

2020 Native and Wild Trout Conference (NWTC) Report

The 2020 NWTC was cancelled due to COVID-19. In lieu of the conference Arizona Game and Fish Department and the Trout Unlimited Council of Arizona have produced a report that gives a snapshot of native and wild trout populations and habitat across the state. Some topics like the Four Forest Restoration Initiative and State and Federal Legislative Update give a year-end report of 2020. Throughout the report are hyperlinks (blue text) that will take you to presentations or other websites for more detailed information. To access the hyperlink simply click on the blue highlighted text.

2020 Topics:

- Waters of the United States (WOTUS)
- Overview of Gila & Apache Trout in Arizona
- Apache Trout Challenges & Recovery in Arizona
- Gila Trout Challenges & Recovery in New Mexico
- Gila Trout Challenges & Recovery in Arizona
- Four Forest Restoration Initiatives
- State and Federal Legislative update
- Fate of the Stocked Gila Trout
- Arizona Council of Trout Unlimited: Highlights of 2019 Activities and Accomplishments
- Arizona Trout Challenge: Fishing for Apache and Gila Trout

Waters of the U.S. (WOTUS) (Krista Osterberg, Arizona Department of Environmental Quality):

Listed below is a presentation by Krista Osterberg at the Arizona Department of Environmental Quality on the recent Waters of the U.S. (WOTUS) executive order that happened in January of 2020. This new ruling changes the parameters of the Clean Water Act. Find out how this will affect Arizona's perennial, intermittent, and ephemeral waters.

- [Executive order on WOTUS, what it means for Arizona's trout waters](#)
- [Slide notes to the above presentation](#)

AZGFD Overview of Gila & Apache Trout in Arizona (Brett Montgomery, AZGFD):

Apache Trout



Apache Trout *Oncorhynchus apache* are native only to the [Black](#), [White](#), and [Little Colorado River](#) drainages in the [White Mountains of east-central Arizona](#). There are currently 26 pure Apache Trout populations within historical range.

Seven of those 26 populations are on Apache Sitgreaves National Forest(ASNF) land or are split between ASNF and White Mountain Apache Reservation (WMAR) land, and the remaining 19 are entirely on WMAR land.

Apache Trout were originally listed as endangered in 1967 but were reclassified as threatened in 1975. Apache Trout were listed primarily because of reduction in habitat largely due to watershed alterations caused by forestry, livestock grazing, reservoir construction, agriculture, road construction, and mining. The presence of Rainbow Trout *Oncorhynchus mykiss*, Cutthroat Trout *Oncorhynchus clarkii*, Brown Trout *Salmo trutta*, and Brook Trout *Salvelinus fontinalis* also represents a large threat to Apache Trout populations. Both Rainbow and Cutthroat Trout can hybridize with Apache Trout compromising the genetic purity of Apache Trout populations. Brown Trout and Brook Trout compete for resources with and may predate upon Apache Trout.

The objective of the Apache Trout Recovery Plan is to establish and/or maintain 30 self-sustaining discrete populations of genetically pure Apache Trout within its historic range. Apache Trout conservation work primarily includes identifying suitable streams in which to establish new populations of Apache Trout. Once a stream has been identified it may require a barrier to be built to prevent upstream movement of nonnative trout. Barriers are built to isolate habitat for native species, preventing upstream movements of non-native species denying them access to those habitats. Once a barrier is in place, the nonnative trout upstream of the barrier will be removed and the section of stream above the barrier will then be repatriated with genetically pure Apache Trout. There is currently no hatchery source of Apache Trout available for recovery purposes, so stable wild populations are used as sources for translocations. This can make finding Apache Trout to use for repatriating fishless streams in their historic range difficult, as it often requires transferring fish from an existing population to start a new population. Unfortunately, many Apache Trout populations are small and cannot support fish being removed to start new populations elsewhere. Current Apache Trout projects include repairing fish barriers, removing nonnative trout from Apache Trout recovery streams, and repatriating Apache Trout into streams throughout their historic range.

For more information see [“Get To Know Your Native”](#).

[Gila Trout](#) (Zach Beard, AZGFD):



Gila Trout *Oncorhynchus gilae* are believed to be native to streams in Arizona and New Mexico in the [Gila River, San Francisco River, Agua Fria River, Tonto Creek, and Verde River drainages](#). However, historical records are lacking and much of historical range for Gila Trout has been inferred from available evidence based on early collection records, historical reports of native trout from drainages prior to the introduction of non-native species, and distribution of historically co-occurring species (e.g., Roundtail Chub). There are currently 22 Gila Trout populations within their historical range, 17 in New Mexico, and five in Arizona. In 1975, there were only five genetically pure Gila Trout populations left. These populations were Spruce Creek, South Diamond Creek, Main Diamond Creek, Iron Creek, and Whiskey Creek. These populations represent the five relict genetic lineages of Gila Trout and play an important role for recovery of the species.

Current threats to Gila Trout include habitat loss due to destruction of streams or water loss, hybridization with nonnative trout, competition with and predation by nonnative trout, and catastrophic wildfires. Fires have had a devastating impact on Gila Trout populations, with the post-fire floods bringing toxic ash flows and drastically altering the habitat. Climate change also represents a threat to Gila Trout as water temperatures rise, drought becomes more common, and available habitat shrinks.

The last [Gila Trout Recovery Plan](#) was completed in 2003, but the U.S. Fish and Wildlife Service recently completed a draft of a new Gila Trout Recovery plan which establishes criteria for the delisting of Gila Trout. These new criteria are (1) 280 km (174 mi) of stream occupied by Gila Trout; (2) Each genetic lineage be represented by at least three geographically separate (> 34 km apart) populations; (3) establish four metapopulations (i.e., a large stream system with multiple tributaries each with a separate population of Gila Trout, allowing different populations to interact and breed with one another naturally) of Gila Trout; (4) nonnative trout are absent from all recovery streams. The Arizona Game and Fish Department's role in Gila Trout recovery is primarily focused on working toward establishing geographically separate populations of the genetic lineages and adding to the total number of stream miles occupied by Gila Trout, because Arizona does not have the habitat to support a metapopulation of Gila Trout.

Unlike with Apache Trout, a broodstock of Gila Trout used to supply fish for recovery purposes is maintained at Mora National Fish Hatchery in New Mexico. The broodstock at Mora NFH includes all five of the relict lineages and has great spawning success, which provides the fish and/or eggs for stockings. The Arizona Game and Fish Department has stocked both fish and eggs in streams to establish recovery populations. The effort has met both success and failure, but there are currently five recovery streams in Arizona that are currently occupied by Gila Trout. These streams are [Frye Creek](#) (South Diamond Creek lineage), [Raspberry Creek](#) (Whiskey Creek lineage), [Dude Creek](#) (Main Diamond Creek, South Diamond Creek, Whiskey Creek, and Whiskey Creek x Spruce Creek), [Chase Creek](#) (Iron Creek lineage), and [Grapevine Creek](#) (South Diamond Creek lineage).

For more information see ["Get To Know Your Native"](#).

Apache Trout Challenges & Recovery in Arizona (Zach Beard, AZGFD):

Recent work for Apache Trout has consisted of barrier improvements, genetic testing, and non-native salmonid removals. In the fall of 2018, two fish barriers that protect wild Apache Trout populations from nonnative salmonids were renovated. The first barrier was the downstream barrier on the West Fork Little Colorado River. A concrete cap was built on the front of the barrier and over the spillway to prevent nonnative salmonids from swimming through channels flowing through the rock-gabion barrier. The second barrier improvement project took place on Bear Wallow Creek. An existing barrier was modified by increasing its height by 4' and constructing an additional 200' wall across the floodplain. Bear Wallow Creek is now scheduled for a stream renovation project and reintroduction of pure Apache Trout beginning in 2021. In 2018, genetic samples were taken from 16 Apache Trout in the West Fork Little Colorado River that appeared to potentially be Apache Trout x Rainbow Trout hybrids. Genetic analysis of those samples confirmed the presence of Rainbow Trout genetics. As a result, an additional 100 genetic samples were taken from Apache Trout in the West Fork Little Colorado River in 2019 and sent off for analysis to better understand the spatial spread of hybridization in the stream. The results of this genetic analysis are still pending. On the West Fork Black River and Thompson Creek Brook Trout were removed to benefit the wild Apache Trout. A single pass of backpack electrofishing was made from the upstream barrier to the White Mountain Apache Reservation boundary removing a total of 323 Brook Trout. In [Conklin Creek](#), eDNA samples were taken to determine if the stream was fishless above a barrier. We did have one sample come back positive for Salmonid eDNA, indicating there may be nonnative trout present above the barrier in Conklin Creek. This result must be investigated further before Apache Trout can be reintroduced in Conklin Creek. Finally, in 2019 the U.S. Fish and Wildlife Service initiated a Species Status Assessment for Apache Trout. A species status assessment is an analytical framework used to inform all Endangered Species Act Decisions. This process will be used to evaluate the current status of Apache Trout and will serve as a five-year status review for Apache Trout. All species listed as threatened or endangered under the Endangered Species Act undergo five-year status reviews to determine whether their status has changed since their last status review or listing. This assessment will be ongoing during 2020.

We have a lot of work with Apache Trout planned for this summer. We will begin extensive planning work in Bear Wallow Creek in preparation for the stream renovation scheduled for 2021. We also plan to conduct a population estimate for Apache Trout in the East Fork Little Colorado River. Several electrofishing passes will also be completed on the West Fork Black River to remove nonnative Brook Trout. Nonnative Brown Trout that may have moved upstream past the downstream Barrier will be removed from between the two barriers on the West Fork Little Colorado River. Finally, we plan to electrofishing and repeat eDNA surveys in Conklin Creek to determine whether Conklin Creek is fishless above the barrier or if there are nonnative trout present upstream. If the stream is determined to be fishless, Apache Trout will be reintroduced as soon as fish become available. To learn more about the Apache trout recovery plan click this [link](#).

Gila Trout Challenges & Recovery in New Mexico (Ryder Paggen, NMGFD)

New Mexico Gila Trout [Restoration in Whitewater Creek](#)

Restoring Gila Trout to their historical range and creating angling opportunities has been a long-time goal for the New Mexico Department of Game and Fish. A project was initiated in 2015 to remove nonnative trout from and restore Gila Trout to 39 km of stream in the Whitewater Creek drainage. In order to remove nonnatives, the Department has completed multiple piscicide treatments and collected over 200 environmental DNA (eDNA) samples to document progress. A third piscicide treatment was conducted in the mainstem and upper tributaries of Whitewater Creek in the autumn of 2019. Additional eDNA surveys are planned for spring of 2020 to evaluate the success of the 2019 piscicide treatment. Stocking of Gila Trout is expected to begin in the later summer and continue for the next 3 years.

New Mexico Gila Trout Angling Opportunity Developments

To promote species [recovery and enhance angling opportunities Gila Trout](#) have been repatriated to Mineral Creek and Lower Whitewater Creek. Both streams have been opened for angling in the last couple of years. Additional repatriation opportunities in the Mogollon, Sapillo, and West Fork Gila drainages are currently being investigated and would provide great Gila Trout fisheries. New Mexico provides Gila Trout angling opportunities in nine streams and anglers can take part in two trout challenges including the [Western Native Trout Challenge](#) and the [New Mexico Trout Challenge](#). Enhancing Gila Trout angling opportunities and offering trout challenges has increased the number of anglers and angler satisfaction as documented in our Annual Gila Trout Angling Surveys. Together with collaboration from other management agencies and the public, the Department continues to make significant strides in [Gila Trout recovery and angling opportunities](#).

Gila Trout Challenges & Recovery in Arizona (Zach Beard, AZGFD):

This past year has been a busy year for Gila Trout conservation in Arizona! Recovery efforts this year consisted of habitat surveys, stocking of 6-month-old Gila Trout, and stocking Gila Trout eggs. In April of 2019, 19,000 Gila Trout eggs were stocked into artificial redds in Grapevine Creek to reestablish a Gila Trout population that had been lost in 2017. Evaluation of the stocking in May of 2019 found 20-30 mm (about 1") Gila Trout in all pools that had been stocked with eggs! A visual survey of the stream in August of 2019 observed 485 Gila Trout, varying from 2-3" in length distributed throughout the stream! An additional 6,000 Gila Trout eggs were stocked in Grapevine Creek in April of 2020. Gila Trout eggs were also stocked in Frye Creek in April of 2019, however, follow up surveys determined this stocking was unsuccessful. However, in November of 2019, 250 Gila Trout were stocked in Frye Creek, staff returned to Frye Creek in

April 2020, and observed individuals that had survived from the November stocking. An additional 16,000 Gila Trout eggs were stocked in Frye Creek in April 2020. In August of 2019 photo point habitat surveys were conducted in the lower portions of Ash Creek, to determine the extent of damage to the habitat following the Frye Fire in 2017. Surveys revealed extensive damage, with all riparian vegetation stripped from the stream, and the stream bed eroding down as much as 20-30 ft in some locations. Ash Creek is unlikely to be suitable for Gila Trout reintroduction in the next 5 years. In Chase Creek, a visual survey in August of 2019 observed 39 Gila Trout, 17 adults, 8 sub-adults, and 14 young-of-year. This was the first time that natural reproduction has been documented for Gila Trout in Chase Creek. In Dude Creek, a visual survey in August 2019 observed 244 Gila Trout, 42 adults, 19 sub-adults, and 183 young-of-year. A full population estimate will be conducted for the Gila Trout in Dude Creek in May 2020. In Raspberry Creek, 250 Gila Trout were stocked in November 2019 to supplement the Gila Trout population started there in 2018. Gila Trout from the previous year's stocking were observed during the November stocking. Currently there are five recovery streams occupied by Gila Trout in Arizona. This is an increase from one stream at the end of 2017.

In addition to the Gila Trout Recovery efforts the department has been working to increase recreational fishing opportunities for Gila Trout in Arizona. The Arizona Game and Fish Department's (AZGFD) Canyon Creek hatchery is in its third year of raising of Gila Trout. Currently, Canyon Creek receives all of their Gila Trout eggs from Mora National Fish Hatchery in excess of recovery needs. Beginning this year Canyon Creek hatchery will be selecting Gila Trout to keep for Broodstock to develop a recreational Broodstock of Gila Trout in Arizona to support recreational Gila Trout stockings. The long term goal of this program is to replace Rainbow Trout recreational stockings with Gila Trout throughout the historic range of Gila Trout. Additionally, the East Verde River will be stocked with only Gila Trout in 2020 for a research project AZGFD is conducting to evaluate Gila Trout recreational fisheries.

You can see some of the stocking activities during the past year at the following:

- [East Verde River](#)
- [East Verde River](#)
- [West Fork of Oak Creek](#)

Four Forest Restoration Initiatives (4FRI): (Kara Armano & Joe Miller, Trout Unlimited):



Trout Unlimited is doing a series of blog posts showcasing AZ-TU's involvement in the 4FRI process and breaking down the intricacies of the forest planning process. Click ["The Importance of Quality Partnerships"](#) to read the first blog post on the beginning of cooperative partnerships. And click [link](#) to be directed to the 4FRI website.

Arizona Game and Fish Departments State and Federal Legislative Update (David Fernandez & Ed Sanchez, AZGFD):



The link below is a state and federal legislative update from the Arizona Game and Fish Department (AZGFD) for November 2020. Each year AZGFD and Trout Unlimited partner with other species conservation groups on state legislation that helps or hurts wildlife, habitat and public lands access. For an update on legislative activities click [Legislative Update](#). And to be directed to the AZGFD legislative and government affairs website, [click here](#)

Fate of the Stocked Gila trout (Alex Loubere, AZGFD):



Estimating Survival, Movement Probability, Angler Satisfaction, and Return to Creel of Gila Trout in the East Verde River

Background

AZGFD currently manages numerous put and take rainbow trout fisheries within the historical range of native Gila Trout. In the interest of providing recreational angling opportunities for native species, the department is initiating a switch from Rainbow to Gila Trout in streams where there is historical evidence for their existence. However, it is unknown how Gila Trout will perform as a replacement for Rainbow Trout in a put and take stream fishery. To investigate this, the Research Branch is conducting a multi-year study aimed at assessing movement, survival and return to creel of Gila Trout, as well as angler effort and satisfaction with the switch in species.

Objectives

- Evaluate movement and survival rates of Gila Trout.
- Compare those estimates to Rainbow Trout movement and survival estimated in a previous study (Fate of Stocked Trout).
- Evaluate return to creel rates of stocked Gila Trout.
- Estimate weekly angler effort and evaluate angler satisfaction with the switch to Gila Trout.

Project Location and Timeline

The study will be conducted on the [East Verde River](#) on the Mogollon Rim outside Payson, AZ. This project was initiated with telemetry in August of 2019. Both creel and telemetry will be conducted during the stocking seasons of 2020 and

2021, with data collection wrapping up by November 2021, aside from the final holdover sampling to be performed in March 2022.

Approach

Movement and survival were assessed for the first 30 radio tagged Gila Trout using radio telemetry techniques. 90 more Gila Trout will be radio tagged and tracked in 2020 and 2021 respectively to get estimates of movement and survival for those two years. Creel Surveys will be conducted during the stocking season of 2020 and 2021 in order to estimate angler effort, satisfaction, and return to creel rates. Electrofishing Surveys will be performed in spring of 2020 and 2021 to assess holdover rates of stocked trout.

Current Project Status

We are currently still in the beginning phase of the project, but data for the first 30 radio tagged Gila Trout has been collected and analyzed. Fish were stocked into the East Verde River on August 30, 2019 in conjunction with the last stocking of the year from Tonto Creek Hatchery. Trout were tracked daily for the first ten days, then weekly until November 2019. Creel waypoints from a previous study (Fate of Stocked Trout) were used to designate high traffic and low traffic zones in terms of angler use. A Multi-State Barker model was used to assess probability of movement between zones on a weekly basis. Movement from a high to low a traffic zone was between 13.5% and 31% per week, while movement from a low traffic to a high traffic zone was between 4.1% and 12.4% per week. Detection probability was 100% for the duration of the tracking period. Weekly survival was between 78.8% and 92.3% per week in high traffic zones, and 94.8%-99.6% in low traffic zones. Given that these fish were stocked at the end of the stocking season, we extrapolated the survival estimates out over the 30 week off season to get estimates of holdover survival. This ranged from 0-8.6% in high traffic zones, and 19.5%-85.5% in low traffic zones. When comparing these estimates to those of Rainbow Trout from the Fate of Stocked Trout study, Gila Trout exhibit higher movement and survival. However, it is important to note that fish stocked at the end of the season may persist longer than those stocked early or mid-season. For this reason, radio tagged fish will be stocked at the beginning, middle, and end of the stocking season in 2020 and 2021. The data from these fish will allow us to get more accurate estimates of movement and survival during the summer months, which are heaviest in terms of angler use.

In order to assess return to creel, angler effort, and angler satisfaction, creel surveys will be performed on the East Verde River from the beginning of stocking in April until the end of September in both 2020 and 2021. Anglers will be counted and interviewed, and their harvest will be identified and counted. Anglers will be asked how satisfied they are with their fishing experience, as well as whether they are there specifically to catch Gila Trout. A Multinomial logistic regression and hurdle models will be used to identify factors that influence angler effort and satisfaction. The disparity between angler and clerk ID of harvest will be used to account for anglers' potential difficulty in telling the difference between Gila Trout and Rainbow Trout left in the system from previous stockings.

To assess holdover rates, we will use single pass electrofishing on 15 randomly selected 50 meter transects. This will be replicated 3 times over the course of 3 days. Analysis will be performed using an N-mixture model design. N-mixture model estimates will be compared to Barker Model estimates so we can assess the accuracy of holdover survival estimates from tracking data. Electrofishing surveys will be performed in March of 2020, 2021 and 2022 prior to the stocking season.

A final report will be completed in 2022, and two publications are expected to be submitted from the creel and telemetry data collected in the same year.

Arizona Council of Trout Unlimited: Highlights of 2019 Activities and Accomplishments

Highlights of the activities and accomplishments of the Arizona Council of Trout Unlimited with conservation partners can be seen at [Year in Review - 2019](#).

Arizona Trout Challenge - Fishing for Apache and Gila Trout:



Arizona's Trout Challenge Program was developed to encourage anglers to learn more about fishing opportunities in the state. AZGFD manages many waters statewide to provide anglers the opportunity to catch several different species of trout, including two found only in the Southwest, Gila Trout and Apache Trout.

For more information on participating in the program go to [Arizona's Trout Challenge Program](#) and video at [Arizona Trout Challenge](#).

Looking for help in achieving the Trout Challenge? The following videos will help guide you in fishing for trout throughout Arizona. Just click on the links to get help to meet the challenge.

- [12 Must-Have Flies for Catching Trout in Arizona](#)
- [How to Fly Fish a Small Stream](#)
- [How to Fly Fish a Lake](#)

Questions on the content provided and suggestions for the 2021 Native and Wild Trout Conference can be sent to info@az-tu.org.