Yale SCHOOL OF THE ENVIRONMENT

Ucross High Plains Stewardship

FELLOWSHIP BRIEF

# Catalyzing Watershed Restoration in National Forests

Alex Wells – Candidate for Master's of Environmental Management 2025

Project collaborators: The National Forest Foundation

## The Need.

After more than 150 years of intensive use, the land and streams of the Intermountain West have been severely degraded, an issue compounded by the ongoing aridification caused by climate change. Ecological restoration can help to repair this damage and facilitate climate change adaptation. However, with 34 to 42% of the 193 million acres of land managed by the U.S. Forest Service in need of restoration, it is critical that these efforts are implemented at scale.

However, this is easier said than done. Implementing ecological restoration at scale is hampered by a lack of funding, a limited workforce, local concerns, and extensive permitting requirements. Stream restoration efforts in particular can face opposition from local landowners and water rights holders who fear that their land and livelihoods might be harmed, which can make organizations and agencies cautious to implement projects. Implementing landscape-scale ecological restoration efforts in the western United States on the timescale of climate change requires addressing all of these challenges.

## The Project.

Alex worked with the National Forest Foundation (NFF) on two projects targeted at breaking down barriers to the NFF's watershed restoration projects. With part of his Fellowship, Alex focused on helping to catalyze stream restoration to restore the natural processes of headwater streams (known as process-based restoration or PBR) in the Roaring Fork Valley of Colorado. While the NFF had identified and begun planning several projects in the Valley, concern about the reactions of downstream water rights holders was slowing their development. Alex sought to address these concerns by developing outreach materials and conducting a stakeholder assessment. Alex also completed the initial phases of an internal tool that the NFF will use to quantify the watershed benefits of their restoration projects. Efficiently quantifying these benefits will help the NFF to obtain critical funding for these projects from corporate sponsors.

# The Findings.

Alex created several deliverables for NFF by leveraging insights from local practitioners, case studies and scientific research on process-based restoration, and current best practices for Volumetric Water Benefit Accounting, These outputs are described below and will be used by the National Forest Foundation and other organizations in the Roaring Fork Valley to overcome barriers to the implementation of ecological restoration projects.

- A pamphlet targeted at water rights holders and landowners in the Roaring Fork Valley that translates the science of what PBR is, what benefits it has been shown to provide, and what its implications could be for water rights.
- An assessment of landowners and water rights holders that could be impacted by a planned NFF restoration projectthat identified potential opportunities and challenges for engaging them.
- Multiple documents to provide guidance and an actionable framework for calculating the watershed benefits of the NFF's ecosystem restoration activities using Volumetric Water Benefits Accounting.

# The Impact.

In the Roaring Fork Valley, Alex's efforts will support the restoration of degraded headwaters streams, including three process-based restoration projects in the White River National Forest being planned by the NFF. The outreach pamphlet that Alex created will be used both by the NFF and several local organizations to start conversations that will help to minimize conflict over PBR on both private and public land in the Valley. Additionally, the watershed benefits tool that Alex designed will be built out by the NFF's GIS team during several phases over the coming year. Once it is operational, it will allow the NFF to measure the watershed benefits of their projects much more efficiently than they had previously, giving them more capacity to increase this critical funding stream. Locally in the Roaring Fork Valley and nationally across the National Forest network, these efforts will help to overcome obstacles to implementing watershed restoration and adapting socio-ecological systems to climate change.

# The Student.

Alex Wells, Research Assistant and Western Resource Fellow | Alex is a Masters of Environmental Management candidate at Yale School of the Environment, specializing in ecosystem management and conservation. Having grown up in the Roaring Fork Valley of western Colorado, his passions and priorities are centered on the Mountain West and how its ecological systems can be adapted to the climate crisis in a way that helps both ecosystems and people. Alex holds a B.A. in Conservation Biology from Middlebury College and spent the four years prior to Yale coordinating wildlife-focused citizen science projects in Vermont and Colorado. In his freetime, Alex enjoys playing guitar and running up, down, and around mountains. See what Alex has been up to. | Blog