

Range-wide habitat assessment of Loach minnow (*Tiaroga cobitis*) and Spikedace (*Meda fulgida*)

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Project Summary

Habitat loss and alteration is a major cause of declining native fish diversity in streams. Much of this habitat alteration is a consequence of human's actively extracting or diverting water from lotic systems. While parts of the Gila River basin possess few diversions and a relatively intact natural flow regime, flows throughout most of the basin have been drastically altered for socioeconomic purposes. The Gila River and its tributaries are home to multiple dams, diversions and also supply water to agricultural and industrial municipalities throughout New Mexico and Arizona. The alteration of habitat and the natural flow regime caused by these diversions, coupled with the introduction of nonnative species, is reducing native fish distributions and abundance in the Gila River basin. Spikedace (*Meda fulgida*) and loach minnow (*Tiaroga cobitis*) are two native small-body cyprinids once widely distributed throughout the Gila River basin that are now classified as federally endangered by the United State Fish and Wildlife Service. Multiple repatriation efforts have been conducted to establish populations of these species in areas where they have been extirpated, but these efforts have not always been successful. The objective of this study is to identify habitat use of these species in relation to habitat availability. We will also assess the composition of potential competitors and predators across our sample sites. We will evaluate habitat at different temporal and spatial scales (mesohabitat to reach level) to identify at what scale habitat requirements aid in the persistence of these populations. This will be done by surveying habitat in locations with natural, successfully repatriated, unsuccessfully repatriated, and extirpated populations of loach minnow and spikedace in an attempt to see what variables may be driving persistence of these populations.

Project Objectives:

- 1) Characterize and compare habitat available and entire fish community structure at 18 sites that have either contemporary populations of loach minnow and spikedace or historically maintained populations of these species.
- 2) Quantify habitat for loach minnow and spikedace across multiple spatial and temporal scales.
- 3) Characterize relationships between genetic population structure determined in a companion study and habitat attributes across the currently occupied range of each species.



Figure 1: Distribution of 18 sites throughout the Gila River basin that will be sampled from October 2018 – June 2020.

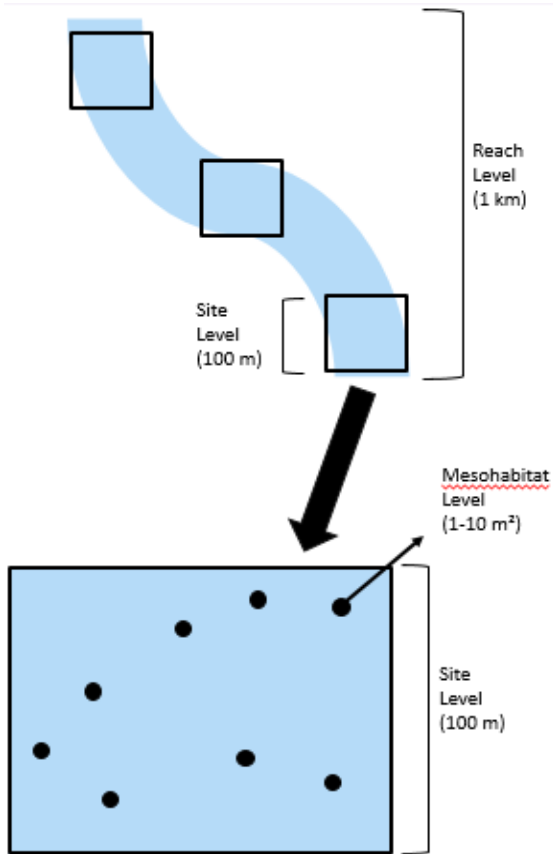


Figure 2: Left - The three differing spatial scales that will be sampled at each site throughout the Gila River basin. The hierarchy of spatial scales from broadest to finest is: Reach Level (1 km), Site Level (100 m) and Mesohabitat Level (1-10 m²). Right – Processing fish samples on the San Pedro River.