An aerial photograph of a river valley. The river flows through a lush green landscape with some rocky patches. In the background, there are rugged mountains with some sparse vegetation. The sky is clear and blue.

***Integrating Freshwater Protection and
Restoration into Wildfire Risk Reduction, Fire-
Fighting Strategies, and Post-Fire Recovery***

**RiversEdge West
2026 Riparian Restoration Conference**

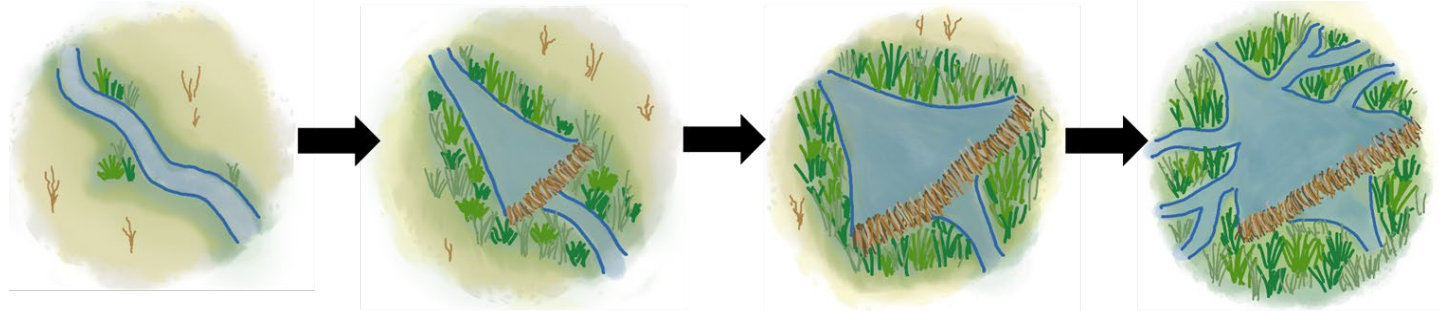
An aerial photograph of a mountain valley. In the foreground, a large, calm pond is surrounded by lush green vegetation and a few evergreen trees. A small island of brush is in the middle of the pond. In the background, steep, rocky mountains rise, some with sparse evergreen forests. A road is visible on the left side of the valley. The sky is clear and blue.

Beavers, BDAs, and Fire Resistant Landscapes

Jessie Moravek, PhD

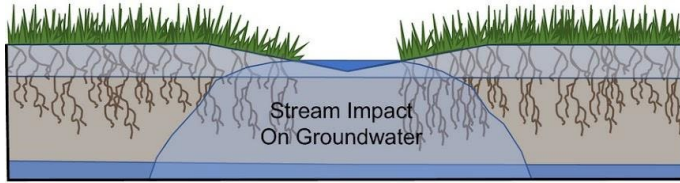
University of Minnesota Fairfax Beaver Lab

Beavers as Ecosystem Engineers

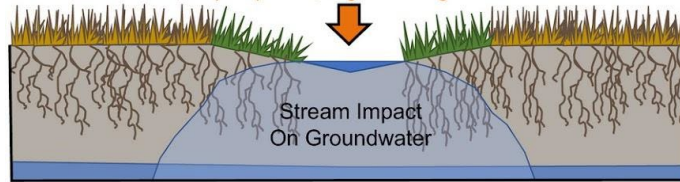


How Beavers Create Fire Resistance

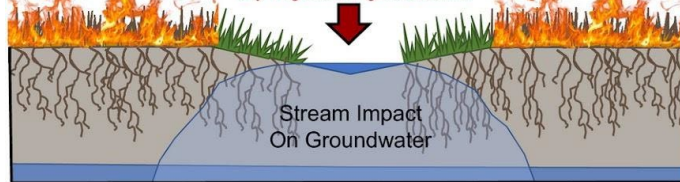
Stream without Beavers



■
Drought Conditions
less precipitation, veg relies on groundwater

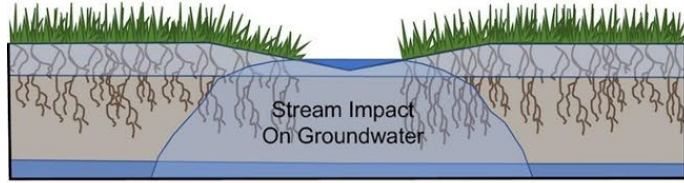


■
Fire Conditions
dry vegetation ignites/burns

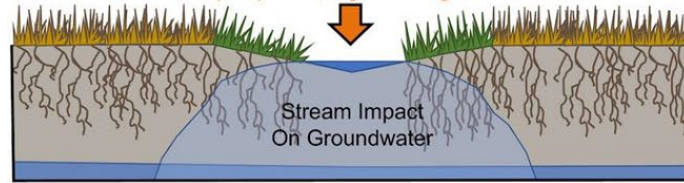


How Beavers Create Fire Resistance

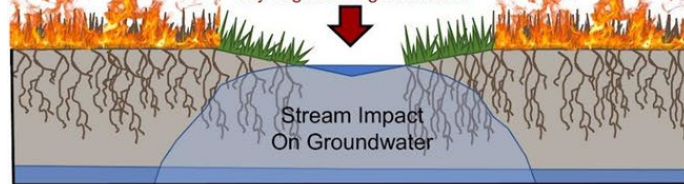
Stream without Beavers



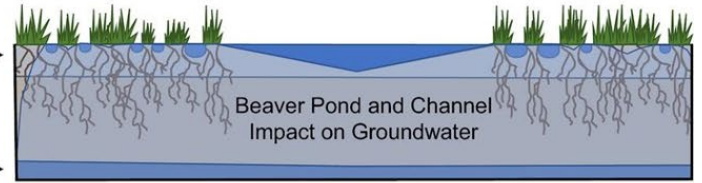
Drought Conditions
less precipitation, veg relies on groundwater



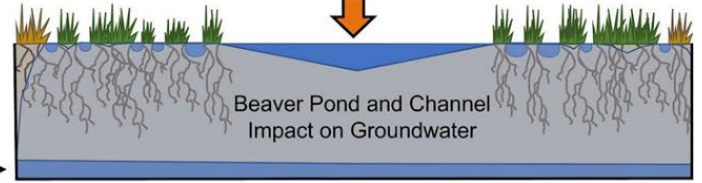
Fire Conditions
dry vegetation ignites/burns



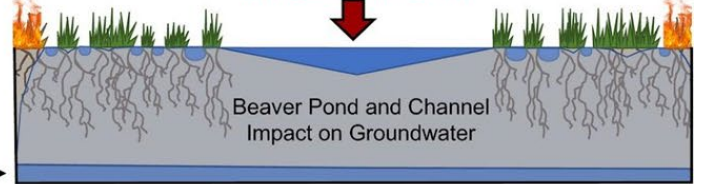
Stream with Beavers



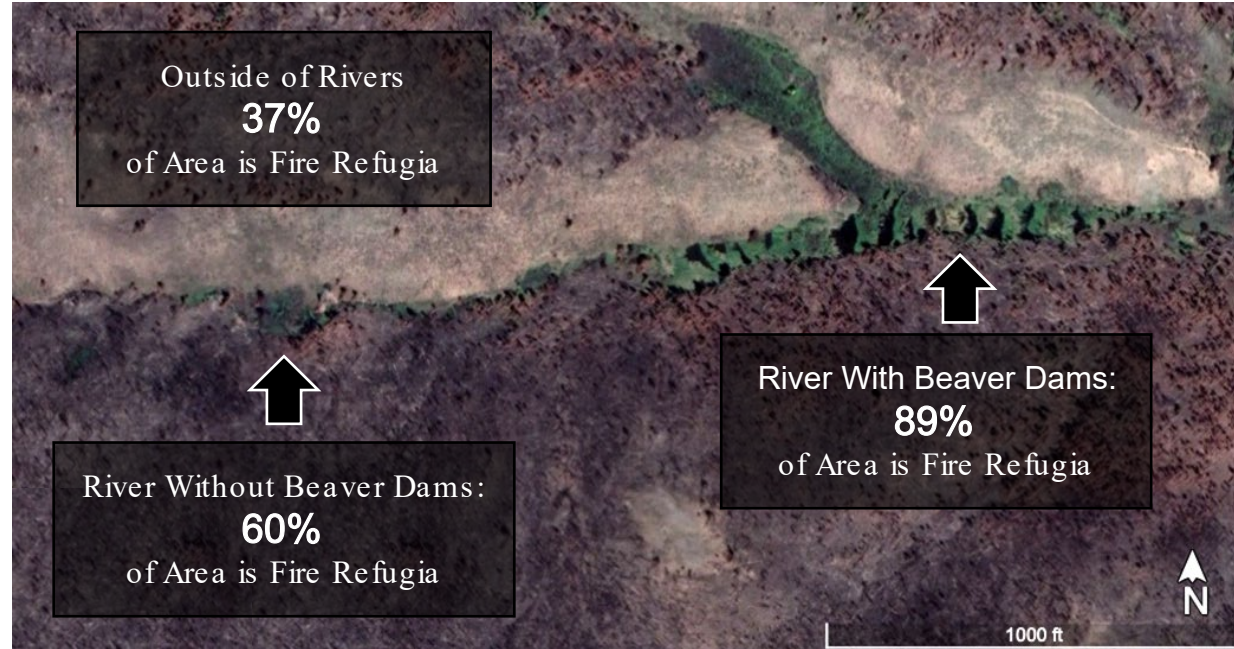
Drought Conditions
less precipitation, veg relies on groundwater



Fire Conditions
dry vegetation ignites/burns

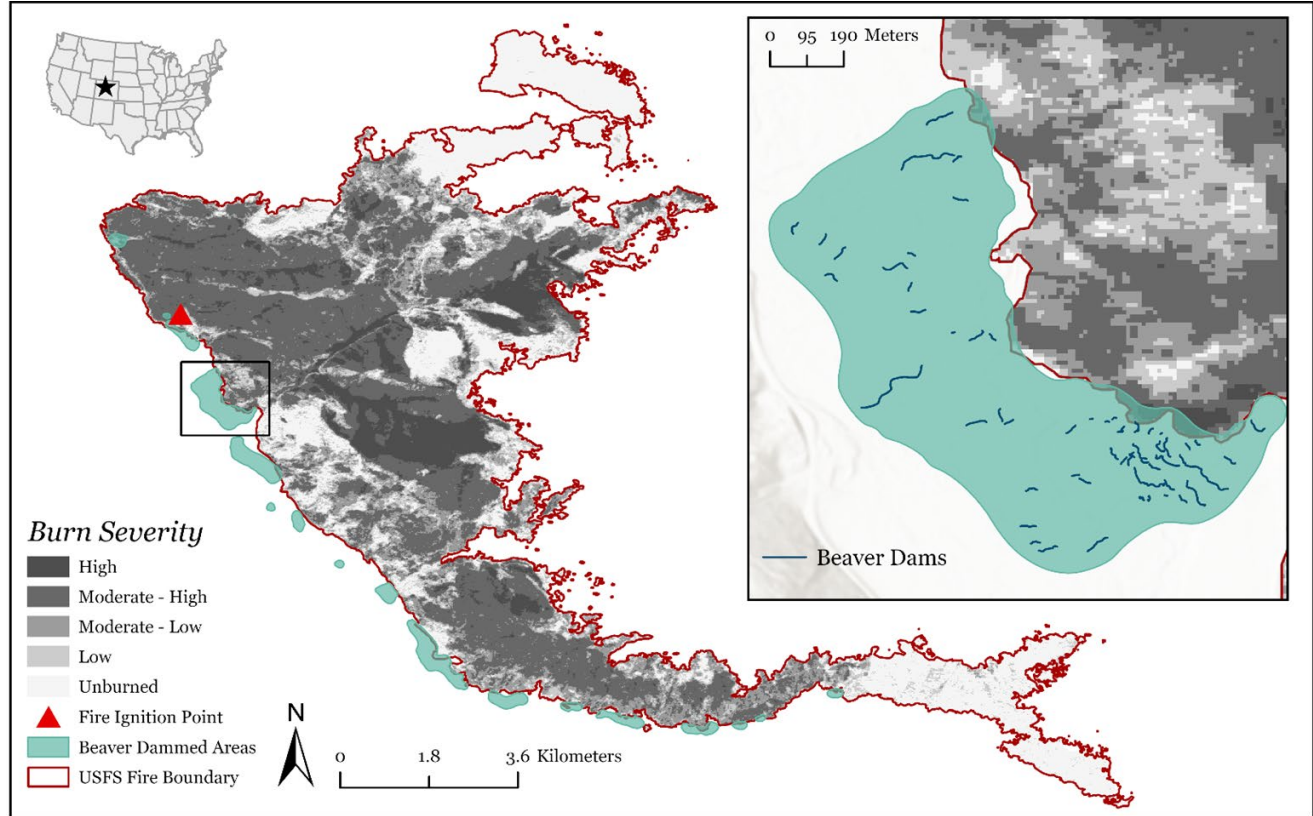


Beaver Complexes are 3x more fire resistant than non-beaver areas

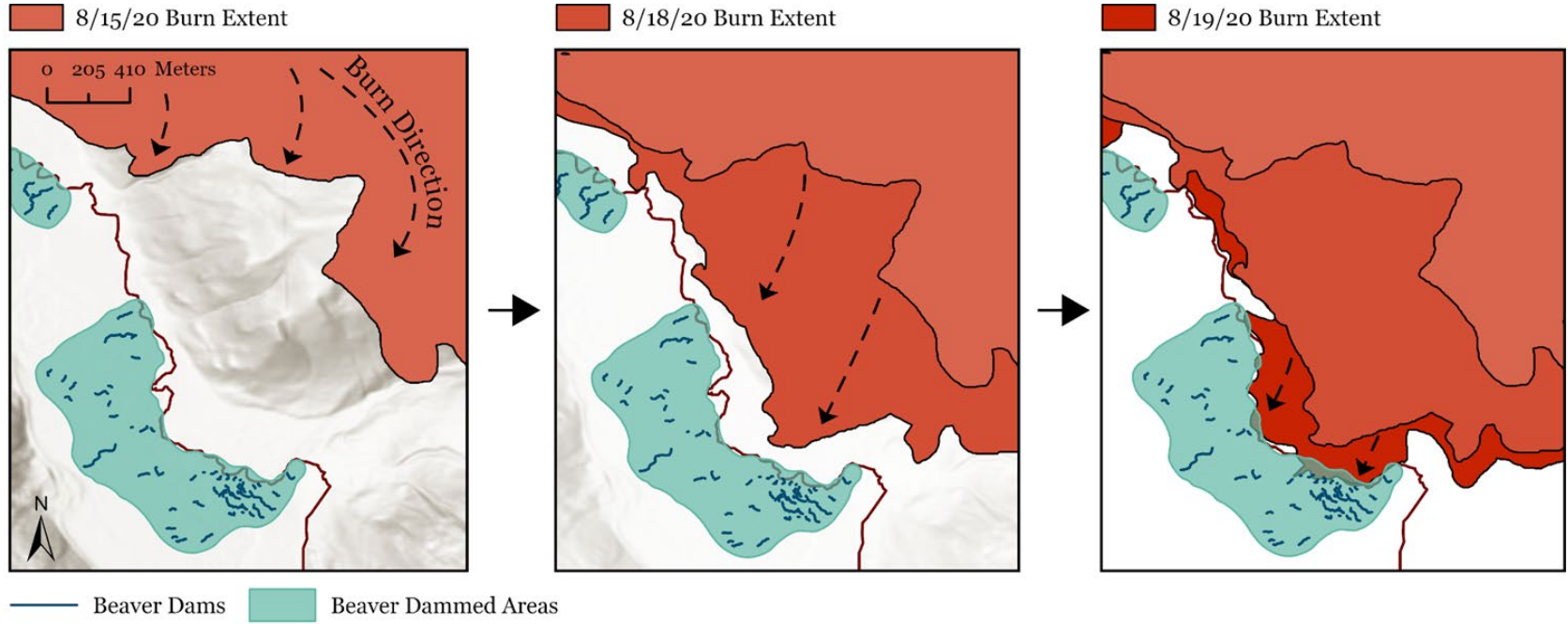


Beaver complexes create fire breaks (sometimes)

Williams Fork
Fire, Colorado
2020



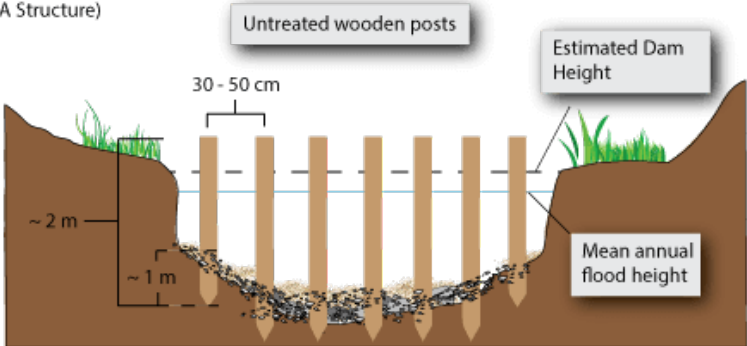
Beaver complexes create fire breaks (sometimes)



Fire breaking probably depends on fire severity, wetland width, age of dam complex, wind, slope, and aspect

Beaver Dam Analogs (BDAs) and LT-PBR

Cross Section View
(Generic BDA Structure)



Plan View
(Convex Primary Dam)

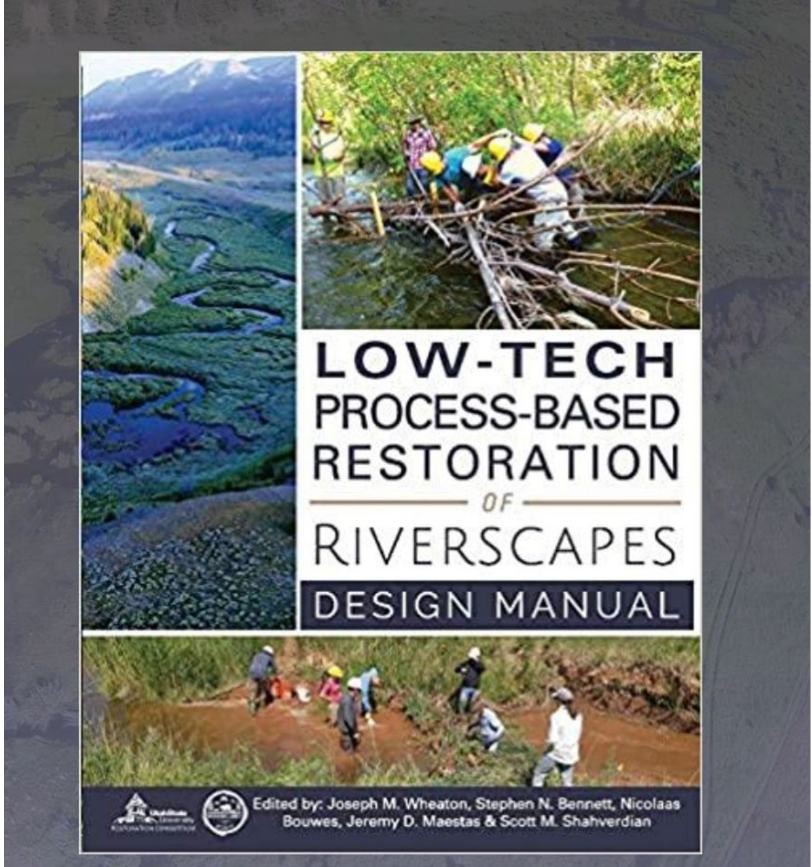
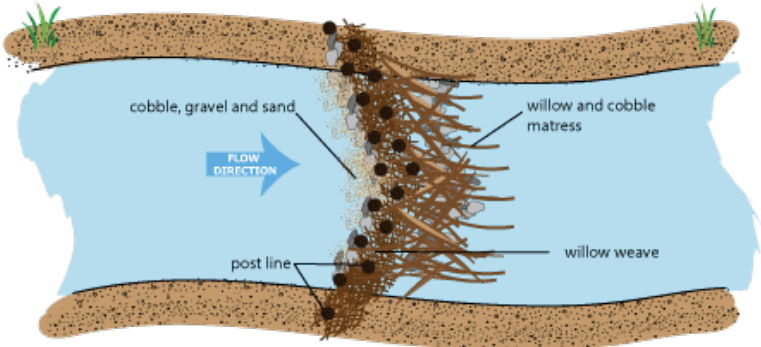
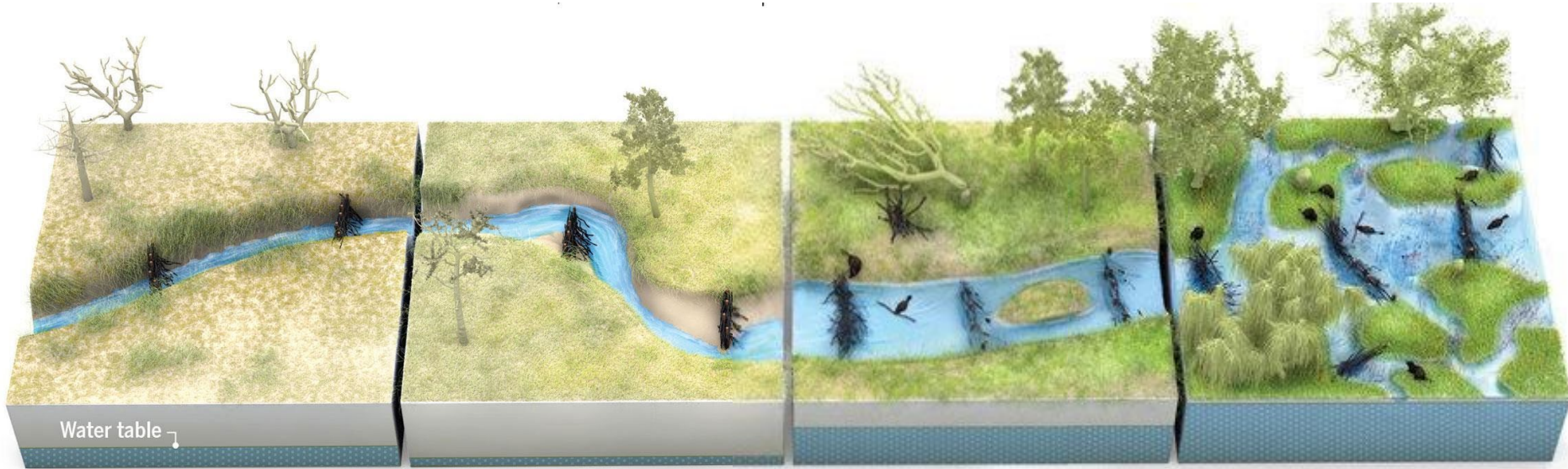


Figure by Anabranh Solutions



Photo: Kevin Swift

Beaver Dam Analogs (BDAs) and LT-PBR



Adding dams

Beaver trapping and overgrazing have caused countless creeks to cut deep trenches and water tables to drop, drying floodplains. Installing BDAs can help.

Widening the trench

BDAs divert flows, causing streams to cut into banks, widening the incised channel, and creating a supply of sediment that helps raise the stream bed.

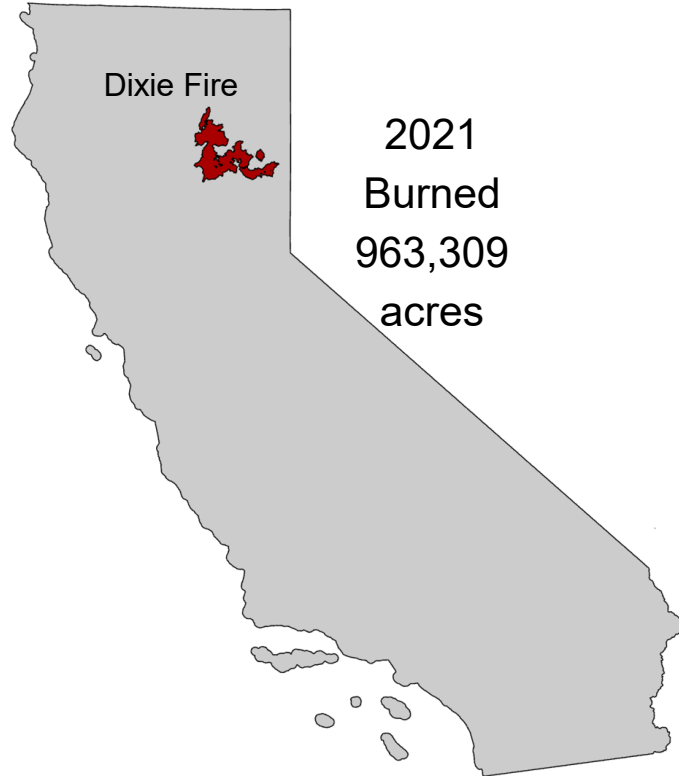
Beavers return

As BDAs trap sediment, the stream bed rebuilds and forces water onto the floodplain, recharging groundwater. Slower flows allow beavers to recolonize.

A complex haven

Re-established beavers raise water tables, irrigate new stands of willow and alder, and create a maze of pools and side channels for fish and wildlife.

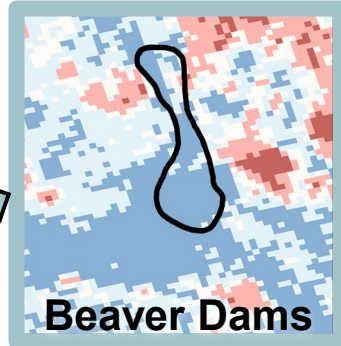
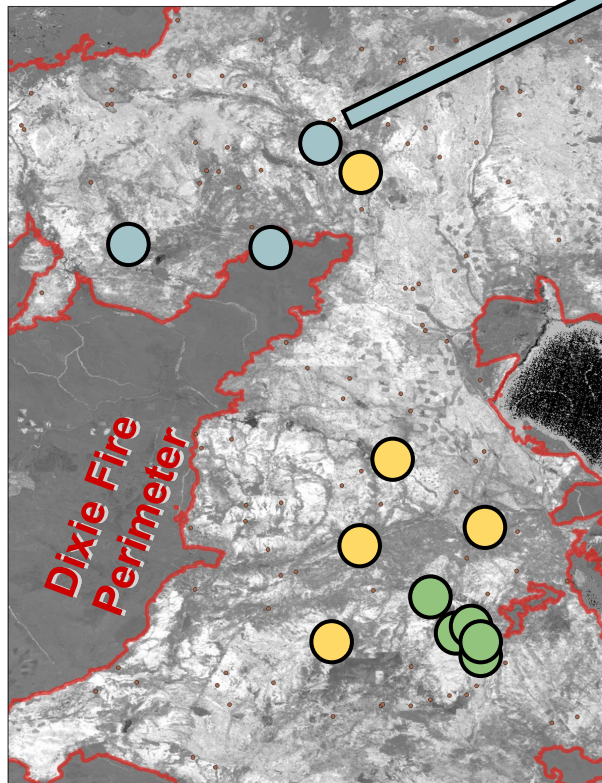
Do BDAs also resist fire?



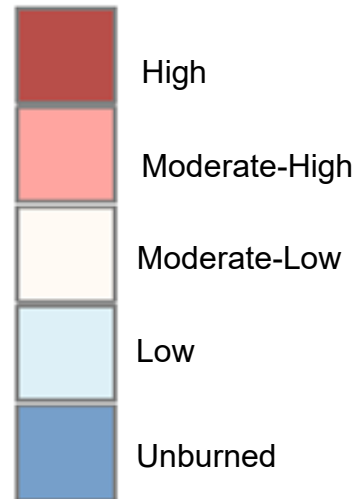
BDA Complex: Tásmam Koyóm



Comparison Sites in Tásmam Koyóm

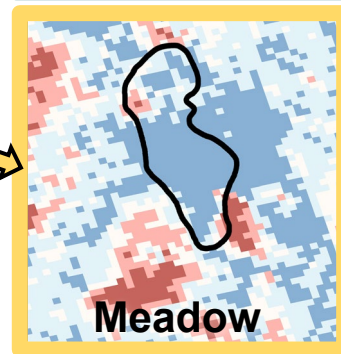
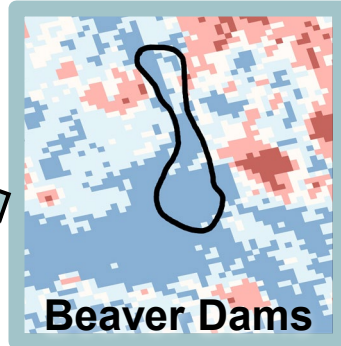
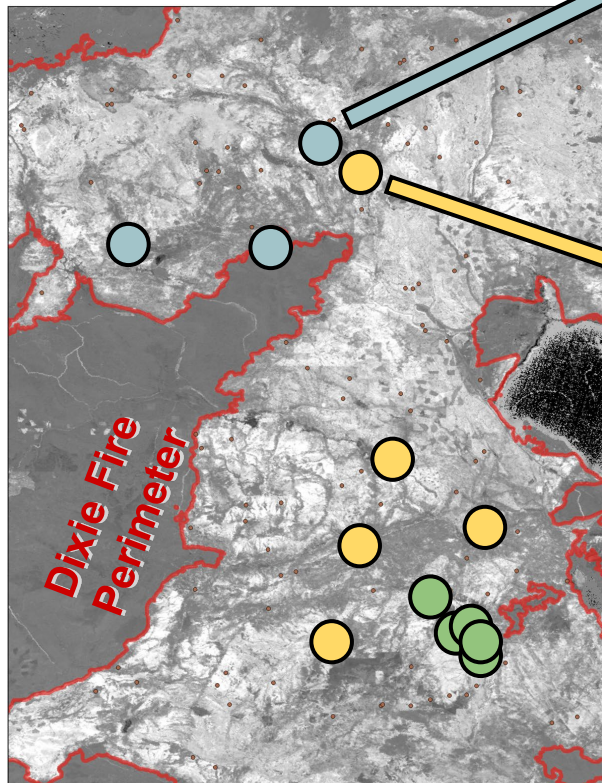


Burn Severity (dNBR)

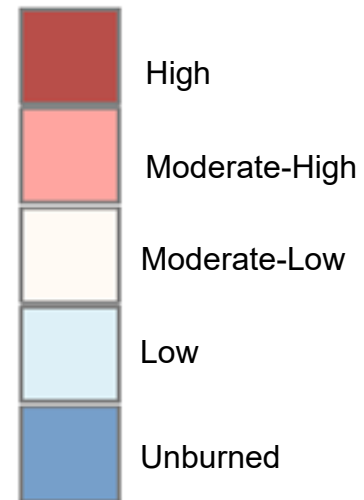


Analysis and Map: Martha
Denton and Emily Fairfax

Comparison Sites in Tásmam Koyóm

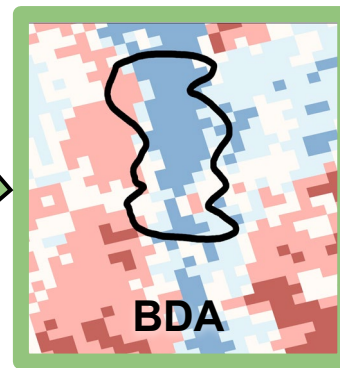
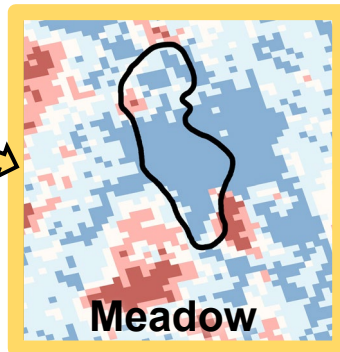
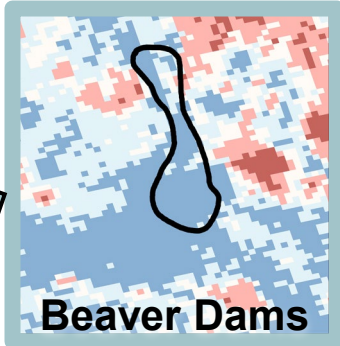
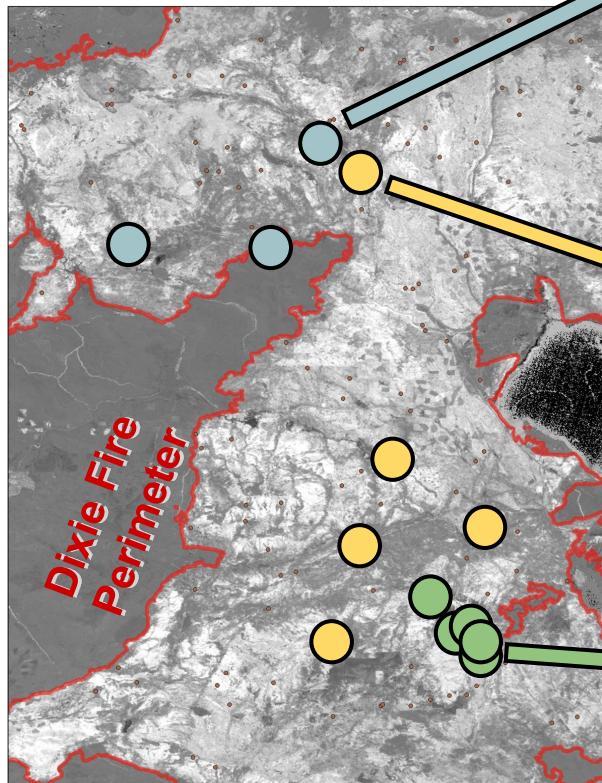


Burn Severity (dNBR)

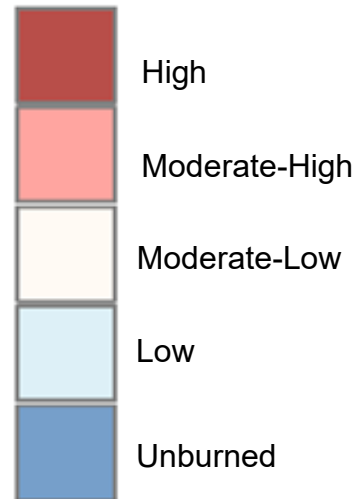


Analysis and Map: Martha Denton and Emily Fairfax

Comparison Sites in Tásmam Koyóm

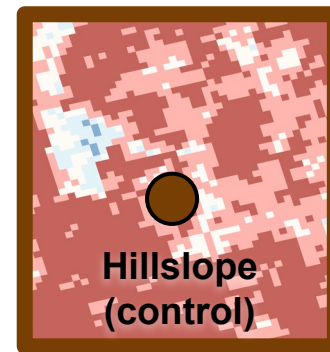
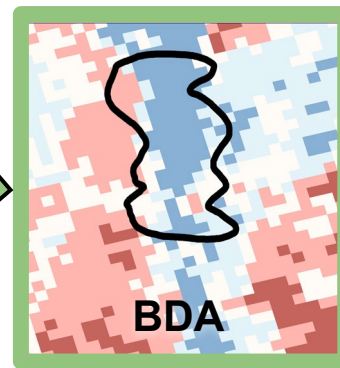
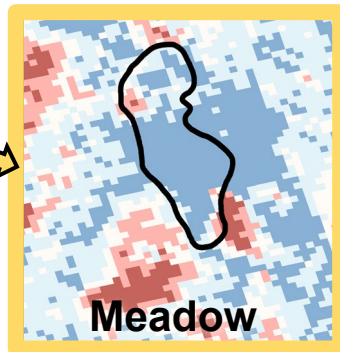
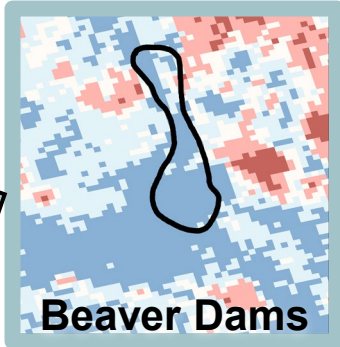
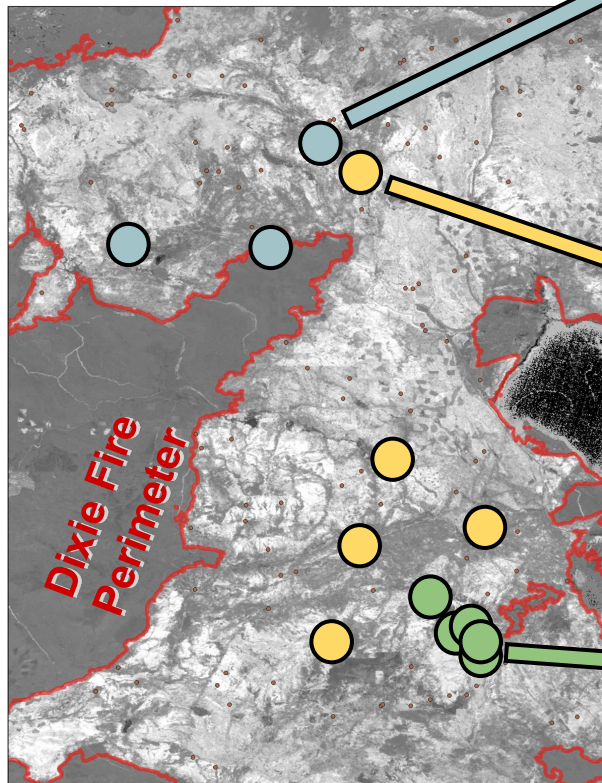


Burn Severity (dNBR)

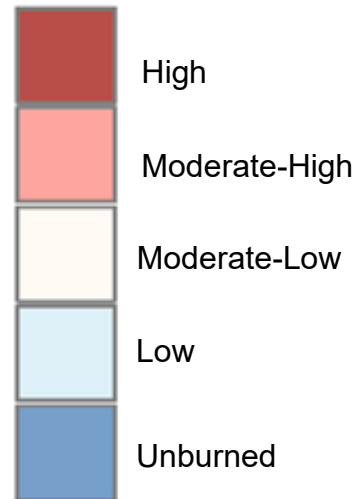


Analysis and Map: Martha
Denton and Emily Fairfax

Comparison Sites in Tásmam Koyóm

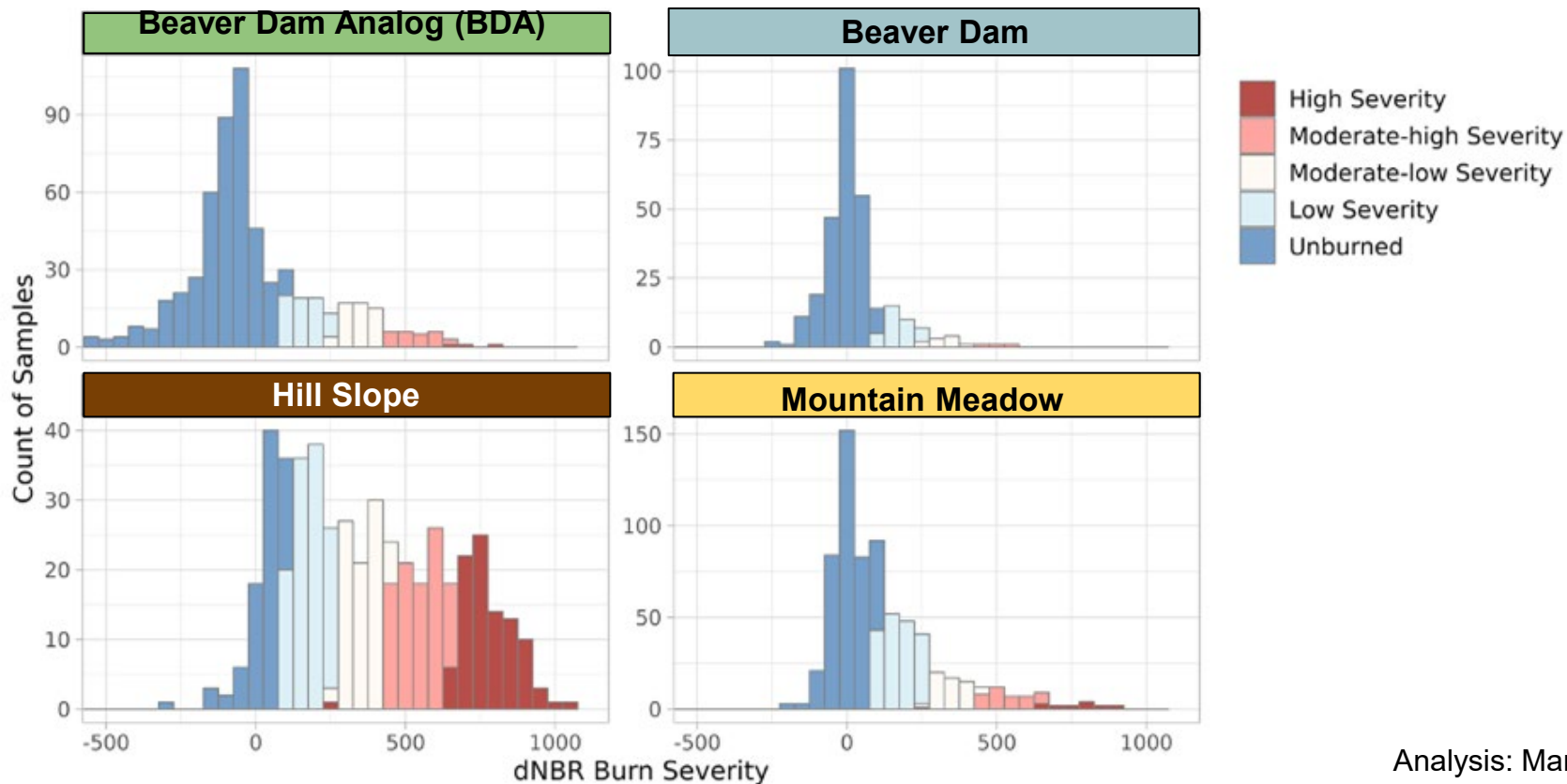


**Burn Severity
(dNBR)**



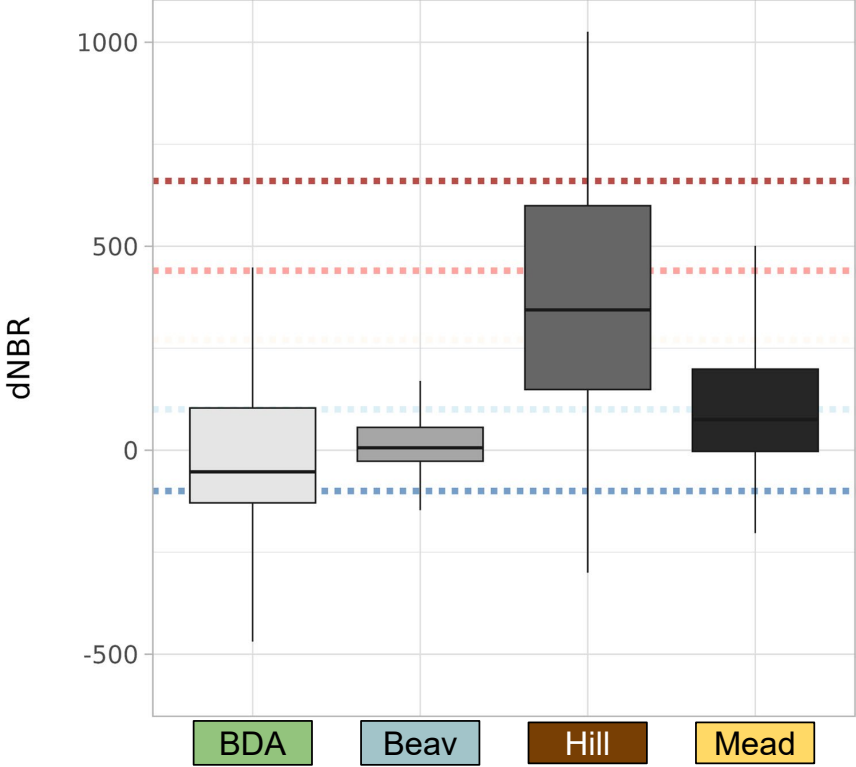
Analysis and Map: Martha
Denton and Emily Fairfax

Beaver dams and BDAs both reduce burn severity

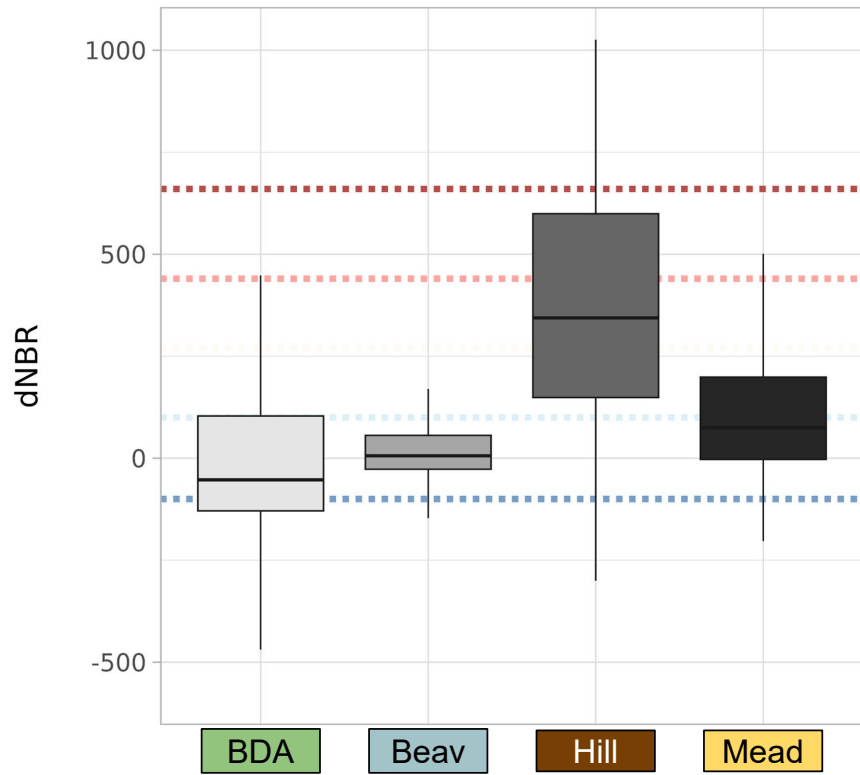


Analysis: Martha Denton
and Emily Fairfax

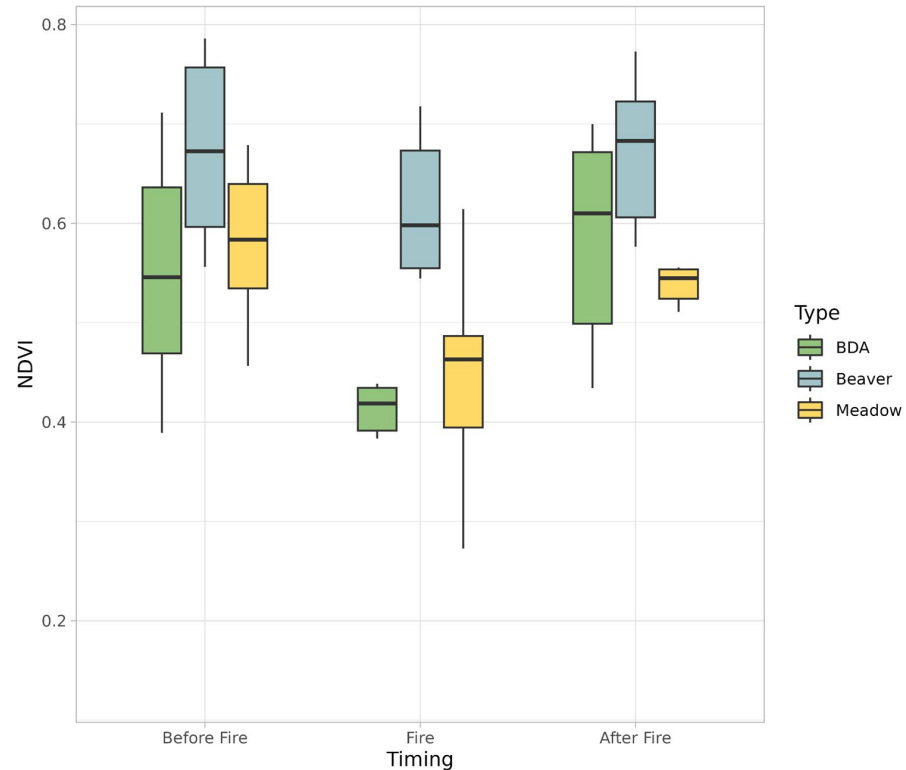
BDA are a little less consistent at reducing burn severity



BDA are a little less consistent at reducing burn severity



BDA vegetation greenness recovers quickly post-fire



Analysis: Martha Denton and Emily Fairfax

Actual beavers are really good at resisting fire. BDAs are less consistent but recover quickly

Continuing research
(stay tuned):

- Fire breaks and beaver wetlands
- Fire resistance in BDAs

Do you know any
BDA sites that
burned in a fire? Let
us know!

morav042@umn.edu

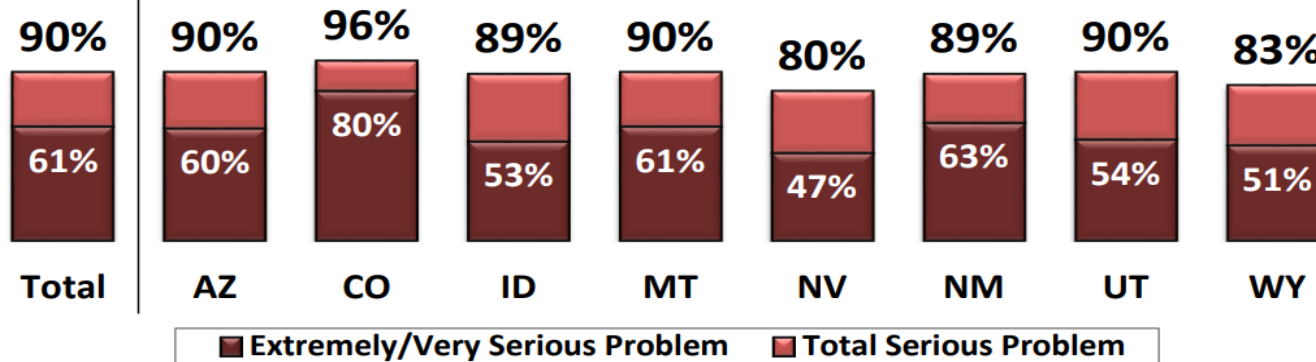


Lack of Federal Protections for Wetlands and Riparian Areas Post-Sackett

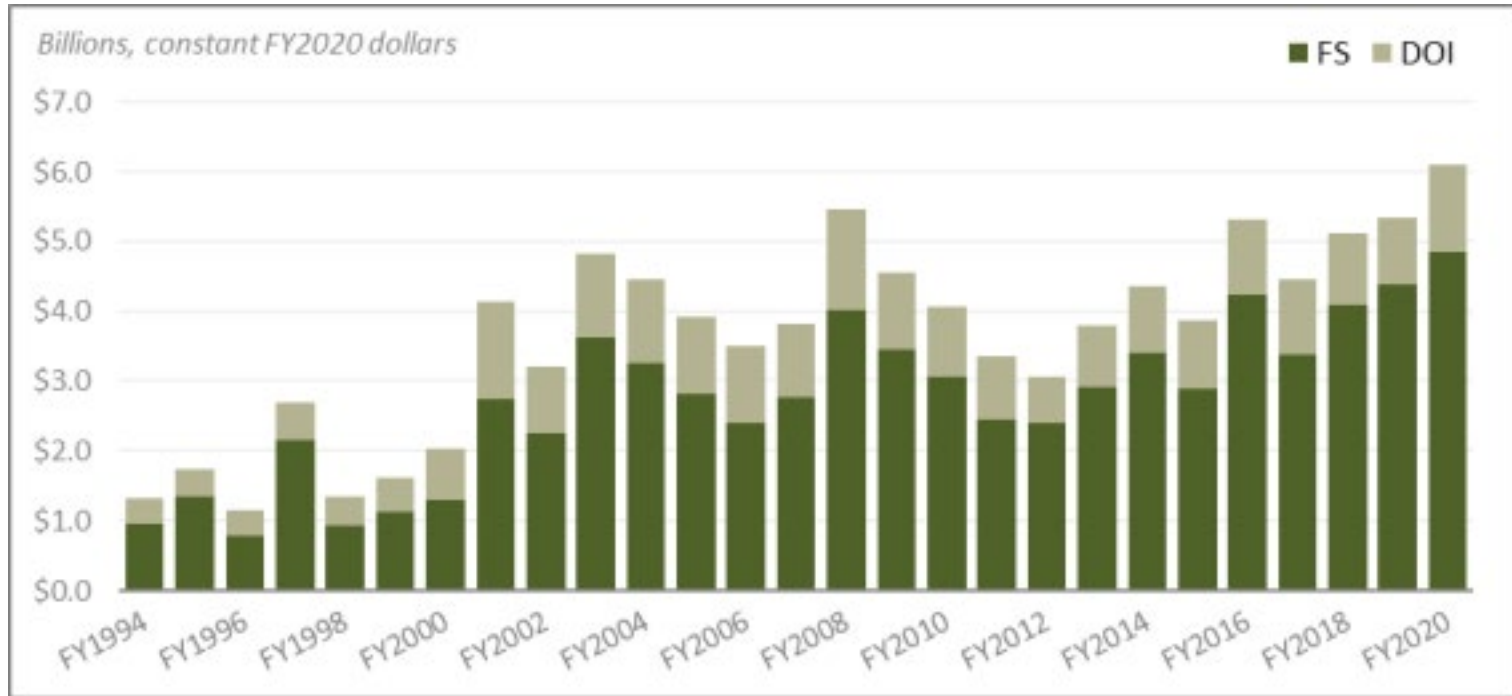


Wildfires, one of the most widely recognized climate-related challenges in the West, continue to be a major source of concern. Nine-in-ten Westerners (90 percent) say “uncontrollable wildfires that threaten homes and property” are a serious problem in their own state, with 61 percent characterizing it as an “extremely” or “very” serious problem. This level of concern is within margin of error with the all-time high of 63 percent in 2022. Concern about wildfires is evident in every single state in this region, and is particularly acute in Colorado and New Mexico, as illustrated in the following chart.

Uncontrollable wildfires that threaten homes and property



Forest Service (FS) and Department of the Interior (DOI) Wildfire Management Appropriations, FY1994-FY2020





NEWS: WILDFIRE

Fighting fire with beavers: How dam-building rodents are deployed to prevent megafires, restore scorched wildlands

Stretches of river that had beaver dams fared better in three fearsome Colorado fires in 2020. People charged with repairing wildfire damage are taking heed.

Firefighting beavers

Fighting fires, one beaver dam at a time

Julie Cleveland
National Forest System, Biological and Physical Resources
October 2, 2023




A Beaver eating a willow branch. (USDA Forest Service Photo)

When you think of beavers, what comes to mind? Busy engineers, pesky rodents, or how about firefighters?

Forest Service Developments

USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE

FS-1270 | September 2025



Integrating Watershed Restoration in Wildfire Management
Opportunities, Approaches, and Examples

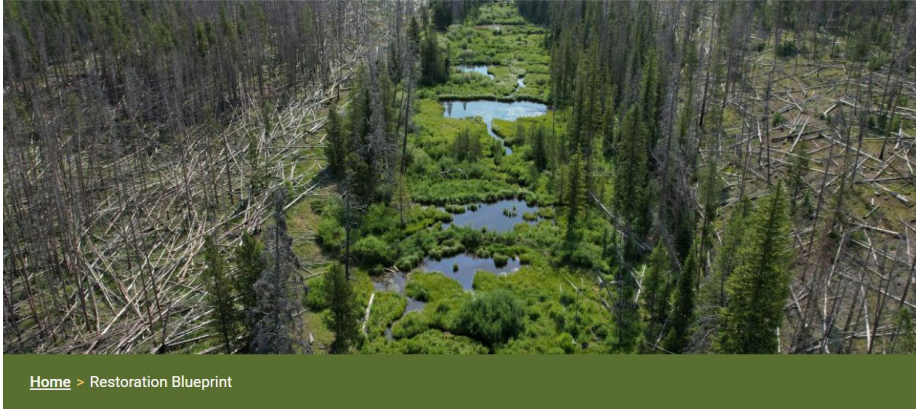
Authors: Nathaniel Gillespie, Pauline Adams, Jen Croft, Rebecca Flitcroft, Johan Hogervorst, Paul Powers, David Callery
Reviewers: Mark Weinhold, Matt Fairchild, Jamie Tripp, Kathryn Ronnenberg

- Forthcoming general report with case studies and examples (**pending review**)
- Stream restoration and wildfire management trainings and workshops in development
- Wildfire and aquatics mapping efforts
- Metrics tracking (FACTs Database)

Soda Creek, Colorado



- Soda Creek feeds into Dillon Reservoir
- Led by National Forest Foundation
- Funded through NFF in-lieu fee program; corporate donations
- First documented riparian restoration project on Forest Service lands to count towards Potential Operational Delineation (POD) designation



Restoration Blueprint

retaining and slowly releasing water throughout the summer. **These floodplains also serve as natural firebreaks**, provide important wildlife habitat, and blunt downstream flooding during heavy storms. BLM-managed rivers and streams also create pockets and pools of cold water that influence the survival of culturally and economically important fisheries, such as salmon, steelhead, and trout. These cold water refugia are found across diverse landscapes, from the sagebrush deserts of the Great Basin, to sweeping vistas of Wyoming, to more than 70 million acres of legendary fish habitat in Alaska.

Bureau of Land Management Developments



- NWF and TRCP Foundation for America's Public Lands proposal
- Partnership with University of Minnesota
- Wildfire behavior and aquatic restoration modeling across entire Colorado River Basin (all public lands)
- Project identification, demonstration, and field tours
- Develop processes to guide BLM (and USFS) wildfire and aquatic restoration integrated strategies

 APRIL 11, 2025

Padilla, Western Senators Introduce Bipartisan Fix Our Forests Act to Combat Wildfires

Comprehensive legislation reduces wildfire risk, advances watershed restoration, improves forest health, and streamlines processes to protect communities

(5) FIRESHED MANAGEMENT PROJECT.—The term “fireshed management project” means any of the following forest or vegetation management activities:

(G) A wet-meadow, floodplain, or riparian restoration activity that increases wildfire resistance.

March 2026

The Foundation for America's Public Lands

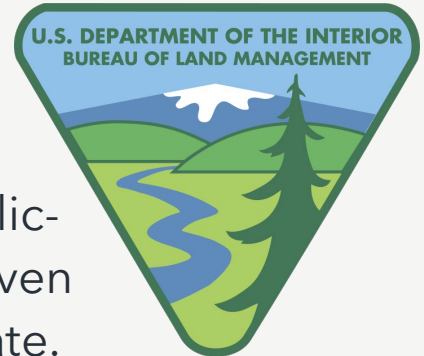
Program Highlights



FOUNDATION OVERVIEW



The official Congressionally-chartered partner of the Bureau of Land Management. Established in 2017, our mission is to foster public-private partnerships and invest in community-driven projects that support the BLM's multi-use mandate.



RESTORATION & STEWARDSHIP

We focus our efforts on:



Addressing the impacts of **prolonged drought** through investment in restoration and stewardship initiatives in the Colorado River Basin.



Partnering with producers to **expand and deploy innovative, adaptive practices** - like virtual fencing technology - to provide greater flexibility when managing livestock in a changing western landscape.



Preserving the phenomena of **Big Game Migrations** by addressing barriers to wildlife movement and restoring critical winter range habitats.

Project Example - Virtual Fence

Sierra Soil and Water Conservation District

Project Title: Combatting Drought through Precision Grazing and Virtual Fencing on Massey Ranch (NM)

Award Amount: \$155,400

Project Outcomes:

- Investment in technology to support drought management over 30,000 acres
- Implement intensive rest rotational grazing
- Protect sensitive vegetation
 - Agave pollinator restoration
- Support multi-generational ranch transfer



Ensuring the hardest working lands in America work for generations to come.

2026 Grantmaking Timeline

January	February	March	April	May	June	July	August	September	October	November	December
Resilient Recreation						Resilient Recreation					
				Motorized Recreation Access							
Big Game Migratory Corridors										Big Game	
Drought Resilience						Drought Resilience					
Virtual Fence										Virtual Fence	
Lands to Love											

An aerial photograph of a lush wetland area. A winding stream flows through a dense field of green vegetation, including grasses and small shrubs. In the background, there are steep, rocky mountains with patches of forest. A dirt road or path runs across the upper left portion of the image. A small wooden structure is visible on the right side. In the lower left corner, a few people are standing near the water's edge. A large, dark, rectangular box with a white background and a black border is centered over the stream, containing the text "Questions?".

Questions?