

SPRING CREEK BARRIER MONITORING, 2018



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Background

Native fishes are declining throughout Arizona, primarily due to deleterious interactions with nonnative aquatic species. One tool used to curtail the decline is the construction of stream barriers to impede upstream migration of nonnative fish species. The Bureau of Reclamation (Reclamation) has constructed several barriers on stream sites to protect and conserve endangered and candidate/proposed species including: Loach Minnow *Tiaroga cobitis*, Spikedace *Meda fulgida*, Roundtail Chub *Gila Robusta*, Gila Topminnow *Poeciliopsis occidentalis*, and Gila Chub *Gila Intermedia*, and other aquatic wildlife including amphibians and reptiles. Reclamation is committed to monitoring stream barriers constructed in accordance with requirements related to the Central Arizona Project for a minimum of five years post-construction. The primary purpose of the monitoring is to evaluate the effectiveness of the barriers. Secondly, monitoring will also provide information on the fish/aquatic community of each stream. Funding was provided to the Arizona Fish and Wildlife Conservation Office to monitor barrier effectiveness over a 5 year period. This report details the second year of monitoring on the Spring Creek Barrier (SCB). The Spring Creek barrier was constructed in 2014. The purpose of the barrier is to provide nonnative free habitat for native Gila Chub, Spikedace, and Gila Topminnow.

Methodology

Monitoring upstream and downstream of the barrier was conducted with a Smith-Root model 12 backpack electrofisher. Methods roughly followed Marsh (2014), in which 200 meters (m) of stream was sampled below the barrier and 200 m above the barrier with a single pass of backpack electrofishing. Mesohabitat (number of pools, riffles, and runs) was quantified for each sampling reach. All fish were measured (in millimeters [mm]); nonnative fish found above barriers were enumerated and euthanized. Presence of other native aquatic wildlife such as Lowland Leopard Frog *Lithobates yavapaiensis* or Mexican Garter Snake *Thamnophis eques* were also noted. Target nonnative species (those species large enough to receive PIT tags) below barriers were tagged with 134 kHz PIT tags, and 0.91 m x 0.61 m remote PIT scanners will be deployed above barriers in subsequent years to detect upstream movement of fish past the barrier.

Results

Downstream efforts

Mesohabitat downstream of the barrier was compromised of approximately 100 meter of riffle/plunge pool habitat and 100 m of pool habitat located between a diversion structure and immediately downstream of the barrier. Electrofishing efforts totaled 862 seconds with a total of 89 individuals captured that comprised 39 Gila Chub, 29 Desert Sucker, and 21 Speckled Dace (Table 1). No nonnative fish species were captured.

Upstream efforts

Mesohabitat upstream of the barrier was compromised of approximately 125 m of pool habitat, 25 m of run habitat, and 50 m of riffle habitat. Electrofishing efforts totaled 1,022 seconds with a total of 46 individuals captured that comprised 14 Gila Chub, 6 Desert Sucker, and 26 Speckled Dace (Table 1). No

nonnative fish were captured. Native Lowland Leopard Frog and nonnative Virile Crayfish *Orconectes virilis* were also observed upstream of the barrier.

Table 1. Summary of fish captured in barrier monitoring efforts on Spring Creek, AZ. Site refers to downstream and upstream of the barrier. CPUE refers to Catch Per Second of Electrofishing in 862 and 1,022 seconds for downstream and upstream, respectively. Numbers and parentheses represent the minimum and maximum total lengths (TL) for each species.

	Species	Number Collected	CPUE	Mean TL (mm)
Downstream	Gila Chub	39	0.05	89.62 (52-165)
	Desert Sucker	29	0.03	107.59 (81-155)
	Speckled Dace	21	0.02	60.00 (43-86)
	<i>TOTAL</i>	<i>89</i>	<i>0.10</i>	
Upstream	Gila Chub	14	0.01	99.64 (43-150)
	Desert Sucker	6	0.01	98.33 (55-130)
	Speckled Dace	26	0.03	54.73 (40-84)
	<i>TOTAL</i>	<i>46</i>	<i>0.05</i>	

Population Structure

Mean total length of Gila Chub was 92 mm with the majority of individuals (81%) less than 110 mm (Figure 1). Mean total length of Desert Sucker was 106 mm with the majority of individuals (86%) between 90 and 130 mm (Figure 1). Mean Total Length of Speckled Dace was 57 mm with the majority of the individuals (83%) being between 50 and 70 mm (Figure 1).

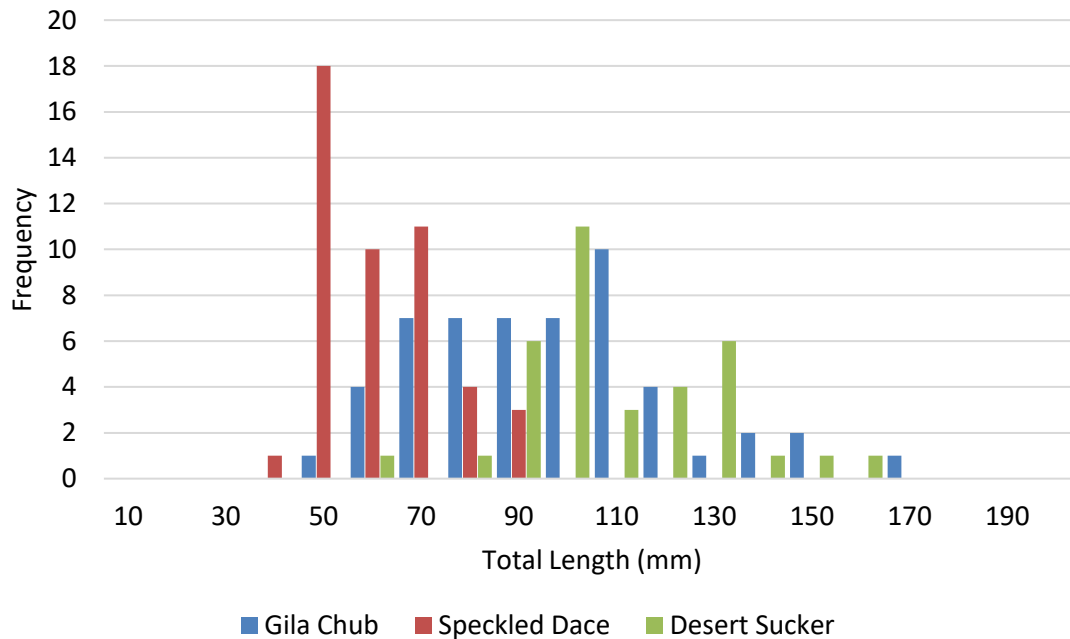


Figure 1. Length-frequency histogram of three fish species captured in barrier monitoring efforts on the West Fork Black River, AZ.

Acknowledgements

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Literature Cited

Marsh, P.C., B.R. Kesner & J.C.G. Marsh. 2014. Blue River fish barrier monitoring. Report, Reclamation Order No. R12PB32035 under BPA No. R10PA32064, Marsh & Associates, Tempe, Arizona. 14 pages.