

## **5-YEAR REVIEW**

### **Ash Meadows Amargosa pupfish (*Cyprinodon nevadensis mionetes*)**



Ash Meadows Amargosa pupfish / Photo credit: USFWS

**September 2020**

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**Ash Meadows Amargosa pupfish (*Cyprinodon nevadensis mionectes*)**

**GENERAL INFORMATION:**

**Species:** *Cyprinodon nevadensis mionectes*

**Listing History**

**FR Notice:** 48 FR 608

**Date of Emergency Listing Rule:** January 5, 1983

**FR Notice:** 48 FR 40178

**Date of Final Listing Rule:** September 2, 1983

**Classification:** Endangered

**BACKGROUND:**

**Most recent status review:** 5-Year Review, March 17, 2010

**FR Notice citation announcing this status review:**

84 FR 36116. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews of 58 Species in California, Nevada, and the Klamath Basin of Oregon. July 26, 2019

**ASSESSMENT:**

**Information acquired since the last status review:**

This 5-year review was conducted by the U.S. Fish and Wildlife Service (USFWS) Southern Nevada Fish and Wildlife Office. Data for this review was solicited from interested parties through a Federal Register notice announcing this review on July 26, 2019. We also contacted State and local agencies, partners, stakeholders, and species experts to request any data or information we should consider in our review. Additionally, we conducted a literature search and a review of information in our files.

The Ash Meadows Amargosa pupfish (*Cyprinodon nevadensis mionectes*) is a small-bodied fish (Cyprinodontiformes: Cyprinodontidae) endemic to the Ash Meadows National Wildlife Refuge in Amargosa Valley, Nye County, Nevada (hereafter “Refuge”). The original listing for this subspecies follows the temporary emergency listing eight months prior (48 FR 608), due to the restricted distribution, and imminent changes to the landscape from sources such as housing subdivisions, clearing of land for road construction and agricultural purposes, pumping of ground water, and diversion of surface flows that threaten the integrity of the species’ habitat and therefore their survival (48 FR 40178).

Rationale for listing the Ash Meadows Amargosa pupfish include the following factors: Factor A—the reduction and manipulation of stream habitat from reduced groundwater within the Ash Meadows basin aquifer; Factor B—Overutilization/collection (not applicable); Factor C—Predation and disease by introduced fish and crayfish; Factor D—No existing regulatory

mechanism to protect the habitat; Factor E—Other natural or manmade factors, including the extremely small range and specialized habitat.

At the time of listing, little was known about the species so most of the species biology information was based on two other aquatic species already listed in Ash Meadows, the Warm Springs pupfish (*Cyprinodon nevadensis pectoralis*) and the Devils Hole pupfish (*Cyprinodon diabolis*). However, as was known at the last 5-Year Review (Service, 2010), all Death Valley group pupfishes are generalist omnivores with similar life-history requirements, and the threats specifically associated with this species are identical with the closely related Warm Springs pupfish occurring on the Refuge. The historical distribution for the Ash Meadows Amargosa pupfish includes much of the perennial water at the Refuge, excluding the springs of the Warm Springs complex.

The Ash Meadows Amargosa pupfish occurred in its historically described springs on the Refuge in 2010, and the species remains in these habitats at present (Kings Pool, Crystal, Longstreet, Rodgers, Jackrabbit, and Fairbanks springs). The threats explained in the previous 5-year review, reduced spring discharge and the impacts of invasive fishes and crayfish, remain as primary threats for this species.

The concerns expressed previously for groundwater extraction have heightened in recent years, with new understanding of the level of connectivity of the aquifer feeding springs of Ash Meadows. The hydrogeology of the region has received even more attention given the ongoing demands for water in the desert (i.e., pumping) and the likely reduced springflow as a consequence of climate change. The USGS report of Halford and Jackson (2020) represents the most recent literature available that expands on the basic notion of nearby pumping affecting Ash Meadows. The Ash Meadows discharge area occurs at the terminus of a hydrologically significant feature referred to as the “megachannel” (Winograd and Pearson 1976). The megachannel is a 80 km (50 mi) long by 40 km (25 mi) wide area of fractured carbonate rock that has estimated transmissivities spanning from 20,000 to 2,000,000 ft<sup>2</sup>/d (Halford and Jackson 2020, p. 136). High estimated transmissivities and confined aquifer conditions cause groundwater pumping signals to propagate large distances 24–32 km (15–20 mi) in short timespans (less than 2 yrs) within the megachannel. Therefore, pumping from carbonate rock in the megachannel can significantly impact water levels and spring discharges in the Ash Meadows discharge area. Halford and Jackson (2020) specifically determined that groundwater pumping from within the central Amargosa Desert, along with Indian Springs, NV, and the Nevada National Security Site can capture discharge from springs within the Ash Meadows discharge area. Further discussions between the FWS and the USGS are planned for 2020 that include conducting further aquifer tests to estimate the level of drawdown of the aquifer and the effects on the springs.

Since the last review, the Nevada State Engineer (NSE) further recognized the potential for groundwater reduction to threaten the habitat at Devils Hole (spring habitat within the Refuge boundaries). The NSE signed Order 1197A (January 12<sup>th</sup>, 2018), *Curtailment of New Appropriations of Groundwater within the Amargosa Valley Hydrographic Basin 230*, that prohibits new applications for water or water diversions within 25 miles of Devils Hole. Order 1197A supersedes 1197, which imposed similar regulations at 10 miles from Devils Hole.

Predatory fishes and crayfish remain at the Refuge, and in the largest habitats co-occurring with the Ash Meadows Amargosa pupfish— [e.g., Fairbanks Spring, Crystal Spring, Big Spring, among others (Service 2020, *unpubl.*)]. The Refuge has treated Fairbanks Spring to remove nonnative fishes, but nonnative fishes occur at the site at present. The Refuge has concentrated on removal of nonnatives from the Warm Springs complex, which threaten the much smaller range of the Warm Springs pupfish [Desert Complex Natural Resource Management Plan (NRMP), *in review*].

Abundance of this species is highly variable, fluctuating 10-20x over the course of the year (Service 2010). As such, the species presents difficulty in estimating abundance, especially in light of changing habitat conditions during the restoration of habitat that is ongoing on the Refuge (see examples in NRMP *in review*; and Desert NWR Complex Comprehensive Conservation Plan 2009). Further, unlike the time period preceding the last review, the Refuge is unable to survey annually due to staffing, oftentimes leading to surveys that occur every 2-3 years, a frequency difficult to determine trends in population size.

### **Conclusion:**

After reviewing the best available scientific information, we conclude that Ash Meadows Amargosa pupfish (*Cyprinodon nevadensis mionectes*) remains an endangered species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Act and analysis of the status of the species in our listing determination (48 FR 40178) remain an accurate reflection of the species current status.

### **RECOMMENDATIONS FOR FUTURE ACTIONS:** (*optional, but may be helpful to identify priorities for management actions and information needs for next 5-year review*)

1. Monitor compliance with Nevada Revised Statute Order 1197A (January 12, 2018), Curtailment of New Appropriations of Groundwater within the Amargosa Valley Hydrographic Basin 230, that prohibits new applications for water or water diversions within 25 miles of Devils Hole (and by proximity Ash Meadows NWR). Water levels in Devils Hole are affected by pumping centers in the Amargosa Desert and the Ash Meadows groundwater basins (Halford and Jackson 2020).
2. Collaborate with the Ash Meadows NWR to implement the *Desert National Wildlife Refuge Complex – Ash Meadows, Desert, Moapa Valley, and Pahrnagat National Wildlife Refuges Final Comprehensive Conservation Plan and Environmental Impact Statement, Volume I – August 2009* (Service 2009) and also the *Draft Ash Meadows Natural Resource Management Plan* in review (Service, *in review*); and
3. Support Ash Meadow Amargosa pupfish research at the Ash Meadows NWR to monitor the population as identified in the *Recovery Plan for the Endangered and Threatened Species of Ash Meadows* (Service 1990); and
4. Monitor the future activity of mineral rights in the Ash Meadows area. The BLM ACEC surrounding the refuge is withdrawn from mining and entry until 2029 (PLO# 7737,

signed November 2<sup>nd</sup>, 2009), but requires renewal every 20 years. Mining can still occur on private inholdings within the refuge, but no active mining permits exist at this time.

**Lead Field Supervisor, Fish and Wildlife Service**

Approved \_\_\_\_\_ Date \_\_\_\_\_

## Literature Cited:

- Halford, K.J., and Jackson, T.R. 2020. Groundwater characterization and effects of pumping in the Death Valley regional groundwater flow system, Nevada and California, with special reference to Devils Hole: U.S. Geological Survey Professional Paper 1863, <https://doi.org/10.3133/pp1863>. 178 pp.
- State of Nevada. 2018. Order 1197A. Nevada State Engineer, Department of Water Resources, Carson City, Nevada. Online at: <http://images.water.nv.gov/images/Orders/1197Ao.pdf>; accessed on 9/30/20. 2 pp.
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- [Service] U.S. Fish and Wildlife Service. 2009. Desert National Wildlife Refuge Complex: Ash Meadows, Desert, Moapa Valley, and Pahrnagat National Wildlife Refuges: final comprehensive conservation plan and environmental impact statement. Pacific Southwest Region Office. Sacramento, California.
- [Service] U.S. Fish and Wildlife Service. 2010. Ash Meadows Amargosa pupfish 5-year Review Summary and Evaluation. January 17<sup>th</sup>, 2010.. Available from: U.S. Fish and Wildlife Office in Las Vegas, Nevada. 40 pp.
- Winograd, I.J. and Pearson Jr, F.J., 1976. Major carbon 14 anomaly in a regional carbonate aquifer: Possible evidence for megascale channeling, south central Great Basin. *Water Resources Research* 12(6), pp.1125-1143.