

Apache Trout

(*Oncorhynchus apache*)

Data: Apache Trout Recovery Plan, Second Revision – 2009; NFWF Apache Trout Business Plan

Partners: Arizona Game and Fish Department, U.S. Fish and Wildlife Service, U.S. Forest Service, Trout Unlimited, White Mountain Apache Tribe, San Carlos Apache Tribe, National Fish and Wildlife Foundation



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Apache Trout Species Status Review

The Apache Trout was first listed as an Endangered Species on March 11, 1967 (32 FR 4001). It was downlisted to threatened in July 1975 (40 FR 29863, Final Special Rule, 17.44(a)) based on recovery actions and a re-analysis of data. The down-listing allowed state, tribal, and federal agencies and partners to conduct management actions under the Recovery Plan, regulate take of the species, and establish sport fishing opportunities. The Recovery Plan was completed in 1979, revised in 1983 and 2009.

Apache Trout Sportfishing Status

In 1975, Apache Trout was one of the first species to be downlisted from endangered to threatened. The downlisting with a 4(d) rule allows the Arizona Game and Fish Department (AGFD) and the White Mountain Apache Tribe (WMAT) (on FAIR lands) to selectively establish sport fishing opportunities and regulate methods of take (via angling), possession limits, seasons, and close specific areas to fishing. (To prevent over-utilization, the following steps have been taken:

- Streams on FAIR that contain relict lineages of Apache Trout have been closed to fishing since 1955.
- Angling opportunities, methods of take, and harvest of Apache Trout on USFS streams has been addressed by

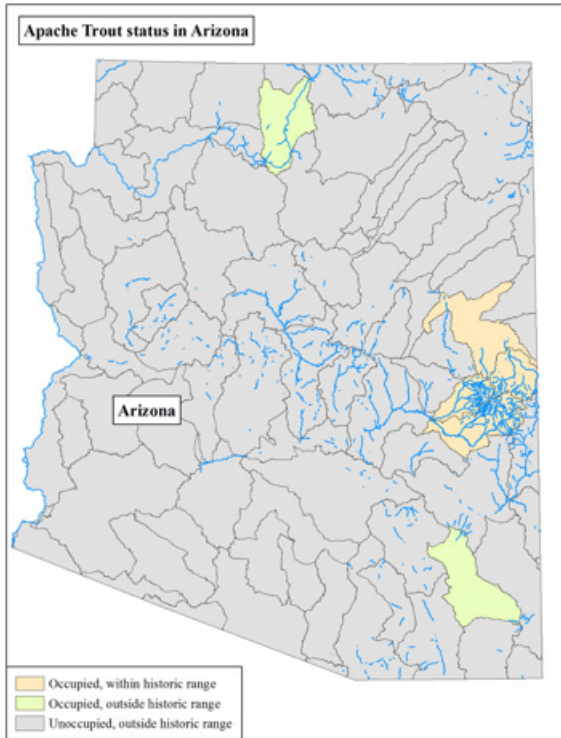
AGFD by imposing and enforcing restrictive regulations via Arizona Revised Statute (A.R.S.) Title 17. Similar restrictions have been developed and enforced by WMAT Wildlife and Outdoor Recreation Division for FAIR streams, including maintaining angling and access closures at relict populations.

- AGFD and WMAT have established several Apache Trout sport fisheries in streams and reservoirs using hatchery-reared fish (from State and Federal hatcheries) and angling regulations that are enforced; these fisheries do not count toward recovery.

Apache Trout Distribution

Historically, Apache Trout occupied streams and rivers in the upper White, Black, and Little Colorado River drainages in the White Mountains of east-central Arizona. Currently, 27 pure (non-hybridized) Apache Trout populations exist within their historical range in Gila, Apache, and Greenlee counties of Arizona, on lands of the Fort Apache Indian Reservation (FAIR) and Apache-Sitgreaves National Forest (ASNF).

Range of the Apache Trout



Thirteen natural populations occur on the FAIR, three reestablished populations occur on the FAIR, nine reestablished populations occur in the ASNF, and two reestablished populations occur in streams on both the FAIR and ASNF. Two streams outside of historical range have pure replicate populations, North Canyon Creek (Ord Creek stock) and Grant Creek. North Canyon Creek received Ord Creek stock in the early 1960s. The natural population in Ord Creek was compromised by brook trout and was renovated and replaced with replicated Ord Creek stock from Coyote (ASNF) and North Canyon (North Kaibab National Forest)

creeks in 1996. Grant Creek in the Pinaleno Mountains also has a replicated pure population of Apache Trout which were stocked in the late 1960s.

Apache Trout Habitat Requirements

Information concerning specific stream habitat requirements for all life stages of Apache Trout is limited. Apache Trout evolved in streams primarily above 1,800 m elevation, within mixed conifer and ponderosa pine forests. Apache Trout generally require water temperatures below 25 degrees C (77 degrees F) with adequate stream flow and shading to minimize lethal temperatures and maintain pools that provide refuge during periods of drought and temperature extremes. Apache Trout require clean coarse gravel substrates for spawning and prefer cover in the form of woody debris, pools, rocks/boulders, undercut stream-banks, or overhanging vegetation at stream margins. In addition to suitable water temperatures and available cover, protected streams (or portions thereof) must have conditions favorable to persistence of Apache Trout, including minimization or elimination of threats from competitive brown trout or brook trout and elimination of interbreeding rainbow or cutthroat trout.

Concerns and Issues Relative to the Conservation and Improvement of Apache Trout

The main factors in the decline of distribution and abundance have been habitat degradation from human activities and associated water withdrawal, competition and predation from non-native trout species, hybridization with introduced rainbow and cutthroat trout, and population impacts due to drought and loss of water. Aquatic invasive species, disease, increasing water temperatures, and the effects of large catastrophic wildfires are potential new concerns for Apache Trout.

Habitat Concerns

Apache Trout distribution and population levels decreased primarily because of habitat alterations and negative interactions with non-native salmonids. Land-use practices, including logging, livestock grazing, reservoir construction, agriculture, and road construction caused damage to Apache Trout habitat (USFWS 2009). Effects were multi-faceted and included: changes to riparian corridors (vegetation) and streambank morphology; increased erosion potential and greater susceptibility of streams to damage from floods (particularly high intensity, short duration events); reduced quantity and quality of spawning and rearing areas; altered stream flow volume and temperature; and negative influences to stream productivity and food supply (e.g., stream dwelling insects). Threats vary in intensity, complexity, and damage depending on location, but ultimately reduce the ability of Apache Trout to effectively persist at all life stages throughout its historical range.

Introduced Species Concerns

Non-native salmonids, such as Rainbow Trout, Cutthroat Trout, Brown Trout, and Brook Trout, were introduced throughout the range of Apache Trout for recreational fishing. Introduction of these species has resulted in competition for resources or habitats, direct predation, and hybridization (with Rainbow and Cutthroat trout). Brown and Brook trout are predators to Apache Trout, as well as competitors for food and space. Such competition has been identified as a cause of the decline of Apache Trout.

Aquatic Invasive Species Threats

Disease has not been considered a factor in the decline of Apache Trout and was not identified as such at the time of listing. However, the closely related Gila Trout has tested positive for the antigens for Bacterial Kidney Disease (BKD) in low amounts in populations of the upper West Fork Gila River, including Whiskey Creek (USFWS 2003). There is no evidence of the carrier in Apache Trout populations.

Whirling disease is not known to be present in any wild or hatchery population of Apache Trout. However, preliminary results from controlled laboratory testing confirmed that Apache Trout (and Gila Trout) are highly vulnerable to whirling disease (Jim Thompson, former USFWS Fish Health Specialist, personal communication). Wild fish health surveys are being conducted on Apache Trout recovery populations, donor populations, and State and Federal hatchery facilities. To date, disease does not seem to be a significant threat to Apache Trout.

Genetic Concerns

Continued monitoring of the pure Apache Trout populations is necessary to protect the genetic purity of restored populations in recovery waters. The inadvertent stocking or use of introgressed fish for restoration purposes would compromise the recovery effort.

Over-utilization Concerns

Although not identified as a reason that led to listing in 1969, unregulated harvest of Apache Trout was another factor that contributed to the species decline from the late 1800s to 1950s. Angling opportunities, methods of take, and harvest of Apache Trout on USFS streams have been addressed by AGFD through the imposition and enforcing of restrictive regulations. Similar restrictions have been developed and enforced by WMAT for FAIR streams. AGFD and USFWS monitor and manage collection permits so that damage to populations from scientific collection is prevented or minimized.

Opportunities to Improve the Status of Apache Trout

The management objectives to protect and restore the Apache Trout include:

- 1) establishment and maintenance of 30 self-sustaining discrete populations of pure Apache Trout throughout its historic range;
 - 2) survey and manage pure Apache Trout populations presently existing in waters outside the historic range;
 - 3) provide habitat protection through implementation of land management practices, habitat improvement programs, acquisitions, and barrier construction and maintenance;
 - 4) provide adequate enforcement of all federal, state, and tribal laws and regulations to ensure protection of Apache Trout;
 - 5) develop public support of the Apache Trout program through an information and education campaign; and
 - 6) work with the National Fish and Wildlife Foundation (NFWF) to implement their Apache Trout Business Plan.
- Proposed actions to protect and secure long-term population viability include:
- Population manipulations, such as surveys, genetic analyses, non-native fish removal, use of hatchery reared fish, and salvage/refugia plans in emergencies;
 - Reestablishment of populations with genetically appropriate fish;
 - Habitat manipulations (placing fish barriers, improving riparian zones, securing water);
 - Maintenance of appropriate fishing regulations and property closures;
 - Continue to exclude stocking of non-native trouts within the same drainage as endemic or replicate Apache Trout populations;
 - Protection of Apache Trout populations from over-utilization and disease;
 - Development and implementation of BMPs, FMPs, and AMPs to enhance

habitat restoration in livestock/elk use areas; and

- Creation of an inter-connected meta-population of Apache Trout that will better withstand stochastic events.

Population manipulations

The recovery strategy for Apache Trout is to establish and maintain 30 self-sustaining populations. A population will be considered established when it is self-sustaining, capable of persisting under the range of variation in habitat conditions that occur in the restoration stream, and when the population is protected from immigration of non-native trout.

Key actions include:

- Survey and manage Apache Trout populations presently existing in waters.
- Reestablish populations with genetically appropriate fish in renovated streams.
- Finalize Apache Trout broodstock management plan.
- Prevent reinvasion of non-natives by maintaining or establishing in-stream barriers as needed.

Maintenance of quality habitat for Apache Trout

Recovery streams that are subject to multiple land-use practices, such as timber harvest or thinning, prescribed fire, livestock grazing,

and intensive recreation, should be managed to maintain healthy riparian corridors that promote sufficient habitat conditions for all Apache Trout life functions. Occupied streams that have unstable or declining conditions should be the focus of remedial actions. Routine monitoring should be used to assess stream conditions.

Key actions include:

- Identifying and baseline existing habitat conditions using a standard protocol.
- Complete habitat improvement or protection on a priority basis.
- Develop BMPs, AMPs or FPs for grazing control in the Apache Trout drainages to reduce land use impacts.
- Manage human impacts through appropriate regulations and control of public access.

Protect Apache Trout in non-historical habitats

To protect against a catastrophic event that could affect isolated Apache Trout populations, the out-of-basin populations should be maintained as Apache Trout refugia.

Key actions include:

- Identify regulatory mechanisms, laws, and policies that are insufficient to fulfill all recovery objectives and protect Apache Trout.
- Monitor, prevent, and control disease and/or causative agents, parasites, and pathogens.

- Implement appropriate laws and regulations to allow Apache Trout populations to persist in light of commercial, scientific, and recreational uses.

Assessment of Appropriate Regulatory functions and mechanisms

The Apache Trout recovery depends, in part, on adequate regulatory mechanisms and management programs remaining in existence to ensure that all populations of Apache Trout and their habitats are maintained.

Key actions include:

- Monitor the genetic diversity, basic population viability standards, and population donor sources for re-introductions.
- Salvage and provide refugia for Apache Trout populations that are threatened by wildfire, drought, barrier failure, or other unforeseen events when deemed prudent and necessary.

Highest Priority Strategies and Actions for Apache Trout Protection and De-listing

1. Refurbish existing fish barriers to secure long-term viability of Apache Trout populations.
2. Implement the actions and objectives in the Revised Apache Trout Recovery Plan and the NFWF Apache Trout Business Plan.

3. Finalize an Apache Trout Conservation Strategy MOU between Arizona Game and Fish Commission, U.S. Forest Service, U.S. Fish and Wildlife Service, White Mountain Apache Tribe, San Carlos Apache Tribe, Arizona Chapter of Trout Unlimited, Federation of Fly Fishers, and Arizona Wildlife Conservation Council based on the completed 2007 Revised Recovery Plan and Status review.
4. Develop proposed delisting rule and post-delisting management plan.
5. Complete metapopulation development, barrier construction and stream renovations needed to get to 30+ populations.
 - West Fork Black River
 - Bonita Creek watershed
 - Bear Wallow Creek (ASNF)
6. Reestablish pure Apache Trout in prepared recovery streams.
 - Conklin Creek
 - Rudd/Benton Creeks
7. Monitor populations to determine current status.
 - South Fork LCR – restock after Wallow Fire effects
 - Fish Creek – Install new fish barrier and restock after Wallow Fire effects
8. Monitor and maintain effective barriers where needed.

On-going partnerships and joint ventures

1. Apache Trout Bring Back the Natives Project: The Apache Trout Recovery Partnership (FWS, AGFD, Trout Unlimited [TU], WMAT, and FS) worked with TU national to develop a \$271,600 National Fish and Wildlife Foundation grant to conduct Apache Trout restoration, research, and education activities. Matching funds from the Arizona Heritage Foundation have added to the effort to restore depleted and extirpated populations and develop robust recreational fisheries.

This project has been completed.

2. NFWF/TU/USFWS Apache Trout Keystone Initiative: Four key strategies have been developed for this Keystone Initiative to address ongoing threats to the sustainability of Apache Trout. If goals are achieved with this investment, not only was Apache Trout abundance estimated to increase by an estimated 50 percent by 2017, but abundance would continue to increase, without financial investment, to an estimated 90 percent by 2020. In combination, actions guided by the Recovery Plan will result in recovery and a possible delisting proposal, and the Initiative will implement key actions that could reduce the effects of stochastic events, expand and improve habitat, and increase Apache Trout abundance, ultimately ensuring their sustainability.

- Metapopulation creation. The creation of three metapopulations will expand and connect isolated recovery streams, making populations less vulnerable to climatic changes, increase population numbers, and help maintain genetic diversity in populations.

- Habitat restoration. Habitat restoration in meadow reaches of small recovery streams will break “invisible barriers,” encouraging use of this habitat by trout and resulting in increased population sizes.
- Population and habitat assessment and monitoring. A long-term monitoring plan to assess population and habitat conditions will be developed and implemented.
- Barrier maintenance and monitoring. A long-term barrier maintenance and monitoring plan will be developed to ensure recovery streams are protected now and after delisting.

Key Partners: Arizona Game and Fish Department, US Fish and Wildlife Service, US Forest Service, White Mountain Apache Tribe, and Trout Unlimited.

Timing: This project is a 10-year plan to secure Apache Trout abundance and habitat. Initiative funding will continue through 2018.

Estimated Overall Cost of Apache Trout Keystone Initiative: \$3,979,000.

WNTI Completed or On-going Projects

Bear Wallow Creek Restoration (2007)—
\$95,200

Conklin Creek Restoration (2008)—\$75,000

Stinky Creek Restoration (2008)—\$75,000

Bear Wallow Creek Barrier improvement
(2009)—\$27,500

Wallow Fire Habitat Assessment (2012)—
\$40,000

References

U.S. Fish and Wildlife Service. 2003. Gila Trout Recovery Plan, Third Revision. Albuquerque, New Mexico.

U.S. Fish and Wildlife Service. 2009. Apache Trout Recovery Plan, Second Revision. Albuquerque, New Mexico.

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