WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Baraboo River Hoop Net Survey

Columbia County, Wisconsin 2021

Photo credit: Wisconsin DNR

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Executive Summary

Channel catfish and flathead catfish are two popular species targeted by Wisconsin anglers. Due to the popularity of catfish species, the Wisconsin Department of Natural Resources (DNR) monitors channel and flathead catfish populations within Columbia and Sauk counties using baited hoop net surveys on the lower Baraboo River and Wisconsin River at Wisconsin Dells, Pine Island and Prairie du Sac on a 4-year rotational basis. Channel catfish abundance on the lower Baraboo River has remained consistent from 2013-2021, while size structure has slightly increased. When compared to recent surveys on the Wisconsin River, the Baraboo River has lower channel catfish abundances. Channel catfish may use the Baraboo River more for spawning migrations in spring and early summer and return to the Wisconsin River for the remainder of the year.

Introduction

The Baraboo River flows for 120 miles and begins as a cold-water stream in Monroe County just west of the village of Kendall near the intersection of County Highway V and Midway Avenue. As the Baraboo River flows south it transitions from a coldwater Class II trout stream in Monroe, Juneau and Sauk counties to a warmwater river that supports multiple gamefish species such as channel catfish in Sauk and Columbia counties. The Baraboo River enters the Wisconsin River approximately 4 miles south of Portage, WI.

Historically there were seven dams located along the Baraboo River with the last removed in 2001. The removal of these dams allows the migration to spawning habitats for many different fish species.

The Wisconsin Department of Natural Resources (DNR) conducted a post spawn baited hoop net survey on the lower stretch of the Baraboo River for catfish species in August 2021. The goal of this survey was to determine the relative abundance and size structure for channel catfish and flathead catfish populations.

PUBLIC ACCESS

Public access points are limited within in the survey area. Access to the lower stretch of the Baraboo River can be had by the Thunderbird Drive boat landing on the Wisconsin River approximately 0.7 miles downstream or the Dekorra Park boat landing approximately 2.5 miles downstream of the confluence with the Baraboo River. The nearest boat landing to the survey area on the Baraboo River is the Luebke boat landing off County Highway W in Sauk County. The most popular shore fishing locations on the Baraboo River in Sauk County are found within the city of Baraboo where anglers can catch a variety of gamefish species like smallmouth bass, sauger, walleye and channel catfish. The Baraboo River Waterfowl Production Area also

provides unique opportunities to explore floodplains and wetlands for fishing or hunting locations.

SURVEY LOCATION

In 2021, a baited hoop net survey was conducted on a 5-mile section of the Baraboo River from the County Highway U bridge downstream to the confluence with the Wisconsin River (Figure 1). The Baraboo River within the survey area is shallow with average depths of 3 to 4 feet and the substrate is mainly composed of sand and silt. River bends have an average depth of 5 to 6 feet with a maximum depth of 10 feet in deep scour holes created by large woody debris. Turbid water and fallen trees make navigation in this section of the Baraboo River very difficult. Large pieces of wood, tree roots and undercut banks within the river provide optimal habitat for catfish species. The riparian area along this section of the Baraboo River features side channels, oxbow lakes, wetland complexes, flooded woodlands and agricultural fields.

FISH ASSEMBLAGE

Gamefish sampled during this survey include black crappie, bluegill, channel catfish, flathead catfish, pumpkinseed, rock bass, sauger, smallmouth bass, walleye and white crappie. Other non-gamefish species collected include common carp, freshwater drum, golden redhorse and shorthead redhorse.

Methods

Catfish species were targeted within the Baraboo River by performing a baited hoop net survey following standard procedures listed in the Wisconsin DNR fish management handbook (Simonson 2015). Hoop nets were set in the end of July to early August and typically sampled every 48 hours with a few exceptions for the survey. Sample dates for the survey can be found in Table 1. This survey used hoop nets with 42-inch fiberglass hoops and 1-inch mesh made of nylon.

A total of ten nets in fourteen different locations were set during this survey. Several nets were moved to new locations to improve catches. Hoop nets were set parallel with the shoreline having the cod end pointing upstream and the mouth facing downstream. Nets were set near optimal catfish habitat in deep runs, above pools or near woody debris to maximize catfish catch rates. Refer to Table 2 for net locations. The cod end of each net was secured by embedding a long stake into the substrate with 50 feet of line running from the stake to the net. The downstream end of each net was secured to the river bottom by a cinderblock anchor with 50 feet of line running from the anchor to the open end of the net. Net retrieval was completed by throwing a grapple hook perpendicular to the anchor rope on the downstream end of each net. Once the anchor rope was caught with the grapple hook, it was carefully pulled up to continue working towards the upstream end of each net hoop by hoop.

Nets were baited by placing roughly 2 pounds of pressed soy cake into a 1/8-inch mesh bag or a bar of Zote soap. Bait was checked and replaced every 48 hours.

Catfish species were measured to the nearest tenth of an inch and weight measurements were taken in grams which was later converted to pounds. All other gamefish had lengths recorded while all non-gamefish were only counted. Top caudal fin clips were given to each channel catfish. This method allowed staff to detect recaptured fish from previous sampling efforts.

Results

A total of 117 channel catfish were sampled during 100 net nights which resulted in a catch per net night of 1.2 channel catfish. The average length of channel catfish collected was 18.1 inches with sizes varying from 5.8 inches to 33.4 inches (Figure 2). The average weight of channel catfish collected was 4.5 pounds with a maximum weight of 17.3 pounds. Channel catfish that were 16 inches or greater (quality size) made up 64% of the total number of channel catfish sampled. However less than 100 stock size fish (11 inches) were sampled which prevented calculation of meaningful PSD values.

A total of 5 flathead catfish were sampled during 100 net nights which resulted in a catch per net night of 0.05 flathead catfish. The average length of flathead catfish collected was 18.2 inches with sizes varying from 13.1 inches to 31.5 inches (Figure 5). The average weight of flathead catfish collected was 6.0 pounds with a maximum weight of 16.9 pounds.

Multiple other gamefish and panfish species were found, in order of abundance, including bluegill (17), black crappie (11), walleye (3), smallmouth bass (2), pumpkinseed x bluegill (1), rock bass (1), sauger (1), and white crappie (1). The survey also found a few non-game species including common carp (9), freshwater drum (7), shorthead redhorse (3) and golden redhorse (1). Hoop nets are made to specifically target catfish species so lower abundances of other gamefish species does not necessarily reflect a low population. Electrofishing is a much more effective method to collect gamefish species commonly found in rivers such as walleye, smallmouth bass and panfish.

Discussion

In 2013 and 2017 the DNR performed similar hoop netting surveys on the same stretch of the Baraboo River. Fisheries Management staff set 10 hoop nets for 10 nights in 2013 and 11 nights in 2017. In 2013 a total of 132 channel catfish were collected with a catch per net night of 1.3 channel catfish. The 2013 survey found that channel catfish had an average length of 18 inches with sizes ranging from 7.1 to 29.5 inches (Figure 4). In 2017 a total of 93 channel catfish were collected with a catch per net night of 0.9

channel catfish. The 2017 survey found that channel catfish had an average length of 22.6 inches with sizes ranging from 8.6 to 32.4 inches (Figure 3).

In 2021, the number of channel catfish sampled increased by 20% when compared to the previous survey in 2017. However, in general, catch rates of channel catfish remained similar in 2013, 2017 and 2021 (Table 3). The 2017 hoop net survey lacked the juvenile fish <12" compared to the 2013 and 2021 surveys. When compared to the 10-year statewide average catch per net night from 2010 to 2019 of 8.7 channel catfish, the Baraboo River in 2021 ranks low with a catch rate of 1.2 channel catfish per net night. When compared to other local rivers such as the Wisconsin River, channel catfish abundances in the Baraboo River are low, although CPUE is similar to the nearest reach on the Wisconsin River at Pine Island (Table 4).

Although the 2013, 2017, and 2021 surveys seem to indicate low abundance of flathead catfish, the method used (baited hoop nets) is best suited for catching channel catfish, and other methods such as low-pulse electrofishing, SCUBA surveys, and unbaited hoop nets set during early spring migration runs typically produce better catches of flathead catfish.

CHANNEL CATFISH MOVEMENT PATTERNS

According to Becker (1983), a preliminary tagging study in the lower Wisconsin River indicated a general downstream movement of channel catfish into the Mississippi River during late summer and autumn and an upstream spawning run into the Wisconsin River during the latter part of May and early June. Also, Catalano (2002) stated lotic species such as channel catfish make seasonal migrations for spawning, establishing summer home ranges and for over-wintering. It's plausible that channel catfish may move upstream into the Baraboo River during spring and early summer to spawn and return to the Wisconsin River in late summer and autumn resulting in lower catch rates in the Baraboo River.

Management Recommendations

The Baraboo River has multiple year classes of channel catfish which suggest that no management changes are necessary. The statewide regulation for general inland waters of 10 channel catfish/flathead catfish per day with no minimum length limit should remain in effect on the Baraboo River (Table 6). DNR is scheduled to continue to monitor catfish populations in the Baraboo River on a 4-year rotation basis and will return to perform another hoop net survey on the Baraboo River in the future. However, future hoop net survey rotations on the Baraboo River may be altered due to budget limitations or the need to conduct catfish surveys on waters not currently part of the area's sampling rotation such as the upper Fox River and other segments of the Baraboo River.

Acknowledgements

Data collection for these surveys was completed by DNR staff Nathan Nye, Clayton Roberts and Casey Weber. Nathan Nye and Tim Simonson provided feedback and edits for this report.

If you have questions or comments about this report, please contact Fisheries Biologist Casey Weber or Team Supervisor Nathan Nye.

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References

Becker, G. C. 1983. Fishes of Wisconsin. The University of Wisconsin Press. Madison, Wisconsin.

Catalano, M. J. 2002. Evaluating Fish-Habitat Relations, Fish Distribution, and Effects of Dam Removal in the Baraboo River, Wisconsin. University of Wisconsin-Stevens Point. Stevens Point, Wisconsin.

Simonson, T. 2015. Surveys and Investigations – Inland Fisheries Surveys. Fish Management Handbook Chapter 510, Wisconsin Department of Natural Resources internal publication. Madison, Wisconsin.

Figures

Figure 1. 2021 catfish species survey area and hoop netting locations on the Lower Baraboo River. Blue dots represent net locations 1-14. (Table 2).

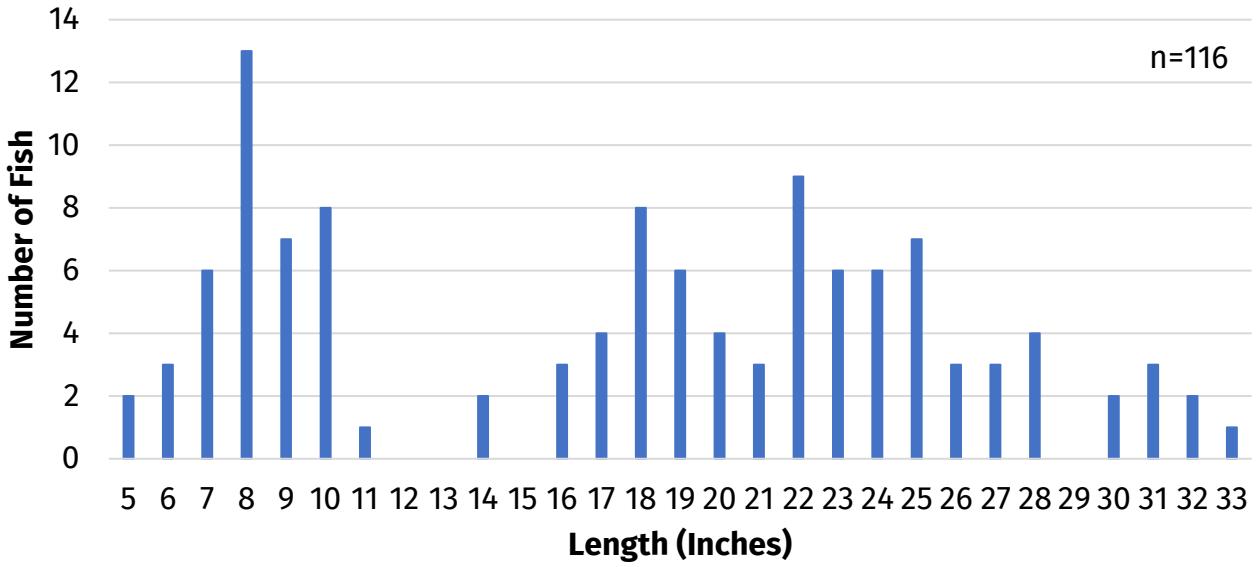

Figure 2. Length frequency distribution of channel catfish surveyed during the 2021 baited hoop net survey on the lower Baraboo River.

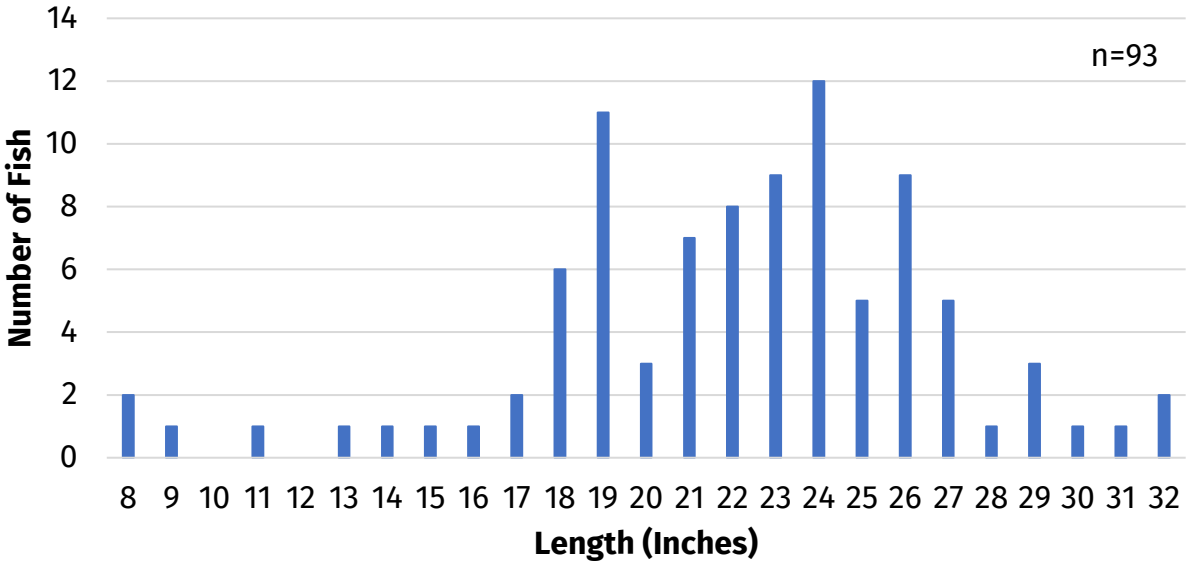

Figure 3. Length frequency distribution of channel catfish surveyed during the 2017 baited hoop net survey on the lower Baraboo River.

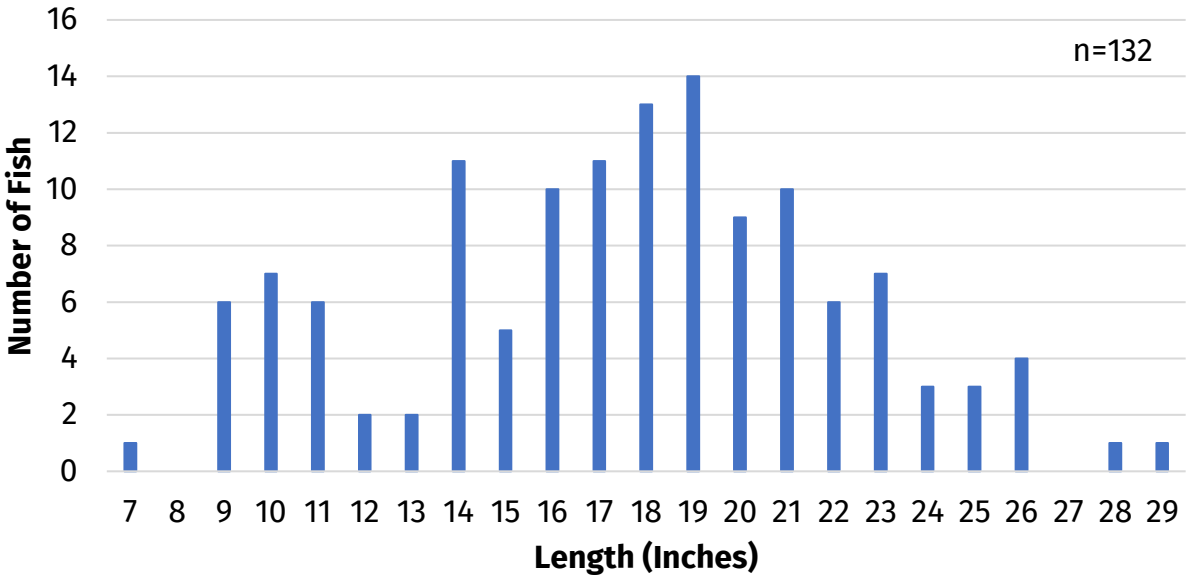

Figure 4. Length frequency of distribution of channel catfish surveyed during the 2013 baited hoop net survey on the lower Baraboo River.

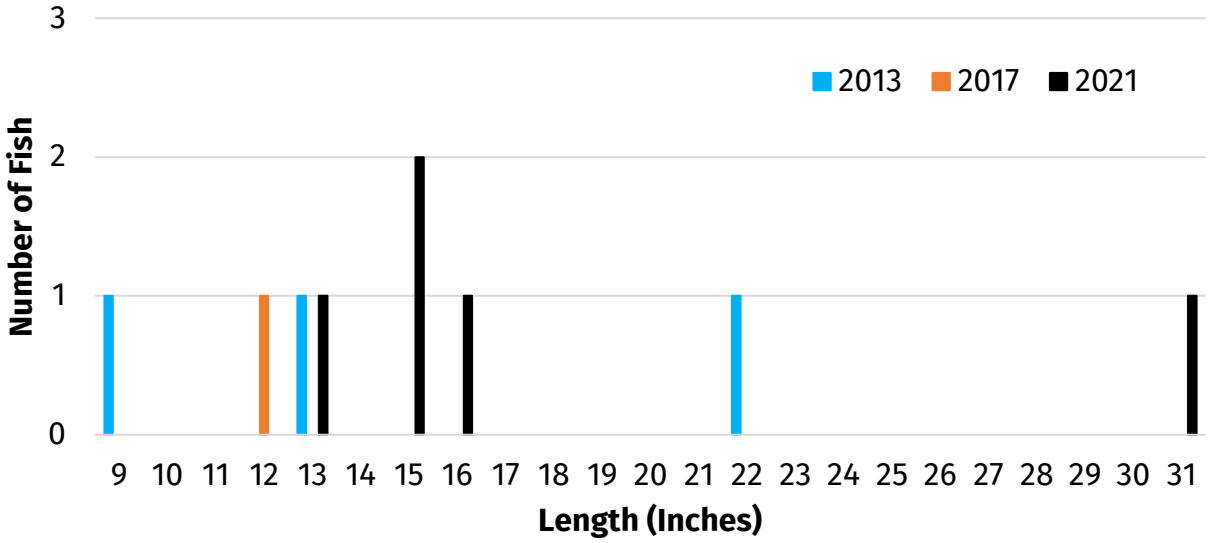

Figure 5. Length frequency distribution of flathead catfish surveyed using baited hoop nets on the lower Baraboo River during 2013, 2017 and 2021.

Tables

Table 1. Survey dates for the 2021, 2017 and 2013 lower Baraboo River hoop net surveys.

LOCATION/YEAR	SET DATE	END DATE	TOTAL NETS	TOTAL NET NIGHTS
Baraboo River / 2021	07/26/2021	08/05/2021	10	100
Baraboo River / 2017	08/07/2017	08/18/2017	10	110
Baraboo River / 2013	08/20/2013	08/29/2013	10	100

Table 2. Latitude and longitude coordinates with set dates for 2021 hoop net locations on the lower Baraboo River.

NET LOCATION	DATE SET	LATITUDE	LONGITUDE
1	07/26/2021	43.48747	-89.44167
2	07/26/2021	43.49034	-89.44279
3	07/26/2021	43.48980	-89.44527
4	07/26/2021	43.49324	-89.44403
5	07/26/2021	43.49632	-89.44785
6	07/26/2021	43.49606	-89.45139
7	07/26/2021	43.49737	-89.45132
8	07/26/2021	43.49814	-89.45414
9	07/26/2021	43.49595	-89.45396
10	07/26/2021	43.49453	-89.45313
11	07/27/2021	43.49596	-89.45553
12	07/29/2021	43.49734	-89.46238
13	08/02/2021	43.49520	-89.46065
14	08/02/2021	43.49886	-89.46041

Table 3. Catch summary of channel catfish and flathead catfish surveyed during the 2021, 2017 and 2013 baited hoop net surveys on the lower Baraboo River.

SPECIES	YEAR	TOTAL FISH COLLECTED	CATCH/ NET NIGHT	AVERAGE LENGTH	MINIMUM LENGTH	MAXIMUM LENGTH
Channel catfish	2021	117	1.2	18.1	5.8	33.4
Channel catfish	2017	93	0.9	22.6	8.6	32.4
Channel catfish	2013	132	1.3	18	7.1	29.5
Flathead catfish	2021	5	0.1	18.2	13.1	31.5
Flathead catfish	2017	1	0.0	12.8	12.8	12.8
Flathead catfish	2013	3	0.0	14.9	9.3	22.0

Table 4. Catch summary of channel catfish from the most recent baited hoop net surveys on the Baraboo River and Wisconsin River.

SPECIES	RIVER	LOCATION	YEAR	TOTAL FISH COLLECTED	CATCH/NET NIGHT	AVERAGE LENGTH
Channel catfish	Baraboo River	Lower Baraboo	2021	117	1.2	18.1
Channel catfish	Wisconsin River	Prairie du Sac	2020	421	4.2	12.7
Channel catfish	Wisconsin River	Pine Island	2019	23	0.2	20.5
Channel catfish	Wisconsin River	Wisconsin Dells	2018	170	1.7	20.3
Channel catfish	Wisconsin River	Pine Island	2016	103	1.0	22.8

1. Catch rates were low during the Wisconsin River Pine Island survey (0.02 channel catfish per net night) in 2019 due to experimenting with different bait types such as livestock mineral block and dog food that proved to be ineffective since soy cake and Zote soap were unavailable.

Table 5. General fishing regulations for the Baraboo River in Columbia and Sauk Counties.

SPECIES	SEASON DATES	DAILY BAG LIMIT	SIZE LIMIT
Largemouth bass and smallmouth bass	Open All Year	5	14” or larger
Northern pike	Open All Year	2	26” or larger
Panfish	Open All Year	25	None
Walleye, sauger and hybrids	Open All Year	3	15-20” and 1 fish over 28”
Muskellunge	1st Saturday in May through December 31	1	50” or larger
Channel and flathead catfish	Open All Year	10	None
Bullheads & rough fish	Open All Year	Unlimited	None