

I. Project Title: **Population Estimate of Humpback Chub in Black Rocks.**

II. Bureau of Reclamation Agreement Number(s): R15PG00083

Project/Grant Period: Start date (Mo/Day/Yr): 10/1/2014  
End date: (Mo/Day/Yr): 9/30/2019  
Reporting period end date: 9/30/2017  
Is this the final report? Yes \_\_\_\_\_ No X

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IV. Abstract: Robust population estimates are now critical to monitor progress towards recovery of the humpback chub (USFWS 2001). Recovery goals require estimates of population size at regular intervals to measure population response to management activities under the Recovery Program. A population estimate was made for the 1998–2000 (McAda 2002), 2003–2004 (McAda 2007), 2007–2008 (Francis and McAda 2011), and a more robust design model reporting on all years 1998–2012 (Francis et al. 2016). This report summarizes the work directed at a fifth estimate of population size for humpback chub in Black Rocks during the 2016–2017 time period. These final reports can be found at: <http://www.coloradoriverrecovery.org/documents-publications/technical-reports/research-monitoring.html>

V. Study Schedule: FY 2016–2018

VI. Relationship to RIPRAP: Colorado River Action Plan: Mainstem; V.C. Estimate humpback chub populations; V.C.1. Black Rocks

VII. Accomplishment of FY 2017 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

New for project 131 are four seining trips, in July and August, aimed at evaluating young-of-year (YOY) *Gila* year-class strength and attempt to determine what environmental variables are most limiting to recruitment. In 2016, all four trips were completed from Mee Canyon to Westwater Wash on the Colorado River. Seining produced 349 YOY *Gila* and one adult roundtail chub (*Gila robusta*); and baited hoop

nets produced 12 adult humpback chub (*Gila cypha*) and 35 adult roundtail chub. YOY *Gila* were collected during all four trips suggesting that a very strong 2016 year-class of *Gila spp.* was produced. In 2017, three seining trips were completed from Mee Canyon to Westwater Wash on the Colorado River in July and August. Seining produced 176 YOY *Gila* and one adult *Gila spp.*; and baited hoop nets produced 35 YOY *Gila*, 3 age-1 *Gila spp.*, 5 adult humpback chub and 18 adult roundtail chub. All YOY *Gila* that were collected with seining occurred on the second trip. While 2017 numbers are not as impressive as 2016, it still appears that 2017 may have produced another moderate sized year-class of *Gila spp.*

Sampling for the mark-recapture portion of this study is conducted in September and October; therefore sampling overlaps two fiscal years. Sampling in calendar year 2016 overlapped into FY 2017 and sampling in calendar year 2017 overlapped into FY2018. Data analysis and final report writing will occur in FY 2018/2019.

Our SOW calls for four sampling passes conducted during alternating weeks in September and October 2016 and 2017. Unfortunately, due to boat trailer and boat motor issues we were only able to complete three sampling passes in 2016. However, four submersible PIT tag antennas were deployed through the fourth pass. All four passes were completed in 2017.

For 2016, boat mounted electrofishing produced 29 roundtail chub (*Gila robusta*) captures, 9 humpback chub (*Gila cypha*; 5 adults and 4 juveniles) captures, and 5 age 1+ juvenile *Gila spp.* captures. For 2017, boat mounted electrofishing produced 9 roundtail chub captures, 9 humpback chub captures (1 adult and 8 juveniles), 18 age 1+ *Gila spp.* captures, 4 bonytail (*Gila elegans*) captures, and 1 Colorado pikeminnow (*Ptychocheilus lucius*) capture.

Baited (with dog food) specialty hoop nets were deployed throughout the reach with hopes to increase capture of juvenile and YOY *Gila spp.* The hoop nets are specialty 54 inch long Delta H turtle nets with ¼ inch mesh and a 4 inch throat. These nets are set the first afternoon and are checked and baited the next morning and then again in the afternoon throughout the trip. For 2016, baited hoop nets produced 367 roundtail chub captures, 97 humpback chub (87 adults and 10 juveniles) captures, 2 bonytail captures, 12 age 1+ juvenile *Gila spp.* and 85 YOY *Gila spp.* captures. For 2017, baited hoop nets produced 682 roundtail chub captures, 128 humpback chub (106 adults and 22 juveniles), 1 bonytail, 43 age 1+ juvenile *Gila spp.* and 7 YOY *Gila spp.* captures.

Seventy-five foot trammel nets have been the primary method used throughout the years and are crucial for comparing catch per effort and fish community changes through time. Four to five trammel nets, with one inch inner mesh, were set to minimize the time between net checks. Attempts were made to keep net sets to 1 to 1.25 hour long. For 2016, trammel nets provided 220 roundtail chub captures, 68 humpback chub (all adult) captures, 3 bonytail captures, 6 Colorado pikeminnow, and 2 razorback sucker (*Xyrauchen texanus*) captures. For 2017, trammel nets provided 721 roundtail chub captures, 57 humpback chub (all adult) captures, 18 bonytail captures, 5 Colorado pikeminnow captures and 1 YOY *Gila* capture.

Three submersible PIT tag antennas (that could only detect 134 khz tags) were deployed in Black Rocks proper during all four passes in 2016. Five PIT tag antennas were deployed in 2017. These fully submersible PIT tag antennas (a product of BioMark) are one meter in diameter with a read range of 40 inches. While this method biases our sampling towards marked fish, these additional sightings should provide valuable insights to post handling survival. Preliminary 2016 data from these antennas include 909 sightings of 335 unique tags. These belong to 133 roundtail chub, 41 humpback chub (40 adults and one juvenile), 2 age-1+ juvenile *Gila spp.*, 17 bonytail, 8 Colorado pikeminnow, 169 razorback sucker, and 1 tagged flannelmouth sucker (*Catostomus latippinis*). Preliminary 2017 data include 63,034 sightings of 655 individual tags, belonging to 335 individual roundtail chub, 86 humpback chub (81 adults and five juveniles), 3 age 1+ *Gila spp.*, 16 bonytail, 8 Colorado pikeminnow, and 51 razorback sucker. There were 11 PIT tags (in 2016) and 154 PIT tags (in 2017) sighted that belong to fish whose data hasn't been reported to the Upper Colorado River Recovery Program (UCRRP) database.

PIT tag data and catch rate data have just been keypunched. More detailed data analysis will begin when data are checked and as time allows. Population estimates, capture probabilities, and coefficients of variations will be included in the final report scheduled to be finalized 12/15/2018. To provide these now would be premature as the larger analysis including data from 1998 to the present will allow for more precise and robust estimates as survival will most certainly be influenced by earlier capture histories.

VIII. Additional noteworthy observations:

Ten additional humpback chub were collected in 2017 and transported to Ouray National Fish Hatchery (Grand Valley Unit) bringing the total Black Rocks humpback chub held in captivity to 28 individuals. These fish were removed from the population to provide a safety net if a catastrophic event wiped out the Black Rocks or Westwater population(s) of humpback chub.

Non-native fishes removed in 2016 include 3 bluegill, 13 green sunfish, 7 gizzard shad, 14 largemouth bass, 3 smallmouth bass, 1 white x flannelmouth sucker hybrid, 3 white sucker, and 3 yellow bullhead. Non-native fishes removed in 2017 include 6 black crappie, 1 bluegill, 8 green sunfish, 7 gizzard shad, 1 largemouth bass, 2 smallmouth bass and 2 white sucker.

IX. Recommendations: Continue project as designed.

X. Project Status: On track.

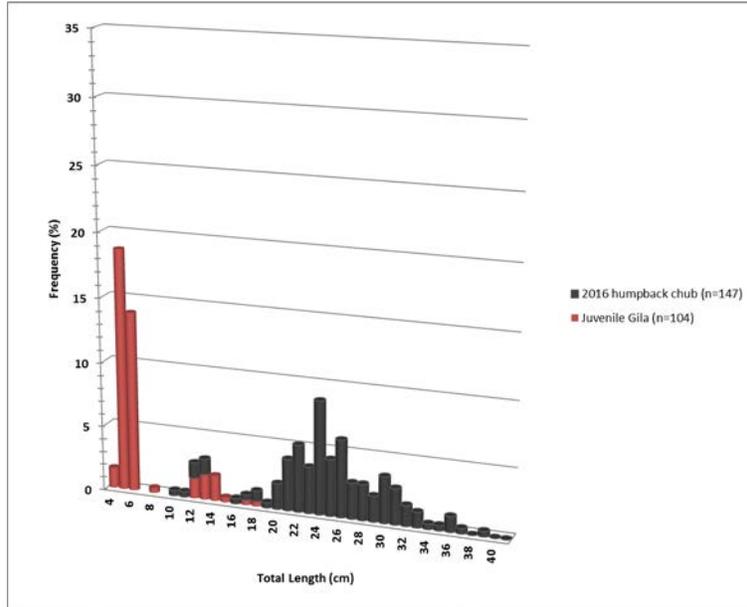
X. FY 2017 Budget Status

- A. Funds Provided: \$99,149
- B. Funds Expended: \$99,149
- C. Difference: -0-
- D. Percent of the FY 2017 work completed, and projected costs to complete: 100%
- E. Recovery Program funds spent for publication charges: -0-

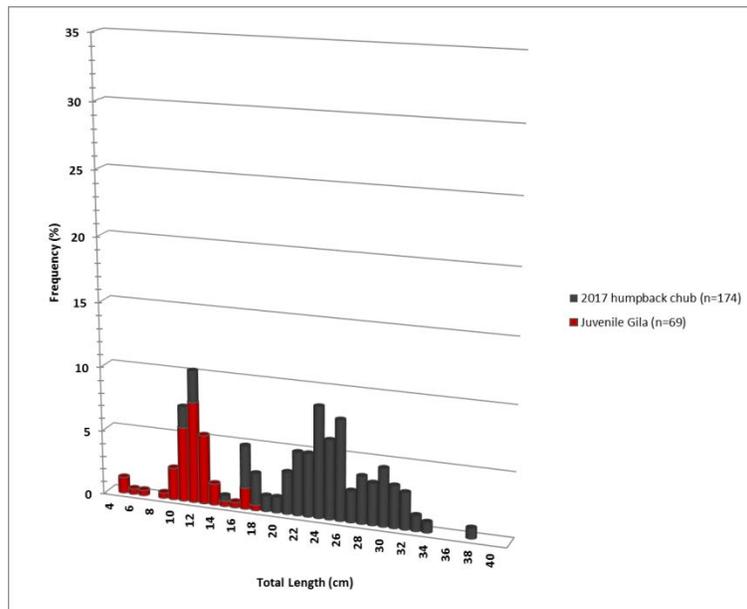
XI. Status of Data Submission: Will be submitted to UCRRP database by January 2018.

XII. Signed: Travis Francis                      11/13/2017  
Principal Investigator                      Date

APPENDIX:



**Figure 1.** Length frequency of humpback chub and juvenile *Gila* captured in Black Rocks, Colorado River, autumn, 2016.



**Figure 2.** Length frequency of humpback chub and juvenile *Gila* captured in Black Rocks, Colorado River, autumn, 2017.

**Table 1.** PIT tagged individuals captured or sighted by year and gear type.

Gear Type	Year	Adult HB and CH	Juvenile HB and CH	YOY CH	RT	BT	CS	RZ	Tagged FM	Unidentified Tags
Trammel Net (captures not individuals)	2016	68	0	0	220	3	6	2	NA	NA
	2017	57	0	1	721	18	5		NA	NA
Hoop Net (captures not individuals)	2016	87	22	85	367	2	0	0	NA	NA
	2017	106	65	7	682	1	0	0	NA	NA
Electrofishing (captures not individuals)	2016	5	9	0	29	0	0	0	NA	NA
	2017	1	26	0	9	4	1		NA	NA
Antenna (individuals)	2016	40	3	0	133	17	8	169	1	8
	2017	81	8	0	335	16	8	51	0	154

### Literature Cited

Francis, T.A., and C.W. McAda. 2011. Population size and structure of humpback chub, *Gila cypha* and roundtail chub, *G. robusta*, in Black Rocks, Colorado River, Colorado, 2007– 2008. Final Report from the U.S. Fish and Wildlife Service to the Upper Colorado River Endangered Fish Recovery Program, Project Number 131. Grand Junction, Colorado.

Francis, T.A., K.R. Bestgen, and G.C. White. 2016. Population status of humpback chub, *Gila cypha*, and catch indices and population structure of sympatric roundtail chub, *Gila robusta*, in Black Rocks, Colorado River, Colorado, 1998-2012. Larval Fish Laboratory Contribution 199. Final Report from the U.S. Fish and Wildlife Service to the Upper Colorado River Endangered Fish Recovery Program, Project Number 131. Grand Junction, Colorado.

McAda, C. W. 2002. Population size and structure of humpback chub in Black Rocks, 1998–2000. Final report to the Upper Colorado River Fish Recovery Program, Project Number 22a3. U. S. Fish and Wildlife Service, Grand Junction, Colorado.

McAda, C. W. 2007. Population size and structure of humpback chub in Black Rocks, 2003– 2004. Final report to the Upper Colorado River Fish Recovery Program, Project Number 22a3. U. S. Fish and Wildlife Service, Grand Junction, Colorado.