

Trout Habitat Restoration Design & Results for a Dreamy Stream



John Giordanengo: Principal Restoration Ecologist, AloTerra Restoration Services (Fort Collins, CO)

Matt Kondratieff: Aquatic Research Scientist, CPW (Denver, CO)

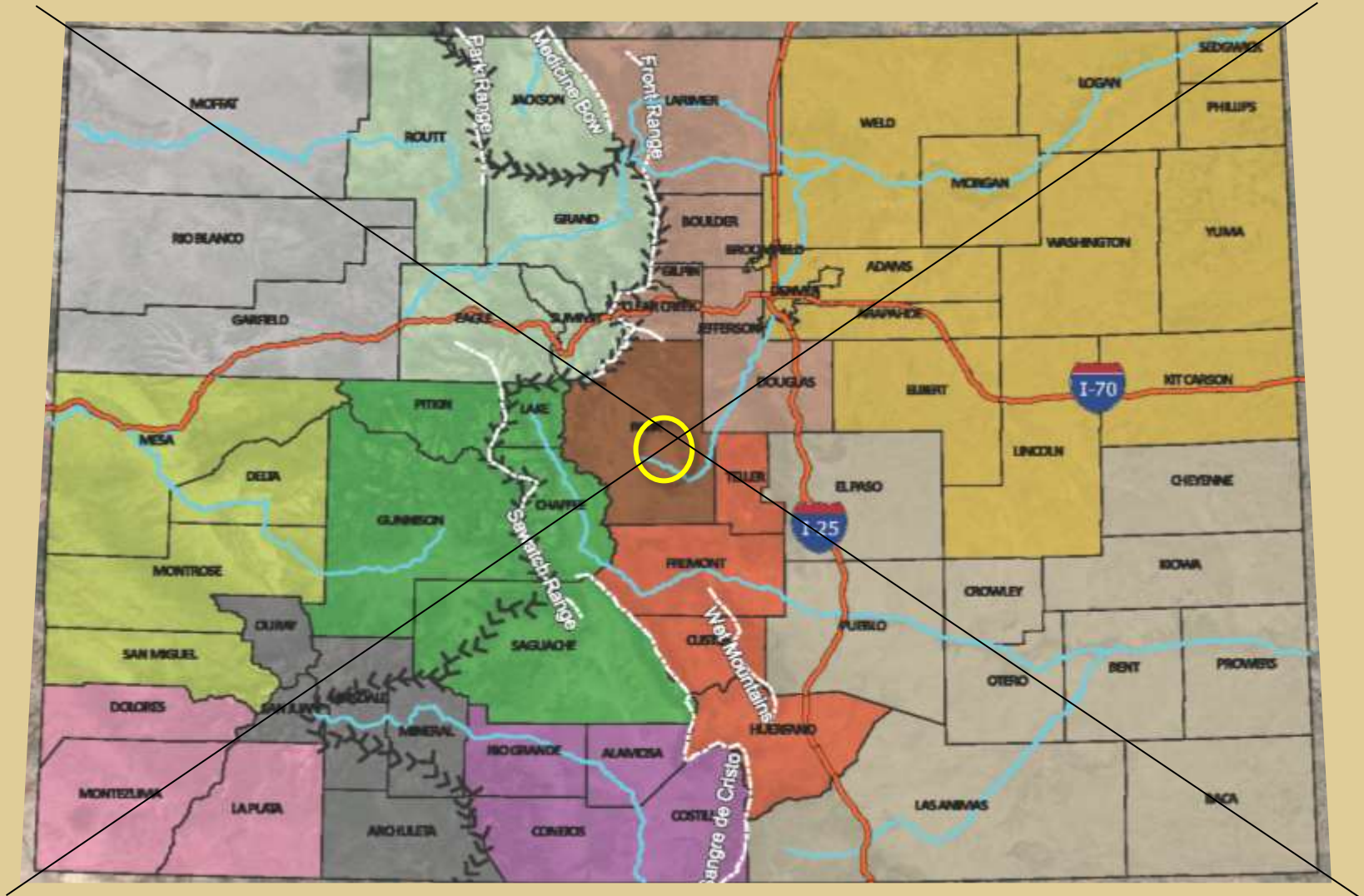
David Bidelspach: Fluvial Geomorphologist, Five Smooth Stones Restoration (Livermore, CO)

Overview

- Applied Research Questions
- Design Treatments
- Data from Badger Basin
- Construction Phase of Dream Stream
- Riparian Restoration Challenges / Opportunities

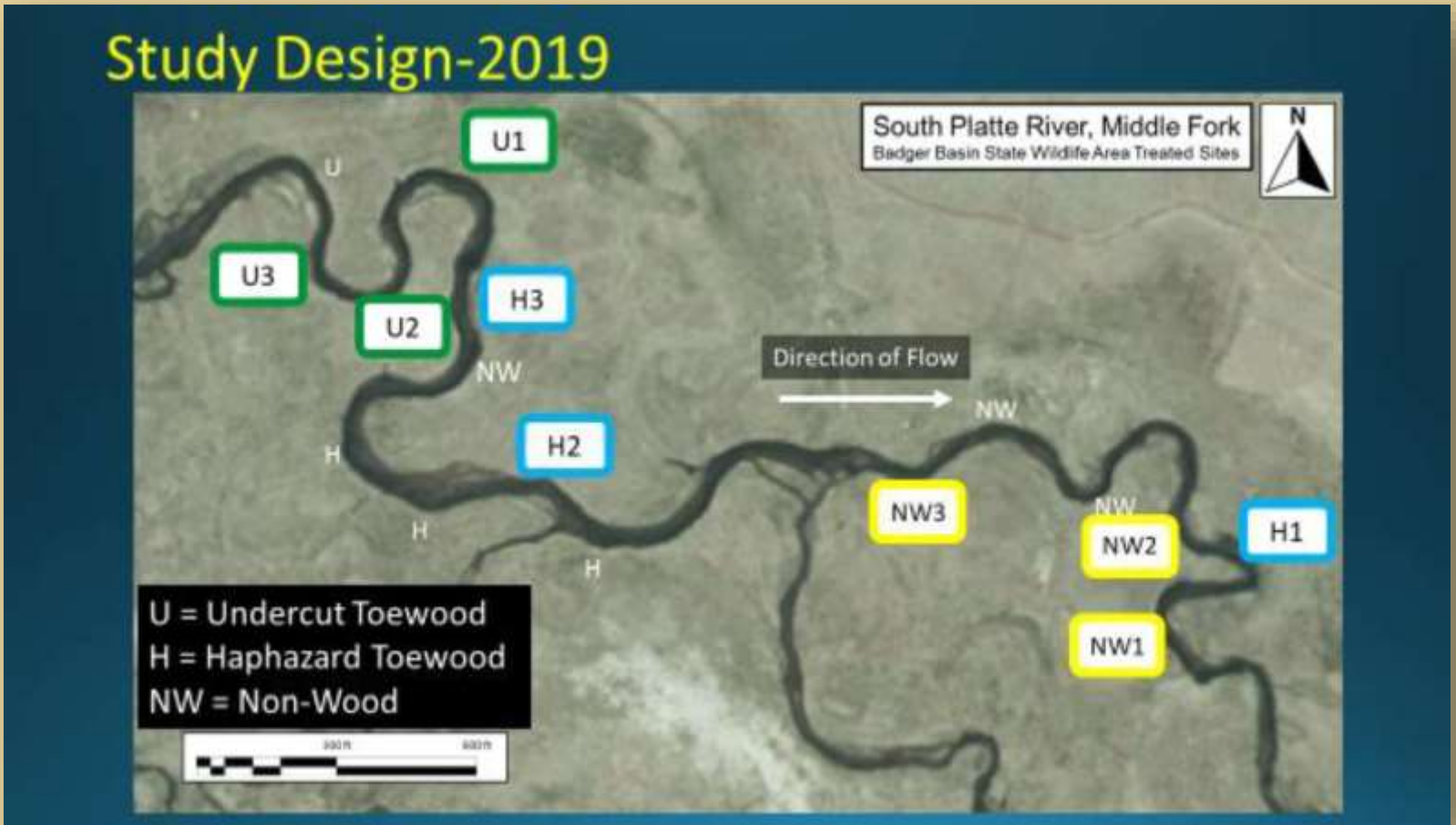


Project Location (South Park, CO)





Badger Basin Trout Habitat Study

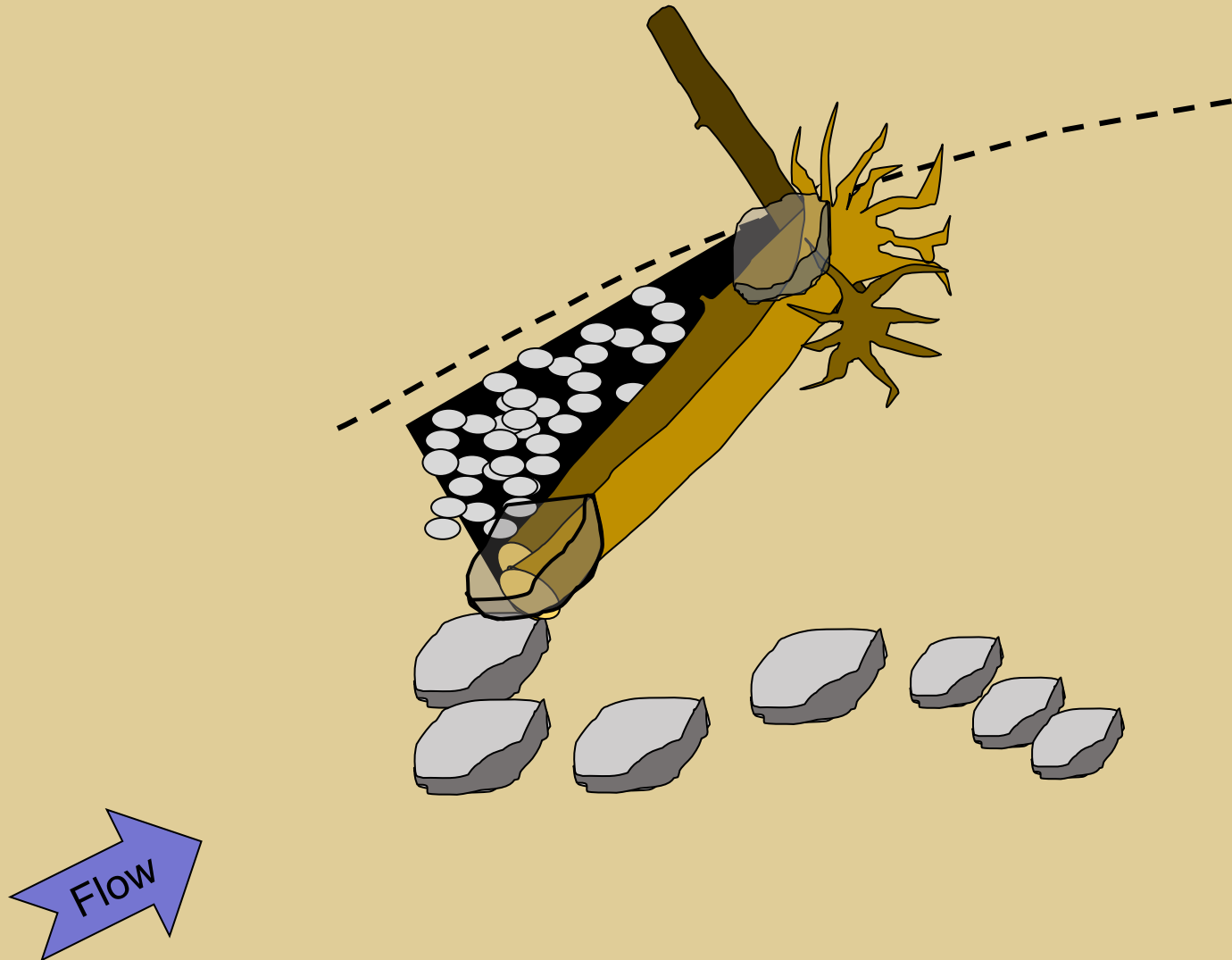


STREAM HABITAT INVESTIGATIONS AND ASSISTANCE PROJECT SUMMARY

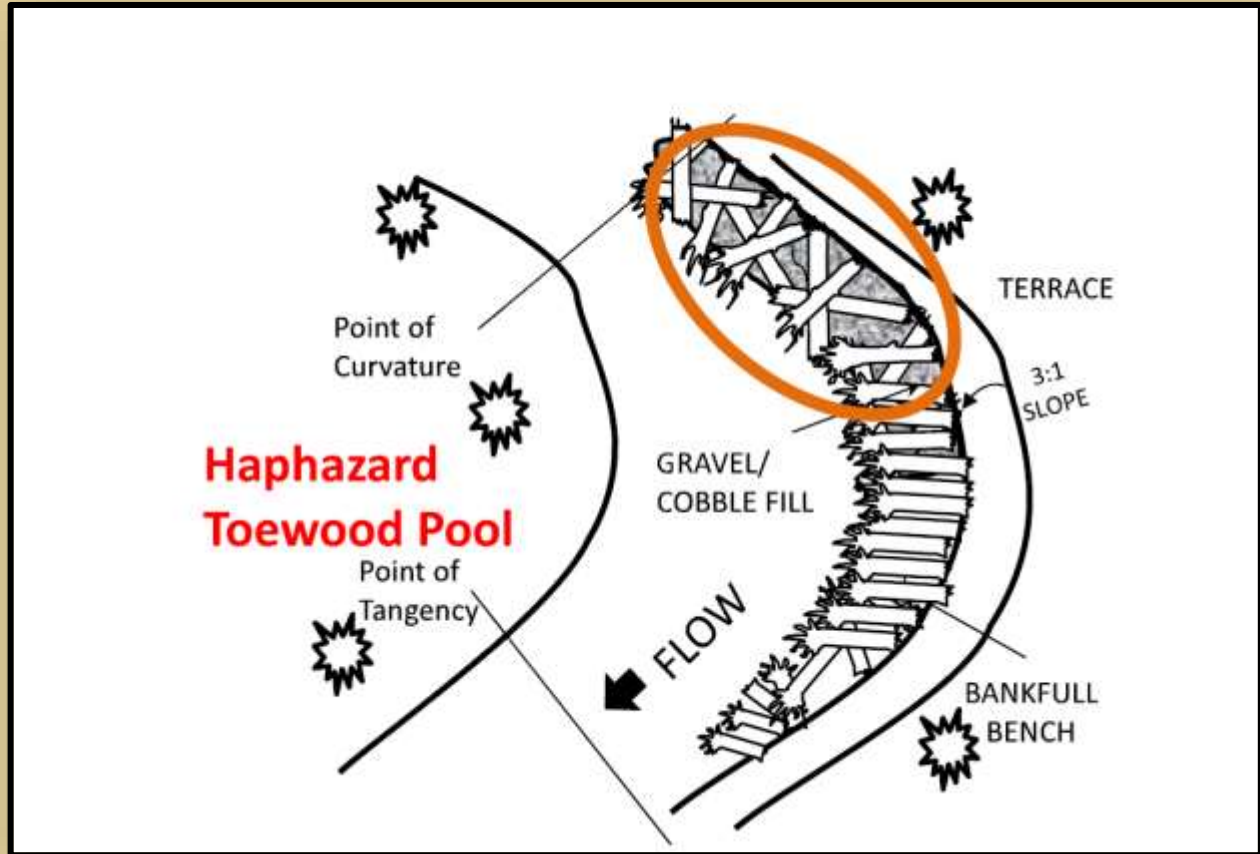
Colorado Parks & Wildlife, Aquatic Research Section. Fort Collins, Colorado. Jan. 2023

Matthew C. Kondratieff, Aquatic Research Scientist (CO Parks & Wildlife)
and Eric E. Richer, Aquatic Research Scientist/Hydrologist (CO Parks & Wildlife)

Log vane/Root wad/J-hook



Haphazard Toewood Pool



Haphazard Toewood Pool



Haphazard Toewood Pool

Excavated Pool

**Large wood
(submerged)**

Point bar



Undercut Toewood Pool

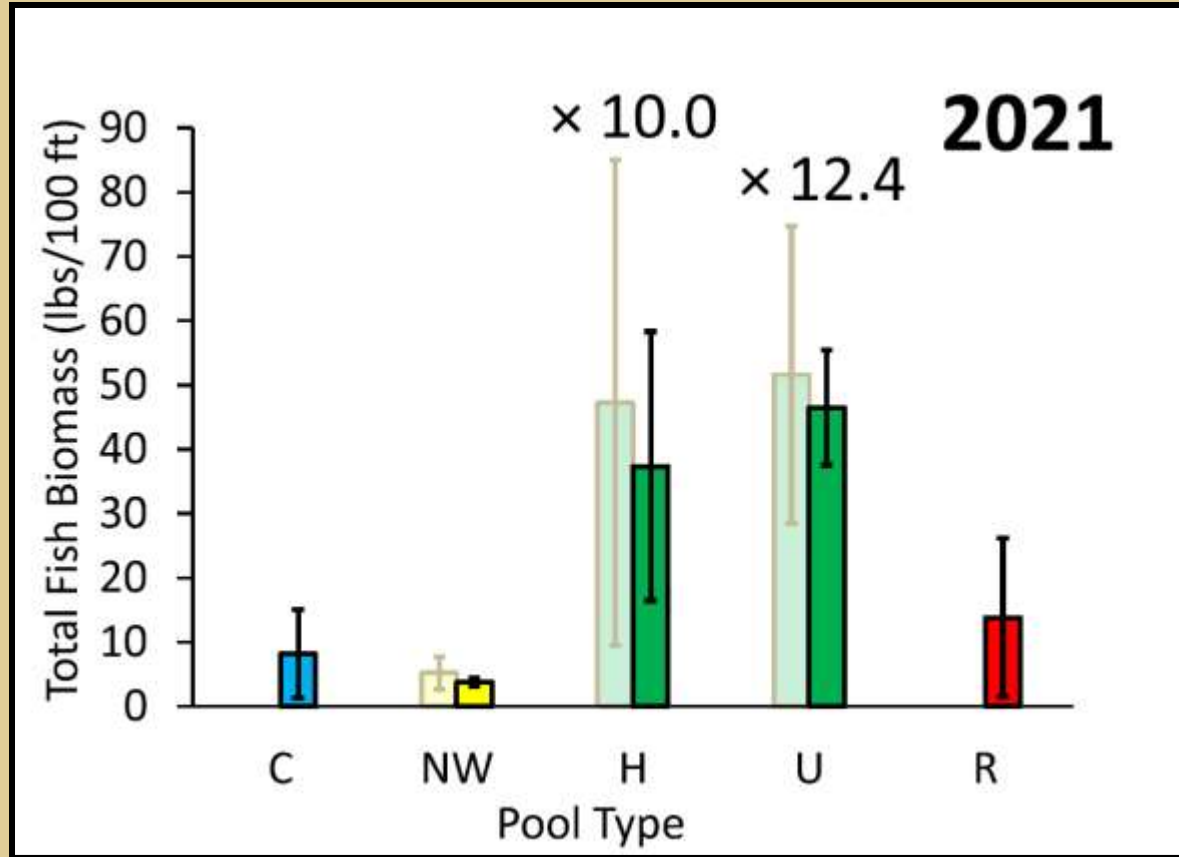


Large wood

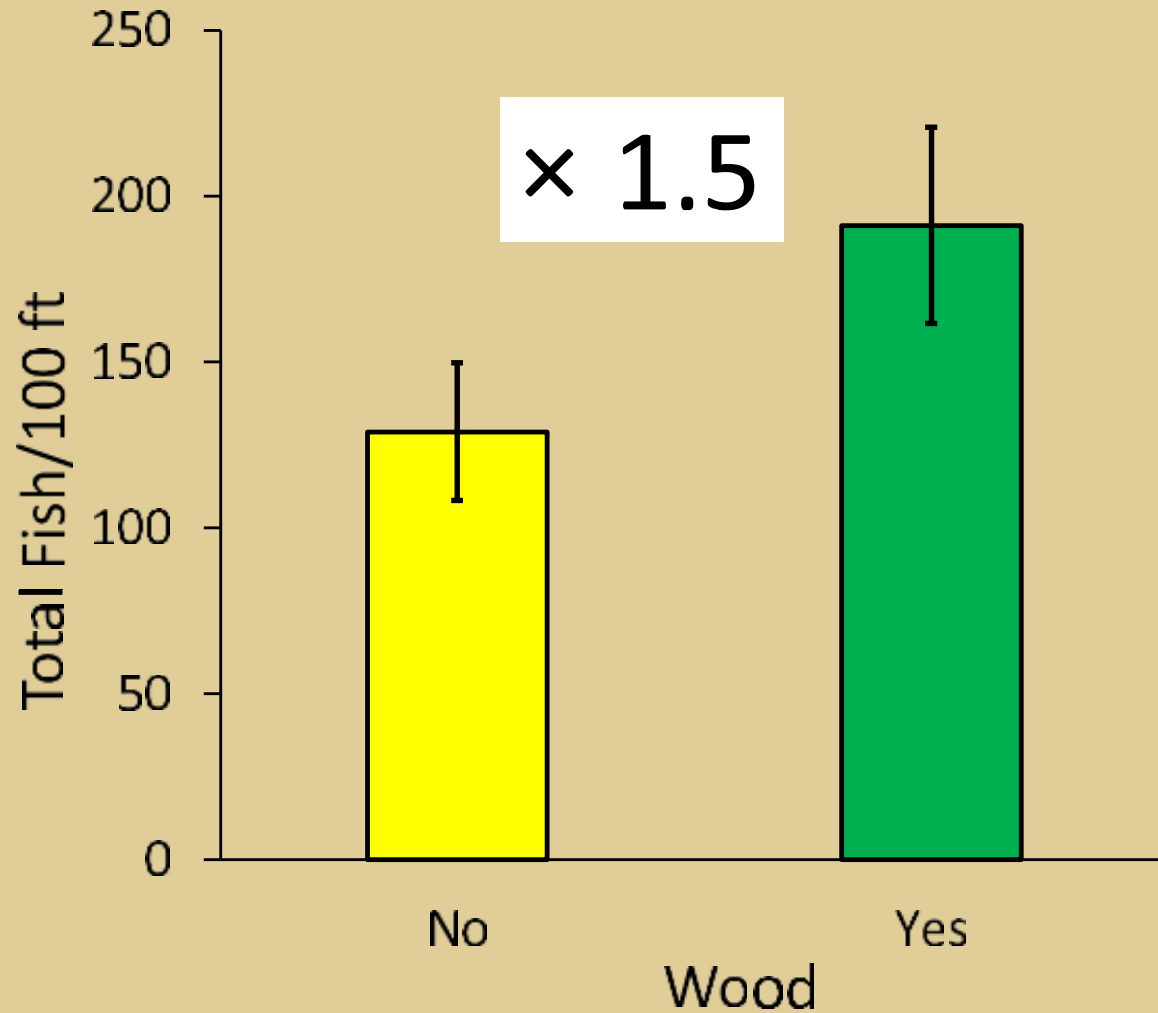
Undercut Toewood Pool



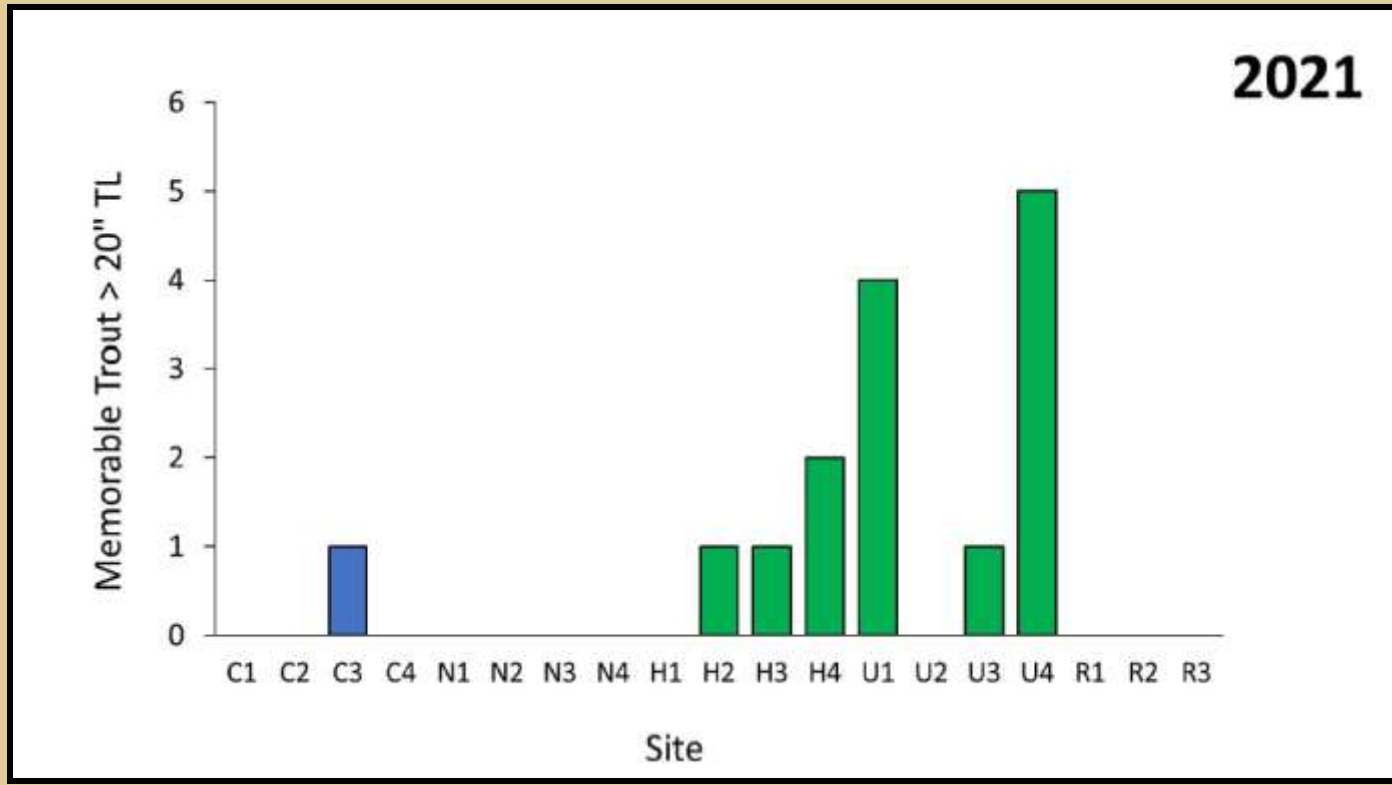
Total Fish Biomass (Badger Basin)



Fish Density (Badger Basin)



Fish Size (Badger Basin)



Badger Basin Data Summary

Toewood-treated Pools:

- residual pool depths 1.5 feet deeper
- up to 19 times more quality-sized Brown Trout
- 8+ times greater Rainbow Trout biomass

Toewood Undercut vs. Haphazard Pools:

- Little difference in trout statistics
- Toewood Undercut pools are much more expensive



A Not-so-Dreamy Stream



Charlie Meyer
Restoration
Reach

A Few Concerns:

- over-widening
- loss of pool habitat
- significant riparian habitat loss
- reduction in sediment supply



Dream Stream – Construction Phase



- Toewood Bank Repair
- J-hook/Log vane/Root wad
- Sod Mat Repair
- Cannel/Riffle Narrowing
- Point Bar Regrading
- Pool Development
- Willow Joint Planting



Riparian Restoration (Willows = Bugs = Fish)



Insect Biomass Increases with Plant Diversity:

Hallman et al. (2021); Welty et al. (2017);
Borer et al. (2012). Plant diversity controls arthropod biomass and temporal stability. *Ecology Letters*, 15:1457–1464.



Site Protection Essential to Riparian Reveg.



2023 Spring Edition of
CTU's "High Country Angler"
(the Dream Stream)

Questions?

john@aloterraservices.com

david.bidelspach@fivessr.com

