

**RECOVERY PROGRAM  
FY 2020-2021 SCOPE OF WORK for:**

Recovery Program Project Number: 175

Evaluate the potential of reestablishing humpback chub in Dinosaur National Monument.

Reclamation Agreement number: \_\_\_\_\_

Reclamation Agreement term: \_\_\_\_\_

Lead agency: TBD

Submitted by: Upper Colorado River Endangered Fish Recovery Program PDO;  
PIs and collaborators TBD.

Date Last Modified: 6/6/2019 1:48 PM

Category:

- Ongoing project  
 Ongoing-revised project  
 Requested new project  
 Unsolicited proposal

Expected Funding Source:

- Annual funds  
 Capital funds  
 Other

- I. Title of Proposal: Evaluate the potential for reestablishing humpback chub in Dinosaur National Monument.
- II. Relationship to RIPRAP: Yampa, IV.A.1 (Augment or restore populations as needed, and as guided by the Genetics Mgmt. Plan)
- III. Study Background/Rationale and Hypotheses:

The previous recovery plans for humpback chub identify a self-sustaining population in Dinosaur National Monument (Whirlpool Canyon/Island Park in the Green River, and Yampa Canyon in the Yampa River); however, the species status assessment considers this population functionally extirpated because individuals have not been collected since 2004 (SSA; U.S. Fish & Wildlife Service 2018). This area has also been determined to be critical habitat for humpback chub. Recent population estimates in Yampa Canyon ranged from 320 in 2001 to 224 adults in 2003 (Finney 2006). Since 2003, no population estimates have been possible because too few humpback chub have been captured. In 2007 about 400 juveniles were taken from Yampa Canyon to hatchery facilities to evaluate the survival of young humpback chub during transport and in a hatchery setting, and potentially for the purpose of establishing a refuge population (Upper Colorado River Endangered Fish Recovery Program 2007). It was determined after the fish were large enough to identify that there were no humpback chub in the sample, confirming that the number of humpback chub is low and roundtail chub and hybrids are common. There are numerous hypotheses for the decline in this population and concerns about the habitat quality to support a large population of humpback chub. These issues will need to be explored in the discussion paper.

The humpback chub has not been translocated in the upper basin, but has been introduced from hatchery stocks once. In December of 1981, a total of 7,600 juvenile humpback chub were hatched and raised at the Willow Beach National Fish Hatchery and released in Cataract

Canyon at 1½ years of age (Valdez 1990). These fish had been hatched from eggs taken from ripe fish in Black Rocks in May 1980 (Arcadio Gonzales-Valdes, University of Mexico at Monterey, Personal Communication to Dr. Rich Valdez, October, 1980). Each released fish was marked with a coded wire nose tag, but fish caught in subsequent investigations have not been examined with a metal detector, and the survival, fate, and eventual influence of these fish on the population size and genetics of the Cataract Canyon population are unknown (U.S. Fish & Wildlife Service 2018).

Translocations have been extremely successful in Grand Canyon to the point that numerous conservation measures require continued and expanded translocations, and even mainstem translocations in order to mitigate predation by rainbow trout. Successful translocations have been made above Chute Falls in the Little Colorado River, Havasu Creek, and Shinumo Creek. These projects have been led by the NPS and USFWS, funded in part by GCDAMP funds and appropriated dollars.

#### IV. Study Goals, Objectives, End Product(s):

The objective of this study is to explore the feasibility and strategies for reintroducing humpback chub in the Upper Colorado River Basin to start new populations or augment existing populations. A similar management action to translocation efforts in the Grand Canyon could be applied to the Yampa Canyon humpback chub population/locale of a former population. The Grand Canyon population has shown its ability to recover and grow fairly rapidly, however the upper basin populations have been mostly stable or in the case of the Yampa Canyon fish, to be extirpated. If this population could be recovered via translocation efforts and be re-established as a natural self-sustaining population it would provide additional confidence in their recovery. The products of this work are a discussion paper that evaluates and identifies the best methods and strategies for procuring and releasing humpback chub into the upper basin, and implementation of approved recommendations for reintroducing humpback chub into DNM to restart a population.

The discussion paper will include at least the following:

1. A history of humpback chub collections in Dinosaur National Monument (DNM: Whirlpool, Lodore, and Split Mountain canyons of the Green River, as well as the Yampa River),
2. An evaluation of habitat suitability for the humpback chub in DNM,
3. Alternative means of procuring and releasing fish, including, but not limited to:
  - a. live translocation of young fish from upper basin populations,
  - b. live translocation of young fish from Grand Canyon, and
  - c. development of brood stock and release of hatchery reared fish.
4. Recommendations for reintroducing humpback chub into DNM to restart a population.

Implementation of approved recommendations may require collaboration with Partners with existing SOWs pertaining to humpback chub population estimates in Cataract Canyon (#130), Desolation/Gray Canyons (#129), and Black Rocks (#131) in order to secure fish for translocation or brood stock development. Implementation of approved recommendations for reintroducing humpback chub into DNM to restart a population includes a budget for the procurement of fish from either Black Rocks/Westwater Canyons, Cataract Canyon, or Desolation/Gray Canyons. Three management units have been recommended for *Gila cypha*: Black Rocks\Westwater Canyon, Desolation\Gray and Cataract Canyons, and the lower basin;

with both upper basin units having slightly higher levels of genetic diversity than the lower basin unit. Based on this study, an upper basin broodstock should be maintained separately from the lower basin broodstock to preserve the genetic differences found in this study, with diversity from both upper basin units represented in an upper basin broodstock (Bohn *et al.* 2018). Procurement of fish would be the initial steps in all alternative means currently being explored, and including fish from both upper basin units would ensure that the genetic diversity of the upper basin is represented and maintained in future reintroduction efforts.

#### V. Study Area:

Dinosaur National Monument, Yampa Canyon

#### VI. Study Methods/Approach:

Recommendations of the discussion paper will be provided to the BC for discussion and approval for implementation. Three dedicated trips a year for collection of humpback chub (life stage dependent on final recommendations of discussion paper) are planned, with Black Rocks/Westwater Canyons and Desolation/Gray Canyons likely sampling locations. For translocation methods, larval or YOY fish would be captured and held in captivity until both identification can be determined and fish health inspections are passed. For development of brood stock, adult fish would be captured and held in captivity. At minimum, 5 un-related males and females (10 fish total, *ie.* broodstock founders) can be mated using a 5x5 di-allele breeding matrix to produce 25 family lots. Additional wild fish should be used to supplement the genetic contribution of the parent stock until the minimum effective population size of 50 is achieved (Wydoski 1994, Czapla 1999).

Sampling efforts between late summer and fall are proposed, with 1-2 weeks between sampling efforts. Sampling methods will be similar to those used for humpback chub in the Westwater Canyon, Black Rocks, and Desolation/Gray Canyons population estimate sampling. Dependent on the life stage of interest, trammel nets will likely be the main sampling method to target adult chubs and electrofishing, hoop nets, and/or seines will likely be used to target juvenile chubs. All federal and state collecting must be obtained. The State(s) of Utah and/or Colorado regulations for importing fish from another state must be met. This includes disease testing requiring the sacrifice of at least 60 individuals of the species being brought into captivity or a surrogate species collected from the same originating waters.

Fish health will likely be maintained during transport by boats equipped with live-wells, an oxygen supply and a re-circulating pump system. Fish will then be transported to a hatchery truck and acclimated to water temperature and conditions and tempered with salt. Trucks will then transport fish to the appropriate hatchery facility (to be determined). Procured fish will likely be isolated from other hatchery fish pending fish health inspection results.

## VII. Task Description and Schedule:

Task one, the discussion paper, will be completed in FY 2020 and provided to the BC for discussion. Pending BC approval, task two, procurement of fish for implementation of recommendations, may begin in October 2020 and continue in late summer/fall in subsequent years.

FY 2020:

Task 1- Discussion paper completed and submitted to PDO for review by: 31 September 2020

FY 2021:

Task 2- Gila collection and transport completed: October 1-31, 2020; August 1 - September 30, 2021

FY 2022:

Task 2- Gila collection and transport completed: October 1-31, 2021; August 1 - September 30, 2022

FY2023:

Task 2- Gila collection and transport completed: October 1-31, 2022; August 1 - September 30, 2023

FY 2024:

Task 2- Gila collection and transport completed: October 1-31, 2023; August 1 - September 30, 2024

## VIII. Deliverables and Due Dates by Fiscal Year:

PIs are requested to submit 6-12 photos by February 28<sup>th</sup> each year. Photos can be submitted here: <https://www.flickr.com/photos/coloradoriverrecovery/>. PIs should make a folder with their SOW number and upload images into that folder. Photographs can be taken using cell phones as the quality is acceptable. Each uploaded image will have a number assigned to it. PIs should email Melanie Fischer at [melanie\\_fischer@fws.gov](mailto:melanie_fischer@fws.gov) the number and a brief description of each photo. Descriptions should include the date taken, location, what is happening in the photo, and who the photographer is. Field report articles of 300-500 words are requested and can be submitted to Melanie Fischer. PIs should include one photo related to field report article in photo submissions.

FY 2020:

Discussion paper completed and submitted to PDO for review by: September 31, 2020

Annual report finalized and submitted to PDO: November 2020

FY 2021:

Photos submitted to I & E committee: February 28, 2021

Annual report finalized and submitted to PDO: November 2021

FY 2022:

Photos submitted to I & E committee: February 28, 2022  
Annual report finalized and submitted to PDO: November 2022

FY2023:  
Photos submitted to I & E committee: February 28, 2023  
Annual report finalized and submitted to PDO: November 2023

FY 2024:  
Field Report article and/or photos submitted to I & E committee: February 28, 2024  
Annual report finalized and submitted to PDO: November 2024

#### IX. Budget Summary:

Please see Interagency Agreement Cost Estimating Tool Spreadsheet Budget Summary for more detailed information.

FY 2020:	\$0.00
FY 2021:	\$33,699.84
FY 2022:	\$34,373.84
FY 2023:	\$35,061.16
FY 2024:	\$35,762.81
<b>Total:</b>	<b>\$138,897.65</b>

#### X. Reviewers:

Reviewed by Upper Colorado River Endangered Fish Recovery Program PDO staff.

#### XI. References:

- Bohn, S., S. Mussmann, and W. Wilson. 2018. Genetic evaluation of upper basin Colorado River *Gila cypha*. Draft Report. Prepared for the Bureau of Reclamation, Boulder City, Nevada, by the U.S. Fish and Wildlife Service, Southwestern Native Aquatic Resources and Recovery Center, Dexter, New Mexico.
- Czapla, T.E. 1999. Genetics Management Plan. Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Finney, S. 2006. Adult and juvenile humpback chub monitoring for the Yampa River Population, 2003–2004. Final report to the Upper Colorado River Fish Recovery Program, Project number 133. U. S. Fish and Wildlife Service, Vernal, UT.
- U.S. Fish and Wildlife Service. 2018. Species Status Assessment Report for the Humpback Chub (*Gila cypha*). U.S. Fish and Wildlife Service, Mountain-Prairie Region 6, Denver, Colorado.
- Valdez, R.A. 1990. The endangered fish of Cataract Canyon. Final report prepared for Bureau of Reclamation. Salt Lake City. Utah. Contract 6-CS-40-03980. Fisheries Biology and Rafting. BIO/WEST Report 134-3.94 pp. + appendices. Logan, UT.

Wydoski, R.S. 1994. Coordinated Hatchery Facility Plan: Need for captive-reared endangered fishes and propagation facilities. U.S. Fish and Wildlife Service, Mountain-Prairie Region 6, Denver, Colorado.