GILA TROUT

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RECOVERY IN ARIZONA

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Gila trout are one of two trout species native to Arizona. Historically, they are thought to be native to the Agua Fria River, Verde River, Tonto Creek, Upper Gila River and San Francisco River drainages in Arizona and New Mexico, though their exact historic distribution is not known with certainty.

Gila trout were not formally described as a species until 1950, when it was estimated that their distribution had been reduced to as few as 20 stream miles, all located in the headwaters of the Gila River in New Mexico. Gila trout were first listed as endangered under the Federal Endangered Species Preservation Act of 1967 (the predecessor of the Endangered Species Act of 1973).

Gila trout were eventually downlisted from endangered to threatened status in 2006 thanks to conservation efforts led by the New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, U.S. Forest Service, Arizona Game and Fish Department and many other partner organizations.

However, Gila trout still face many threats including large-scale, high-severity wildfires, climate change, hybridization with nonnative rainbow and cutthroat trout, and competition and predation from other nonnative trout species including brown and brook trout.

Gila Trout in Arizona

Historical records of Gila trout in Arizona are sparse. The earliest reports of native trout in Arizona come from the San Francisco River drainage in far eastern Arizona and the famed naturalist Aldo Leopold. Leopold wrote in a report from 1921 that the Blue River, a tributary to the San Francisco River in Arizona, was "at the time of settlement in about 1885, stirrup-high in grama grass and covered with groves of mixed hardwoods and pine. The banks were lined with willows and the river abounded with trout."

Native trout were also collected from KP Creek, a tributary of the Blue River in 1904 by F. Chamberlain. However, after the collection was stored at the United States National Museum, it was subsequently lost before ascertaining the true species of trout it belonged to.

Native trout also occurred in the Eagle Creek drainage, a tributary of the Gila River in eastern Arizona. Native trout were collected there from Chitty Creek, but have since been lost through hybridization with rainbow trout. The native trout historically reported from the upper Gila River drainage and San Francisco River drainages are now presumed to have been Gila trout, largely based on the presence of relict populations of the

species still found in those drainages today.

In central Arizona, native trout were collected from Oak Creek, a tributary to the Verde River, prior to 1890 and were later determined to be Gila trout. Native trout were also reported in West Clear Creek, another tributary of the Verde River. Trout collected in 1975 from Sycamore Creek, a tributary of the Agua Fria River, were reported to be a hybrid of Gila trout and rainbow trout based on the spotting pattern.

Aldo Leopold also provided some anecdotal evidence of the presence of native trout in Tonto Creek in central Arizona through a note in his archives dated 1923, which read: "Trout in Tonto Cr. seem to be Eastern Brook. First put in 1920. Now seem to be up to 16". (Hubert says there are also natives in it.)"

However, the historical occurrence of Gila trout in the Verde, Agua Fria River and Tonto Creek drainages is mostly inferred based on the parallel distribution of a morphological form of roundtail chub.

Historical Reintroduction Efforts

Reintroduction efforts for Gila trout in Arizona began in 1974 when 65 individuals were translocated from Main Diamond Creek, New Mexico, to Gap Creek, Arizona (tributary to the Verde River). This population initially grew to about 150 individuals but by 1990 only six trout were detected and the population is now considered extirpated.

Further efforts to reintroduce Gila trout to Arizona took place in 1999 when Gila trout from Spruce Creek, New Mexico, were stocked into Dude Creek, Arizona (Verde River Drainage). Unfortunately, these Gila trout never did well in Dude Creek and were extirpated from the stream following a wildfire in the early 2000s.

1999: Dude Creek stocking

2000: Raspberry Creek stocking

2009 and 2011: Frye Creek stocking

2016: Goldwater Lake stocking

In 2000, more Gila trout from Spruce Creek, New Mexico, were translocated to Raspberry Creek, Arizona. These individuals reproduced successfully and persisted in Raspberry Creek until they were eliminated following the Wallow Fire in 2011. Four more populations were established in Arizona with Gila trout from Mora National Fish Hatchery from 2009 to 2015 (Frye Creek in 2009, Grapevine Creek in 2009, Ash Creek in 2012 and Dude Creek in 2015).

At the beginning of 2017, Gila trout in Arizona were in a good place. There were four occupied streams (Ash Creek, Dude Creek, Frye Creek and Grapevine Creek) where fish were persisting. Frye Creek had been open to catch-and-release angling since 2015 and was providing a unique opportunity for anglers to catch wild-spawned Gila trout in Arizona for the first time since the species was listed under the Endangered Species Act.

Then on June 7, 2017, a lightning strike ignited the Frye Fire on Mount Graham, near Safford, which grew to over 48,000 acres and burned through the Ash Creek and Frye Creek drainages. Unfortunately, the subsequent flooding eliminated Gila trout from both creeks.

While the Frye Fire was burning, another fire — the Goodwin Fire — started on June 24 in the Bradshaw Mountains. The Goodwin Fire eventually burned over 28,000 acres through the Grapevine Creek drainage and surrounding areas. After the post-fire monsoon flooding, the Gila trout in Grapevine Creek were also eliminated.

Following these two fires, Arizona only had one remaining Gila trout population left in the state in Dude Creek.

Recent Recovery Efforts

Following the devastating summer of 2017, work to recover Gila trout in Arizona began with the introduction

2018: West Fork Oak Creek stocking

2021: Population estimate for Gila trout in Grapevine Creek

of the species in Chase Creek. The creek previously supported a population of rainbow trout, but Arizona Game and Fish staff completed a project in 2015-2016 to remove rainbow trout from Chase Creek using electrofishing to stun and collect the fish.

Following the successful removal of rainbow trout, fingerling (4 to 5 inches in length) Gila trout were stocked into Chase Creek in fall 2017 and again in fall 2018. Follow-up surveys have documented survival of these fish and two consecutive years of natural reproduction. There are future monitoring efforts and another stocking of Gila trout planned for Chase Creek this fall, but we are excited about how the population has continued to grow.

The only Gila trout population to survive the horrible summer of 2017 — Dude Creek — has also continued to grow and do well. Dude Creek received its third and final supplemental stocking of Gila trout from Mora National Fish Hatchery in fall 2017. Since then department staff have continued to monitor the population's growth and documented three straight years of natural reproduction. A population estimate survey in 2020 found that Gila trout are abundant in the stream with multiple size classes present.

Prior to fall 2018, it was determined that Raspberry Creek, which had lost its Gila trout population following the Wallow Fire in 2011, was again suitable to support the species! So beginning in 2018, the department stocked fingerling Gila trout every fall for three consecutive years.

Typically, when we start a new Gila trout population, we like to have three consecutive years of stockings to help start the population. Initial observations have documented survival of Gila trout from all three stocking efforts and now that the initial stockings for Raspberry Creek are complete, further population monitoring is scheduled for this fall.

In Grapevine Creek, another of the streams that Gila trout were eliminated from in 2017, a habitat survey was completed in 2018. Based on the results, it was determined that the habitat was still suitable for the species. So in spring 2019, Gila trout were stocked into Grapevine Creek as eggs in artificially constructed redds or spawning nests.

Initial observations in May 2019 found hundreds of newly hatched Gila trout throughout Grapevine Creek and determined the stocking had been a huge success! Grapevine Creek received an additional stocking of eyed eggs in 2020 and now supports

Thanks to Gila trout recovery efforts, two streams opened to limited catch-and-release angling on May 1.

one of the highest densities of Gila trout in Arizona.

In fact, there are so many Gila trout that during the higher flows in spring 2020, lots of Gila trout moved too far downstream and got themselves stuck in rapidly receding waters. Luckily, department staff were able to rescue 196 of them, moving them upstream to safety with the help of some pack llamas.

At Frye Creek, one of the streams that lost its Gila trout in 2017, habitat surveys were completed in 2018 to assess the habitat following the Frye Fire. The habitat was found to be suitable for the species and initial stocking efforts began in 2019 when Gila trout eggs were stocked in April. Fingerling Gila trout were also stocked in Frye in fall 2019. Additional Gila trout were stocked as both eggs and fingerlings in 2020. Initial follow-up surveys confirmed survival from these stockings, and Gila trout in Frye Creek are well on their way to recovery.

One of the big summer projects of 2020 involved the transfer of Gila trout from a stream in New Mexico to start a new population in a stream in Arizona. In August 2020, 94 Gila trout were transferred from Big Dry Creek, New Mexico, to Coleman Creek, Arizona. This project involved personnel from the New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, U.S. Forest Service and Arizona Game and Fish Department.

These Gila trout were collected via electrofishing and then flown by helicopter from Big Dry Creek to the nearest airstrip. From there they were loaded on a hatchery truck and driven to Coleman Creek, where department staff loaded them in insulated, aerated buckets and hiked them to the creek to be stocked. We hope to see these Gila trout thrive in their new home here in Arizona!

Finally, over in Marijilda Creek on Mount Graham near Safford, there has been an ongoing project to introduce Gila trout. Marijilda Creek previously supported a population of hybrid Apache trout and rainbow trout originally introduced to the stream in the 1960s. Department staff began a project in 2015 to remove the few remaining trout hybrids from the stream using electrofishing to stun and collect the fish.

Following several surveys where no trout were collected, department staff used a sampling tool called "environmental DNA" (eDNA), which can detect DNA shed from organisms living in the stream in water samples. Results from the eDNA sampling confirmed no nonnative trout remained in the stream and Gila trout were stocked in fall 2020 as fingerlings. This stocking was the culmination of many years of work to introduce Gila trout to Marijilda Creek.

Currently in Arizona there are seven streams occupied by Gila trout for recovery purposes. This is the largest number of occupied streams since the early 1900s or possibly even earlier, and Arizona Game and Fish has plans to introduce Gila trout to an additional one or two streams this year. Gila trout recovery in Arizona is headed in a great direction, and we are very excited about the future of the species in the state!

New Angling Opportunities

Thanks to the recovery efforts, two of these recovery streams — Dude Creek and Grapevine Creek — opened to limited catch-and-release angling on May 1. Dude Creek and Grapevine Creek will be open to angling from May 1 to Dec. 31 on an annual basis with the following restrictions: catch-and-release only for trout; trout must be immediately released unharmed; no trout may be kept; artificial fly and lure only; and single-pointed barbless hooks only.

From Jan. 1 to April 30 of each year, Dude Creek and Grapevine Creek will be closed to angling to protect the Gila trout during the time of year in which they spawn and are more vulnerable to mortality even from catch-and-release angling.

This is the first time since 2017 that Arizona anglers will have the opportunity to catch wild-born Gila trout in Arizona! It also marks the return of wild Gila trout to the Arizona Wild Trout Challenge, which was developed to encourage anglers to learn more about fishing opportunities in the state. Learn more about the challenge at www.azgfd.gov/troutchallenge.

Besides Gila trout recovery streams that are open to catch-and-release angling, the Arizona Game and Fish Department also stocks Gila trout into several water bodies around the state to create recreational fishing opportunities. Some of these waters include the East Verde River, Goldwater Lake, Lynx Lake, Watson Lake and Frye Mesa Reservoir. Gila trout are typically stocked into these water bodies at catchable sizes (9 to 10 inches average length) with larger retired broodstock also stocked on occasion (18 to 22 inches average length). These create great opportunities for anglers to get out and enjoy the great outdoors in Arizona.

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