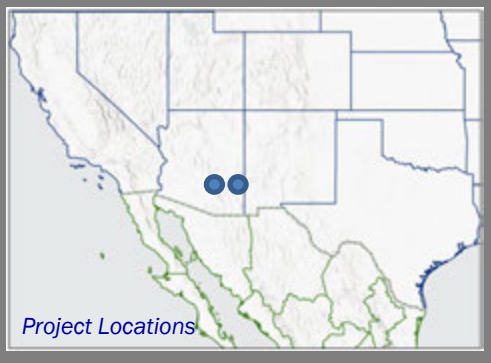
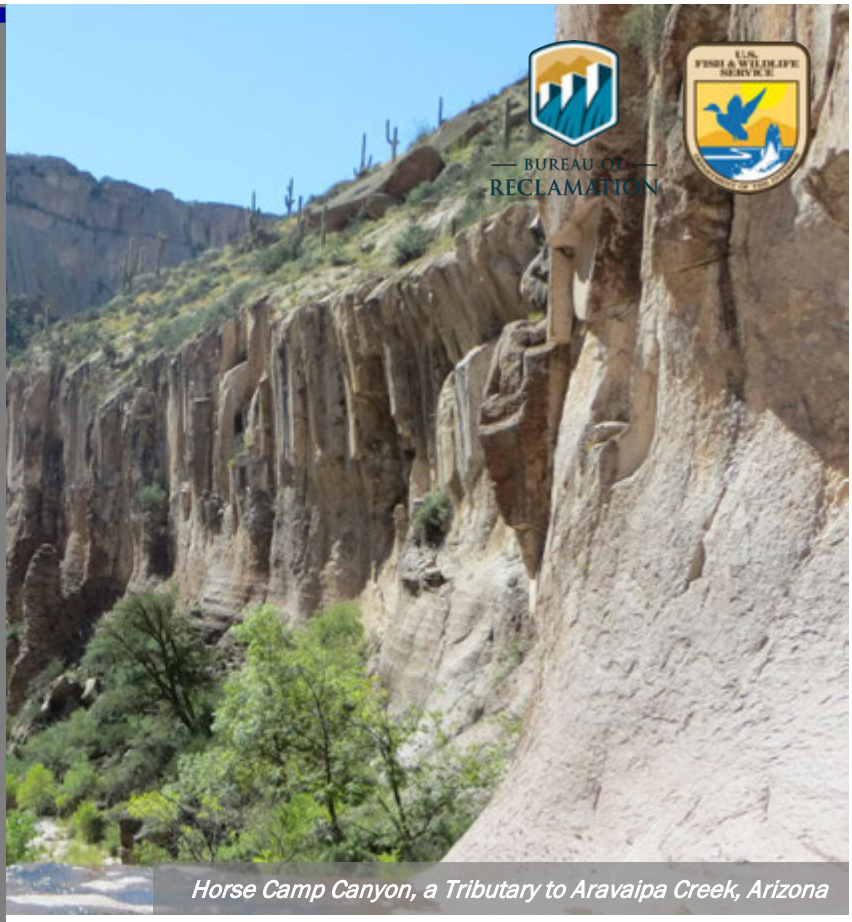
RESTORATION

Successful Green Sunfish Control in Aravaipa and Bonita Creeks

Aravaipa and Bonita Creeks are unique in southeastern Arizona as they are perennial streams that still support intact or nearly intact native fish assemblages. Highly piscivorous Green Sunfish (*Lepomis cyanellus*), native to eastern North America, have been introduced throughout the western United States and invaded several Arizona stream systems, including both Aravaipa and Bonita Creeks. Native fishes in these creeks face competition for limited resources and predation by many non-native aquatic species, especially by Green Sunfish. To protect native species and promote recovery, fish biologists and managers implemented a mechanical removal project for Green Sunfish to prevent their populations from expanding.



Project Locations



Horse Camp Canyon, a Tributary to Aravaipa Creek, Arizona

KEY ISSUES ADDRESSED

Introduced aquatic species, including Green Sunfish, pose a significant ecological threat to the native fish assemblages in Bonita and Aravaipa Creeks. In Bonita Creek, a chemical treatment conducted in 2008 was not effective in eliminating non-native fish species. As such, additional strategies, including mechanical removal, were implemented by managers to remove expanding populations of non-native fishes. Mechanical removal is time, effort, and financially intensive, and it is most effective in closed systems that incorporate a fish barrier, to prevent recolonization of non-native species. Because of the high costs and effort needed for successful removal, adequate funding is crucial to provide for the necessary staff and equipment resources.

PROJECT GOALS

- Conduct surveys for native and non-native fish presence in Aravaipa and Bonita Creeks
- Protect unique native fish assemblages in Aravaipa and Bonita Creeks
- Remove Green Sunfish from study locations
- Conduct periodic surveys for non-native fish presence and absence

EXTENSIVE SUNFISH CONTROL EFFORTS

During 2009-2017, over 23,000 Green Sunfish were mechanically removed by hand from Bonita Creek, and from 2010-2015 almost 4,000 Green Sunfish were removed from Horse Camp Canyon.

Gila Chub from Bonita Creek

PROJECT HIGHLIGHTS

Point Source Discovered: Project surveys revealed Horse Camp Canyon, a tributary to Aravaipa Creek, as the only point source for Green Sunfish populations.

Intensive Mechanical Removal Methods: Project members deployed a diverse range of gear, matched to specific habitat types, to remove Green Sunfish, including backpack electroshockers and baited minnow traps.

More Funding Support: Removals started in 2009 from Bonita Creek and 2010 from Horse Camp Canyon. Limited funding, however, constrained the effort needed to fully eradicate non-native sunfish. In 2016, the Bonita Creek project received additional funding from Bureau of Reclamation and Bureau of Land Management. This added funding was pivotal for increasing capacity for removal efforts.

Sunfish Eliminated in Horse Camp Canyon and Bonita Creek: Green Sunfish have not been detected in either location since 2015 and 2017, respectively. Green Sunfish have also not been captured from mainstem Aravaipa Creek since 2015.

Collaborators

- See online for a full list of collaborators

Funding Partners

- Bureau of Land Management, Washington Office, Division of Fish and Wildlife Conservation
- Reclamation, Gila River Native Fishes Conservation Program

Lead Author: Alex Koeberle, University of Arizona, March 2020.
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Photos courtesy of Heidi Blasius and Bureau of Land Management

LESSONS LEARNED

Project biologists have documented increasing abundances of native fishes such as Gila Chub in Bonita Creek and Longfin Dace in Aravaipa Creek. Other native aquatic species have benefitted, too, with biologists observing increased populations of native lowland leopard frogs as well as increased macroinvertebrate diversity in Horse Camp Canyon.

Early on, project members were routinely told by other fisheries professionals that mechanical removal was not possible in either creek. This project, however, demonstrates that in some situations mechanical eradication is possible with adequate resources to maintain a persistent and intensive effort.

The first few years' effort of removing Green Sunfish from Horse Camp Canyon were not successful in eliminating Green Sunfish due to limited financial support. For example, project members began in the spring by removing 600-800 sunfish and end in the fall with only a handful of Green Sunfish remaining, only to rediscover hundreds more sunfish again the following spring. Additional BLM funding in 2013 led to enhanced removal efforts and subsequent sunfish eradication by 2015 in Horse Camp Canyon.

NEXT STEPS

- Monitor to ensure Green Sunfish are absent
- Incorporate Environmental DNA (eDNA) surveys to confirm eradication of Green Sunfish
- Eradicate Yellow Bullhead in both systems

PROJECT RESOURCES

For more information on this project, contact Heidi Blasius: hblasius@blm.gov

For additional project resources and case studies, scan the QR code below or visit the CCAST website: WWW.DESERTLCC.ORG/RESOURCE/CCAST

Field Crew with Equipment Hiking into Horse Camp Canyon