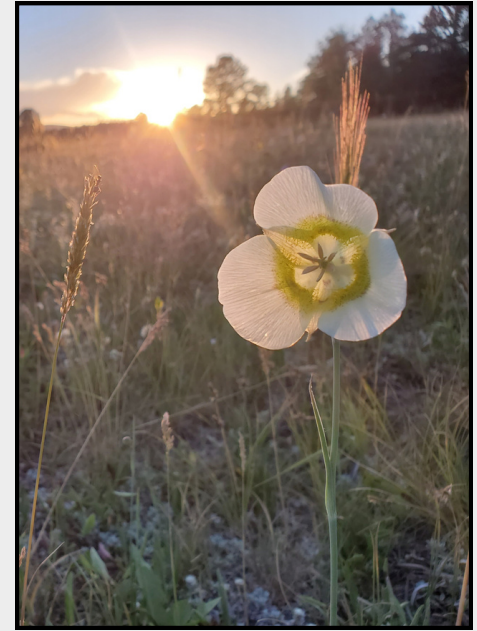




What are the specific effects of restoration treatments on populations of species of collaborative concern across the CFLR project area?



LEFT: Native bees and pan trap bycatch pinning in preparation for identification and curation. RIGHT: Mariposa lily (*Calochortus gunnisonii*) in higher elevation meadow within CFLRP.

Intended monitoring:

Completed monitoring:

Monitor bee species diversity and abundance pre- and post-treatment.

Bee pan trap surveys followed guidelines of National Native Bee Monitoring Network and incorporated into forest plot protocols. Bee identification and curation underway by regional subject matter experts.

Calculate the number of miles of stream occupied by cutthroat trout.

Occupied stream miles to be calculated from species-specific Conservation Strategies. Plans for treatment-focused Environmental DNA (eDNA) sampling are underway.

Calculate the percent of suitable habitat within focal sub-watersheds with active beaver.

Refining Beaver Restoration Assessment Tool (BRAT) to identify suitable habitat. Exploring means to expand community science (iBeaver, created by Defenders of Wildlife) to monitor beaver activity.



Overview of results:



Lewis' woodpecker
(*Melanerpes lewis*)



Wild bees



Abert's squirrel
(*Sciurus aberti*)



cutthroat trout
(*Oncorhynchus clarkii pleuriticus*; *Oncorhynchus clarkii virginalis*)



American beaver
(*Castor canadensis*)

NOTE: Population monitoring is focused on American beaver, cutthroat trout, and wild bees.

Wildlife Species	Monitoring Metric	Target Range	2023 Measure
American beaver	% of potential habitat occupied within HUC12	TBD – how to determine?	TBD – informed by potential habitat (see map) and community science surveys (not yet implemented).
Cutthroat trout	Miles of stream occupied by cutthroat trout conservation populations	TBD – informed by species' Conservation Strategies	TBD – informed by species' Conservation Strategies AND treatment focused eDNA sampling
	Miles of stream occupied by cutthroat AND invasive trout		
Wild bees	Diversity and Abundance	N/A – Insufficient published data	TBD – bee identification and analysis underway.

Notes about population monitoring table:

- Due to inconsistent mapping efforts between NM and CO, a potential beaver habitat map was developed for the CFLRP. This simplified map defined potential beaver habitat as perennial streams (USGS National Hydrography Dataset) with <20% slope (USGS Digital Elevation Model) and within 100m of deciduous vegetation (US EPA National Aquatic Resource Surveys and Natural Heritage NM Riparian Habitat Map).
- Pollinator population “health” and their environmental resilience is typically understood by analyzing diversity and density (Lopez-Urbe et al. 2020 - *Defining Pollinator Health: A Holistic Approach Based on Ecological, Genetic, and Physiological Factors*) and multiple indices provide a greater insight onto the interactions within a system (Morris et al. 2014 - *Choosing and using diversity indices*).

Overview of environmental DNA (eDNA) sampling:

Cutthroat trout (and other fish) shed DNA into their surroundings via excrement and scales. This eDNA can be collected via water samples to determine the presence of a given species. eDNA samples can be stored for many years and analyses are rapidly advancing. By collecting baseline samples in the early years of the CFLRP, there is potential to compare future conditions with current ones, and measure the interaction between species movement, riparian treatments, and future disturbances (such as wildfire and post-fire sedimentation or flooding). eDNA sampling is expected in spring/summer 2024.

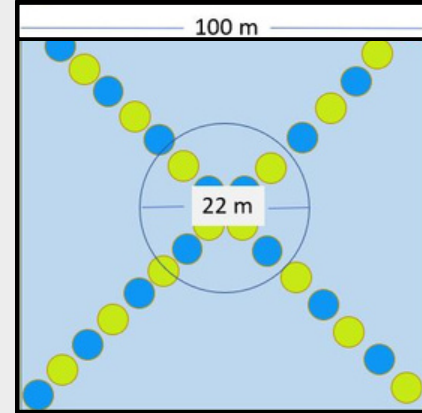
Goal 1: To delineate the distribution of native cutthroat trout within watersheds where in-stream habitat treatments and/or population recovery is occurring.

Goal 2: To delineate distribution of non-native trout (rainbow, brown, and brook).

Goal 3: To expand eDNA sampling within the Rio Chama CFLRP footprint to capture baseline data for use as technological advances and future disturbances occur.

Preliminary bee data from 2023:

	Pinyon-Juniper (1 site)	Ponderosa Pine (2 sites)	Dry Mixed Conifer (2 sites)	Wet Mixed Conifer (3 sites)	All Forest Types
Bee Genera	6	15	17	16	25
Individuals - ALL	364	898	404	1435	3101
Wild bees	324 (89%)	534 (59%)	159 (39%)	233 (16%)	1250 (40%)
Non-bee bycatch	40 (11%)	364 (41%)	245 (61%)	1202 (84%)	1851 (60%)



Bee pantrap monitoring incorporates three colors of cups, filled with soapy water, left on site for approx. 6 hours.

Notes from the field:

Species of collaborative concern were determined in 2022 by the 2-3-2 Monitoring Committee and group of USFS Wildlife Biologists.

Following National Native Bee Monitoring Network protocols, pan trap surveys occurred on 28 forest plots (1/3 of plots at each treatment site were sampled for bees). All bees and bycatch (unintended take) were pinned and sent to subject matter experts for identification, population analysis, and curation. Bycatch should be stored for long-term documentation and analysis but it's important to reconsider whether or not all non-bee bycatch from pantraps needs to be pinned and labeled - this effort is time consuming and costly. In 2023, bycatch included flies, butterflies, and moths.

Native cutthroat trout population data are published in the Conservation Strategies for each species. Both the Colorado River and Rio Grande cutthroat trout Conservation Strategies were updated in 2023, however due to the sensitive nature of the species data, it is not publicly available and 2-3-2 Partners are working to analyze the data for the CFLRP. eDNA samples will be collected throughout select stream reaches - this effort will be piloted in 2024.

American beaver presence/absence surveys are an opportunity for community science and 2-3-2 Partners are tracking additional opportunities for measuring beaver presence throughout the CFLRP (including potential virtual assessment). A Beaver Restoration Assessment Tool (BRAT) can model suitable habitat to focus on-the-ground survey locations. Various BRAT options are being explored, but in the meantime a simple, CFLRP specific model was created to expand upon an existing Rio Grande National Forest assessment and provide a consistent approach across the full CFLRP.

Table summarizes adaptive management (AM) watch-outs as defined in Edition 1 of the 232 Partnership Multiparty Monitoring plan. AM watch-outs were determined by the 232 Partnership at the February 2023 meeting in Taos, NM. Yellow boxes indicate the watch-out was met, or not measured, and should be considered for collaborative discussion.

AM Watch-out	Commentary
Species presence responds differently than expected to habitat modifications	Baseline data only - no comparative data
Detection of competing and/or predatory invasive species	Monitoring for competing or predatory species did not occur
Presence in areas outside of suitable habitat and/or defined range	Analysis not conducted.

Monitoring Committee Recommendations and Takeaways

- Revisit the list of species of collaborative concern.
- Clarify role of monitoring: what data do we actually need?
- Leverage partner existing data, as well as potential partners who might already be collecting data across the landscape.

Rio Chama CFLRP monitoring efforts and collaborative discussions are ongoing. Please direct comments and questions to cody@forestguild.org.