

WEST FORK BLACK RIVER BARRIER MONITORING, 2017



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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*, 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. Secondarily, 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 first year of monitoring on the West Fork Black River (WFB). Constructed in May 2016, the barrier on the WFB is located 0.6 kilometers above the confluence with the East Fork Black River. The purpose of the barrier is provide nonnative free habitat for native Apache Trout *Oncorhynchus apache* and Loach Minnow among other native species. The waters above the barrier have yet to be renovated of nonnative fish, but a baseline survey is important in establishing the fish community structure pre and post renovation both upstream and downstream of the barrier.

Methodology

Monitoring upstream and downstream of the barrier was conducted with a Smith-Root type 24A backpack electrofisher and baited hoop nets (50-60 cm diameter, 100 cm long, a single 10 cm throat, 6 mm nylon mesh netting). Methods roughly followed Marsh (2014), in which 200 meters (m) of stream was sampled below each barrier and 200 m above each barrier with a single pass of backpack electrofishing. Mesohabitat (number of pools, riffles, and runs) was quantified for each sampling reach. Five baited hoop nets were deployed overnight in a large pool immediately upstream of the barrier. All fish were measured (in millimeters [mm]) with the exception of Speckled Dace in which they were enumerated after measuring the first 20; nonnative fish found above barriers were enumerated and euthanized. Presence of other native aquatic wildlife such as Lowland Leopard Frog *Lithobates yavapaiensis* or Narrow-headed Garter Snake *Thamnophis rufipunctatus* 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 for the 200 m downstream transect was predominately comprised of riffle habitat with the exception of the final 10 m immediately downstream of the barrier being comprised of deep pool habitat. Electrofishing efforts totaled 2704 seconds with a total of 25 Brown Trout *Salmo trutta*, 40

Speckled Dace *Rhinichthys osculus*, one Apache Trout *Oncorhynchus apache* (Photo 1) and seven Desert Sucker *Pantosteus clarki* being captured (Table 1). All Brown Trout were PIT tagged and released back into the water alive (Appendix).



Photo 1. Apache trout *Oncorhynchus apache* captured below the barrier.

Upstream efforts

The 200 m upstream transect began at the top of the large (100 m) pool immediately upstream of the barrier. Hoop nets were deployed in the pool in lieu of electrofishing it. The entire 200 m was comprised of riffle habitat.

Electrofishing efforts totaled 1533 seconds with a total of one brown trout, 102 speckled dace, and six desert sucker being captured (Table 1). The five hoop nets placed in the large pool captured no fish and 32 nonnative Virile Crayfish *Orconectes virilis*.

Table 1. Summary of fish captured in barrier monitoring efforts on the West Fork Black River, AZ. Site refers to downstream and upstream of the barrier. CPUE refers to Catch Per Second of Electrofishing in 2704 and 1533 seconds for downstream and upstream, respectively.

Site	Species	Number Collected	CPUE	Mean TL (range [mm])
Downstream	Apache Trout	1	0.001	191 (191-191)
	Desert Sucker	7	0.003	116 (50-240)
	Speckled Dace	40	0.015	69 (41-98)
	Brown Trout	25	0.009	220 (112-410)
	Total	73	0.027	-
Upstream	Desert Sucker	6	0.004	39 (29-51)
	Speckled Dace	102	0.067	61 (31-95)
	Brown Trout	1	0.001	266 (266-266)
	Total	109	0.071	-

Population Structure

The Apache Trout measured 191 mm and was missing both pectoral fins indicating it was potentially of hatchery origin (Photo 1). Mean total length of Brown Trout was 221 mm with several large individuals greater than 250 mm (Figure 1). Mean total length of Desert Sucker was 80 mm with few adults over 100 mm and only one large adult over 200 mm (Photo 2) with the majority of the individuals being young of year and sub-adults less than 100 mm (Figure 1). Mean Total Length of Speckled Dace was 65 mm with the majority of the individuals being 50-100 mm (Figure 1).



Photo 2. Desert sucker *Pantosteus clarki* captured below the West Fork Black River Barrier.

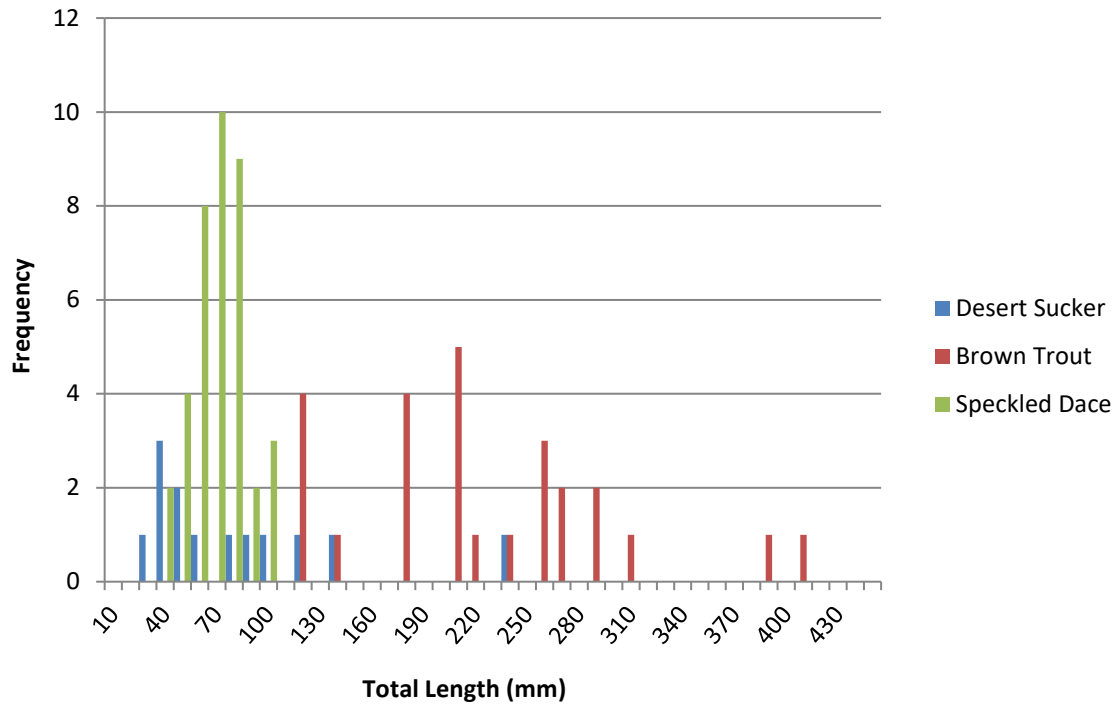


Figure 1. Length-frequency histogram of three fish species captured in barrier monitoring efforts on the West Fork Black River, AZ.

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.

Appendix. List of PIT Tags inserted into Brown Trout *Salmo trutta* below the West Fork Black River Barrier.

TL(MM)	PIT Tag Number
262	3DD.003C0228C0
282	3DD.003C0228D9
260	3DD.003C0228C3
233	3DD.003C0228BC
208	3DD.003C022895
171	3DD.003C0228C1
202	3DD.003C0228D6
204	3DD.003C0228A7
180	3DD.003C02288E
180	3DD.003C022885
204	3DD.003C02289A
120	3DD.003C0228CF
178	3DD.003C0228B8
112	3DD.003C0228C9
115	3DD.003C0228E0
137	3DD.003C0228BD
120	3DD.003C0228BA
305	3DD.003C0228CB
385	3DD.003C0228B2
208	3DD.003C0228AB
288	3DD.003C0228D5
260	3DD.003C022886
410	3DD.003C0228B9
256	3DD.003C0228B5