

WATER MONITORING REPORT

MONITORING THE ECOLOGICAL CONDITIONS THAT CONSERVE THE ENDANGERED ZUNI BLUEHEAD SUCKER IN THE RIO NUTRIA PRESERVE

BACKGROUND

The Zuni bluehead sucker, *Catostomus discobolus yarrowi*, is a federally listed endangered subspecies of fish whose populations have decreased by 90% in New Mexico, where it is now restricted to isolated habitats in the Zuni Mountains and Pueblo of Zuni. This fish faces threats including habitat loss, sedimentation (especially linked to wildfire and grazing), and climate change (which will bring higher water temperatures, lower water levels, and more frequent and severe flooding events). In parts of its range, the Zuni bluehead sucker also competes with non-native aquatic species.



Figure 1. Adult Zuni bluehead sucker. Photo courtesy of Angela Palacios (USFWS)

U.S. Fish & Wildlife Service
2021 Zuni Bluehead Sucker Sampling

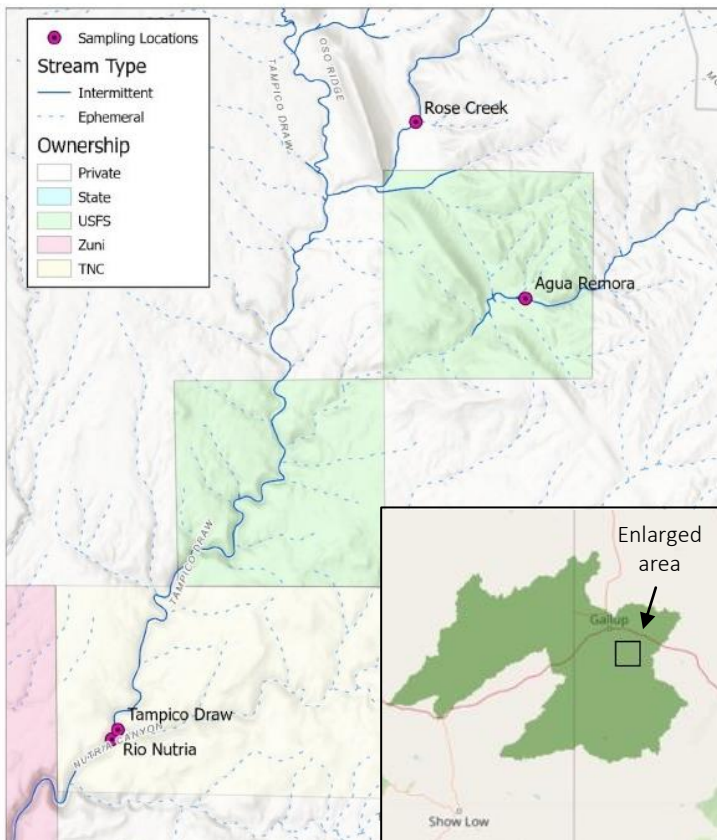


Figure 2. Maps showing the global range of the Zuni bluehead sucker (lower right) and the sites included in this study (Tampico Draw and Rio Nutria). Map courtesy of Jennifer Johnson (USFWS)

Since 2013, the Forest Stewards Guild in collaboration with the University of New Mexico, US Forest Service, Great Old Broads for Wilderness, US Fish & Wildlife Service (USFWS), Pueblo of Zuni, River Source, Inc., The Nature Conservancy (TNC), and others have monitored water quality at several Zuni bluehead sucker habitat sites in the western portion of the Zuni Mountains. Two sites of particular interest are the Rio Nutria and Tampico Draw, both of which lie within The Nature Conservancy's Rio Nutria Preserve. Monitoring water here illuminates the conditions that allow the Zuni bluehead sucker to persist in mixed age populations in the Rio Nutria below the confluence with Tampico Draw and farther downstream. Suckers were once present above the confluence but have not been observed here for a number of years.

Researchers take spot water quality measurements of parameters such as dissolved oxygen, dissolved solids, conductivity, and pH using a portable water quality tester device up to four times per year. Installed Hobo U20 logger devices automatically measure water temperatures and water levels every sixty minutes.

RESULTS

Water temperatures were measured in the deepest part of Tampico Draw and Rio Nutria pools, both of which are around 18 inches deep. Data revealed occasional critical warming (above 30° C) in the summer, especially June and July. The overall trend is of increasing water temperatures since 2014, although our sample size is small. Rising water temperatures could pose a threat to the Zuni bluehead sucker given that as water temperatures rise, dissolved oxygen and water levels decline.



Figure 3. Water temperatures recorded at the Rio Nutria (orange) and Tampico Draw (blue) sites between May 15th and October 13th, 2014-2022

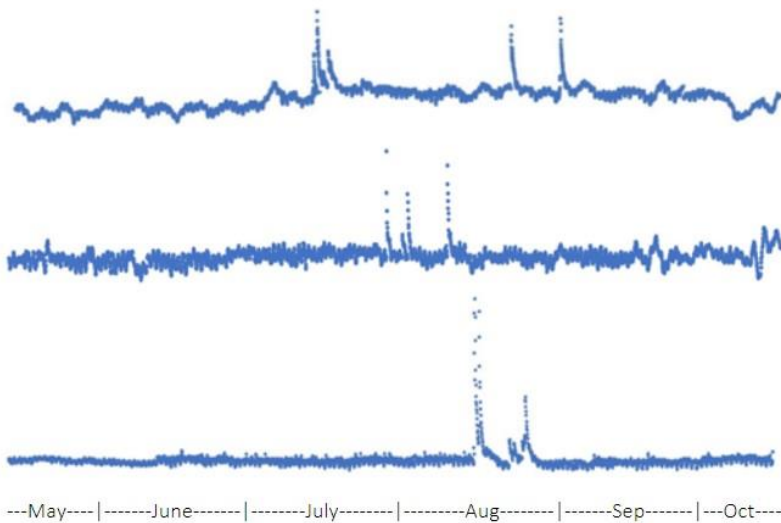


Figure 4. Water levels at the Rio Nutria site between May 15th and October 15th, 2018 (top), 2021 (middle), and 2022 (bottom)



Figure 5. Hobo U20 automatic data logger

Water level was monitored in the Rio Nutria pool from late spring to early fall in 2018, 2021, and 2022. Data showed four to five major flood pulses per monsoon season clustered between July 14th and September 1st. On average, flood events lasted 15 hours with a range of 10 to 28 hours. Major flood events have the potential to wash fish out of the system, while sustained drought could lower water beyond critical levels.

GOING FORWARD

The Guild and its partners will continue monitoring water quality, water temperature, and water level in the Rio Nutria Preserve on an ongoing basis. These efforts complement Zuni bluehead sucker population monitoring conducted by USFWS, Pueblo of Zuni, and TNC in this area. Despite occurring within a protected area, this population of Zuni bluehead sucker remains vulnerable to climate change and wildfire. Monitoring will allow us to evaluate changes to water quality, level, and temperature associated with these, or other, disturbances.