

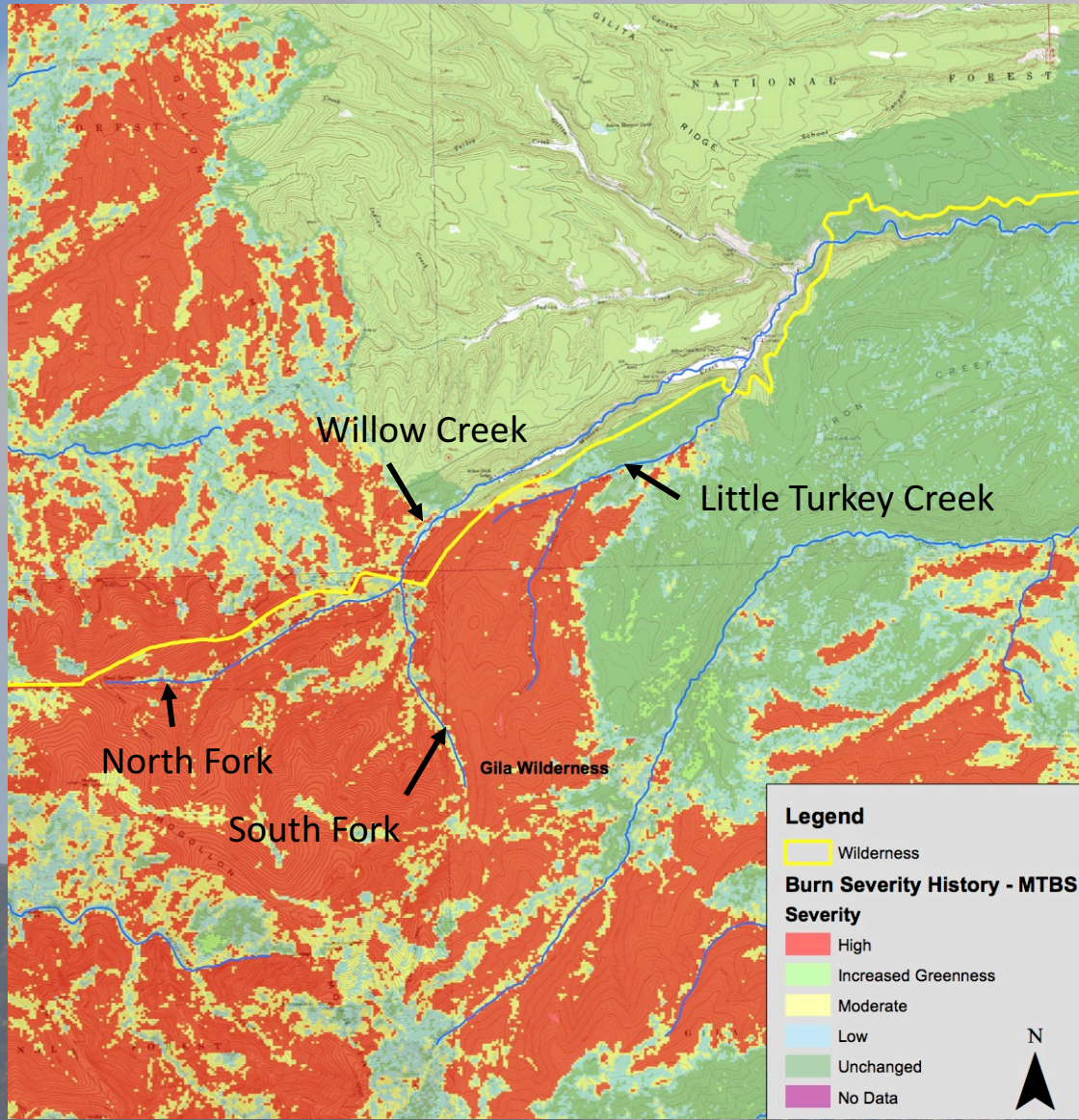


*Working towards restoration of a fire-impacted Gila trout watershed with TU-coordinated volunteers (and some mules).*



Jeff Arterburn, TU Gila/Rio Grande Chapter  
Jim Brooks, JEB Outfitters LLC,  
Eric Head, TU Gila Trout Project Manager

# Whitewater-Baldy Wildfire 2012



# New Opportunity for Restoration of Gila Trout



## Willow Creek Gila Trout Restoration Project

**The Return of a New Mexico Native**

Before European settlers ventured into the Gila River Basin, Willow Creek was likely home to Gila trout. Unfortunately, nonnative species, including brown trout and rainbow trout, were introduced in the early 1900s—species that compete with, prey upon and sometimes interbreed with Gila trout.

Gila trout conservation efforts began in the early 1920s with the closure of streams to angling and establishment of a Gila trout hatchery near White Creek. Despite early successes, Gila trout was listed as endangered in 1973 under the federal Endangered Species Act.

In response, conservation efforts increased and resulted in the downlisting of Gila trout in 2006 from endangered to threatened status. Downlisting allowed the New Mexico Department of Game and Fish to offer—after a 50-year hiatus—regulated angling for this native trout.

**Back from the Ashes**

Wildfires often are destructive to the landscape and its inhabitants, but there can also be benefits. In 2012, the Whitewater-Baldy Fire burned across many Gila trout streams (see inset map) eliminating many of those populations. However, in Willow Creek post-fire debris and ash flows killed nonnative trout. This provided a unique opportunity to establish a Gila trout fishery.

About a year after the fire, Gila trout were stocked in Willow Creek and began to reproduce. In 2016, a fish barrier was built above the confluence with Gilita Creek that prevents nonnative trout from swimming into Willow Creek. The success in Willow Creek has helped improve the conservation status of Gila trout and also provides anglers a special opportunity to fish for this rare trout.

Gila trout      Volunteers assist biologists with annual fish surveys      Willow Creek fish barrier

Restoration and continuing improvements to the Gila trout fishery at Willow Creek are made possible by the cooperative efforts of these organizations and with the invaluable support and commitment of volunteers.

The 2012 Whitewater Baldy Fire affected many Gila trout streams.  
 — Gila trout population 2012 (pre-fire)  
 — Highways  
 — Whitewater Baldy Fire perimeter



## Habitat Monitoring w/ Volunteers



National Wilderness  
Stewardship Alliance

# *Post Wildfire Erosion*

**Little Turkey Creek  
2016**



**Significant Erosion and  
Sediment Loss 2017**



# Documenting Dynamic Habitat Conditions in the Willow Creek Watershed

## Milestones: Citizen/Angler Science

- 2015-16 TU Contract Nonnative Removal
- 2016 Fish Barrier Completion
- **2017 Wilderness Stewardship Funding**
- **2020-2021 WNTI Habitat Methods \$**
- **2021 NMED Watershed-Based Plan published (Natural Channel Design)**



**Natural Channel Design**  
Engineering Inc.  
ncdengineeringinc.com

## 2017 Flooding Impacts to Pools

Spring 2017



Fall 2017



# Setting the Stage for Habitat Restoration

EPA/NMED Clean Water Act

*High Quality Coldwater Aquatic Life*

Not Supporting due to Impairments

- Aluminum
- Temperature

WBP Provides Geophysical & Engineering Assessment of Watershed Conditions

- Instability
- Identifies remedies and costs

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Willow Creek Watershed-Based Plan

NMED SUB-GRANT: 667-393-1B



Natural Channel Design, Inc.  
2900 N. West Street, Suite 5  
Flagstaff, AZ 86004

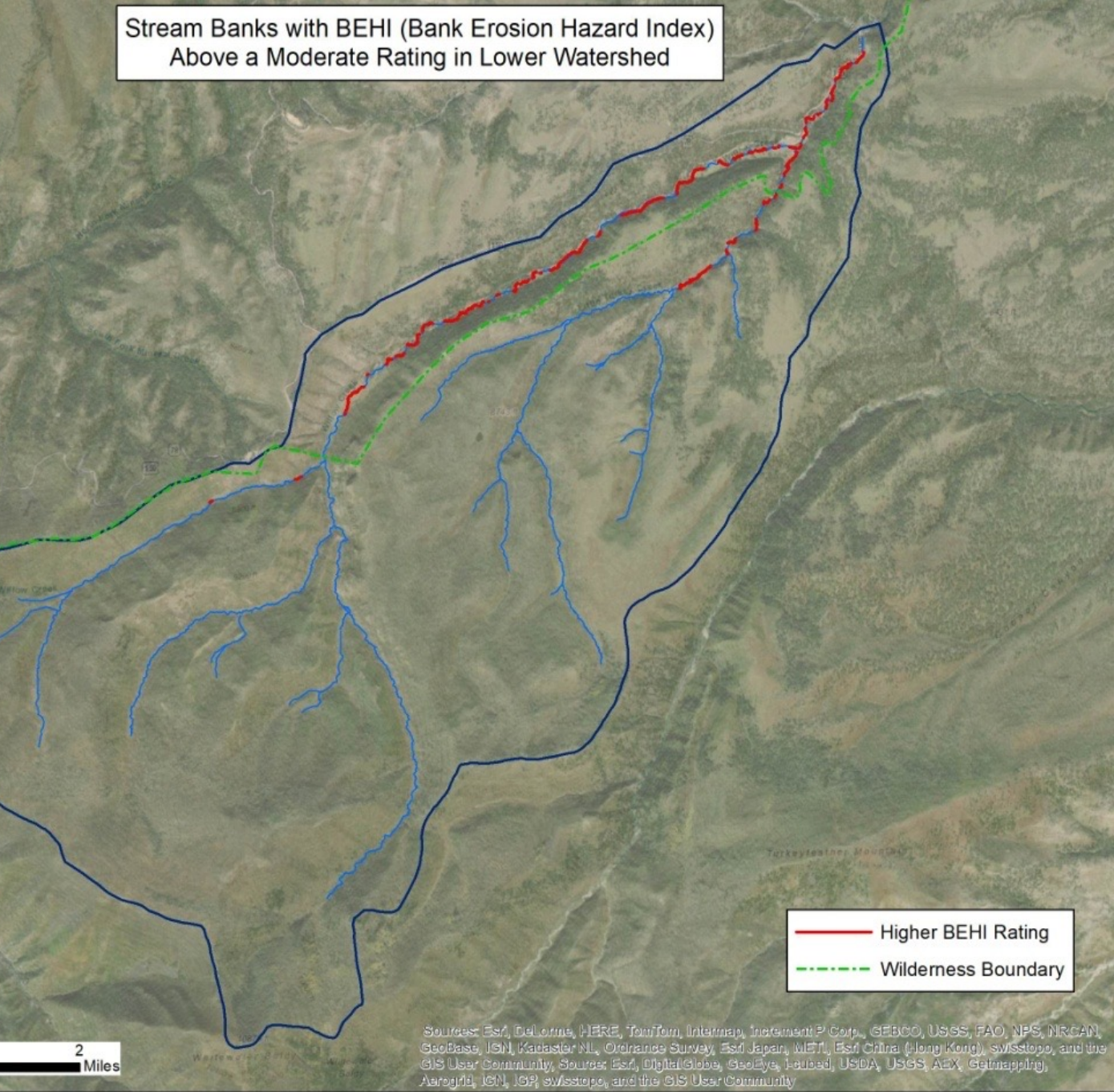
Natural  
Channel  
Design, Inc.

June 2021

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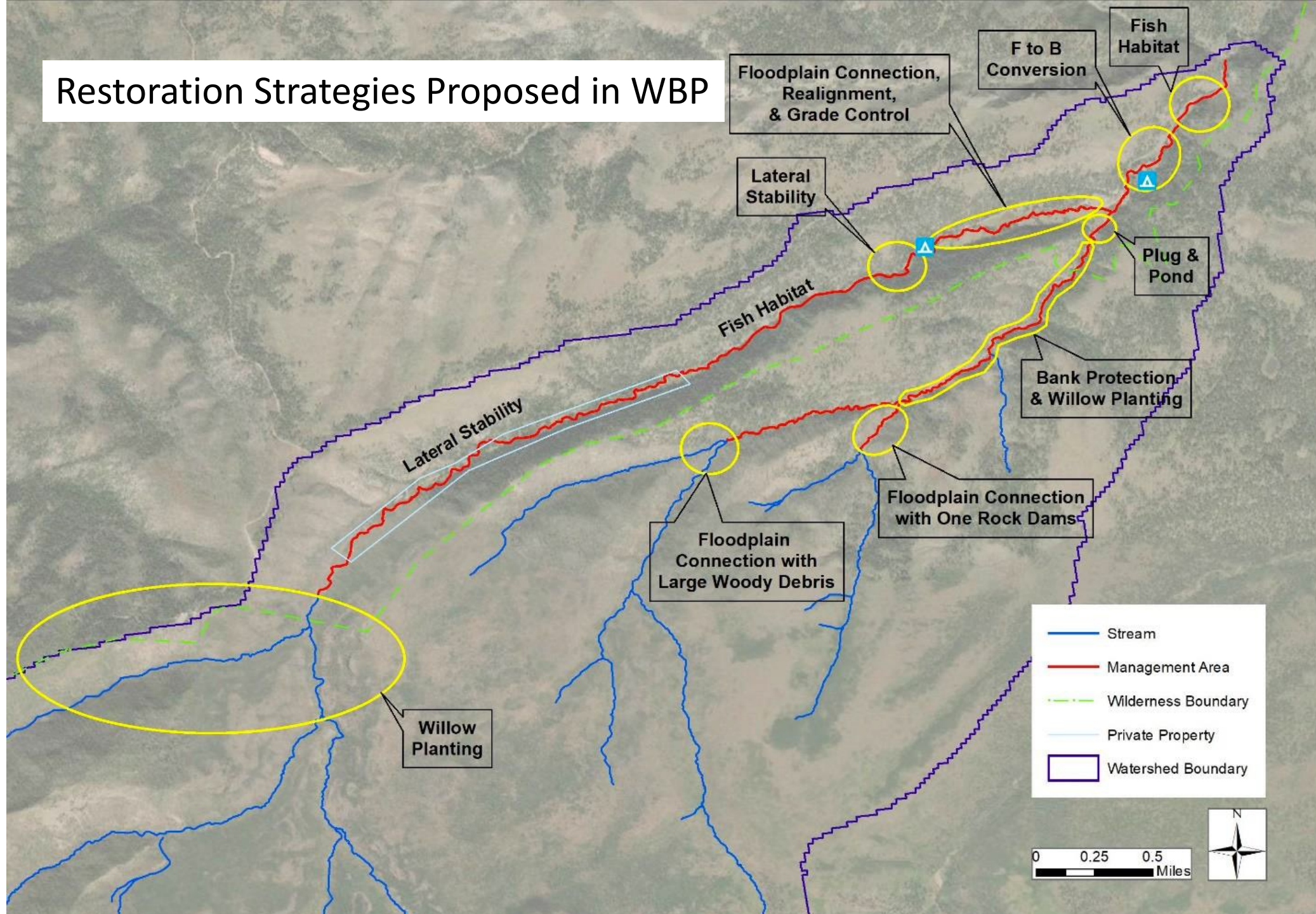
# Bank Erosion

Stream Banks with BEHI (Bank Erosion Hazard Index) Above a Moderate Rating in Lower Watershed





# Restoration Strategies Proposed in WBP



# Little Turkey Creek: Focus for GRG-TU Volunteer Effort





# NMED River Stewardship Program

- ✓ Proposal for Phase I Restoration FY21
- ✓ Environmental Compliances 2020-21



**Natural Channel Design**  
Engineering Inc.  
[ncdengineeringinc.com](http://ncdengineeringinc.com)



## RSP Little Turkey Creek Proposal Funded 2022

- ✓ Begin Implementation of Process Based Restoration Methods



## Rock Structures

# Log Structures

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- Designed to halt a major upstream head cut.
- Zig-zag orientation of logs provides stability



# Willow Poles & Bundles



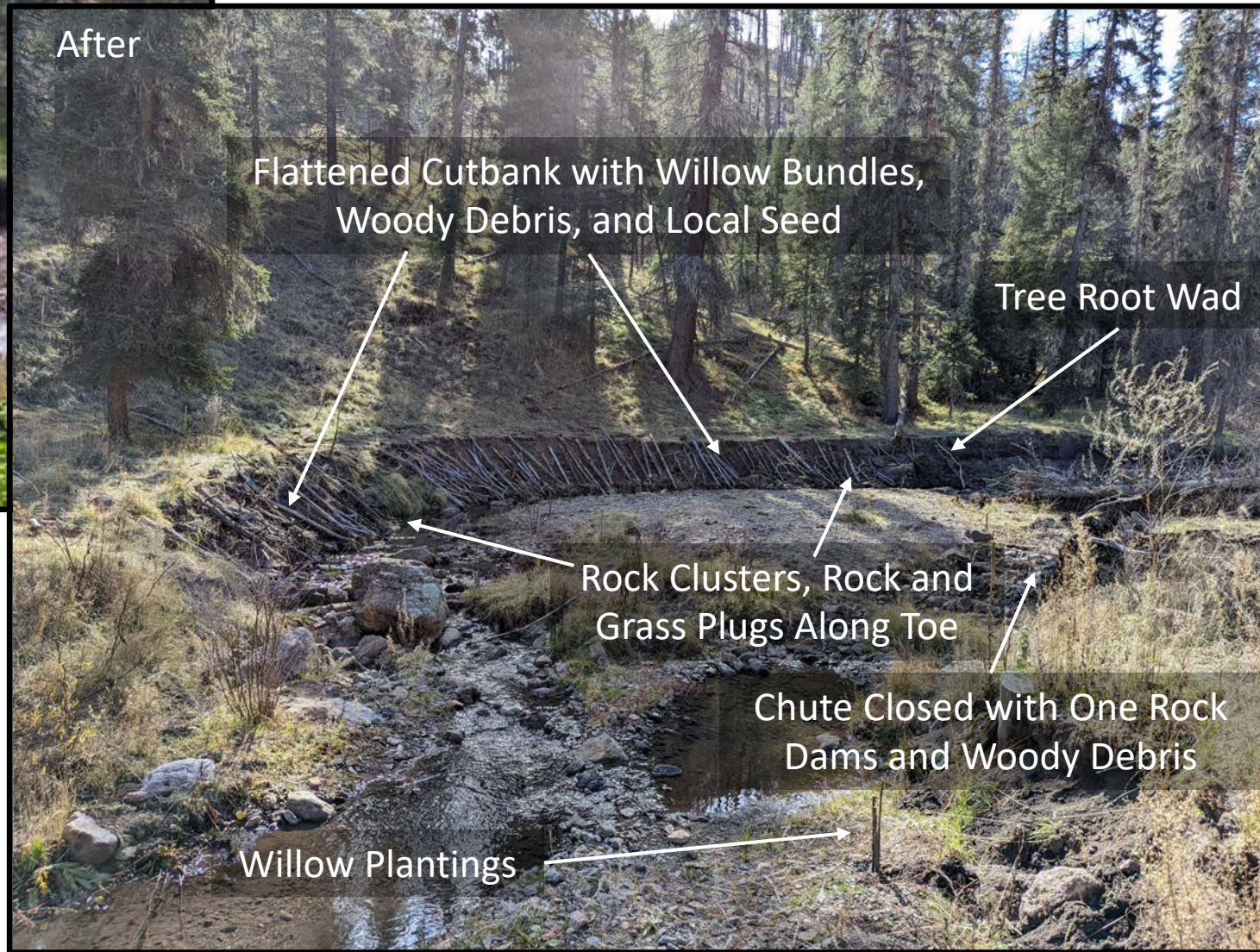
Before



## Bank Repair at "Trout Bend"



After





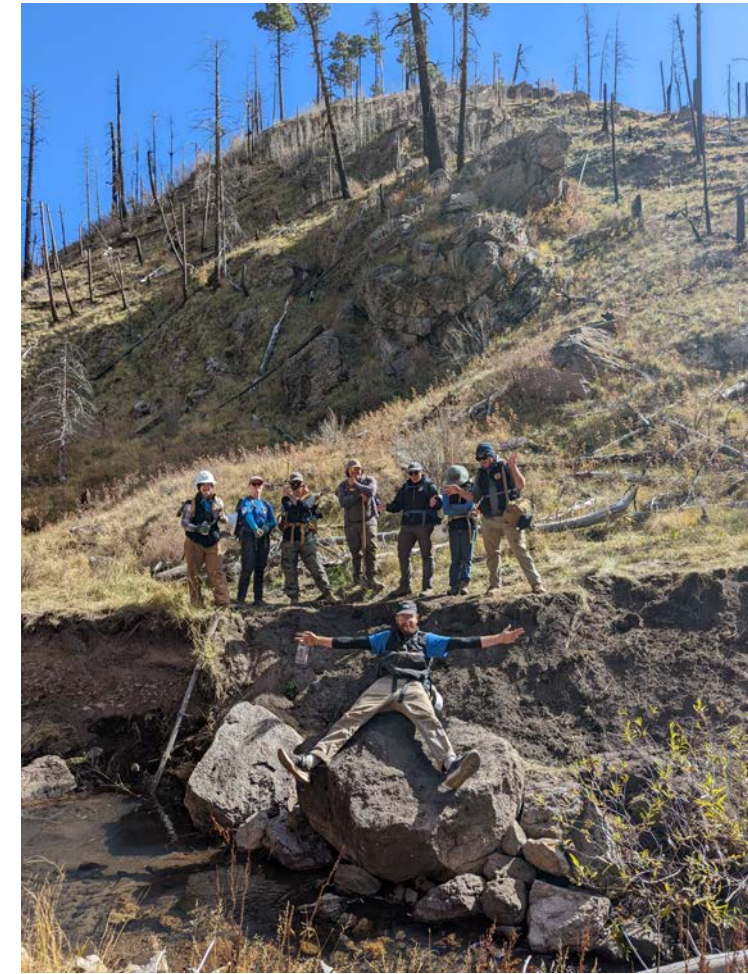
# Rocky Mountain Youth Corps

AmeriCorps program out of  
Albuquerque and Taos



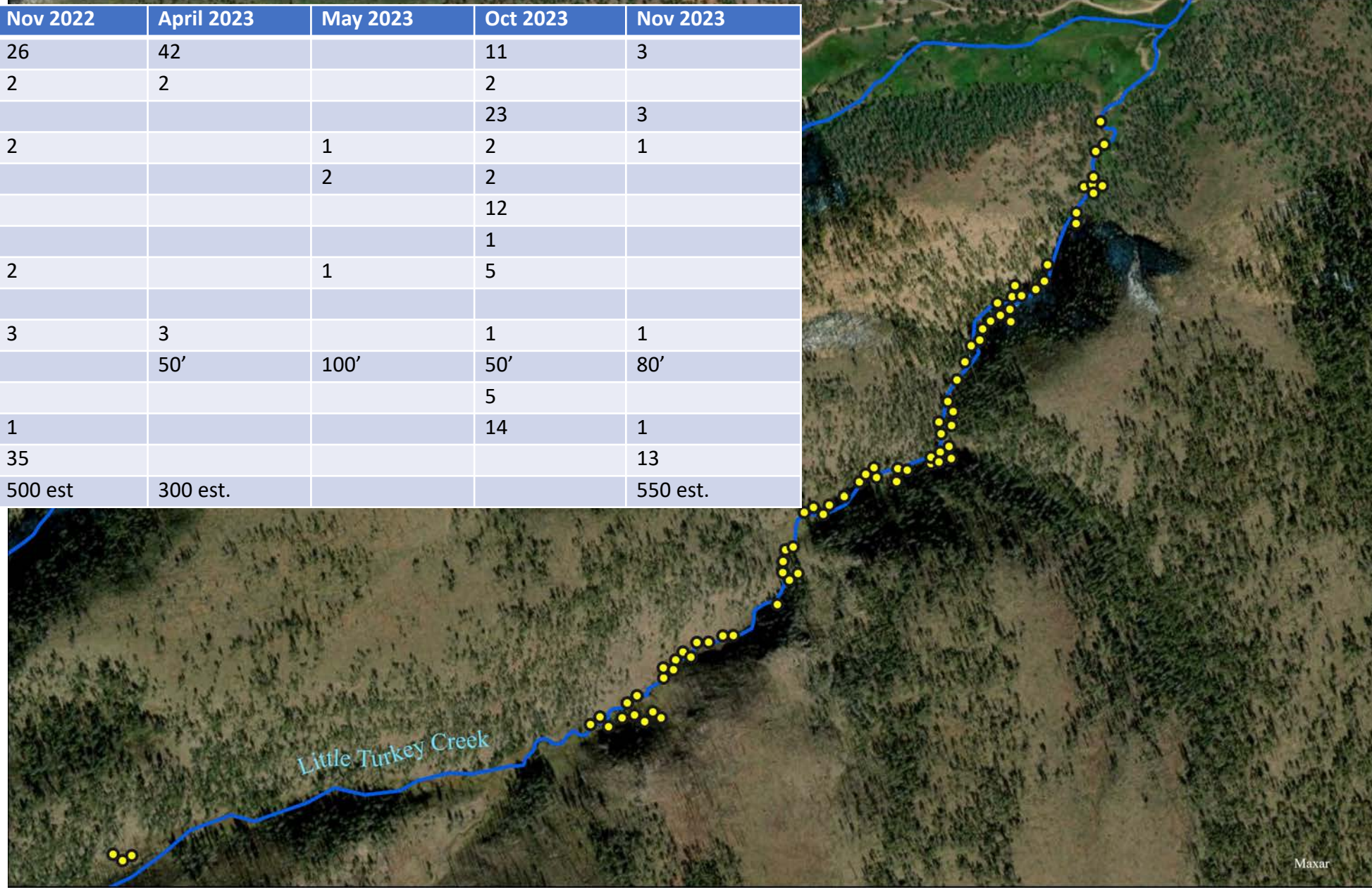
<= Installing Root Wad

Boulder Structure  
Created with  
Primitive Tools =>



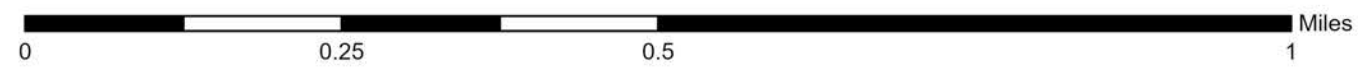
<= Constructing Rock Vane

Remedy	Aug 2022	Nov 2022	April 2023	May 2023	Oct 2023	Nov 2023
One Rock Dam		26	42		11	3
Zuni Bowl		2	2		2	
Toe Rock	3				23	3
Rock Rundown	1	2		1	2	1
Rock Vane	1			2	2	
Rock Cluster					12	
Rock Constrict					1	
Log Vane		2		1	5	
Log Jam	1					
Bank Contour	1	3	3		1	1
Brush Revetment			50'	100'	50'	80'
Woody Debris					5	
Plug Side Channel		1			14	1
Willow Bundle		35				13
Willow Pole	400 est.	500 est.	300 est.			550 est.



Cumulative #  
Installations  
(11/23)

Monitoring TBD  
May 2-5, 2024



● Restoration Site



PCS: NAD 1983 UTM Zone 12N  
GCS: GCS North American 1983  
Datum: North American 1983  
Projection: Transverse Mercator

# The Watershed Opportunity

5-Year \$40M USFS-TU  
Regional Projects



National Fish and  
Wildlife Foundation



Habitat Stamp  
>\$1M Willow Creek



Water Trust Board Funding to San  
Francisco Soil and Water  
Conservation District

Citizen Scientists

**GILA • RIO GRANDE**



River Stewardship  
Program



LTC Phase II Proposal  
Under review FY24



United States Department of Agriculture



Forest Service

Southwestern Region

December 2023

# Gila National Forest

## Gilita Creek

### Watershed Restoration Action Plan

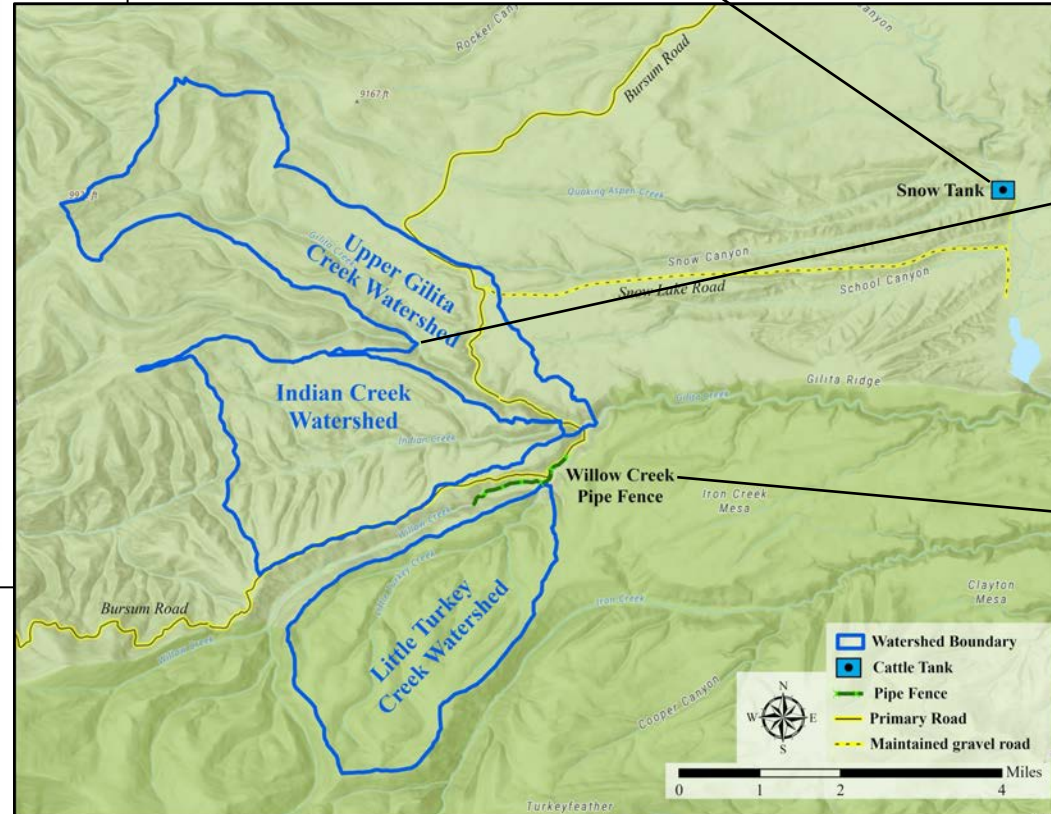
Reserve Ranger District, Gila National Forest  
Catron County, New Mexico



<= Snow Tank



Gilita Creek



Floodplain Wet Meadow  
Pipe Fencing

# TU-USFS Connecting Adjoining Watersheds



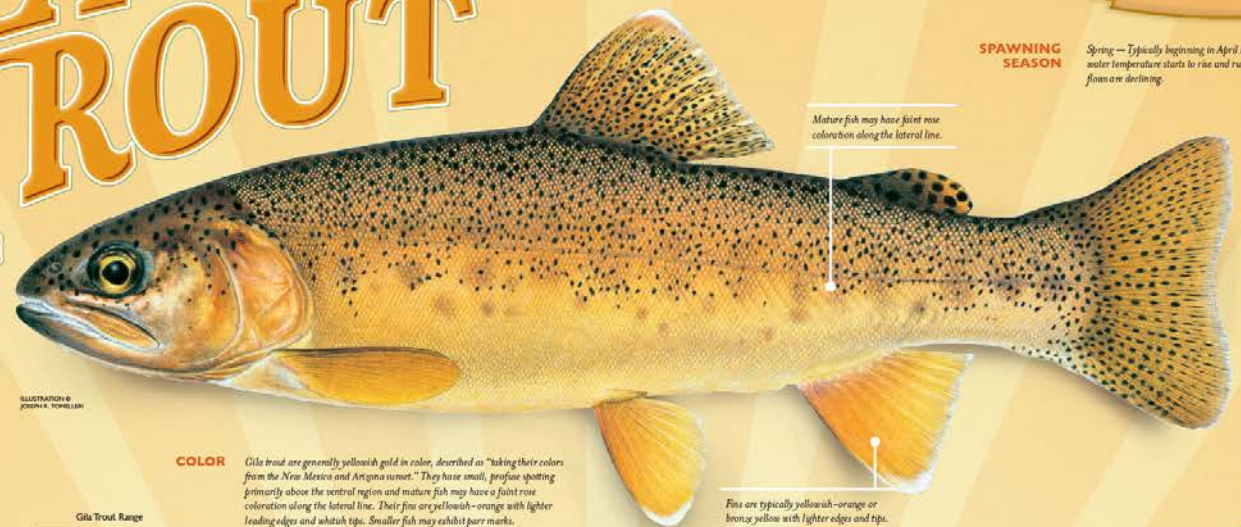


**Volunteers Needed!**  
**Contact: Eric Head**  
[eric.head@tu.org](mailto:eric.head@tu.org)

# Learn to Know Your Native

# GILA TROUT

*Oncorhynchus gilae*



**HABITAT** Gila trout are generally found in small, cool, streams at higher elevations.

**SIZE** Gila trout vary across an available habitat. Adults are generally less than 10" in small headwater streams, but can reach 15" in larger streams and up to 20" in stocked lakes.

**SPAWNING SEASON** Spring — Typically beginning in April when water temperature starts to rise and runoff flows are declining.

Mature fish may have faint rose coloration along the lateral line.

Fins are typically yellowish-orange or bronzy yellow with lighter edges and tips.

**COLOR** Gila trout are generally yellowish gold in color, described as "taking their colors from the New Mexico and Arizona sunset." They have small, profuse spotting primarily above the ventral region and mature fish may have a faint rose coloration along the lateral line. Their fins are yellowish-orange with lighter leading edges and whitish tips. Smaller fish may exhibit parr marks.

## A Species in Time

Native Gila trout along with the closely related Apache trout likely represent the earliest living branch of ancestral trout with origins in the Gulf of California. During one of the earlier glacial periods, perhaps as much as a million years ago, these trout ascended up the Colorado River and to the headwaters of the Gila River basin. Later, in a warmer, drier time between glacial periods, the two groups of fish were isolated from each other with those in the Salt River portion of the basin evolving into the Apache trout, and those in the upper Gila, upper Verde and other tributaries of the Gila basin becoming Gila trout.

Aquatic and terrestrial insects. Larger adults eat other fish.

ILLUSTRATION © JOSHUA K. THOMAS

**Legend**

- Rivers
- Watershed
- Sub-basins
- County boundaries
- Gila Trout Range
- Historic Range
- Current Range

### Threats and Current Status

Today, Gila trout are listed as "threatened" by the U.S. Fish and Wildlife Service and can be found in 16 streams across New Mexico and Arizona. Work continues to increase and connect these populations to protect the species and ensure healthy, robust, fishable numbers of Gila trout for generations to come.

**Isolation and fragmentation** in small streams and very limited range leave them particularly vulnerable to habitat loss, climate change, and invasive wildfires.

**Nonnative trout** — Gila trout do not compete well with brown and brook trout, and they readily hybrid with rainbow trout.

**Habitat degradation** — Roads, logging, grazing, mining and development pose risks to Gila trout populations.

**Climate change** — More severe drought, more frequent and intensive wildfire and warmer water temperatures can destroy entire populations of Gila trout.

Current range is about 10% of historic range.

### HISTORIC AND CURRENT RANGE

Gila trout are endemic to mountain streams in the Gila, San Francisco, Agua Fria and Verde River drainages in Arizona and New Mexico. Although in pioneer days their range included over 600 miles of streams, Gila trout are now limited primarily to the headwaters of those drainages.

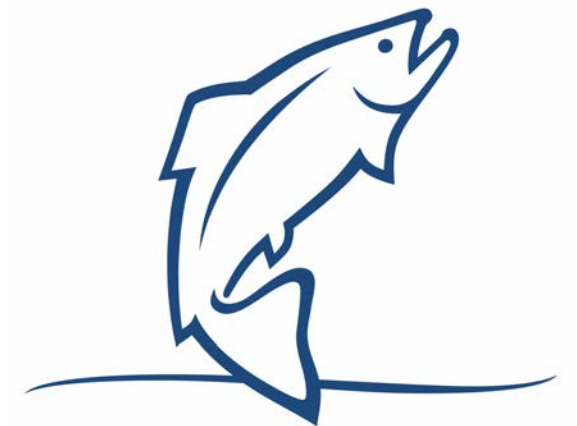
# It's a Southwest Treasure!

## Fishing for Natives

The Game and Fish Departments of Arizona and New Mexico manage all the Gila trout fisheries in the southwest. Gila trout broodstock are kept at the Mora National Fish Hatchery and fishable trout are reared in limited numbers in a few New Mexico and Arizona state hatcheries. Currently, fishing for Gila trout is limited to only a few streams to check with your local game and fish department to confirm stocking schedules and regulations.

Don't forget!

# GILA • RIO GRANDE



# TROUT UNLIMITED

Map data sources: ESRI, USGS, NOAA

