**5- Year Review Short Form**

**Species Reviewed:**

Bonytail (*Gila elegans*)

**Federal Register Notice Announcing Initiation of this Review:**

May 27, 2016. Endangered and threatened wildlife and plants; 5-year status reviews of 21 species in the Mountain Prairie Region (81 FR 33698).

**Lead Region:**

Region 6, Upper Colorado River Endangered Fish Recovery Program, Tom Chart, Director, 303–236–9885.

**Current Classification:**

Endangered

**Current Recovery Priority Number:**

5C. This recovery priority number is indicative of a species facing a high degree of threat; has a low recovery potential; is listed at the species level; and there is the potential for conflicts between needed recovery actions and economic activities.

**Methodology used to complete this review:**

This review was completed by the Upper Colorado River Endangered Fish Recovery Program (UCREFRP) Office in cooperation with Region 2, on June 27, 2019. All pertinent literature and documents on file at the UCREFRP Office were used for this review, with specific emphasis on new information obtained since 2012. New information included increasing evidence of survival of stocked fish and limited evidence of natural reproduction; however, new information did not alter our understanding of the species status and threats per the analyses contained in the most recent status review (USFWS 2012).

**Review Summary:**

The bonytail is a fish species endemic to warm-water habitats of the Colorado River and its tributaries. The species was historically widespread and common from Mexico to Wyoming, but by the late 1970s had declined to less than 50 known individuals. The U.S. Fish and Wildlife Service (Service) originally listed bonytail as an endangered species in 1980 under the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq*.), citing extirpation from most of its range in the Colorado River Basin due to habitat alteration (45 FR 27710; April 23, 1980). The decline of bonytail populations, likely beginning in the 1950s, was largely undocumented prior to the last wild individuals being brought into captivity. Because the species became functionally extinct prior to extensive sampling efforts, the ecology of the bonytail, including habitat preferences, is largely unknown (USFWS 2002; Lower Colorado River Multi-Species Conservation Program 2016). Large mainstem dams, water diversions, habitat modification, nonnative fish species, and degraded water quality that caused population declines of other native fishes in the Colorado River likely also affected bonytail (Miller 1961; Minckley and Deacon 1991).

**Review Summary (continued):**

Glen Canyon Dam physically separates bonytail populations into two recovery units, the upper and lower basins. Two management programs, the Upper Colorado River Endangered Fish Recovery Program (UCREFRP) in the upper basin and the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) in the lower basin undertake the majority of management actions for the conservation of the species, including stocking, flow management, nonnative fish removal, and habitat development. Despite management efforts, signs of bonytail survival in the wild remain rare and the ecology of the species remains poorly understood.

Without viable, wild bonytail populations, the species continues to rely on hatchery propagation to persist in the wild and advance recovery efforts. The founder population of 10 individuals used for hatchery broodstock was captured from Lake Mohave between 1976 and 1978 (USFWS 2002). Hatcheries in the upper basin produce and stock over 35,000 adult bonytail per year into upper basin rivers, including the Green, White, Yampa, Dolores, Gunnison, San Rafael, Price, and Colorado rivers (UCREFRP Integrated Stocking Plan Revision Committee 2015). In the lower basin, hatcheries produce and stock over 13,000 adult bonytail per year into several reaches, and backwaters, of the lower Colorado River (LCR MSCP 2015). The Programs successfully maintain genetic diversity and refuge populations of the species. However, when hatchery reared individuals are stocked into the wild, survival rates are extremely low, and therefore the viability of bonytail populations remain low.

The 2002 recovery goals for bonytail identified the alteration of habitat (flow regimes, water temperature, physical habitat and barriers reducing connectivity; Factor A) and the presence of nonnative species (Factor C) as significant threats to the species. Management actions through two conservation programs continue to address these identified threats (Factor D), but the lack of viable bonytail populations in the wild and ongoing threats continue to influence the condition of the species. Habitat alteration and nonnative predators remain threats to the bonytail. Overutilization (Factor B), diseases and parasites (Factor C) were not identified as substantial threats to the species. The present levels of hybridization among *Gila* species is not considered a threat to the species, but will be re-evaluated as *Gila* species populations increase to determine impacts (USFWS 2012). Hybridization likely was common historically between the Colorado River *Gila* species, with the presence of a few bonytail haplotypes found among all upper basin humpback chub (*Gila cypha*) populations (Bohn *et al*. 2018). The effects of pollutants remains somewhat unknown but the imminent threat of potential spills or leaching of environmental contaminants still remain high for bonytail (Factor E). Below we summarize new information that has become available since the most recent status review, our last 5-year review for the species (USFWS 2012).

Although augmentation has been occurring for decades, survival of stocked bonytail in the upper basin remains very low, with documented survival rates of approximately 2 percent (UCREFRP Biology Committee 2017). Post-stocking survival is documented each time a fish is "encountered," either through physical handling or passive interaction with antennas placed in the river. Encounters with stocked bonytail are increasing, with 11,113 individuals, or approximately 5 percent of the bonytail stocked since 2012, encountered (*i.e.* captured, detected, or transferred) (STReaMS 2019). It is currently unknown as to whether the increase in encounters is because populations are increasing or because technology to detect them has

**Review Summary (continued):**
improved. While both active and passive sampling for bonytail occur, 95 percent of the encounters are PIT tag antenna detections (UCREFRP Biology Committee 2017; STReaMS 2019). In the lower basin, survival of hatchery released bonytail also remains low in natural systems, with less than 4 percent survival beyond 30 days post-release between 2007 and 2017 (McCall *et al.* 2017). This data suggests that a very small percentage of stocked bonytail survive long-term in the mainstem of the Colorado River. The LCR MSCP manages three isolated backwaters where bonytail are recruiting and are likely self-sustaining, including High Levee Pond, Imperial Ponds and Davis Cove backwater (J. Newton, personal communication 2019). All three locations are managed specifically for bonytail and nonnative fish species are excluded.

Despite natural reproduction within the upper and lower basins in some managed floodplain wetlands and backwater habitat (Bestgen et al. 2017, LCR MSCP 2018), survival of larval bonytail has not been observed and no young-of-year or juvenile fish have ever been found in the rivers of the Colorado River basin. No self-sustaining populations in the rivers of the upper or lower basins have been established.

**Recommendations on species status**:

After reviewing the best available scientific information, we conclude that the bonytail remains an endangered species. Our review of new information compiled since 2012 does not change our evaluation of species status and the threats affecting the species under the factors in 4(a)(1) of the Act from our most recent review of the species (USFWS 2012). Specifically, the continuing lack of any viable populations in the wild, low rates of survival for stocked fish, and ongoing threats associated with habitat alteration, predation by nonnative fish, and potential spills or leaching of environmental contaminants supports our previous evaluation that the bonytail remains in danger of extinction across its entire range and thus continues to meet the definition of an endangered species under the Act. Therefore, we recommend no change in status to the species at this time.

**Recommended future actions:**

Additional research providing a better understanding of how habitat alternations, diseases and parasites, nonnative fishes, and potential contaminants affect the physical condition, survival, and reproduction of bonytail could further facilitate this species' recovery. Intensive management remains necessary in order to facilitate this species' recovery.

Based on our experience managing the other Colorado River fish, the suite of threat management actions identified in the 2002 Bonytail Recovery Goals still provide managers with reasonable guidance until more species-specific information is identified. Similarly, we have not gathered compelling information to recommend revising the demographic criteria in those goals. Therefore, we do not recommend revising the Bonytail Recovery Plan at this time and will reevaluate the need for revision at the time of the next 5-year review.

**Approve:** Tom Chart **Date:** 6/27/19

**Tom Chart, Director**
**Upper Colorado River Endangered Fish Recovery Program**

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