

I. Project Title: Population monitoring of humpback and bonytail chub in Cataract Canyon.

II. Bureau of Reclamation Agreement Number: R09AP40844

Project/Grant Period: Start Date: 10/01/2012  
End Date: 04/30/2015  
Reporting period end date: 09/30/2013  
Is this a final report? Yes  No

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IV. Abstract: Achievement of recovery goals for humpback chub requires monitoring six self-sustaining populations in the upper and lower Colorado River basins. In Cataract Canyon, between 2003 and 2005, three pass mark/recapture sampling was conducted to obtain annual point estimates for adult humpback (Badame 2008) and those estimates ranged from 273–468 humpbacks within the canyon. Due to the small size of the population and probable violations of modeling assumptions monitoring is limited to biennial assessments of the annual fall catch rate trend and is ongoing. Annual fall catch rates remain stable and have shown no significant trend over the last 20 years fluctuating between 0.010 and 0.035 fish per hour.

V. Study Schedule: Initial year 2008, ongoing.

VI. Relationship to RIPRAP:

#### GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

V. Monitor populations and habitat and conduct research to support recovery actions (research, monitoring, and data management).

V.A. Measure and document population and habitat parameters to determine status and biological response to recovery actions.

## COLORADO RIVER ACTION PLAN: MAINSTEM

- V. Monitor populations and habitat and conduct research to support recovery actions (research, monitoring, and data management).
- V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions
- V.C.3. Cataract Canyon

### VII. Accomplishments of FY13 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1: Complete one sampling trip in Cataract Canyon in September/October 2013.

Annual sampling was conducted September 30–October 9, 2013 at three long-term trend monitoring sites, at Rapid 12, and one location below the “Big Drop” rapids (Figure 1). Daily mean flows ranged from 6,460–7,140 ft<sup>3</sup>/sec (Figure 2) and water temperatures ranged from 13.5–16.3 °C.

A total of 11 humpback chub were captured in 2013. Two humpback chub were recaptured with original capture dates in 2009 and 2011; changes in total length (4-5% increase in TL) were minimal for both recaptured individuals corresponding with the findings of slow growth rates in Cataract Canyon by Badame (2008). All chub were caught in trammel nets during 508.3 hours of effort resulting in a catch rate of 0.022 humpback chub/net hr (Table 1). Humpback chub trammel net catch rates within Cataract Canyon remain stable and have shown no significant trend over the last 20 years; fluctuating between 0.010 and 0.035 fish per hour (Figure 3).

Electrofishing resulted in capturing no humpback chub during 3.5 hrs of sampling (Table 1). One Colorado pikeminnow (TL=266) and one razorback sucker (TL=360) were captured via electrofishing. Nonnative fishes observed included channel catfish, walleye, gizzard shad and common carp.

Hoop nets were set as a supplemental capture method however no humpback chub were captured during 30 hours of sampling (Table 1). Channel catfish was the only species captured in hoop nets in 2013.

All humpback chub caught by trammel nets were adults (>150 mm) with a mean total length of 236±30 mm. The size structure of adult humpback chub within Cataract Canyon remains narrowly distributed (Figure 4).

Prior to this year’s sampling below the Big Drop rapids (Waterhole), no sites had been sampled below the Big Drops since 2008. No chub were found and due to high site fidelity often observed in humpback chubs it is likely that re-colonization of this recently created habitat would be slow.

A total of 139 fish consisting of 9 species were captured by trammel nets in Cataract Canyon in 2013. No Colorado pikeminnow were captured via trammel nets in 2013. Humpback chub and razorback sucker made up 11% of all fish captured in trammel nets and all native species combined were 18% of the total catch. Humpback chub and channel catfish were the most common native and nonnative species present.

No bonytail were captured in 2013.

Task 2: Data entry

The 2013 data have been entered and quality checked and will be transferred to the UCRRP database manager by January 15, 2014.

Task 3: Annual reporting

An annual progress report summarizing the 2013 data and comparing it with past monitoring efforts will be submitted by Nov 13, 2013.

VIII. Additional Noteworthy Observations: Other native fishes collected during the study include roundtail chub (n=1), flannelmouth sucker (n=4), and bluehead sucker (n=3). Nonnative fishes collected during the study include channel catfish (n=103), common carp (n=5), walleye (n=5) and one black bullhead.

IX. Recommendations:

- Persistent occurrence of humpback chub warrants continued monitoring of distribution and relative abundance via a single sampling pass.
- Continue to employ trammel nets as the primary sampling tool.
- Continue to employ electrofishing to allow collection of YOY and juvenile chub.
- Continue to include suitable habitat below the Big Drop rapids in monitoring.
- Continue to employ baited hoop nets as an additional sampling method in an attempt to increase humpback chub captures.

X. Project Status: On track and ongoing.

XI. FY13 Budget:

A. Funds budgeted:	\$30,607
B. Funds expended/obligated:	\$30,607
C. Difference:	\$ 0
D. Percent FY2011 work completed:	100%
E. Recovery Program funds spent for publication charges:	\$ 0

XII. Status of Data Submission: The 2013 data have been entered and quality checked and will be transferred to the UCRRP database manager by January 15, 2014.

XIII. Signed: Julie Howard      Date: November 13, 2013

XIV. Literature cited:

Badame, P.V. 2008. Population estimates for humpback chub (*Gila cypha*) in Cataract Canyon, Colorado River, Utah, 2003-2005. Final report of Utah Division of Wildlife Resources, Moab Field Station to Upper Colorado River Endangered Fish Recovery Program. Denver, CO.

Table 1. Comparison of methods, years sampled, effort, and catch rates for adult humpback chub (HB,  $\geq 200$  mm TL), bonytail, and juvenile chub (all *Gila spp.*,  $< 200$ mm) for all sites combined, Cataract Canyon, 2003-2013. Total fish caught and effort reported and average calculated for CPUE.

Method	Year	<i>Gila spp.</i>			Effort (hrs or m <sup>2</sup> )	CPUE (fish/hr)		
		# HB	# BT	# Juv.		HB	BT	Juv. Gila
Trammel netting	2003	44	20	0	1375	0.032	0.008	0.000
	2004	43	1	0	1245	0.035	0.001	0.000
	2005	31	5	0	1375	0.022	0.003	0.000
	2008	6	0	0	409	0.015	0.000	0.000
	2009	18	1	0	623	0.029	0.002	0.000
	2010	11	2	0	566.2	0.019	0.004	0.000
	2011	9	0	0	366.8	0.024	0.000	0.000
	2013	11	0	0	508.3	0.022	0.000	0.000
<b>Total/Average</b>		<b>173</b>	<b>29</b>	<b>0</b>	<b>6468</b>	<b>0.025</b>	<b>0.002</b>	<b>0.000</b>
Electrofishing	2003	2	2	0	8.9	0.225	0.225	0.000
	2004	0	0	0	7.5	0.000	0.000	0.000
	2005	0	0	0	8.2	0.000	0.000	0.000
	2008	0	0	0	1.5	0.000	0.000	0.000
	2009	2	0	5	5.5	0.364	0.000	0.909
	2010	0	0	3	4.1	0.000	0.000	0.730
	2011	0	0	0	0	0.000	0.000	0.000
	2013	0	0	0	3.5	0.000	0.000	0.000
<b>Total/Average</b>		<b>4</b>	<b>2</b>	<b>8</b>	<b>39.2</b>	<b>0.074</b>	<b>0.028</b>	<b>0.204</b>
Seine netting	2003	0	0	0	0	0.000	0.000	0.000
	2004	0	0	0	0	0.000	0.000	0.000
	2005	0	0	0	0	0.000	0.000	0.000
	2008	0	0	0	184	0.000	0.000	0.000
	2009	0	0	0	56	0.000	0.000	0.000
	2010	0	0	0	0	0.000	0.000	0.000
	2011	0	0	0	0	0.000	0.000	0.000
	2013	0	0	0	0	0.000	0.000	0.000
<b>Total/Average</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>240</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Minnow trap & Hoop Netting	2003	0	0	0	9.9	0.000	0.000	0.000
	2004	0	0	0	0	0.000	0.000	0.000
	2005	0	0	0	0	0.000	0.000	0.000
	2008	0	0	0	0	0.000	0.000	0.000
	2009	0	0	1	76.5	0.000	0.000	0.013
	2010	0	0	0	0	0.000	0.000	0.000
	2011	0	0	0	0	0.000	0.000	0.000
	2013	0	0	0	30.0	0.000	0.000	0.000
<b>Total/Average</b>		<b>0</b>	<b>0</b>	<b>1</b>	<b>116.4</b>	<b>0.000</b>	<b>0.000</b>	<b>0.002</b>

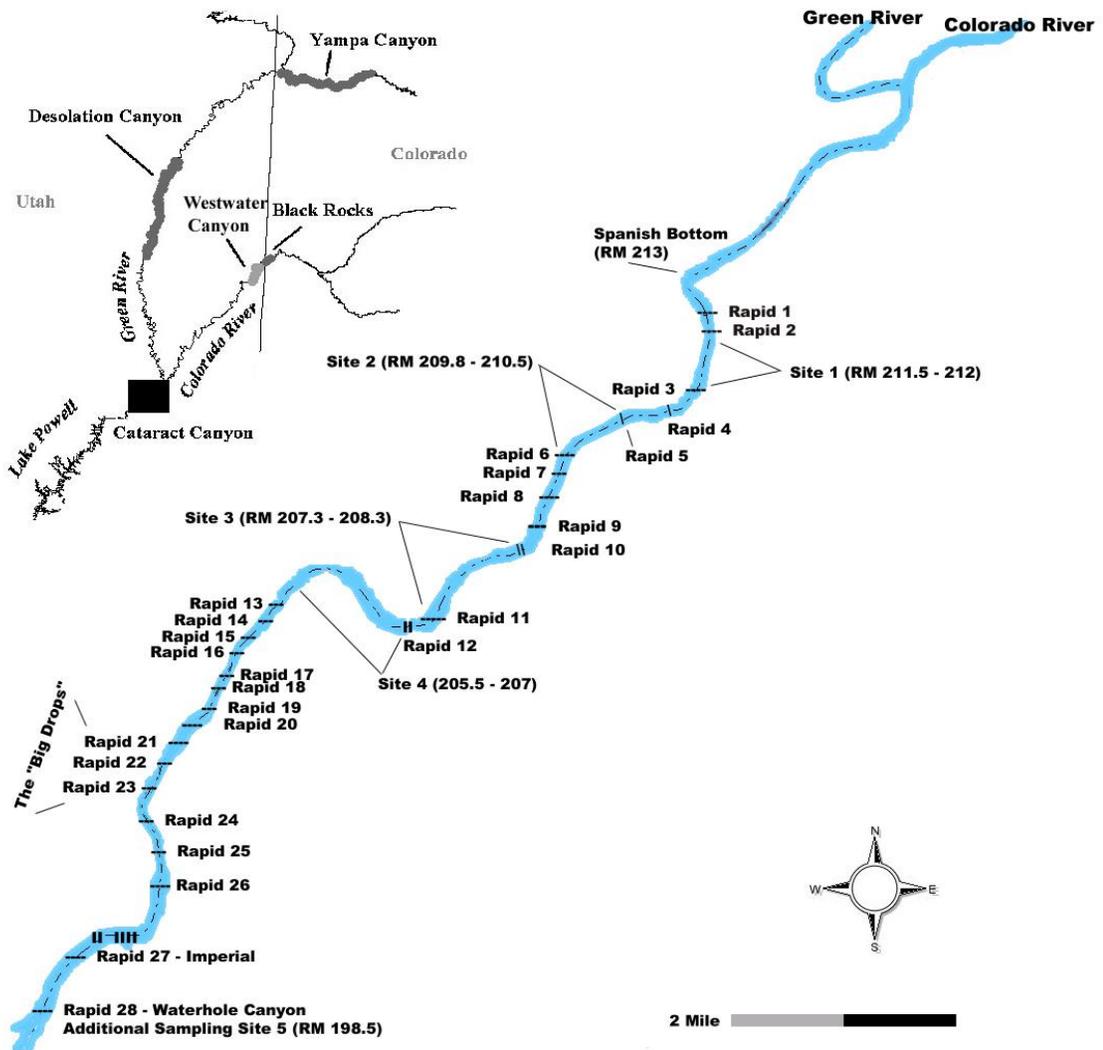


Figure 1. Cataract Canyon map detailing sampling locations during 2003–2013.

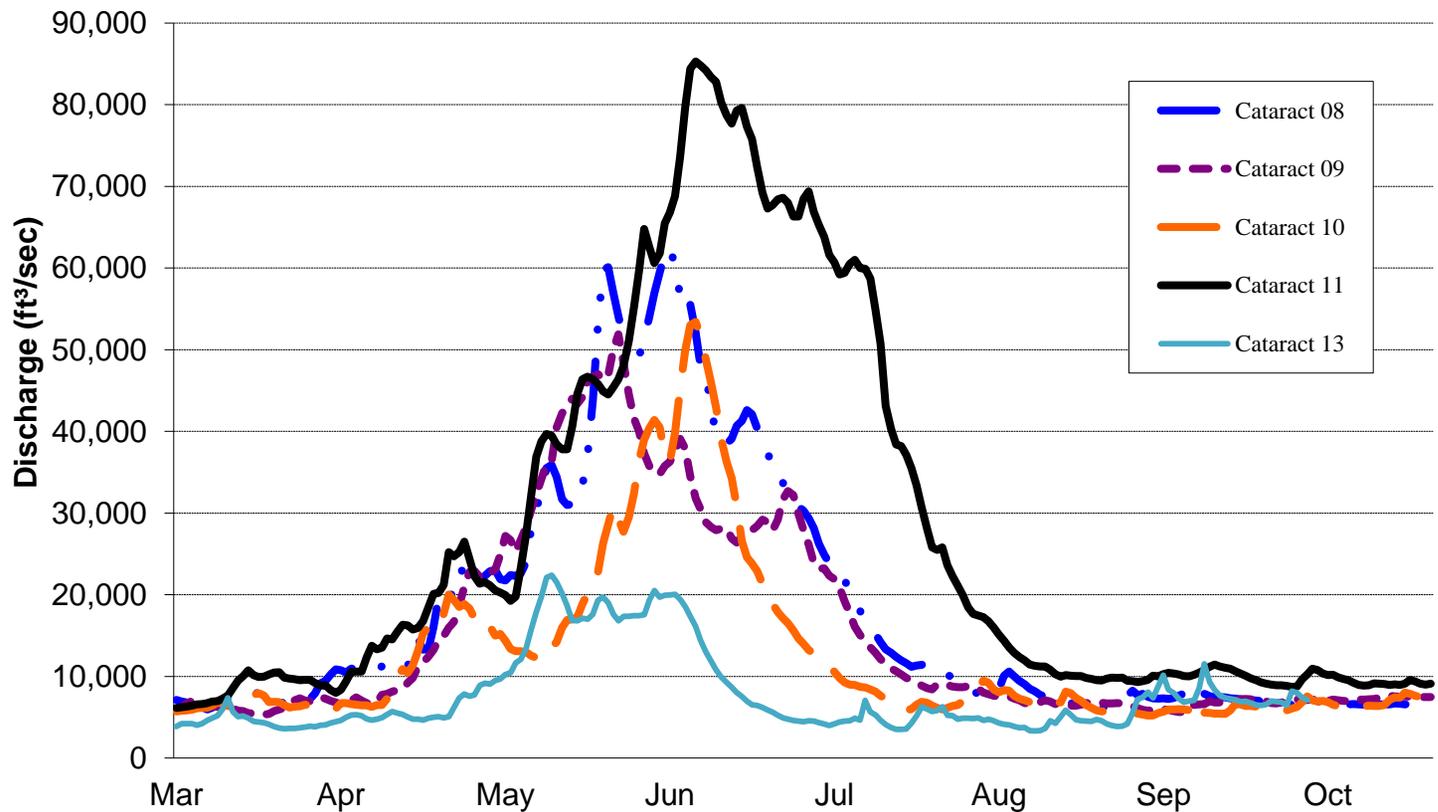


Figure 2. Hydrograph of daily discharge (ft³/sec) for Cataract Canyon 2008–2013. Data compiled from USGS gauge numbers 09315000 and 09180500 on the Green and Colorado respectively.

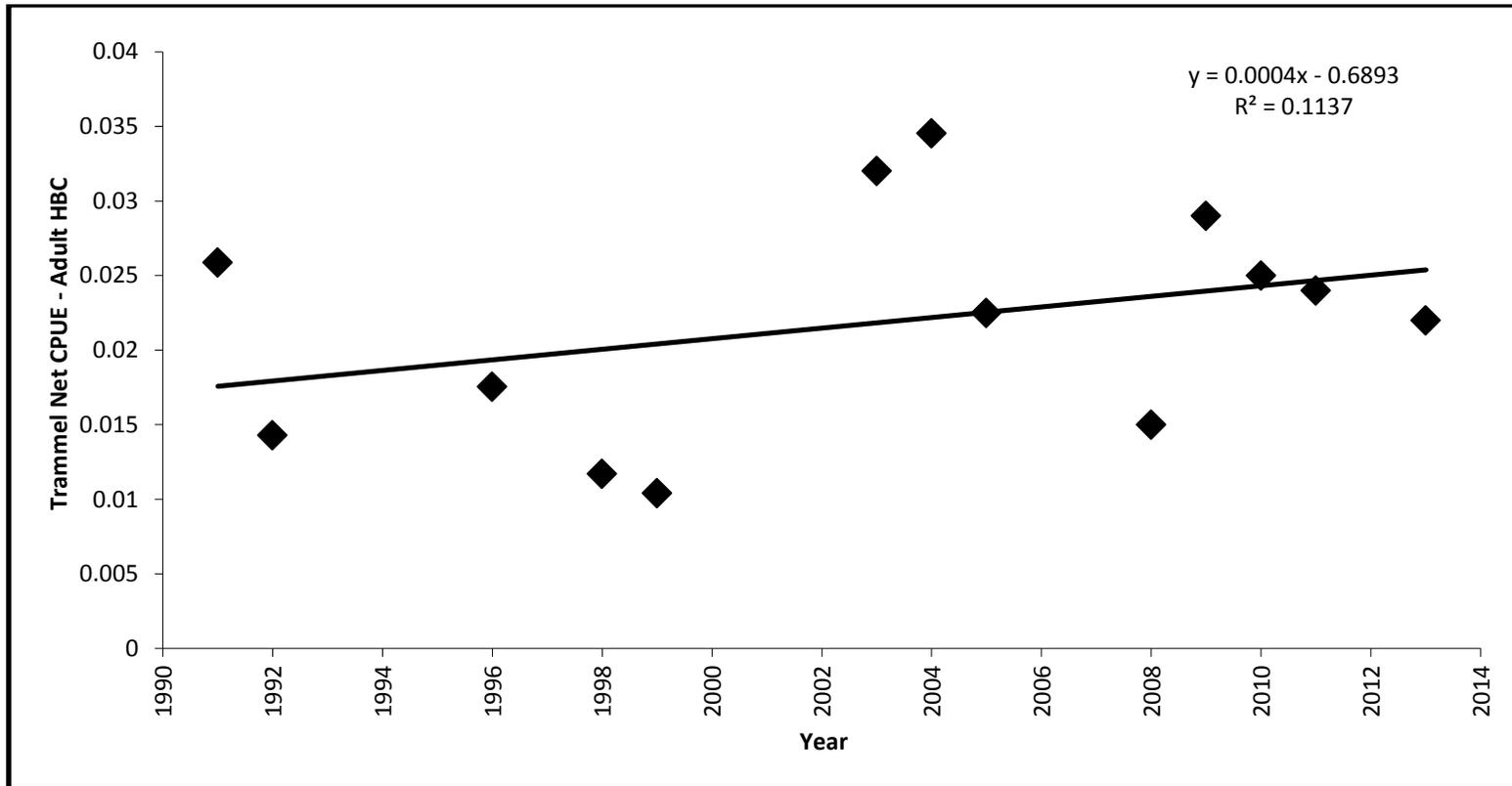


Figure 3. Total catch per unit effort (CPUE) for humpback chub in Cataract Canyon fall collections for all captures between 1991 and 2013.

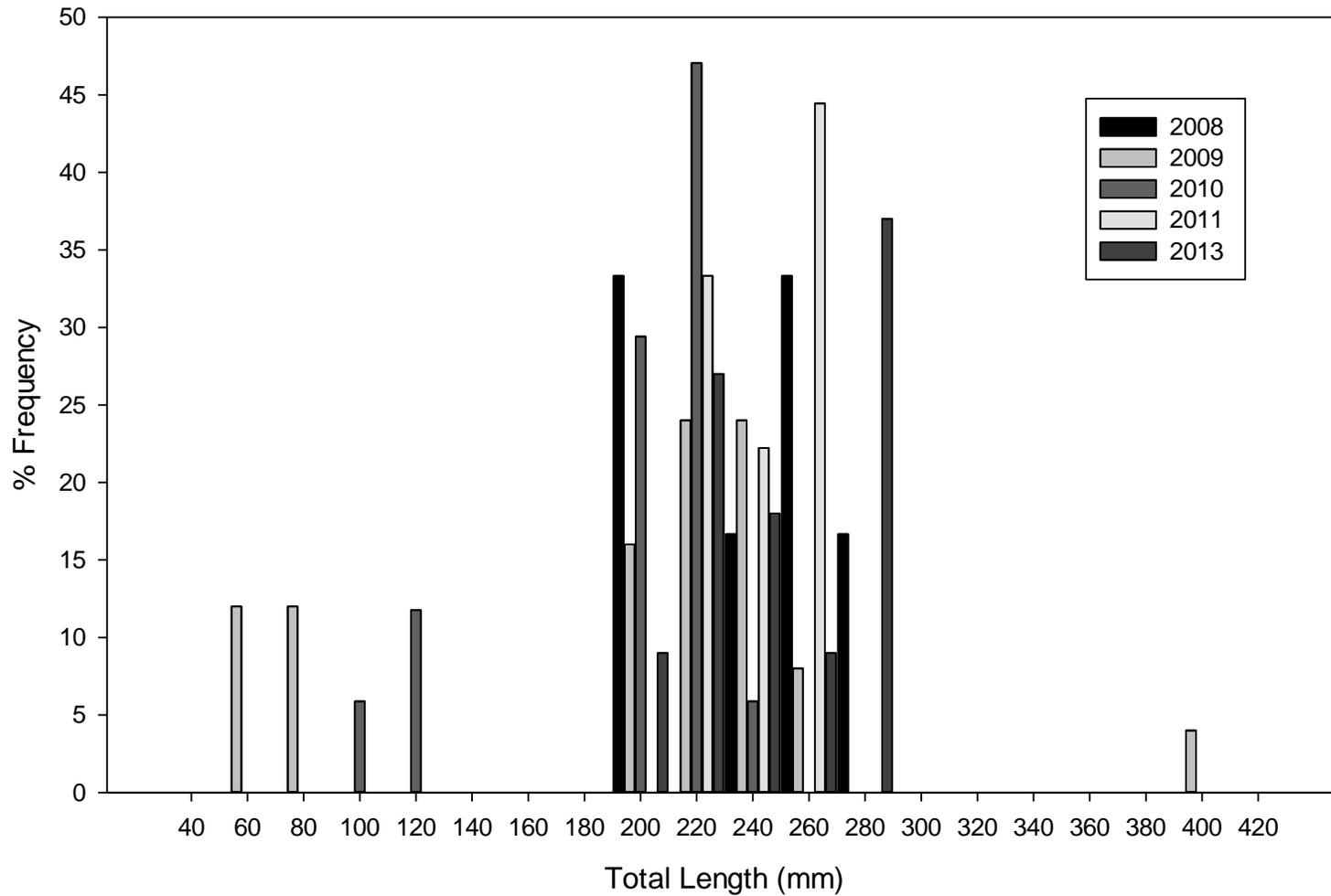


Figure 4. Total length frequency distributions by year for all adult humpback chub (>150mm TL) and juvenile *Gila* (<150mm TL) captured in Cataract Canyon via all sampling methods (2008–2013).