplain to the river attenuates flooding by slowing velocities, storing water on the floodplain, and decreasing energy along channel margins.
- Innovative, extensive use of GPS machine control allowed more efficient channel, swale, and floodplain grading and precise placement of key members within large wood structures.
- Collaboration, scale, and nested stream restoration projects create synergistic value for species at high risk and may prove to be more resilient to climate change compared to single projects.
- Monitoring efforts will be ongoing, using Action Effectiveness Monitoring (AEM) protocols.

Acknowledgements

