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AZGFD
Aquatic Species
Conservation

IN THE CURRENT

By the Numbers – Native Fish Recovery Progress

What difference does 10 years make for native fish recovery? Answer: the establishment of at least 112 new populations in the wild and captivity, across 18 species of native fish in Arizona. Over the past decade, the Arizona Game and Fish Department has stocked approximately a quarter million warm-water native fish.

One of the fundamental goals of most native fish recovery plans and conservation strategies is the translocation and establishment of new populations at extirpated sites or at suitable locations within their historic range. Over the past decade, nearly 300 stockings of warm-water native fish into 130 or more sites have been completed.

Keep in mind that does not include Apache and Gila Trout stockings that were done concurrently, nor does it include recent translocations of warm-water native fish that are still undergoing post-stock monitoring to confirm if those populations have bred and become self-sustaining.

The Arizona Game and Fish Department works closely with the U.S. Fish and Wildlife Service and other federal, state, and tribal natural resource agencies, landowners, local governments, non-governmental organizations, universities, and other interested parties to further native fish conservation. This work often involves years of planning, coordination, and lots of paperwork before fish can even be moved.

Fortunately, voluntary Candidate Conservation Agreements, Habitat Conservation Plans, and Safe Harbor Agreements (SHA) increase opportunities to partner with private and non-federal landowners to establish new refuge populations and protect extant populations and their habitat in the wild. For example, under the statewide Topminnow and Pupfish SHA, the Department has secured and established 21 new populations of these endangered fish. These refuge populations also provide source fish for future recovery efforts.

Not all of the Department's native fish stocking efforts are successful, but over time those populations that do establish move us closer to achieving recovery for listed species and help preclude the need to list others.

By Jeff Sorensen, Native Fish and Invertebrates Program Manager, and Tony Robinson, CAP Native Fish Program Manager, Nongame Wildlife Branch

New Populations Established by Species, 2006-2015

Gila Topminnow: 13 wild and 23 captive
Desert Pupfish: 5 wild and 19 captive
Sonoyta Pupfish: 2 captive
Gila Chub: 3 wild and 1 captive
Roundtail Chub: 4 wild and 5 captive
Bluehead Sucker: 2 wild
Little Colorado River Sucker: 1 wild
Little Colorado Spinedace: 4 wild
Loach Minnow: 2 wild and 4 captive
Spikedace: 3 wild and 3 captive
Longfin Dace: 4 wild and 5 captive
Speckled Dace: 2 wild and 1 captive
Sonora Sucker: 1 wild
Desert Sucker: 1 wild
Bonytail: 2 captive
Razorback Sucker: 2 captive
Yaqui Chub: 1 captive
Mexican Stoneroller: 1 wild

Inside this issue:

> **A success rate of only 53.4% was calculated with 244 correct identifications on 451 trials using the Minckley and DeMarais key.**

#TRENDINGNOW

Does Observer Bias Affect Species Identification of Members of the Roundtail Chub Complex?

In 2000, Minckley and DeMarias published an identification key with overlapping morphologic and meristic characters to describe the *Gila robusta* complex of chub: Roundtail Chub, *G. robusta*; Gila Chub, *G. intermedia*; and Headwater Chub, *G. nigra*. The Department wanted to test the accuracy of observers using that key to identify specimens of Gila complex fishes to species*.

For this test, a panel of ten observers with at least ten years of experience working with the *Gila* complex was convened. The success rate of identification for three species of *Gila* were compared using 89 fish collected from 15 localities in the Gila River Basin. Only one species was known or thought to occur at each locality.

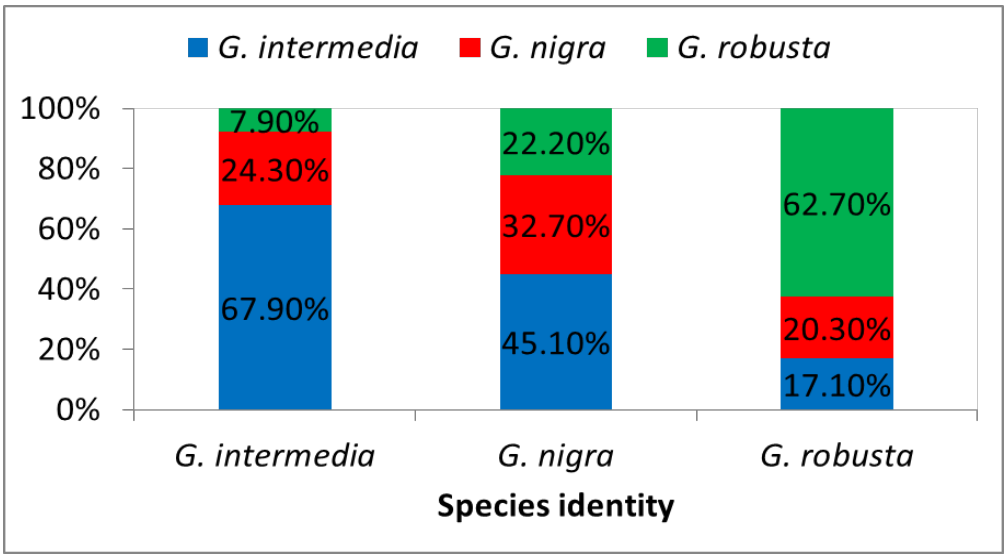
A success rate of only 53.4% was calculated with 244 correct identifications on 451 trials using the Minckley and DeMarais key. No species was perfectly identified, and this pattern differed from random chance ($G = 131.98$; $p < 0.0001$).

By species, *G. intermedia* was most frequently identified correctly (67.9%), *G. robusta* second (62.7%); *G. nigra* was the least correctly identified (32.7%). *Gila nigra* were most commonly misidentified as *G. intermedia* (45.1%) and occasionally as *G. robusta* (22.2%).

Similarly, observers identified at least two species of chub from all localities, and 13 of 15 localities had all three species identified.

The results of the Department's study demonstrated the challenges of accurate species identification using the recognized key, whereby one of two scenarios is true: (1) multiple species identifications from the same collection locality are accurate, and *Gila* species are sympatric in most cases, or (2) only a single species is present at each locality and multiple species identifications result from morphologically indistinguishable *G. intermedia*, *G. nigra*, and *G. robusta*.

By Clay Crowder, Native Fish Coordinator, Nongame Wildlife Branch; Julie Meka-Carter, CAMP Program Manager, Fisheries Branch; Daniel Leavitt, Senior Projects Manager, Contracts Branch; Brian Hickerson, and



*Roundtail and Headwater Chub are identified as distinct species per Minckley and DeMarais (2000). The Arizona Game and Fish Department recognizes Roundtail Chub, Headwater Chub, and Gila Chub as a species complex rather than composed of the three discrete species.

IN THE FIELD

Recent & Upcoming AZGFD-led Activities Around the State

Region I Pinetop:
- No native fish activities planned, December 2015 to February 2016

Region II Flagstaff:
- December 7: Roundtail Chub round-up at Bubbling Ponds Hatchery

Region III Kingman:
- No native fish activities planned, December 2015 to February 2016

Region V Tucson:
- November 13: Desert Pupfish and Gila Chub salvaged from the International Wildlife Museum pond

Region VI Mesa:
- November 20: Rio Salado Audubon Center pond habitat improvement workday
- December 16: Chase Creek habitat survey for potential chub introduction

Region VI Mesa continued:
- January 12-13: Coon Creek habitat survey for potential chub introduction
- January 17: Horseshoe Ranch Wildlife Area volunteer workday
- February (date to be determined): Region VI Native Fish Conservation Team meeting

Gila Trout Stocked into Dude Creek and West Fork Oak Creek

A volunteer stocking Gila Trout. Photo by AZGFD.

In late October, 1000 Gila Trout were stocked into Dude Creek along the Mogollon Rim, and another 1000 into West Fork Oak Creek, near Sedona.

Department biologists were joined by volunteers from Trout Unlimited and Federation of Fly Fishers local chapters, along with U.S. Fish and Wildlife Service and U.S. Forest Service staff to complete these long-awaited native fish stockings. These fish were supplied by Mora National Fish Hatchery in New Mexico.

Gila Trout had been absent from Dude Creek since the early 2000s. Dude Creek is a recovery stream for this species, and is closed to fishing.

Gila Trout were stocked into West Fork Oak Creek under the 4(d) rule of the Endangered Species Act, which allows recreational fishing for this threatened species in certain waters. West Fork Oak Creek now provides a new opportunity for Arizona anglers to catch a native trout.

By Mike Anderson, Native Trout Coordinator, Fisheries Branch

Gila Topminnow Found in Parker Canyon Drainage and Lower Santa Cruz River Near Nogales

On September 30th, Department biologists confirmed that Gila Topminnow were present downstream of Parker Canyon Lake in southern Arizona. This is the first reported occurrence of this endangered species in that drainage.

Parker Canyon is an intermittent stream that drains into the Upper Santa Cruz River near the international border.

In late October, a follow up survey by Department, U.S. Fish and Wildlife Service, U.S. Forest Service, and Arizona-Sonora Desert Museum biologists, along with Sally and Jerry Stefferud and Chuck Minckley, found and collected live topminnows for genetic analysis and to possibly start a refuge population.

Forty-three of these fish are now being held at Arizona State University's Animal Care Facility.

In mid-November, a multi-partner survey of the Lower Santa Cruz River near Nogales, also found Gila Topminnow—the first time in a decade.

Since 2009, the water quality in that river reach has greatly improved, due to an upgrade in the Nogales International Wastewater Treatment Plant.

The topminnow in this reach were likely dispersed from Fresno Canyon, a tributary to Sonoita Creek that drains into the Lower Santa Cruz River, about 8.5 miles south of the survey location.

Gila Topminnow. Photo by AZGFD.

By Ross Timmons, Native Fish Coordinator, Nongame Wildlife Branch

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BACK AT THE PONDS

ARCC Overhaul Now Underway

The Aquatic Research and Conservation Center (ARCC) has received nearly $1.5M from the Bureau of Reclamation for a facility overhaul to increase fish holding capacity, improve biosecurity, and improve rearing conditions for Gila River basin fishes.

The first phase of construction will nearly double ARCC's capacity to spawn endangered Loach Minnow and Spikedace.

Twenty state-of-the-art fiberglass spawning raceways, plumbing, and enclosed fencing are all included in this first phase. Eleven existing raceways will be replaced.

ARCC staff broke ground in October and will continue site preparation as Reclamation and Department engineers work with contractors to complete the first phase by March 1, 2016.

Phase two, expected to be finished in 2017, will include a retaining wall, two large ponds and large circular rearing tanks, and a new steel building.

Moving old raceways (re-purposed missile crates) out of the way for new construction at ARCC. Image by AZGFD.

By Matt O'Neill PhD, Native Fish Research Biologist, Research Branch

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Head Starting Leopard Frogs at Bubbling Ponds

Head starting leopard frogs consists of collecting egg masses and raising the young in a predator-free environment, then releasing the juveniles back to the wild.

The Bass House building at Bubbling Ponds is one such facility that is used to head start the threatened Chiricahua Leopard Frog. The Bass House facility is very successful at growing out large numbers of healthy frogs.

Last June, 600 Chiricahua Leopard Frog tadpoles were transferred from the Department's Pinetop facility, where they were captive bred, to Bass House. By late August, most of those tadpoles had developed into frogs and were released back into the White Mountains.

The frogs were placed into two wild sites in the Black River area and a Safe Harbor Agreement-enrolled site near Concho.

By Sarah Taylor, Bubbling Ponds Hatchery Manager, Fisheries Branch

For more information about any of these articles, visit www.azgfd.gov or e-mail nativefish@azgfd.gov.

Arizona Game and Fish Department Mission

To conserve Arizona's diverse wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations.