



Low Tech Process-Based Restoration on New Mexico's Headwater Streams: Spotlight on San Antonio Creek

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About Rio Grande Return



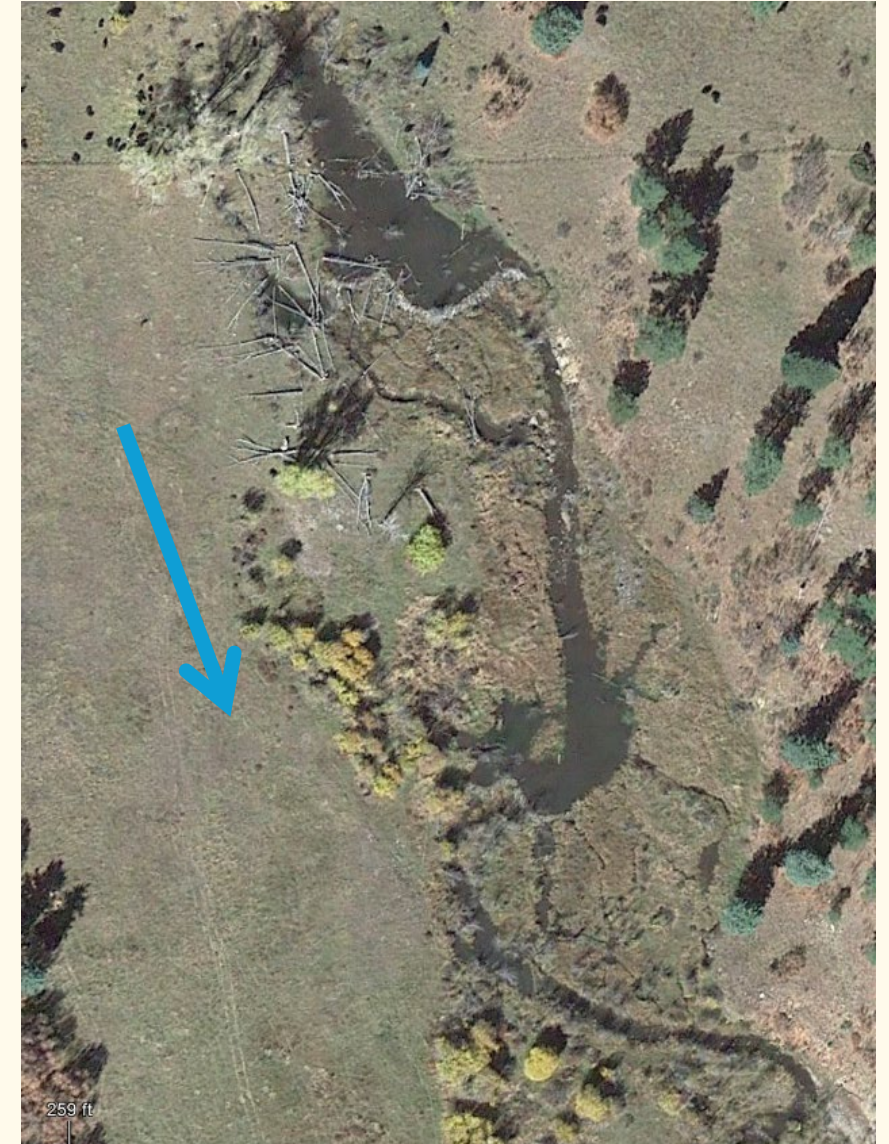
Who We Are

Rio Grande Return (501c3) restores riverscapes and ecosystems unique to the arid Southwest. We use low tech process-based methods to help the earth heal itself.

Our methods rely heavily on human labor rather than machines.



Goal: Headwater Stream Floodplain Connection





Beaver dams help
prevent downstream
flooding and erosion.
Ponds act as natural filters,
removing silt, pollutants and
excess nutrients from the
water.

Reference Conditions

Beaver-dominated streams have multiple channels and pools that span the floodplain.

Natural infrastructure: Beaver infrastructure includes the dams, the ponds, the trees, the woody debris, and the beaver channels beneath the pond.



Current Conditions of New Mexico's Headwater Streams

- Channelized and incised
- Poor access to floodplain
- Wood and trees/shrubs absent
- Only ~7% of all NM streams are perennial
- ~45% of assessed NM streams are impaired for water quality



Low Tech Process-Based Restoration



- Beaver Dam Analogs
- Post-Assisted Log Structures
- Large Woody Debris Structures
- Riparian Planting
- Fencing

Since 2020, Rio Grande Return constructed and maintained 4,000 structures on 15 stream-miles and planted 600,000 willows and cottonwoods.



Beaver Dam Analog

Beaver Dam Analogues



Post-Assisted Log Structures



Large Woody Debris Structures





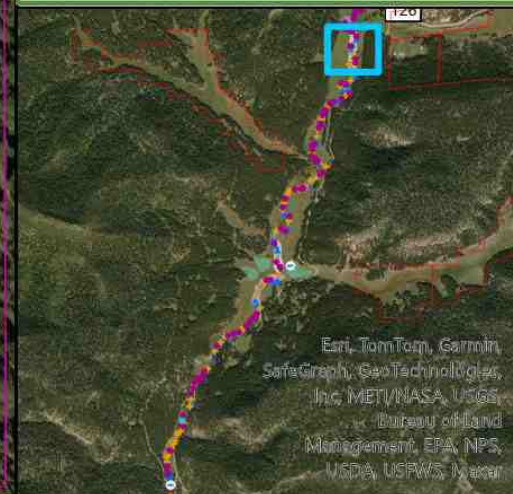
Lower Rio de las Vacas - Low-Tech Process-Based Restoration

Telephone Canyon Complex 2



- | | |
|-----------------------------|-----------------------------|
| BDA | Zone of Influence Complex 3 |
| ▲ LWDS | Map Sheet |
| ✕ PALS | Active Floodplain |
| ● | Historic Floodplain |
| Zone of Influence Complex 1 | |
| Zone of Influence Complex 2 | |

Complex 2: Blown out beaver dam and current dam building activity. BDAs to improve habitat for beaver and PALS alternating with BDAs to source sediment, aggrade channel, and improve floodplain connectivity.



0 400 800 Feet



Challenges to Implementation



- Regulatory issues
- Agency priorities
- Endangered Species Act timelines
- Work Schedules
- Weather and Fire
- Requires adaptive management
- Requires multi-partner, multi-year investments
- Ability to monitor and return to work in systems

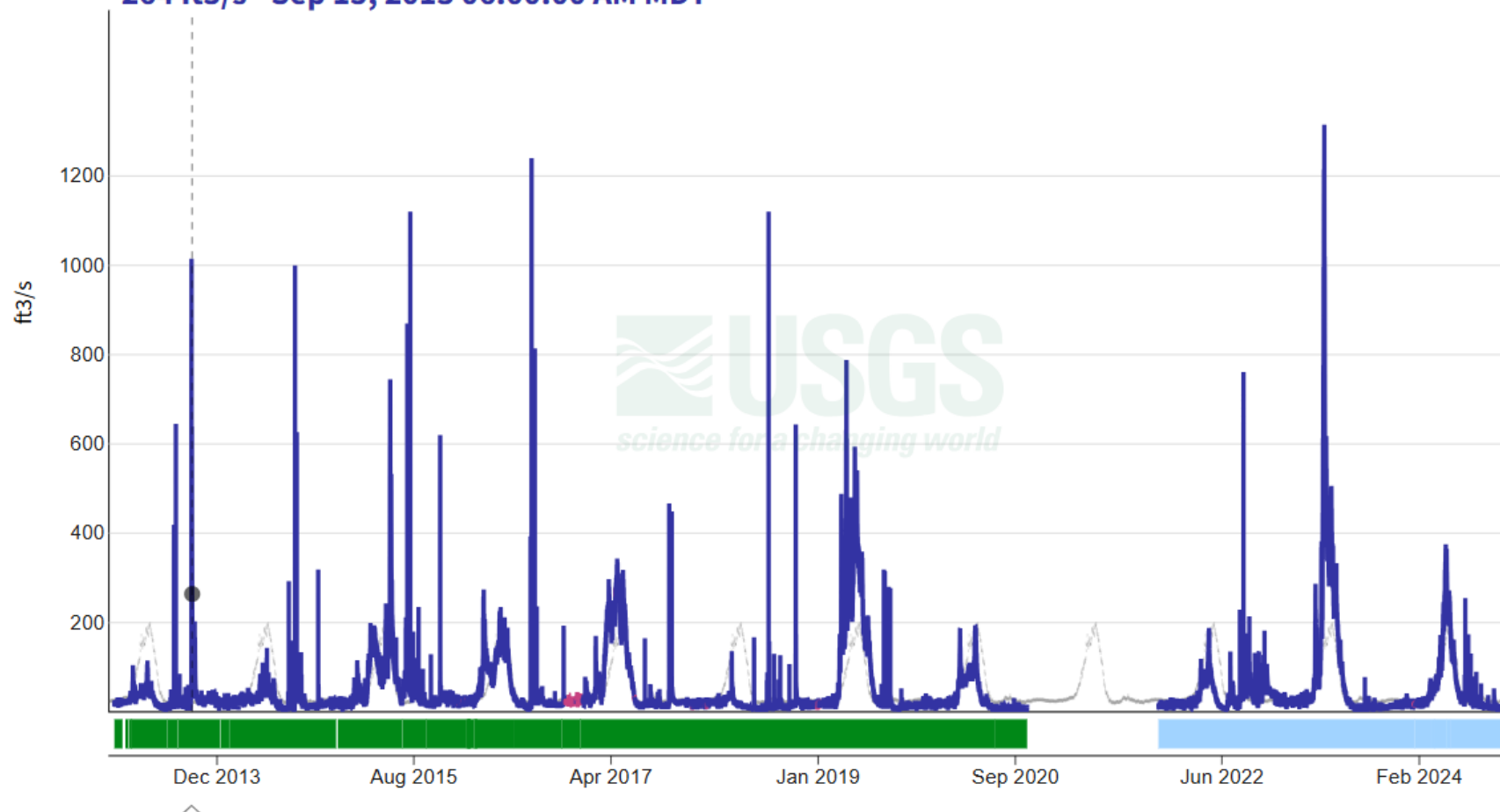


Jemez River Near Jemez, NM - 08324000

January 1, 2013 - November 15, 2024

Discharge, cubic feet per second

264 ft³/s - Sep 15, 2013 06:00:00 AM MDT



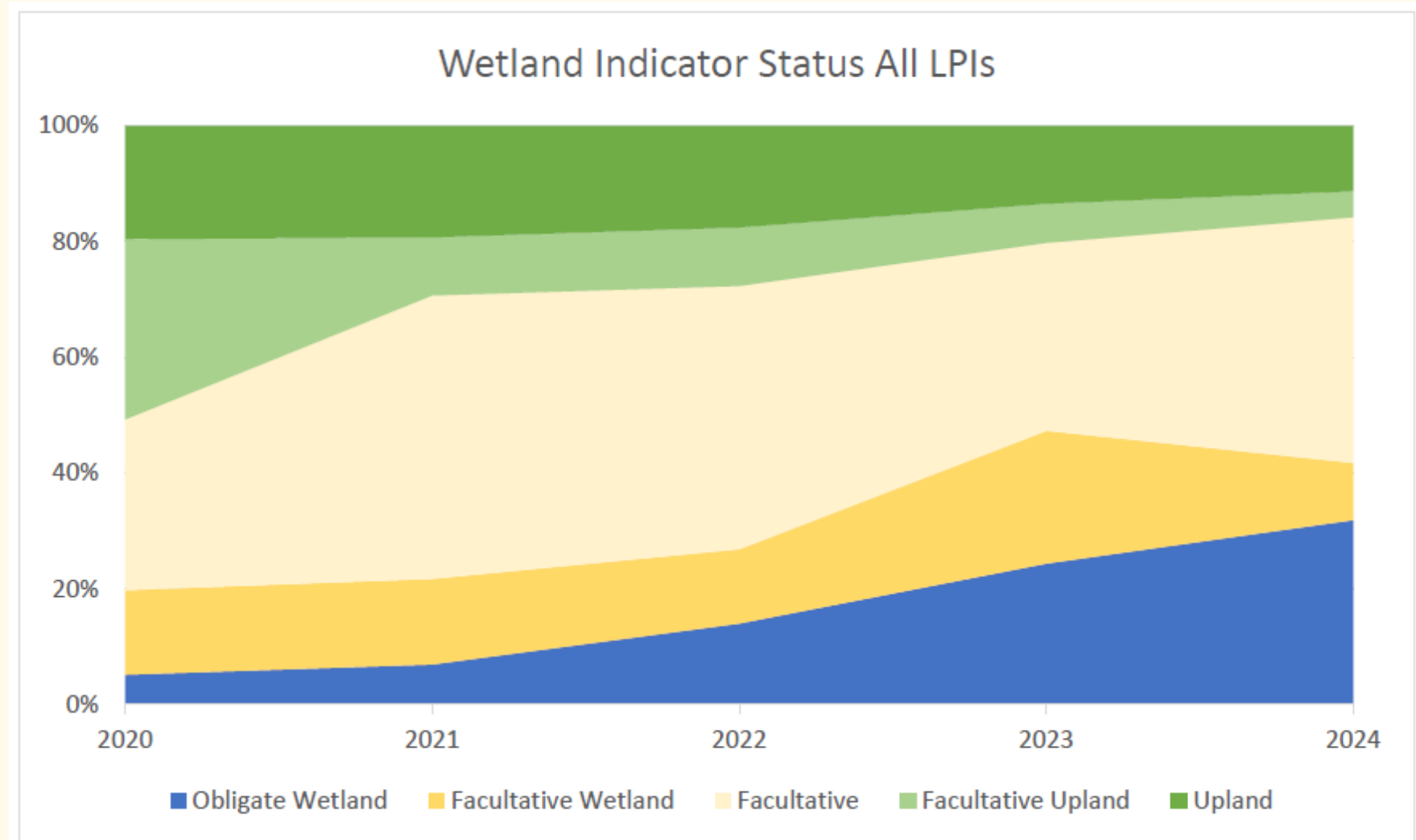
Effects of 2023 Spring Runoff



Indicators of Success (San Antonio Creek): 2020-2024



- Water table adjacent to stream rose up to 3'.
- Wetland obligate vegetation species increased from 5%-32% across 7 transects.
- Non-native vegetation species decreased from 53% to 12%.
- Willows are propagating naturally (poles were planted in 2012).
- Driscoll et. al (2025) found increase in fire-adapted, drought-adapted and wetland adapted species.



Beaver Occupation of Beaver Dam Analogue





San Antonio Creek

October 2020



November 2020



August 2021



September 2022



August 2023

Beaver Coexistence – Pond Leveler

