

CONSERVATION OF NATIVE FISHES & MANAGEMENT

ACTIVITIES FOR FY 2021

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Figure 1: Heart Bar reach during nonnative removal. Photo: NMFWCO

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INTRODUCTION & TASKS

The concept of landscape scale conservation is reflected in the recovery activities occurring in the Gila River Basin through diverse partnerships and range-wide management approaches in dealing with environmental threats such as wildfires, climate change, and nonnative aquatic species. Central Arizona Project (CAP) mitigation funding is provided by Bureau of Reclamation to the Gila River Basin Native Fish Conservation Program (Conservation Program) for collaborative projects. The U.S. Fish and Wildlife Service's New Mexico Fish and Wildlife Conservation Office (FWCO) in Albuquerque, along with the U.S. Forest Service's Gila National Forest (USFS), assists the New Mexico Department of Game and Fish (NMDGF) with implementing many of its Conservation Program tasks within the New Mexico portion of the Gila River basin. Starting in fiscal year (FY) 2018, funding was provided to New Mexico FWCO to continue implementing the following tasks: West Fork nonnative species removal, threatened and endangered fish repatriation & monitoring, and Middle Fork inventory & assessment. In FY 2019, the Native Fish in the Classroom (NFIC) Program was added. The tasks are geared towards conservation of endangered spikedace (*Meda fulgida*), loach minnow (*Tiaroga cobitis*), and Gila chub (*Gila intermedia*) (now classified as roundtail chub (*Gila robusta*)) in the Gila River Basin.

Task 1.1: West Fork Nonnative Removal

The West Fork Gila River near the confluence of Middle Fork and East Fork supports a largely intact native fish assemblage, including one of the two surviving spikedace populations in New Mexico. Nonnative fishes are the primary threat to persistence of native fishes in the Gila forks area. Since 2006, the Conservation Program has provided funding to remove nonnative fishes from an approximately 4 km reach along the West Fork Gila River. The 4-km reach extends from the confluence of the West Fork Gila River and Little Creek upstream to the bridge of NM-15 and is referred to as the Heart Bar reach. Nonnative fish removal occurs on an annual basis, generally during June. This year, the Johnson Fire disrupted the remote West Fork sampling, and the nonnative removal took place the last week of May instead of June.

For FY 2021, nonnative removal efforts included personnel from NMDGF, USFS, NMFWCO, and Kansas State University. Beginning from Little Creek, crews worked upstream in segments defined by the mesohabitats of riffles, runs, and pools. Habitat data collected generally included length and width of habitat, depth, and substrate. Fish collection comprised of a single sampling pass, in an upstream direction, using a backpack electrofisher, a seine, or both, depending on the habitat. Fish were identified to species, weighed (g), and measured (mm) for total length (TL) and standard length (SL). Six nonnative fish species were collected (Table 1). All nonnative species were processed and removed from the river. Three Gila trout were found (Table 2).

Table 1. Total number of nonnative fish species captured and density of all fishes in the West Fork Gila River nonnative removal in 2021. Data provided by NMDGF.

Nonnative Fish Species	Number Captured	Density (fish/100 m2)
Bullhead spp.	108	0.392
Brown trout	3	0.029
Common carp	2	0.02
Smallmouth bass	59	0.281
Western mosquitofish	79	1.183
Oncorhynchus spp.	1	0.004

Table 2. Total number of native fish species captured and density of all fishes in the West Fork Gila River nonnative removal in 2021. Data provided by NMDGF.

Native Fish Species	Number Captured	Density (fish/100 m2)
Desert sucker	892	5.391
Loach minnow	590	11.272
Longfin dace	556	5.999
Roundtail chub	71	665
Sonora sucker	1667	6.491
Speckled dace	107	1.349
Spikedace	107	1.916
Gila trout	3	0.028



Figure 2: Nonnative removal crew on the West Fork Gila River. Photo: NMFWCO

Task 1.2 Threatened and Endangered Fish Repatriation & Monitoring

Funding was provided to New Mexico FWCO to assist NMDGF in undertaking repatriations and monitoring of threatened and endangered fishes within the Gila River basin in New Mexico. Potential repatriation sites are to be evaluated for habitat, water quality, and fish diseases, as well as National Environmental Policy Act and Endangered Species Act compliance prior to stocking.

Multiple stockings into each repatriation stream will be performed successively for three to five consecutive years or until the desired populations are considered established or unsustainable. These streams will also be monitored annually until the stocked population is established or becomes unsustainable. Once stocked populations are established, streams will be surveyed at least once every five years.

Augmentation did not occur for loach minnow and spikedace in FY 2021; however, some repatriation monitoring and broodstock collection did occur. Three streams repatriated with loach minnow were monitored in FY 2021: Saliz, Bear, and Negrito Creeks. Loach minnow were found at the Cottonwood Campground location, where they were stocked in 2020. They were not abundant at other locations in

Saliz. Loach minnow were found at Bear Creek, and none were found in the sites sampled at Negrito Creek. The monitoring efforts were completed by NMDGF and NMFWCO. More information regarding the results of these survey efforts can be found in the Gila River Basin Native Fishes Conservation Program: New Mexico Department of Game and Fish 2021 Annual Report.

After the Johnson Fire, NMFWCO, USFS, NM Ecological Services, and Arizona Game and Fish Department (AZGFD) Aquatic Resources and Recovery Center (ARRC) personnel evacuated 100 loach minnow and 50 spikedace from the Heart Bar reach. The fish were transported to the Arizona ARRC to be used as broodstock. Approximately 320 Gila chub were preemptively evacuated out of Turkey Creek to the Southwestern Native Aquatic Resources and Recovery Center and were restocked in early FY 2022.



Figure 3: Spikedace collected during nonnative removal and fish monitoring efforts in May 2021 on the West Fork Gila River. Photo: NMFWCO

Permanent Site Monitoring

New Mexico FWCO also assisted NMDGF and USFS personnel with annual Gila River fish community monitoring at permanent sites in FY 2021. Long-term monitoring provides data used to support recovery actions while tracking changes in presence/absence and density of native and nonnative fishes throughout the Gila River Basin.

Each of the following tributaries has one long-term monitoring site: San Francisco, Tularosa, East Fork Gila, West Fork Gila, and Middle Fork Gila rivers. Four sites are located on the mainstem Gila River spanning from Cliff, NM to near the Arizona border: Ash Canyon, Cherokee Canyon, Iron Bridge, and Sunset Diversion. Crews moved upstream working the reach in segments defined by the mesohabitats of riffles, runs, and pools. Habitat data collected included length, width, depth, and at least 3 flow measurements. Fish collection was done in a single sampling pass, in an upstream direction, using a backpack electrofisher, seine, or a combination of both (depending on the habitat). Fish were identified to species, weighed (g), and measured (mm) for total length (TL) and standard length (SL). Loach

minnow were collected at five sites. Spikedace were collected at four sites. All data was collected and maintained by NMDGF. Information regarding the results of these survey efforts can be found in the New Mexico Department of Game and Fish Native Fish Conservation Efforts 2021 Annual Report.

Task 1.3 Remote Sites (formerly Middle Fork) Inventory & Assessment

Much of the Gila River Drainage in New Mexico is extremely remote, making it difficult and costly to sample. The drainage is also dynamic, and there have been significant changes in the Gila and San Francisco rivers since the Conservation Program funded an inventory of the Gila River forks from 2005-2008. The most significant changes were caused by Whitewater-Baldy Fire, which burned large portions of the upper Gila and upper San Francisco watershed in 2012, and the resultant post-fire flooding. This fire and flooding eliminated nonnative fishes from at least one tributary (Willow Creek) of the Middle Fork Gila River and may have created opportunities for native fish protection in other locations. The Middle Fork inventory task was expanded to include additional remote sites that hadn't been recently surveyed to include East Fork and West Fork Gila River drainages.

West Fork Gila River drainage remote sites were scheduled to start in FY 2021. The Johnson Fire threatened the area, so the upper West Fork sampling was rescheduled for FY 2022. The lower West Fork was sampled in June. All data can be found in the New Mexico Department of Game and Fish Native Fish Conservation Efforts 2021 Annual Report.

Task 1.4 Native Fish in the Classroom (NFIC) – Gila & Mimbres Drainage

In FY 2017, a partnership between USFS - Gila National Forest, MNFH, and New Mexico FWCO allowed for the expansion of the NFIC Program into schools within the Mimbres and Gila River Basins. The NFIC Program is an environmental education program developed by New Mexico FWCO in 2011. The program allows students to meet and learn about native fishes in or near their community.

In FY 2021, videos were made for a virtual Gila & Rio Grande based NFIC Program that will provide an alternative to classroom programs. The video series will bring fish observation activities to students while providing greater accessibility to any schools interested in participating in the NFIC Program. The video footage was provided by Angela Palacios, Pueblo of Santa Ana, Sevilleta National Wildlife Refuge, Amigos de la Sevilleta, AZGFD ARRC, and NMDGF.

The BOR provides CAP funding for projects selected by the Gila River Basin Native Fishes Conservation Program Technical Committee. The Service, as a member of the Conservation Program, contributes to the development of information and education programs to promote endangered fish recovery. In addition to funding provided for the NFIC Program, the Conservation Program also provided funding to develop and procure educational materials specific to the Gila River basin. NMFWCO's goal was to provide a visually appealing, multifunctional educational item. Staff also wanted to highlight their community's native fishes while providing a tangible resource for students and community members with information reiterating learned material from the NFIC Program and materials distributed during Gila River based community outreach events. The educational item is a cotton bandana (22" x 22") featuring the native fish community of the Gila River basin.



Figure 4: Gila River native fish community bandana. Photo: NMFWCO

The NFIC Program ended prematurely due to school closures in response to COVID-19. Staff worked diligently with partners and teachers to address fish care in the classrooms during the extended closure and, ultimately, the removal of fish from the schools. Most of the fish were released by staff and partners at their designated release sites.

In May 2021, Angela Palacios moved to a different position. The Native Fish in the Classroom Program will continue through the Gila National Forest.

REFERENCES

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