

Arizona Game and Fish Department

Region III Fisheries Program

Verde River: Perkinsville-Sycamore Creek Fish Survey Report

July-August 2019

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Executive Summary

On July 16-18, 2019 the Region III Fisheries Program led a fisheries community survey of a 12.5-mile section of the upper Verde River. The section started at approximately 1.5 miles down-stream of the Perkinsville Bridge and ended at the Sycamore Creek confluence. A total of 2,843 fish, representing eleven species were sampled. Eighty-one percent of the sample was native fish. Desert Sucker represented 24% of the sample followed Sonora Sucker (22%), Roundtail Chub (21%) and Speckled Dace with 14%. Redeye Bass were the most abundant non-native fish sampled with 15% of the sample.

Introduction

The Verde River begins below the Sullivan Lake Dam, near Paulden, and flows for 125 miles (201 Km) through private, state, tribal and United States Forrest Service lands before reaching the dam at Horseshoe Lake. The Verde River meets the Salt River near the community of Fountain Hills which is east of Phoenix. The purpose was to continue monitoring species occurrence and abundance of the upper Verde River in compliance with statewide protocol standards. This survey will serve as a comparison to similar surveys done in previous years on the same stretch of river.

Methods

A Smith-Root canoe mounted electrofishing unit with a single sphere anode and four cathode tails were used throughout the entire survey. A deadman switch was operated by hand on top of the generator as the canoe was maneuvered in and around available habitats. One individual operated a deadman switch and canoe. Netters were primarily positioned downstream of the canoe, collecting all fish possible. In areas where this was not effective or safe, the electrofishing unit was operated from inside the canoes and followed or mirrored by the remaining support canoes. Seventy-four percent of the 2,200 meters of sample area were sampled from outside the canoes and 26% from inside the canoes. One of the eleven sites was floated 100% of the 200 meters. In 2005, AZGFD standardized the site lengths to 200-meter sections randomly selected over the reach being sampled. This was done to avoid some sites being over 400-meters long and others only being 180-meters. Random sites were generated using Expert GPS and a random number generating program in order to minimize sampling bias. The standardized lengths, while still retaining enough length to incorporate multiple habitat types, seemed to address the human and physical limitations of the surveys better.

Results

The Perkinsville to Sycamore Creek electrofishing site map is represented in Figure 1. Total trip hours were estimated to be 19 hours with a total distance traveled at 11.5 miles (Table 1). A total of 11 sites, three of which were fixed, were surveyed within this section of the Verde River (Table 2). A combined 2,295 native fish were sampled compared to 548 non-native fish. Native fish accounted for 81% of the total sample (Table 3). The catch per unit effort (fish/15minutes) of native fishes were 35.3 for Speckled Dace *Rhinichthys osculus*, 52.0 for Roundtail Chub *Gila robusta*, 54.1 for Sonora Sucker *Catostomus insignis*, and 58.8 for Desert Sucker *Pantosteus clarkii*

(Table 3). Redeye Bass *Micropterus coosae* was the most abundant non-native species with a CPUE of 36.28 followed by Red Shiner *Cyprinella lutrensis* 6.9, Yellow Bullhead *Ameiurus natalis* 2.4, Fathead Minnow *Pimephales promelas* 1.5, Green Sunfish *Lepomis cyanellus* .5, Common Carp *Cyprinus carpio* .2, and Black Bullhead *Ameiurus melas* .1 (Table 3). Redeye Bass, Sonora Sucker and Roundtail Chub were the only species sampled at all eleven sample sites (Table 4). Small bodied fish (<66 millimeters) accounted for 91% of the total sample (Figure 2).

Discussion

The Verde River fishery is directly related to the natural flow regime over any given amount of time. High flow events decrease non-native fish species allowing native fish species to increase (Poff and Allen 1995). This year native fish accounted for 81% of the total sample which is an increase of 59% over the 2016 survey on the same section of the Verde River and represents a 5% increase over 2010's 76% of the total catch. Fortunately changes in the fish community can occur rapidly based on data AZGFD has collected over the past 15 years (Verde River Survey Reports 2004-2019) and what Rinne and Stefferud (1998) and Propst et. al. (2008) suggested in their study of abiotic and biotic factors on the fish community in the Verde River.

Recommendations

The Verde River Watershed Management Plan is completed and outlined in the plan are strategies to address management challenges the Department currently faces on the upper Verde. Fish population monitoring according to the standardized protocol procedures, performed every three years, will continue to provide adequate data for management purposes.

Literature cited

- Poff, N.L., and Allen. 1995. Functional organization of stream fish assemblages in relation to hydrological variability. *Ecology* 76:606-627.
- Propst, D.L., K.B. Gido, and J.A. Stefferud. 2008. Natural flow regimes, nonnative fishes, and native fish persistence in arid-land river systems. *Ecological Applications* 18:1236-1252.
- Rinne, J.N., and J.A. Stefferud. 1998. Verde River Native Fishes; The impacts of abiotic and biotic factors. Final report for Heritage Project 196002

Acknowledgments

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Figures

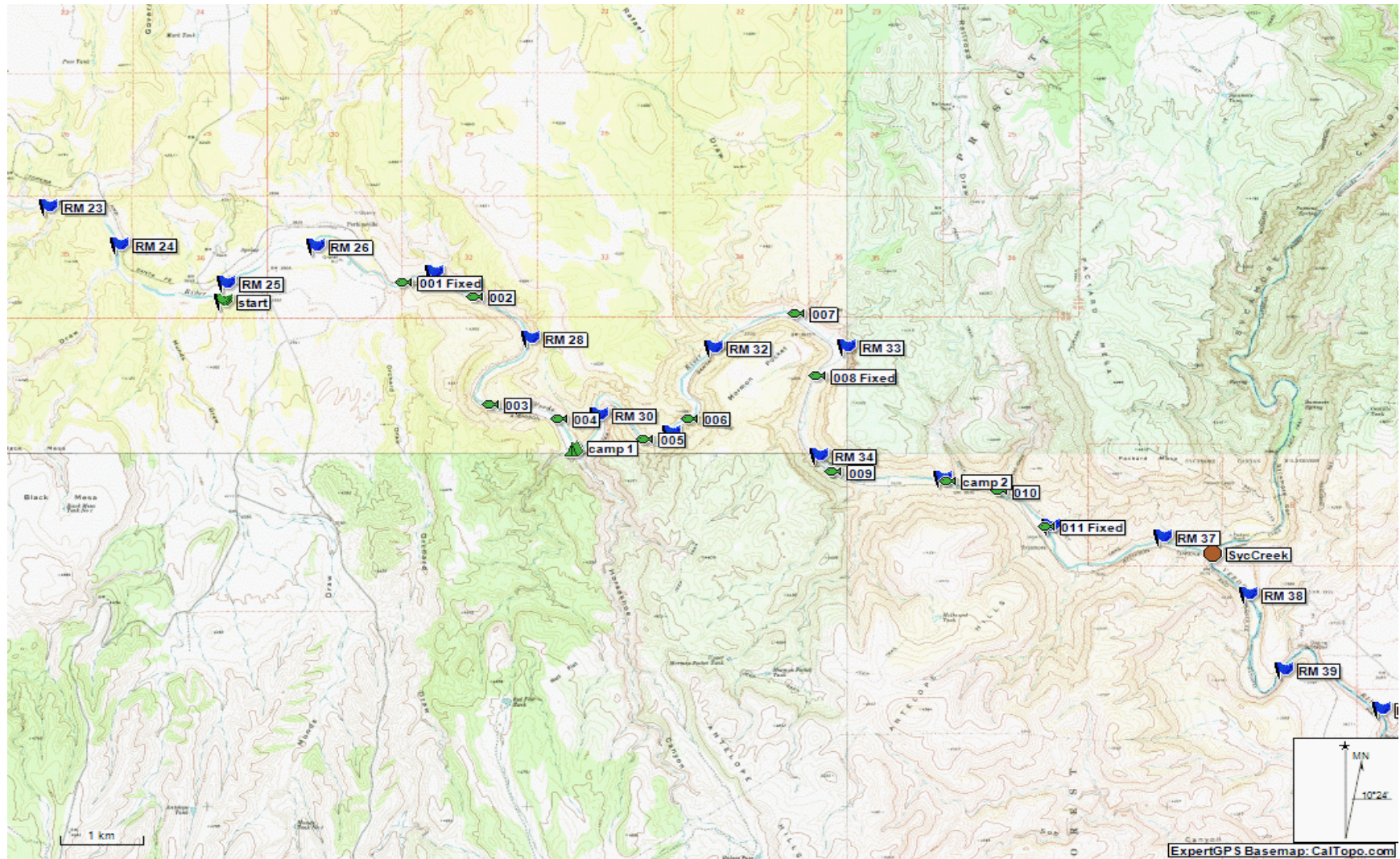


Figure 1. Map of electrofishing sites of the Perkinsville to Sycamore Creek section of the upper Verde River surveyed July 30-August 1, 2019.

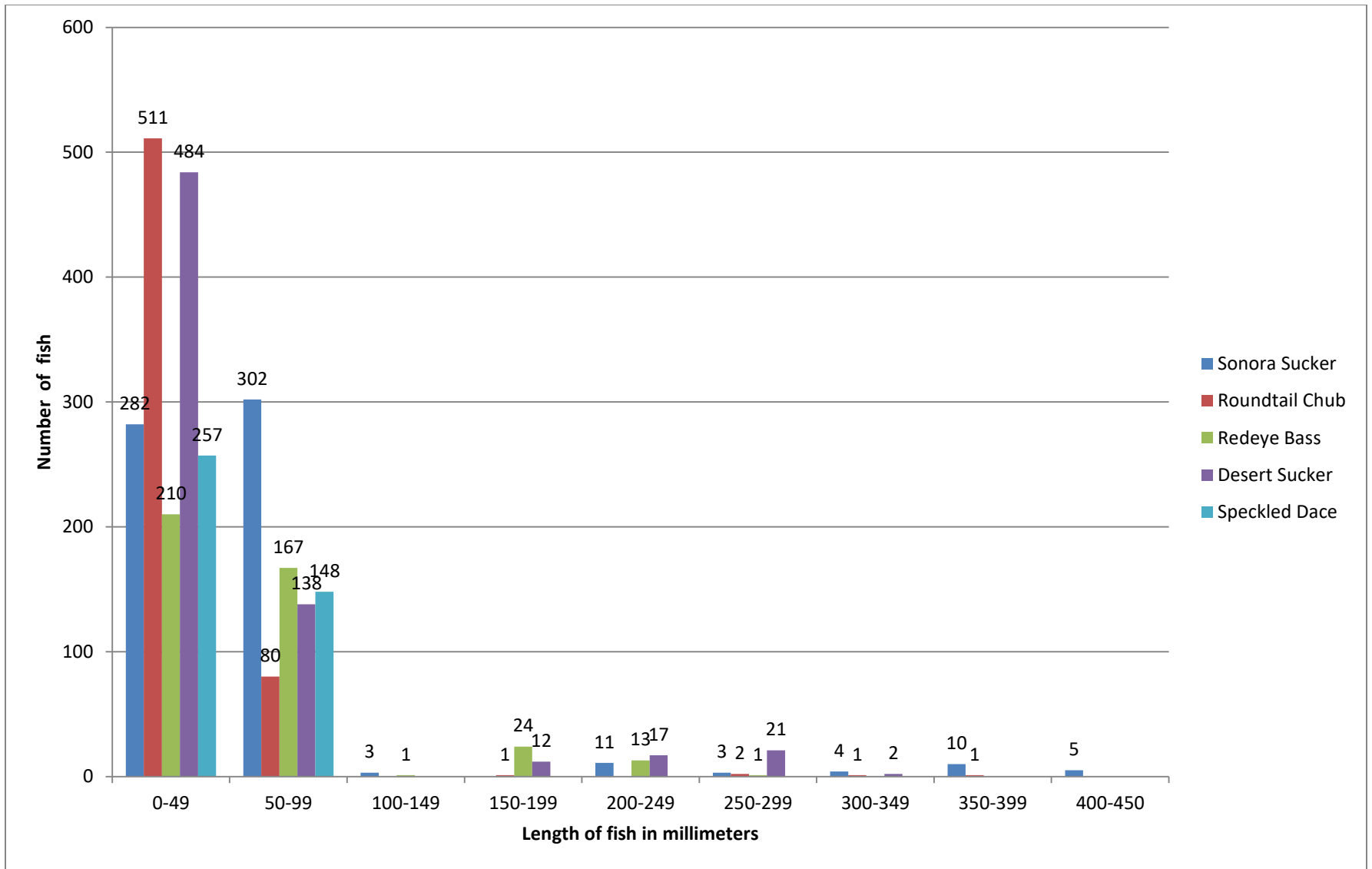


Figure 2. Length frequency of selected species sampled electrofishing the Perkinsville to Sycamore Creek section of the upper Verde River on July 30-August 1, 2019.

Tables

Table 1. Summary of number of survey hours, number of survey sites, total fish per day and daily sampling effort (minutes) for each survey day from Perkinsville to Sycamore Creek section of the upper Verde River surveyed on July 30-August 1, 2019. (Note: hours reflect actual float time and do not include vehicle shuttle, load and unload time)

Date	Trip Hours	Distance traveled (approximate miles)	Number of Sample Sites	Total Fish	Total Sampling Effort (minutes)
7/30/2019	8	4.5	4	1195	64
7/31/2019	8	5.5	5	1167	77.5
8/1/2019	4	2.5	2	481	29.7
Total	20	12.5	11	2843	171.2

Table 2. Site number with associated waypoint and approximate river mile for sites sampled electrofishing on the upper Verde River, Perkinsville to Sycamore Creek on July 30-August 1, 2019. (See Figure 1).

Site Number	Approximate River Mile	Date
1 Fixed	26.7	7/30/2019
2	27.4	7/30/2019
3	28.5	7/30/2019
4	29.3	7/30/2019
5	30.8	7/31/2019
6	31.2	7/31/2019
7	32.6	7/31/2019
8 Fixed	33.4	7/31/2019
9	34.2	7/31/2019
10	35	8/1/2019
11 Fixed	36.2	8/1/2019

Table 3. Number sampled, percent of total sample, CPUE (catch per 15 minutes) and Standard Error of all species sampled electrofishing on upper Verde River survey, Perkinsville to Sycamore Creek July 30-August 1, 2019.

Species	Number Sampled	Percent of Total	CPUE	Standard Error
Black Bullhead	1	0	0.09	0.09
Yellow Bullhead	27	1	2.35	1.54
Sonora Sucker	620	22	54.07	17.87
Common Carp	2	0	0.17	0.17
Red Shiner	79	3	6.89	3.16
Roundtail Chub	596	21	51.98	19.19
Green Sunfish	6	0	0.52	0.20
Redeye Bass	416	15	36.28	7.64
Desert Sucker	674	24	58.78	22.92
Fathead Minnow	17	1	1.48	1.06
Flathead Catfish	405	14	35.32	20.84

Table 4. Total number of fish sampled and species composition for each site electrofishing on the upper Verde River survey, Perkinsville to Sycamore Creek July 30-August 1, 2019 (All sites 200 meters in length).

Site	Minutes	Black Bullhead	%	Yellow Bullhead	%	Sonora Sucker	%	Common Carp	%	Red Shiner	%	Roundtail Chub	%	Green Sunfish	%	Redeye Bass	%	Desert Sucker	%	Fathead Minnow	%	Speckled Dace	%	Site Total	Relative Abundance (CPUE)
1	19.1	0	0	0	0	87	20	0	0	0	0	6	1	1	0	26	6	182	42	0	0	135	31	437	343.2
2	15.4	0	0	18	0	222	38	0	0	11	2	8	1	1	0	39	7	71	12	0	0	219	37	589	573.7
3F	18.9	0	0	5	4	20	17	0	0	12	10	8	7	0	0	24	20	20	17	1	1	31	26	121	96.0
4	10.6	0	0	0	0	11	23	0	0	11	23	1	2	2	4	11	23	5	10	4	8	3	6	48	67.9
5	13.4	1	1	0	0	24	22	2	2	37	34	1	1	1	1	14	13	0	0	12	11	17	16	109	122
6	11.1	0	0	1	7	3	20	0	0	3	20	4	27	1	7	3	20	0	0	0	0	0	0	15	20.3
7	22.7	0	0	2	0	10	2	0	0	0	0	110	27	0	0	93	23	190	47	0	0	0	0	405	267.6
8F	14.5	0	0	0	0	43	9	0	0	1	0	196	41	0	0	63	13	172	36	0	0	0	0	475	491.4
9	15.8	0	0	0	0	57	35	0	0	1	1	41	25	0	0	41	25	23	14	0	0	0	0	163	154.7
10	16.8	0	0	1	0	61	26	0	0	3	1	106	44	0	0	61	26	7	3	0	0	0	0	239	213.4
11F	12.9	0	0	0	0	82	34	0	0	0	0	115	48	0	0	41	17	4	2	0	0	0	0	242	281.4
Total=	171	1	0	27	1	620	22	2	0	79	3	596	21	6	0	416	15	674	24	17	1	405	14	2843	249.1