Pahrump poolfish (*Empetrichthys latos*)

5-year Review: Summary and Evaluation

U.S. Fish and Wildlife Service

Southern Nevada Fish and Wildlife Office

Las Vegas, Nevada

August 7, 2023

5-YEAR REVIEW
Pahrump poolfish (*Empetrichthys latos*)

GENERAL INFORMATION

Original listing[1]

Species: Pahrump poolfish (*Empetrichthys latos latos*)
Date listed: March 11, 1967
FR citation(s): 32 FR 4001
Entity listed: Subspecies
Classification: Endangered

Proposed Reclassification[2]

Species: Pahrump poolfish (*Empetrichthys latos latos*)
Date listed: September 22, 1993
FR citation(s): 58 FR 49279
Entity listed: Subspecies
Classification: Endangered

Withdrawal of Proposed Reclassification[3]

Species: Pahrump poolfish (*Empetrichthys latos*)
Date listed: April 2, 2004
FR citation(s): 69 FR 17383
Entity listed: Species
Classification: Endangered

BACKGROUND

Most recent status review:
The status of Pahrump poolfish was last reviewed in 2018 through a 5-year status review (Service 2018).

FR Notice citation announcing this status review:
83 FR 28251. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews of 50 Species in California, Nevada, and Oregon. Published on June 18, 2018.

[1] Originally listed as endangered under the Endangered Species Preservation Act (Udall 1967). Its endangered status was retained with the passage of the Endangered Species Act of 1973.
[2] Species was proposed for downlisting from endangered to threatened status.
[3] Withdrawal of proposed rule published on September 22, 1993 (58 FR 49279) to reclassify from endangered to threatened status. Subspecies designation was elevated to full species.

ASSESSMENT

Species overview:
Classified as a subspecies named *Empetrichthys latos latos* by Miller (1948), the Pahrump poolfish (*Empetrichthys latos*) became a full species when *E. l. pahrump* and *E. l. concavus* went extinct. Following the extinction of the Ash Meadows poolfish (*E. merriami*) in the late 1940s or early 1950s, they became the only extant species within the genus *Empetrichthys* (Soltz and Naiman 1978; Miller et al. 1989). Extirpated from its only known native habitat at Manse Spring, near Pahrump Nevada, in 1975, there are currently four refuge locations which contain Pahrump poolfish: 1) Corn Creek; 2) Shoshone Ponds; 3) Springs Preserve; and 4) Spring Mountain Ranch State Park.

Information about the ecology, behavior, life history, and habitat requirements of the Pahrump poolfish is limited and based largely on historical information derived from its ancestral home at Manse Spring. The species occupies entirely different habitats today.

Information acquired since the last status review:
This 5-year review was conducted by the U.S. Fish and Wildlife Service's (Service) Southern Nevada Fish and Wildlife Office. Data for this review were solicited from interested parties through a Federal Register notice announcing this review on June 18, 2018. We contacted State agencies, Federal agencies, local agencies, and species experts, to request any data or information we should consider in our review. Additionally, we did not receive any information from the public in response to our Federal Register Notice announcing this 5-year review.

Since the Service's 2018 5-year review for Pahrump poolfish, limited new information has become available. The new information received since 2018 is in the form of peer reviewed publications, agency monitoring reports, and updates to the status of refuge populations.

Status of refuge populations:
Refuge populations are vital to the short- and long-term management of Pahrump poolfish. They provide suitable habitat needed to prevent the extinction of poolfish and meet recovery criteria. To avoid conflict with other native species, refuge populations have been established at novel habitats on the landscape that combine artificial and natural features. These sites employ passive management and require only periodic maintenance to infrastructure (e.g., servicing pipes/pumps, pond cleaning) and biological management (e.g., population surveys, mixing of genes from other locations, removal of nonnative species).

While refuge populations play an important role in the persistence of Pahrump poolfish, they are not without challenges. Refuge populations rely on partners willing to take on fiscal and regulatory responsibilities to assist with the management of an endangered species. The Service's National Wildlife Refuge System, Nevada State Parks, Nevada Department of Wildlife (NDOW), Bureau of Land Management (BLM), and Las Vegas Valley Water District (LVVWD) have all voluntarily undertaken management of Pahrump poolfish. They contribute staff time and funding to maintain refuge populations. However, without permanent dedicated funding and staffing it is unrealistic to expect any single refuge population to be managed in perpetuity.

Provided below is a summary of the status of each of the four active refuge populations.

Corn Creek

The Corn Creek population of Pahrump poolfish is located near the Desert National Wildlife Refuge Visitor Center, Clark County, Nevada. This site has served as a Pahrump poolfish refuge location for over 50 years (Lockard 1971); however, residency by poolfish at Corn Creek has not been continuous as multiple extirpation events have occurred. These extirpation events have typically been associated with the introduction of nonnative aquatic species as summarized previously by the Service (2018). Currently, two distinct habitats provide suitable habitat for the Pahrump poolfish at Corn Creek: 1) A small aquarium enclosure consisting of a North and South Tank; and 2) a Concrete Pond fed by multiple spring outflows.

Since the Service's 2018 5-year review, the refuge population at the Concrete Pond and associated spring habitat has been restored following the removal of nonnative aquatic species (i.e., shortfin mollies, koi, and common carp). The removal of nonnative aquatics was achieved through two chemical treatments using rotenone, conducted in January 2021. Following treatments, Pahrump poolfish were reintroduced and continue to thrive.

Population estimates for the most recent survey are as follows (NDOW 2022a):

- North Tank – 14 with a 95% confidence interval of 7 to 30.
- South Tank – 46 with a 95% confidence interval of 33 to 68.
- Concrete Pond[4] – 1,573 with a 95% confidence interval of 575 to 3,931.

Shoshone Ponds

The Shoshone Ponds refuge population of Pahrump poolfish is located on lands managed by the BLM in White Pine County, Nevada. The site consists of multiple artesian fed ponds (Refuge Pond, Stock Pond) as well as a small stream habitat (Flowing Well). Pahrump poolfish were first introduced into Shoshone Ponds in 1972; however, this population was believed to have been lost due to vandalism. In 1976, a reintroduction event ultimately led to the establishment of this location. Shoshone Ponds consist of three distinct habitats: 1) Refuge Pond; 2) Flowing Well; and 3) Stock Pond.

During 2020 and 2021, the BLM implemented habitat restoration work funded through the Southern Nevada Public Lands Management Act. This work included efforts to combine the three Refuge Ponds (North, South, and Middle) into a single Refuge Pond as well as the excavation and re-lining of Stock Pond.

Population estimates for the most recent survey are as follows (NDOW 2022b):

- Refuge Pond – 4,279 with a 95% confidence interval of 3,862 to 4,740.
- Flowing Well – 286 with a 95% confidence interval of 184 to 473.

[4] Estimate of population reported is highly variable due to a low number of recaptures during survey. This is potentially due to a drop in temperature between mark and recapture sessions, which resulted in a decrease of activity level for poolfish.

Springs Preserve

The Springs Preserve population of Pahrump poolfish was established in 2018 in Clark County, Nevada, following the ratification of a Safe Harbor Agreement between the Service and LVVWD. A total of 290 poolfish were translocated into the Upper and Lower North Fork Ponds (NDOW 2022c). These connected ponds have provided a stable refuge location with documented recruitment.

Since the Service's 2018 5-year review, the Service and LVVWD have pursued funding opportunities to create additional habitat at the Springs Preserve. In 2023, the LVVWD was awarded Recovery Challenge funding from the Service to construct additional ponds for the Pahrump poolfish. This work is expected to be completed by 2026.

Population estimates for the most recent survey are as follows (NDOW 2022c):

- Upper North Fork Pond – 29 with a 95% confidence interval of 18 to 50.
- Lower North Fork Pond – 104 with a 95% confidence interval of 77 to 142.

Spring Mountain Ranch State Park

The Lake Harriet population of Pahrump poolfish is located at Spring Mountain Ranch State Park, Clark County, Nevada. This site is the largest refuge population of Pahrump poolfish with annual surveys resulting in population estimates often exceeding 10,000 individuals. However, recent introductions of nonnative aquatic species (e.g., western mosquitofish, red swamp crayfish) have required the site to be renovated.

Since the Service's 2018 5-yr review, efforts to restore function and reestablish Pahrump poolfish have been successful. Between 2017 and 2019, Lake Harriet was drained and renovated to remove nonnative aquatic species. In 2020, Pahrump poolfish were reintroduced to Lake Harriet.

Population estimate for the most recent survey is as follows (NDOW 2022d):

- Lake Harriet – 8,798 with a 95% confidence interval of 5,241 to 15,996.

Research and/or grant supported activities:

The following two research projects have occurred since 2018 and have contributed to our knowledge of Pahrump poolfish life history.

1. Stockwell, C.A., M.R. Schmelzer, B.E. Gillis, C.M. Anderson, and B.D. Wiseden. 2022. Ignorance is not bliss: evolutionary naiveté in an endangered desert fish and implications for conservation. Proc. R. Soc. B 289: 20220752.

2. Lackmann, A.R., S. Kettelhut, B.L. Paulson, C.M. Anderson, S.C. Goodchild, K.D. Guadalupe, and C.A. Stockwell. 2021. Thin-sectioned otoliths reveal sexual dimorphism and a 10-year lifespan in the endangered Pahrump poolfish. North American Journal of Fisheries Management. American Fisheries Society.

Conclusion

Since the Service's 2018 5-year review, conditions at Shoshone Ponds and Spring Mountain Ranch State Park refuge habitats have improved following the completion of restoration work and reintroduction of Pahrump poolfish. At Corn Creek and Spring Mountain Ranch State Park, nonnative fish removal efforts were successful, and all refuge populations are now free from nonnative fish species. However, red swamp crayfish are still present at Corn Creek and remain a threat. Additionally, abundance across the range of the species has increased.

After reviewing the best available scientific information, we conclude that Pahrump poolfish remains an endangered species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Endangered Species Act (Act) and analysis of the status of the species in our 2018 5-year review remains an accurate reflection of the species current status. However, substantial progress has been made towards reaching downlisting criteria and further evaluation through a Species Status Assessment may be warranted in the foreseeable future.

RECOMMENDATIONS FOR FUTURE ACTIONS

- Maintain existing refuge habitats
    - Continue to improve and update refuge habitats to maintain long-term function.
    - Remove nonnative aquatic species, as needed.

- Establish or re-establish populations
    - Develop interest, from both private and public entities, in Manse Spring to allow reintroduction and protection of habitat (e.g., conservation easement, purchase property).
    - Create additional populations using tools provided under Section 10 of the Act.

- Continue to seek funding opportunities to facilitate actions which aid in the recovery of the species.

Field Supervisor, Southern Nevada Fish and Wildlife Service

Approve GLEN KNOWLES Digitally signed by GLEN KNOWLES Date: 2023.08.07 16:24:37 -07'00' Date _____

Literature Cited

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Miller, R. R., J. D. Williams, and J. E. Williams. 1989. Extinctions of North American fishes during the past century. Fisheries 14(6): 22-38.

Nevada Department of Wildlife (NDOW). 2022a. Field Trip Report: Corn Creek Pahrump Poolfish Population Assessment. September 14 and 21, 2022. Prepared by Kevin Guadalupe. 8pp.

Nevada Department of Wildlife (NDOW). 2022b. Field Trip Report: Pahrump Poolfish Population Assessment Survey and Translocation to Stock Pond. August 3 and 4, 2022. Prepared by Kevin Guadalupe. 12pp.

Nevada Department of Wildlife (NDOW). 2022c. Field Trip Report: Las Vegas Creek (Restored) North Fork Pond #1a (Lower), and #1b (Upper), Clark County, NV. July 20 and 27, 2022. Prepared by Kevin Guadalupe. 7pp.

Nevada Department of Wildlife (NDOW). 2022d. Field Trip Report: Pahrump Poolfish Population estimate Surveys at Spring Mountain Ranch State Park. September 13, 19, 22-23, 2022. Prepared by Kevin Guadalupe. 9pp.

Soltz, D. L. and R. J. Naiman. 1978. The natural history of native fishes in the Death Valley system. Natural History Museum of Los Angeles County, Science Series 30:24.

Udall, S.L. 1967. Native Fish and Wildlife, Endangered Species. Federal Register 32: 4001.

U.S. Fish and Wildlife Service (Service). 2018. Pahrump poolfish (*Empetrichthys latos*) 5-Year Review: Summary and Evaluation. 28pp.