

- I. Project Title: **Population Estimate of Humpback Chub in Black Rocks.**
- II. Bureau of Reclamation Agreement Number(s): R10PG40052
- Project/Grant Period: Start date: 10/01/2006  
End date: 09/30/2012  
Reporting period start/end date: 10/01/2011 to 9/30/2012  
Is this the final report? Yes \_\_\_\_\_ No X
- III. Principal Investigator(s):  
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- IV. Abstract: Robust population estimates are now critical to monitor recovery of the humpback chub population (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 time period (McAda 2002), 2003–2004 time period (McAda 2007) and 2007–2008 time period (Francis and McAda 2011). This report summarizes the work directed at a fourth period estimate of population size for humpback chub in Black Rocks during the 2011–2012 time period. These final reports can be found at <http://www.coloradoriverrecovery.org/documents-publications/technical-reports/research-monitoring.html>
- V. Study Schedule: *FY 2011 – FY 2013*
- VI. Relationship to RIPRAP: Colorado River Action Plan: Mainstem; V.C. Estimate humpback chub populations; V.C.1. Black Rocks

VII. Accomplishment of FY 2012 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Sampling for this study is conducted in September and October; therefore sampling overlaps two fiscal years. Sampling in calendar year 2012 overlapped into FY 2013. Data analysis and final report writing will occur in FY 2013.

Four sampling trips were conducted during alternating weeks in September and October 2012. The first trip occurred the week of September 10<sup>th</sup> and the last sampling trip was made during the week of October 22<sup>nd</sup>.

Low base flows in the Colorado River (during 2012) made it impractical and unsafe to drive large jet boats to Black Rocks. Thus, electrofishing was not used as a sampling technique in 2012. However, baited (with razor grower feed) 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. We had hoped to compare the catch of these nets with that of electrofishing; however, this will not be possible during this estimate period. Baited hoop nets provided 263 roundtail chub (*Gila robusta*) captures, 32 humpback chub (*Gila cypha*) captures, and 22 age 1+ juvenile *Gila spp.* captures.

Seventy five foot trammel nets continue to be the primary method used that successfully captures all species of *Gila*. 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. Trammel nets provided 401 roundtail chub captures, and 104 humpback chub captures.

Experimental Passive Integrated Transponder (PIT) tag antennas (that could only detect 134 khz tags) were deployed during the third pass (week of October 9<sup>th</sup>). Baited antennas were deployed for similar intervals as baited hoop nets, and one baited hoop net was activated as an antenna. While this method biases our sampling towards marked fish, these additional sightings should provide valuable insights to post handling survival.

Fifty three unique tags were detected by antennas. Thirteen of these tags were inserted into humpback chub, eight of which were not traditionally captured (trammel or hoop net) in 2012. Of the five humpback chub detected by the antennas that were traditionally handled, two were handled during a pass other than the third pass. Four of these humpback chub were originally tagged in 2008 (two in Black Rocks and two in Westwater Canyon), five were tagged in 2011 (Black Rocks), and four were tagged in 2012 (Black Rocks). Thirty eight of the tags were inserted into roundtail chub, twenty three of which were not traditionally captured in 2012. Of the fifteen roundtail chub detected by the antennas that were traditionally handled, three were handled in a pass other than the third pass. Three of these roundtail chub were originally tagged in 2007 (Black Rocks), four were tagged in 2008 (Black Rocks), twenty were tagged in 2011

(seventeen in Black Rocks, and three in Westwater Canyon), ten were tagged in 2012 (Black Rocks), and one was tagged at an unknown time and location. One tag detected was inserted into a juvenile *Gila spp* in Black Rocks 2011. The final tag detected belongs to a fish that has not been reported to the Upper Colorado River Recovery Program (UCRRP) database.

A record setting total of 112 individual humpback chub were captured during fall 2012 (Figure 1); eleven of those fish were subsequently recaptured in a different sampling pass of fall 2012. A total of 78 individual humpback chubs were captured during fall 2011 (Figure 1); eight of those fish were subsequently recaptured in a different sampling pass of fall 2011. Recapture rate improved generally over previous years.

In 2011, a total of ten humpback chub were captured that had also been collected during previous years sampling. Two of those fish were originally tagged in Westwater Canyon by Utah Division of Wildlife Resources in 2004 and 2008. The remaining eight fish were originally tagged in Black Rocks by the U.S. Fish and Wildlife Service: two were tagged in 1998, one was tagged in 2003, three were tagged in 2007, and two were tagged in 2008. One humpback chub with a positive recapture was not found in the database.

In 2012, a total of twenty one humpback chub were captured that had also been collected during previous years sampling. Five of those fish were originally tagged in Westwater Canyon by Utah Division of Wildlife Resources in 2004 (n=1) and 2007 (n=4). The remaining sixteen fish were originally tagged in Black Rocks by the U.S. Fish and Wildlife Service: one was tagged in 1999, one was tagged in 2007, two were tagged in 2008, and twelve were tagged in 2011.

In 2011, a total of 152 individual age one juvenile *Gila spp.* were collected (Figure 3). In 2012, a total of twenty two individual age one juvenile *Gila spp.* were collected (Figure 3). While morphological distinction is very difficult to determine in the field, certainly some proportion of these fish are humpback chub. These figures are promising as only one was captured during the 2007–2008 sampling period.

In 2011, 511 individual roundtail chubs were collected from Black Rocks (Figure 2); twenty two of these fish were recaptured in a subsequent sampling pass. In 2012, 622 individual roundtail chub were collected (Figure 2); fifteen of these fish were captured in a subsequent pass.

In 2011, a total of fifteen roundtail chub were captured that had also been collected during previous years sampling. Two of those fish were originally tagged in Westwater Canyon by Utah Division of Wildlife Resources in 2005 and 2008. The remaining thirteen fish were originally tagged in Black Rocks by the U.S. Fish and Wildlife Service: six were tagged in 2007, and seven were tagged in 2008. Three roundtail chub with positive recaptures were not found in the database.

In 2012, a total of forty five roundtail chub were captured that had also been collected during previous years sampling. Five of those fish were originally tagged in Westwater Canyon by Utah Division of Wildlife Resources in 2005 (n=3) and 2007 (n=2). The remaining forty fish were originally tagged in Black Rocks by the U.S. Fish and Wildlife Service: three were tagged in 2007, eight were tagged in 2008, and twenty eight were tagged in 2011. One roundtail chub with a positive recapture was not found in the database.

While 2012 sampling produced a record catch of individual humpback chub; alarmingly, it also produced a record catch of largemouth bass (n=78, *Micropterus salmoides*) and gizzard shad (n=78, *Dorosoma cepedianum*). This is an alarming tenfold increase when compared to our 2011 catch of seven largemouth bass and zero gizzard shad.

PIT tag data and catch rate data have just been keypunched. More detailed data analysis will begin when data are checked and time allows. Population estimates, capture probabilities, and coefficients of variations will be included in the final report scheduled to be finalized 11/01/2013. To provide these now would be pre-mature 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. Recommendations:

1. Continue data analysis and final report writing.
2. During fall 2013 collect YOY and age 1+ *Gila spp.* for a refuge population to be reared at the Snooks Bottom Native Species Hatchery.
3. During future years sampling (next estimate scheduled for the fall of 2015 & 2016) increase the number of baited hoop nets, and utilize baited antennas.
4. Consider the Barker model which includes 'resightings' of tags with antennas for survival estimates and discuss with statistician how to use these data in an abundance estimator.
5. Consider one netting trip a year (during the off years of this study) to control and monitor centrarchids in Black Rocks.

IX. Project Status: On track and Ongoing

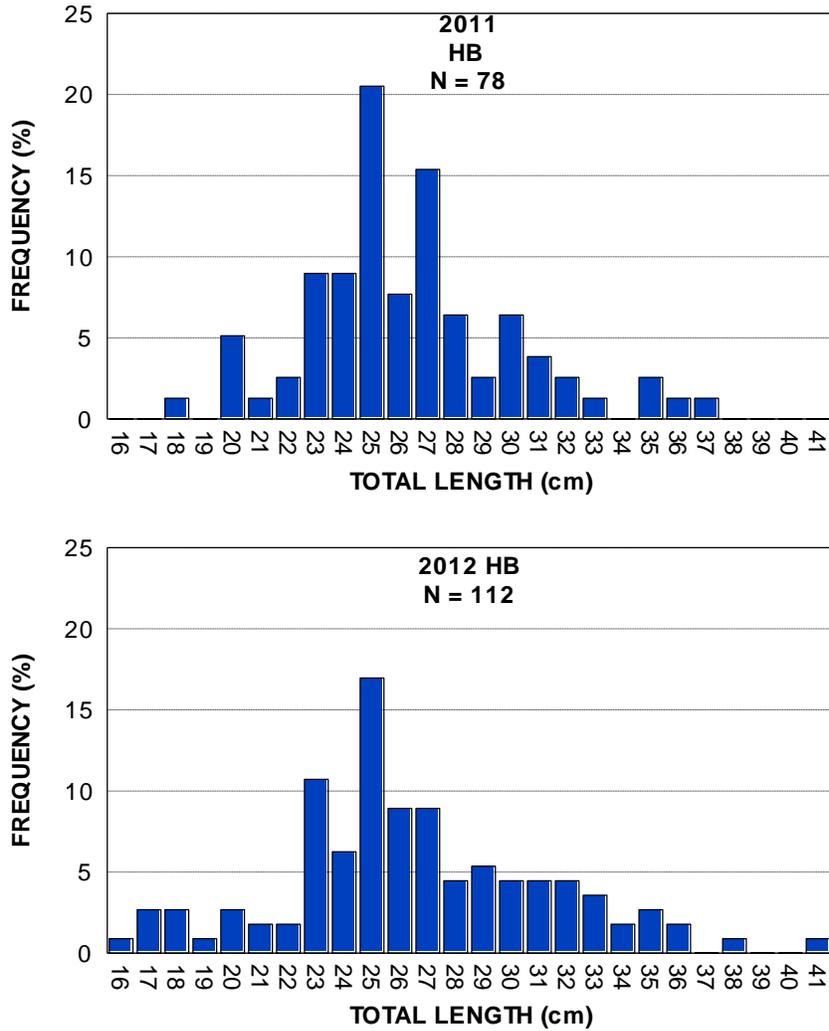
X. FY 2012 Budget Status

- A. Funds Provided: 50,340
- B. Funds Expended: 50,340
- C. Difference: -0-
- D. Percent of the FY 2012 work completed, and projected costs to complete: 100%
- E. Recovery Program funds spent for publication charges: -0-

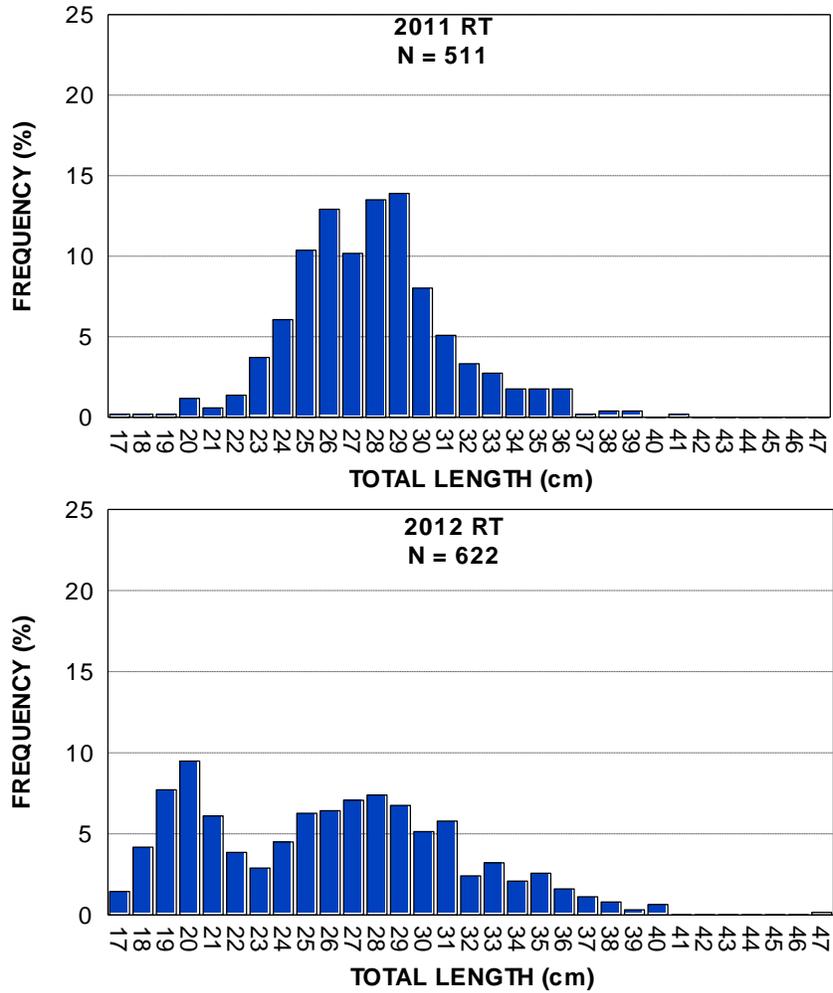
XI. Status of Data Submission (Where applicable): Will be submitted to UCRRP database by January 2012.

XII. Signed: Travis Francis 10/28/2012  
Principal Investigator Date

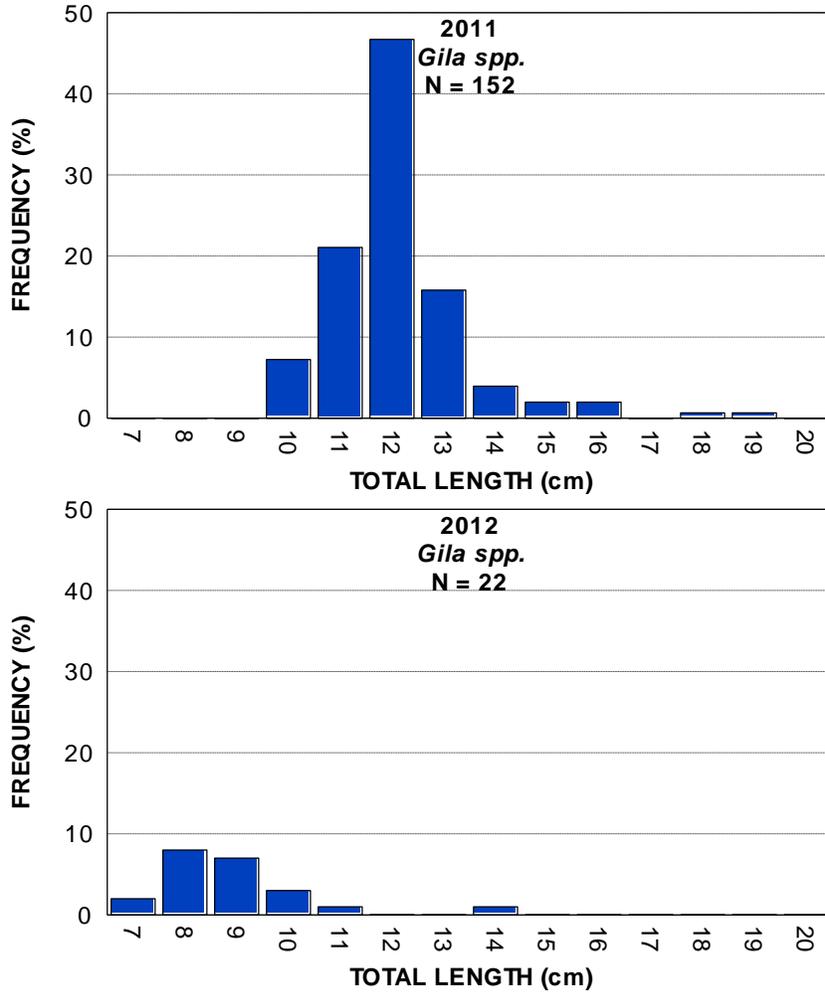
APPENDIX:



**Figure 1.** Length Frequency of Humpback chub captured in Black Rocks, Colorado River, autumn, 2011 and 2012.



**Figure 2.** Length frequency of roundtail chub captured in Black Rocks, Colorado River, autumn, 2011 and 2012.



**Figure 3.** Length frequency of juvenile *Gila spp.* captured in Black Rocks, Colorado River, autumn, 2011 and 2012.



## ANNUAL PERFORMANCE PROGRESS REPORT (PPR)

BUREAU OF RECLAMATION AGREEMENT NUMBER: R10PG40052

UPPER COLORADO RIVER RECOVERY PROGRAM PROJECT NUMBER: 131

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Performance: Robust population estimates are now critical to monitor recovery of the humpback chub population (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 1998B2000 time period (McAda 2002), 2003–2004 time period (McAda 2007) and 2007-2008 time period (Francis and McAda 2011). Field work directed at a fourth estimate of population size for humpback chub in Black Rocks during the 2011-2012 time period is now complete. These final reports can be found at <http://www.coloradoriverrecovery.org/documents-publications/technical-reports/research-monitoring.html>