Wisconsin Department of Natural Resources

Wisconsin River Creel Survey Of The Prairie Du Sac Dam Tailwater Fishery 2020-2021

Bradd Sims, Daniel Walchak, & Mitchell Trow
Bureau of Fisheries Management

Photo by (Bradd Sims/DNR)

Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, WI 53707-7921

Executive Summary

Wisconsin Department of Natural Resources fisheries staff conducted a random stratified roving access creel on the Wisconsin River from the Prairie du Sac Dam downstream to State Highway 12 encompassing 3 river miles and 300 acres. The creel started Nov. 1, 2020 and ended Oct. 31, 2021.

The creel was composed of 198 survey days, 395 instantaneous counts and 2,194 interviews encompassing 3,951 anglers. Wisconsin residents made up 82% of the anglers, with 17% nonresident and 1% of unknown residency. Boat anglers represented 61.1% of the anglers interviewed, shore anglers 37.4%, ice anglers 1.3% and 0.2% were unknown. Total effort of all anglers was 66,605.6 hours or 222.0 hours per acre. Effort for boat anglers was 36,526.4 hours or 121.8 hours per acre. Effort for shore anglers was 30,079.2 hours or 100.3 hours per acre.

Anglers reported catching 35 species of fish with 22 species harvested. They reported 18,150 individual fish caught with 2,838 (15.6%) fish harvested. Walleye was the most abundant species with anglers reporting 6,074 caught. Bluegill was the most abundant species harvested with anglers reporting 961 Bluegill in their creel.

Walleye and Sauger were the most targeted species receiving a combined 44.7% of angler effort, totaling 99.2 hours/acre. Estimated total catch of Walleye by anglers is 24,781 with an estimated total harvest of 828. Estimated total catch for Sauger is 14,614 with an estimated total harvest of 469. Exploitation rates of Walleye and Sauger were estimated at 67.0% and 33.3% respectively. Anglers fishing for “anything” had the second highest effort with 14.4% of the total effort totaling 9,591.2 angler hours or 32.0 hours/acre. Lake Sturgeon received 11.5% of angler effort with 25.5 hours/acre. Catfish species received 6.4% (14.2 hours/acre) of angler effort, Muskellunge 6.0% (13.3 hours/acre), Shovelnose Sturgeon 5.2% (11.5 hours/acre) and Smallmouth Bass 4.1% (9.1 hours/acre) of angler effort. Panfish species (Bluegill, Pumpkinseed, Green Sunfish, Yellow Perch and crappie spp.) received 3.9% of total angler effort with 8.7 hours/acre.

A majority of anglers (57.8%) expressed a preference to manage Walleye for larger size with some harvest allowed. Anglers expressed a preference to manage Muskellunge and Smallmouth Bass as trophy fisheries with restricted harvest.

Contents

Introduction

The 92.3-mile stretch of Wisconsin River from the Prairie du Sac Dam to the Mississippi River is locally referred to as the Lower Wisconsin River (LWR). The LWR is an important recreational resource in southern Wisconsin having been declared the first Wisconsin State Riverway in 1989. The majority of the LWR consists of a braided channel river with substrate dominated by sand with the occasional cobble/gravel riffle. From the Prairie du Sac Dam downstream approximately seven miles, the LWR is single-thread channel with substrate made up primarily of sand with exposed bedrock, small boulders, cobble and gravel. This is the preferred spawning habitat for many fish species residing in the LWR. Immediately below the dam is a scour pool that ranges from 32 to 38 feet in depth and has an area of 40 to 48 acres depending on river flow. With suitable depth and refuge from fast current, the scour pool is ideal overwintering habitat for multiple fish species.

Desirable spawning and overwintering habitat lead to high concentrations of fish within the Prairie du Sac tailwater area. The Prairie du Sac Dam is an upstream migration block that also contributes to congregation of fish, allowing for more efficient harvest by anglers.

There have been 94 fish species representing 23 families recorded from the LWR. The LWR supports an abundance of species preferred by anglers such as Walleye, Sauger, Smallmouth Bass, Lake Sturgeon, Shovelnose Sturgeon, Channel Catfish, Flathead Catfish, Muskellunge and panfish. The LWR also supports abundant populations of non-traditional species sought by anglers such as buffalo spp., Bowfin and Gar. Because the LWR supports diverse and abundant fish populations, angling remains one of the more popular recreational activities.

The most recent creel survey for this area was completed in 1990 and 1991 by the Wisconsin Department of Natural Resources (DNR) (Rasmussen et. al., 1994). Divided into four zones, the creel survey covered the entire LWR. The Prairie du Sac zone extended from the Prairie du Sac Dam to the railroad bridge 0.5 mile below State Highway 12 and encompassed the current study area. Angler effort within the Prairie du Sac zone, January 1990 – January 1991, was estimated at 170.6 angler hours per acre. Angler effort in the Prairie du Sac zone was 14.7 times greater than other zones surveyed (Rasmussen et. al., 1994). Ease of access, navigability, year-round open season for multiple species, and concentration of desirable fish species results in increased effort by anglers in the Prairie du Sac Dam tailwater area.

Objectives for this study are:

1. Quantify angler effort, catch and harvest of multiple fish species.
2. Determine exploitation of Walleye, Sauger, Muskellunge and Smallmouth Bass.
3. Define angler management preferences for Walleye, Muskellunge and Smallmouth Bass.

Location

The Prairie du Sac tailwater creel was conducted on a stretch of the Wisconsin River from the Prairie du Sac Dam downstream to State Highway 12 (Figure 1). The creel area was 3 river miles and 300 acres.

Construction of the Prairie du Sac Dam began in 1911, and the dam was in operation as a source of hydropower beginning in 1914. It is still generating hydroelectric power today (Figure 2). The dam is impassable to upstream fish movement. Most downstream movement occurs during high flows when the dam spill gates are open. In 2009, trash racks with one-inch spacing were installed in front of the intake to the hydroelectric powerhouse, minimizing fish entrainment and turbine mortality.

Angler Access

Ample access is available for shore anglers and boat anglers. Together, Wisconsin Power & Light Company, Village of Prairie du Sac, Village of Sauk City and the State of Wisconsin allow approximately 3.5 miles of access for shore anglers. The Village of Prairie du Sac with the Veterans of Foreign Wars maintain fee access for trailered and carry-in watercraft at Veterans Memorial Park within the study area. The Village of Sauk City provides watercraft access just outside of the study area with parking for vehicles with trailers only.

Methods

DNR fisheries staff conducted a random stratified roving access creel from Nov. 1, 2020 until Oct. 31, 2021. With this design, there was one shift per creel day scheduled. Two instantaneous angler counts and roving angler interviews were conducted during each scheduled shift. The creel shift schedule was generated using the RAND function of a Microsoft Excel program (G. Hatzenbeler, DNR, personal communication, Feb. 11, 2022). The schedule included three weekdays per week, all weekends and all holidays except Thanksgiving, Christmas Eve and Christmas. Three weekdays per week and all weekend days were left on the schedule for the months of March, April and September. This was to better document the spring Walleye run and September hook and line season for Lake

Sturgeon. For all other months, a random number generator program was used to reduce the creel schedule to a mean of two weekdays per week and six weekend days per month. The total number of days in which a creel was conducted was 198.

Creel shift times and instantaneous count times were also generated using the RAND function (Microsoft Excel). With reduced daylight hours, creel shifts for October, November, December, January and February were 10 hours, with start times ranging from 7 a.m. to 9 a.m. Creel shifts for the remaining months were stratified into morning and afternoon shifts. Start times ranged from 6 a.m. to 8 a.m. for morning shifts and 1 p.m. to 2 p.m. for afternoon shifts. Shift durations ranged from 6 hours 45 minutes on days with less daylight hours to 8 hours on days with more daylight hours. Instantaneous counts were randomized to have one count in the first half of the creel shift and one count in the second half of the creel shift. Instantaneous counts were conducted with a single pass by boat from the Prairie du Sac Dam to State Highway 12 bridge. During one pass, the creel clerk would count all individual boat anglers and shore anglers actively fishing. During times of inclement weather or unsafe river conditions, the creel clerk would conduct angler counts from shore using multiple vantage points along the study area. Binoculars and floodlights were used at times to assist in identification of anglers.

Angler interviews were conducted prior to, between and after the instantaneous counts. Anglers with complete and incomplete trips were interviewed, and an effort was made to conduct as many complete interview trips as possible. Data collected during the interviews included the date, type of fishing (boat or shore), license type (resident or nonresident), number in party, completed trip (yes or no), time of interview, time started fishing, time spent trolling, non-fishing time, fishing with guide (yes or no), tournament participant (yes or no), target species with percent of time fished for, total number and species of fish caught, total number and species of fish harvested, length of fish harvested, and reason for release if not harvested. Anglers were also asked what their management preference was for each of these species: Muskellunge, Walleye and Smallmouth Bass. Anglers were given four answers to choose from: 1) Keep fish for harvest, size is unimportant; 2) Manage for larger size fish with some harvest allowed; 3) Trophy management with restricted harvested; 4) Do not care or have no interest. Anglers were only asked this question during their first creel interview to avoid repetitive answers.

Effort is reported as angler hours and/or angler hours per acre. Total angler effort, effort by month, weekday effort, weekend effort, boat angler effort and shore angler effort were calculated using instantaneous count data of boat and shore anglers. Ice anglers were included with the boat anglers when calculating effort. Microsoft Excel was used to store and analyze data from angler interviews. Data was entered into the DNR Fisheries Management Information System with effort data auto-calculated by the same system. Completed angler interviews

were used to estimate catch rates, harvest rates, targeted effort for species, effort per angling type, resident effort, nonresident effort and angler success rates per hour.

Exploitation rates for legal-sized fish were estimated using angler tag returns for Walleye, Sauger, Smallmouth Bass and Muskellunge. The equation used to estimate exploitation is $(n^h/(n^t*0.781))/0.35$ where n^h is the number of tagged fish reported as harvested, n^t is the number of legal sized fish in the system that were tagged, 0.781 assumes a one-year tag loss rate of 21.9% (Koenigs et al. 2013) and 0.35 assumes an angler tag return rate of 35% (Nickel 2018). The lower Wisconsin River is an open system. For the purposes of this creel and study area, immigration and emigration of tagged and non-tagged fish are assumed equal. Walleye, Sauger, Smallmouth Bass and Muskellunge were captured from Oct. 15, 2020 to Nov. 20, 2020 using a standard Wisconsin boom electrofishing unit with pulsed direct current. Duty cycle was 20 pulses per second and pulse rate was 60%. Volts ranged from 257 to 300 and amps ranged 9 to 14. Downstream passes were made starting at the dam and ending near the State Highway 60 bridge. Floy anchor tags (FD-94; Floy Tag and Manufacturing Inc.) were deployed into the fish using a Floy Mark II tagging gun equipped with a 33-mm needle. Tags were inserted at an acute angle into the base of the dorsal fin. Species, tag number and total length of each fish was recorded at time of capture. Tags were placed in 732 Walleye, 272 Smallmouth Bass, 277 Sauger and 89 Muskellunge.

Floy tag 0589 deployed in a Walleye. Photo by (Bradd Sims/ DNR)

Results

The creel was composed of 198 survey days, 395 instantaneous counts, and 2,194 interviews encompassing 3,951 anglers. Of the 2,194 angler interviews, 1,791 (81.6%) were completed angler trips and 403 (18.4%) interviews were conducted prior to the anglers competing their trip. Wisconsin residents made up 82% of the anglers interviewed with 17% nonresident, and 1% of unknown residency. Boat anglers represented 61.1% of the anglers interviewed, shore anglers 37.4%, ice anglers 1.3% and 0.2% were unknown.

Total effort of all anglers was 66,605.6 hours (SD, 2031.26) or 222.0 hours per acre. Boat anglers contributed 54.8% of the total effort and shore anglers accounted for 45.2% of the total effort. Effort for boat anglers was 36,526.4 hours (SD, 1531.3) or 112.1 hours per acre. Effort for shore anglers was 30,079.24 hours (SD, 1334.59) or 109.9 hours per acre.

Anglers fished weekdays for 33,635.3 hours (50.5%) and weekend days for 32,970.3 hours (49.5%). A temporal distribution of total angler effort, shore angler effort and boat angler effort is depicted in Figure 3. Angler effort was greatest during the month of March with 11,264.3 hours. In March, anglers target the spring Walleye/Sauger run. September, the open hook and line season for Lake Sturgeon, had the second highest effort with 9,492.6 hours. Traditional opening day for Wisconsin is the first Saturday in May. Even though many species are open year-round on the LWR, many anglers will still begin fishing on the first Saturday in May. Angler effort for the month of May was 7,872.1 hours. Shore angler effort was greater than boat angler effort from April through August and boat anglers had greater effort during all other months. Shore angler effort was greatest for May, June, and July with 4,637.4, 4,263.1, and 4,337.8 hours respectively. Boat angler effort was greatest in March and September with 8,245.5 and 5,685.1 hours respectively and overlapping with the spring Walleye run and September Lake Sturgeon hook and line season.

The percent of total effort by resident anglers was 76.4 and 22.4 for nonresident anglers. Anglers with unknown residency made up the remaining 1.2%. Resident anglers on average spent 3.9 hours per trip. Nonresident anglers spent on average 6.2 hours per trip. A temporal distribution of resident and nonresident angler effort is depicted in Figure 4. Resident angler effort was greatest in March with 10,718.3 hours, accounting for 21.1% of the resident angler effort. Nonresident angler effort was greatest in September with 4,734.3 hours, accounting for 31.7% of the nonresident angler effort.

Anglers reported catching 35 species of fish (Table 1). The ten most abundant species reported caught during angler interviews, with number reported in parentheses, were Walleye (6,074), Sauger (3,582), Bluegill (1,735), Freshwater Drum (1580), White Bass (1,182), Lake Sturgeon (835), Smallmouth Bass (803), buffalo spp. (508), Channel Catfish (503) and Shovelnose Sturgeon (274). Estimated total yearly catch by species is listed in Table 2. Walleye and Sauger were the most targeted species receiving a combined 44.7% of angler effort. Lake Sturgeon had the second highest targeted effort receiving 11.5% of angler effort. Catfish species received 6.4% of angler effort and Muskellunge 6.0%. Other notable gamefish species, Shovelnose Sturgeon and Smallmouth Bass received 5.2% and 4.1% of angler effort. Anglers fishing for anything that bites made up 14.4% of the total effort. Percent angler effort for species targeted is depicted in Figure 5.

Anglers reported harvesting 22 different species of fish. The ten most abundant species reported harvested, with number reported in parentheses, during angler creel interviews were Bluegill (961), White Bass (477), Walleye (406), Freshwater Drum (292), crappie spp. (158), Channel Catfish (128), Sauger (115), Shovelnose Sturgeon (110), buffalo spp. (44) and Smallmouth Bass (22). Estimates of total yearly harvest for targeted species are listed in Table 2.

Walleye And Sauger

Walleye and Sauger populations on the LWR are sustained by natural reproduction with no supplemental stocking. Recruitment into these populations also occurs by immigration from the Mississippi River and Lake Wisconsin. Within the creel area, Walleye and Sauger utilize available habitat for overwintering and spawning. Adult Walleye and Sauger will be most abundant from late fall through early spring. Walleye and Sauger are the most sought-after species in the LWR (Rasmussen et al. 1994). On the LWR, Walleye and Sauger are open all year to hook and line angling. Three in total of Walleye, Sauger or their hybrids may be kept. Walleye must be at least 18.0 inches and Sauger or hybrids must be at least 15.0 inches.

Walleye and Sauger were the most targeted species during this creel, receiving a combined 44.7% of angler effort totaling 29,752.7 hours and 99.2 hours/acre. Resident anglers made up 88.2% of the total effort targeting Walleye and Sauger. Nonresident anglers made up 10.3% of the total effort with anglers of unknown residency at 1.5%. Angler effort for Walleye and Sauger was greatest in March and April with 10,890 and 4,022 angler hours respectively (Figure 6).

All anglers interviewed reported catching a total of 6,074 Walleye with 203 harvested and 3,582 Sauger caught with 115 harvested. Estimated total catch of Walleye by all anglers is 24,781 with an estimated total harvest of 828. Estimated total catch for Sauger is 14,614 with an estimated total harvest of 469. Anglers targeting Walleye and Sauger reported catching 5,835 Walleye with 191 harvested and 2,105 Sauger caught with 74 harvested. Average catch rates by anglers targeting Walleye and Sauger were 1.0 Walleye per hour and 1.4 Sauger per hour. On average, it took Walleye/Sauger anglers 33.3 hours to catch one harvestable Walleye and 20 hours to catch one harvestable Sauger. Exploitation rates of Walleye ≥ 18 inches and Sauger ≥ 15 inches were estimated at 67.0% and 33.3% respectively. The majority of anglers (81%) gave sub-legal total length as the reason for releasing Walleye and Sauger. Catch and release fishing was the second highest reason for release at 16.5%. Length of Walleye harvested ranged from 12 to 28 inches with a mean length of 19.1 inches. Walleye between 18 inches and 19 inches total length made up 46.9% of the Walleye harvest. Length of Sauger harvested ranged from 15 to 20 inches with a mean length of 16.1 inches. Sauger measuring between 15 inches and 16 inches total length made up 46.8% of the Sauger harvest. Length frequency histograms of Walleye and Sauger harvested are displayed in Figures 7 and 8.

Lake Sturgeon

The Lake Sturgeon population on the LWR is sustained by immigration from the Mississippi River and Lake Wisconsin. While natural recruitment is believed to take place in the LWR, no evidence has been found to support this. Lake Sturgeon are present year-round within the creel area, with large adults utilizing available habitat for overwintering and possible spawning. The LWR is open to the inland Lake Sturgeon hook and line season that runs from the first Saturday in September through September 30. September 4 was the opening day in 2021. Anglers may keep one Lake Sturgeon 60 inches or greater per harvest tag.

Juvenile Lake Sturgeon are a common by-catch for anglers fishing below the Prairie du Sac Dam. They are often mis-identified as Shovelnose Sturgeon. Photo by (Bradd Sims/DNR)

Lake Sturgeon received 11.5% of angler effort totaling 7,648 hours and 25.5 hours/acre. Resident anglers made up 26.1% of the total effort targeting Lake Sturgeon. Nonresident anglers made up 73.9% of the total effort. All angler effort for Lake Sturgeon was during the September hook and line season.

All anglers interviewed reported catching a total of 835 Lake Sturgeon with 15 harvested. Nine of the 15 were harvested illegally by the same group of anglers in one trip. They misidentified juvenile Lake Sturgeon as Shovelnose Sturgeon. Most of the Lake Sturgeon caught were juveniles. Estimated total catch of Lake Sturgeon by all anglers is 3,407 with an estimated total harvest of 61. Anglers targeting Lake Sturgeon reported catching 245 with 6 harvested. The average catch rate by anglers targeting Lake Sturgeon was 0.13 per hour. Harvest rate was 0.003201 Lake Sturgeon per hour. One harvestable Lake Sturgeon was caught every 312.4 hours of angler effort. Adult Lake Sturgeon ≥ 50 inches total length had a preseason population estimate of 163. Anglers registered 19 Lake Sturgeon during the September hook and line season for an exploitation rate of 11.7% (N. Nye, DNR, personal communication, Feb. 8, 2022).

Channel And Flathead Catfish

Channel Catfish and Flathead Catfish populations on the LWR are sustained by natural reproduction with no supplemental stocking. Recruitment into these populations also occurs with immigration from the Mississippi River and Lake Wisconsin. Within the creel area, the scour pool provides critical overwintering habitat for Channel and Flathead Catfish. Some individuals will stay within the area year-round while many migrate downstream 30 to 40 miles for spawning and summer habitat. From the Prairie du Sac Dam to Highway 12, the open

season for catfish is May 1 through Nov. 30. Catfish of any size may be kept with a daily bag limit of 10 total.

Channel Catfish and Flathead Catfish received 6.4% of angler effort totaling 4,262.7 hours and 14.2 hours/acre. Channel Catfish were more popular among catfish anglers receiving 62.6% of all catfish angling effort. Flathead Catfish received 37.4% of all catfish angling effort. Angler effort for Channel Catfish and Flathead Catfish combined was greatest in August and July with 992.4 and 962.2 angler hours respectively. Angler effort for Channel Catfish was greatest in August and September with 703.2 and 513.7 angler hours respectively. Angler effort for Flathead Catfish was greatest in July and September with 514.0 and 305.5 angler hours respectively. Temporal distribution for angler hours targeting Channel Catfish, Flathead Catfish, and both species combined is depicted in Figure 9.

It is not uncommon for anglers to catch Flathead Catfish and Channel Catfish below the Prairie du Sac Dam as seen in this photo. Photo by (Bradd Sims/DNR)

All anglers interviewed reported catching a total of 803 Channel Catfish with 128 harvested. Estimated total catch of Channel Catfish by all anglers is 2,052 with an estimated total harvest of 522. Anglers targeting Channel Catfish reported catching 106 with 61 harvested. Percent of catch harvested was 57.5%. Total length of Channel Catfish harvested as reported by anglers ranged from 10 to 31 inches with a mean length of 18.5 inches. Fifty-five percent of the Channel Catfish harvested were between 16 and 22 inches. The majority, 81%, of anglers targeting Channel Catfish gave catch and release fishing as the reason for not harvesting a Channel Catfish. The remaining 19% of anglers gave unacceptable size as their reason for not harvesting a Channel Catfish. The average catch rate by anglers targeting Channel Catfish was 0.16 fish per hour. On average it took Channel Catfish anglers 6.25 hours to catch one Channel Catfish. The average harvest rate was 0.09 Channel Catfish per hour. Resident anglers made up 60.4% of the effort targeting Channel Catfish. Nonresident anglers made up 39.6% of the effort targeting Channel Catfish.

All anglers interviewed reported catching a total of 130 Flathead Catfish with 21 harvested. Estimated total catch of Flathead Channel Catfish by all anglers is 530 with an estimated total harvest of 86. Anglers targeting Flathead Catfish reported catching 42 with 5 harvested. Percent of catch harvested was 11.1%. Total length of Flathead Catfish harvested as reported by anglers ranged from 11 to 45 inches with a mean length of 24.2 inches. Fifty-three percent of the Flathead Catfish harvested were between 20 and 25 inches. The majority of anglers targeting Flathead Catfish (85%) gave catch and release fishing as the reason for not harvesting a Flathead Catfish. The other two reasons receiving

10% and 5% respectively were unacceptable size and closed season. The average catch rate by anglers targeting Flathead Catfish was 0.11 fish per hour. On average it took Flathead Catfish anglers 9.1 hours of effort to catch one Flathead Catfish. Nonresident anglers made up 54.2% of the effort targeting Flathead Catfish. Resident anglers made up 44.1% with anglers of unknown residency making up the remaining 1.7% of effort targeting Flathead Catfish.

Muskellunge

Muskellunge have been documented within the upper 30 miles of the LWR with the majority located within the upper six miles where they stay year-round. Muskellunge are not stocked in the LWR and natural reproduction has not been documented. Most muskellunge found in the LWR have immigrated from Lake Wisconsin, hence the concentration of fish located within the upper six miles. Muskellunge open season is from the first Saturday in May 1 to Dec. 31. From the Prairie du Sac Dam to Highway 12 the minimum length limit is 50 inches with a daily bag limit of one.

Muskellunge received 6.0% of angler effort totaling 4,029.3 hours and 13.3 hours/acre. Resident anglers made up 84.9% of the total effort targeting Muskellunge. Nonresident anglers made up 14.4% of the total effort with anglers of unknown residency at 0.7%. All anglers interviewed reported a catching 63 Muskellunge with 0 harvested. Anglers targeting Muskellunge had 65.1% of the total reported catch with 41 reported caught. Estimated yearly Muskellunge catch by all anglers is 257. It took Muskellunge anglers an average of 24.1 hours of effort to catch one Muskellunge. Angler effort for Muskellunge was greatest in May with 893.1 hours and 22.2% of Muskellunge effort (figure 10). Combined, the months of October, November and December accounted for 42.8% of the total angler effort targeting Muskellunge. Hours of effort required to catch one Muskellunge during October, November and December averaged 16.9.

Shovelnose Sturgeon

The Shovelnose Sturgeon population on the LWR is believed to be sustained by natural reproduction with no supplemental stocking. Gravid females and ripe males have been sampled during spring surveys. Recruitment into this population also occurs with immigration from the Mississippi River. Some Shovelnose Sturgeon will be present year-round while others migrate up from the Mississippi River to spawn and return to the Mississippi River post spawn. On the LWR, Shovelnose Sturgeon are open all year to hook and line angling with a daily bag limit of three and no size limit.

Shovelnose Sturgeon received 5.2% of angler effort totaling 3,481.6 hours and 11.5 hours/acre. Resident anglers made up 55.2% of the total effort targeting

Shovelnose Sturgeon. Nonresident anglers made up 40.3% of the total effort with anglers of unknown residency making up the remaining 4.5%.

All anglers interviewed reported catching a total of 274 Shovelnose Sturgeon with 110 harvested. Percent of catch harvested was 40.1. Anglers targeting Shovelnose Sturgeon reported catching 134 with 95 harvested. Percent of catch harvested was 70.9%. Estimated yearly catch by all anglers was 1,118 with an estimated yearly harvest of 449. Total length of harvested Shovelnose Sturgeon reported by anglers ranged from 24 to 31 inches with a mean length of 26.3 inches. Catch and release and unacceptable size were two reasons given by Shovelnose Sturgeon anglers for fish not harvested. Both reasons received 50% of the response. The average catch rate by anglers targeting Shovelnose Sturgeon was 0.16 fish per hour.

Smallmouth Bass

The Smallmouth Bass population on the LWR is sustained by natural reproduction with no supplemental stocking. Recruitment into this population may also occur with immigration from the Mississippi River, Lake Wisconsin and smaller tributaries. Many adult Smallmouth Bass will migrate into the creel study area to overwinter, returning to their downstream habitats in the spring to spawn and spend the summer. There are many individuals that will stay within the creel study area year-round. On the LWR, Smallmouth Bass are open all year to hook and line angling with a daily bag limit of five and a minimum size limit of 14 inches total length.

Smallmouth Bass received 4.1% of angler effort totaling 2,739.7 hours and 9.1 hours/acre. Resident anglers made up 88.8% of the total effort targeting Smallmouth Bass. Nonresident anglers made up 9.2% of the total effort with anglers of unknown residency making up the remaining 2%. Angler effort for Smallmouth Bass was greatest in June and July with 616.7 and 496.2 angler hours respectively (Figure 11).

All anglers interviewed reported catching a total of 803 Smallmouth Bass with 22 harvested. Percent of catch harvested was 2.7%. Anglers targeting Smallmouth Bass reported catching 424 with 9 harvested. Percent of Catch harvested was 2.1%. Estimated yearly catch of smallmouth bass by all anglers was 3,276 with an estimated yearly harvest of 90. Exploitation rate of Smallmouth Bass ≥ 14 inches was estimated at 4.6%. Total length of harvested Smallmouth Bass reported by anglers ranged from 8 to 19 inches with a mean length of 16.1 inches. The majority, 65%, of anglers gave catch and release fishing as the reason for releasing Smallmouth Bass that were caught. Not seeking Smallmouth Bass was the second highest reason for release with 18.8% of the anglers. For anglers targeting Smallmouth Bass, 87.4% gave catch and release fishing as the reason for releasing Smallmouth Bass. The average catch rate by anglers targeting Smallmouth Bass was 0.63 fish per hour.

Panfish

“Panfish” under Wisconsin Administrative Code NR 20.03(29) for Wisconsin hook and line regulations includes Bluegill, Pumpkinseed, Green Sunfish, Black Crappie, White Crappie, Yellow Perch, Warmouth and Orange Spotted Sunfish. The same species are included as panfish for this report. Panfish populations within the LWR system are self-sustaining. Panfish frequent backwaters, side channels and areas with slower current.

Panfish received 3.9% of angler effort totaling 2,590.6 hours and 8.7 hours/acre. Resident anglers made up 98.2% of the total effort targeting panfish. Nonresident anglers made up 1.2% of the total effort. Within the study area, Bluegill was the most abundant panfish species making up 86.0% of all panfish caught. Crappie spp. made up 11.0% of all panfish caught, Yellow Perch 2.7% and Pumpkinseed, Warmouth and unidentified panfish made up the remaining 0.3%.

All anglers interviewed reported catching a total of 1,735 Bluegill and harvesting 961. Percent of catch harvested was 55.4. Anglers targeting Bluegill reported catching 1,242 and harvesting 747. Percent of catch harvested was 60.1%. The average catch rate by anglers targeting Bluegill was 2.51 fish per hour. Bluegill had a total estimated catch of 7,078 by all anglers with and a total estimated harvest of 3,921.

All anglers interviewed reported catching a total of 222 crappie and harvesting 158. Percent of catch harvested was 71.2%. Anglers targeting crappie reported catching 146 and harvesting 132. Percent of catch harvested was 90.4%. The average catch rate by anglers targeting crappie was 1.08 fish per hour. Crappie had a total estimated catch of 906 by all anglers and a total estimated harvest of 645. Black Crappie is the most abundant species of crappie found below the Prairie du Sac Dam. White Crappie is sporadic in occurrence. Reasons for releasing panfish with percent response in parentheses include catch and release (45.2%), unacceptable size (31.9%), not seeking species (17.8%) and other reason (5.1%).

White Bass

The White Bass population on the LWR is sustained by natural reproduction with no supplemental stocking. Recruitment into this population may also occur with immigration from the Mississippi River and Lake Wisconsin. Adult White Bass will migrate into the creel study area to overwinter and spawn. Some may return to their downstream habitats to spend the summer. There are individuals that will stay within the creel study area year-round. On the LWR, White Bass are open all year to hook and line angling with no daily bag limit and no size limit.

White Bass received 2.3% of angler effort totaling 1531.9 hours or 5.1 hours/acre. Resident anglers made up 88.8% of the total effort targeting White Bass. Nonresident anglers made up 9.2%% of the total effort with anglers of unknown residency making up the remaining 2%.

All anglers interviewed reported a total catch of 1,182 White Bass and harvest of 477. Percent of catch harvested was 40.4%. Anglers targeting White Bass reported catching 606 and harvesting 308. Percent of catch harvested was 50.8%. The average catch rate by anglers targeting White Bass was 1.6 fish per hour. White Bass had a total estimated catch of 4,822 by all anglers and a total estimated harvest of 1,946.

Northern Pike

The Northern Pike population on the LWR is sustained by natural reproduction with no supplemental stocking. Recruitment into this population may also occur with immigration from the Mississippi River. While some individuals can be found in the main river channel, most of the Northern Pike population associated with the LWR will be found residing in side-channels, backwater sloughs, and lakes. On the LWR, Northern Pike are open all year to hook and line angling with a daily bag limit of two and a minimum size limit of 26 inches.

Northern Pike received 0.35% of angler effort totaling 57.4 hours or 0.19 hours/acre. Resident anglers made up 82.5% and Nonresidents made up 17.5% of the total effort targeting Northern Pike.

All anglers interviewed reported catching a total of 21 Northern Pike with no Northern Pike harvested. Anglers targeting Northern Pike reported catching four with zero harvested. Percent of total catch by anglers targeting Northern Pike is 19.0%. The average catch rate by anglers targeting Northern Pike was 0.07 fish per hour. On average it took 14.3 hours of effort to catch one Northern Pike for anglers targeting this species. Northern Pike had a total estimated catch by all anglers of 86 and zero harvested.

Largemouth Bass

The Largemouth Bass population on the LWR is sustained by natural reproduction with no supplemental stocking. Recruitment into this population may also occur from the Mississippi River and Lake Wisconsin. While some individuals can be found in the main river channel, most will be found residing in side-channels, backwater sloughs and lakes. On the LWR, Largemouth Bass are open all year to hook and line angling with a daily bag limit of five and a minimum size limit of 14 inches total length.

Largemouth bass received 0.02% of angler effort totaling 2.9 hours. All anglers interviewed reported catching a total of 35 Largemouth Bass with one harvested. Anglers targeting Largemouth Bass reported catching zero.

Non-Traditional Species

Supporting over 90 different fish species, the LWR is a destination for anglers targeting non-traditional species. For this report, non-traditional species includes the following from greatest to least effort by anglers: buffalo species (Smallmouth and Bigmouth Buffalo), Freshwater Drum, redhorse species (Shorthead, Golden, and Silver Redhorse), gar species (Longnose and Shortnose Gar), and Bowfin. These species are sustained by natural reproduction and open all year to hook and line angling with no daily bag limit and no length limit.

Buffalo species present include Smallmouth, Bigmouth and Black Buffalo (Wisconsin State Threatened). All anglers interviewed reported catching a total of 508 buffalo with 44 being harvested. Anglers targeting buffalo fished for a total of 60.95 hours. They reported catching 98 buffalo and harvested 17. Buffalo species had a total estimated catch of 2,073 by all anglers with a total estimated harvest of 180.

While buffalo species were not differentiated for this creel, Smallmouth Buffalo was the only species identified as being harvested. Creel clerks were able to visually identify some Smallmouth Buffalo while anglers would describe a buffalo as having a deep, white/grey body with a sucker-type mouth, characteristics of Smallmouth Buffalo.

Freshwater Drum are common throughout the entire LWR residing in main channel habitats. All anglers interviewed reported catching a total of 1,580 Freshwater Drum. This was fourth highest of all species reported in the creel and accounted for 8.7% of the total reported catch. Anglers reported harvesting 292. Estimated total catch of Freshwater Drum by all anglers 6,446. Estimated total angler harvest of Freshwater Drum is 1,191. Anglers targeting Freshwater Drum fished for a total of 35.8 hours catching 16 and harvesting nine.

Redhorse species that have been sampled in this portion of the LWR include Shorthead, Silver, Golden and River (Wisconsin State Threatened). All anglers interviewed reported a total catch of 82 redhorse with 22 being harvested. Anglers targeting redhorse fished for a total of 11.83 hours and were not successful in catching any redhorse species. The Shorthead Redhorse is the most common species in the LWR and the only species identified as being harvested.

Gar species present include Longnose Gar and Shortnose Gar. All anglers interviewed reported a total catch 27 gar with six being harvested. Anglers targeting gar fished for a total of 2.67 hours. They caught four gar and harvested zero. While species of gar were not differentiated for this creel, Longnose Gar were reported being caught by anglers more than Shortnose Gar, however the six gar harvested were identified by creel clerks as Shortnose Gar.

Angler with a Longnose Gar caught below the Prairie du Sac Dam. Non-traditional species are becoming more popular to pursue. Photo by (John Lyons)

Bowfin are common to abundant in areas of the LWR. While some individuals can be found in the main river channel, most will reside in backwater sloughs and lakes. All anglers interviewed reported a total catch of 20 Bowfin with one being harvested. One angler reported targeting Bowfin. They fished for a total of 1.1 hours and did not catch a Bowfin.

Wisconsin Threatened And Special Concern Species

Paddlefish, a state threatened species, are common below the Prairie du Sac Dam. Photo by (Nathan Nye/DNR).

One state special concern species, American Eel, and two state threatened species, Paddlefish and Blue Sucker, were reported being caught by anglers. Anglers reported catching 98 Paddlefish and one Blue Sucker. No Paddlefish or Blue Sucker were reported as harvested. Anglers reported catching two American Eels, both released. The American Eels were verified from angler photos.

Non-Native Species

Bighead Carp harvested below the Prairie du Sac Dam. Photo by (Mitchell Trow/DNR).

Non-native species reported by anglers with number caught in parenthesis included Common Carp (72), Bighead Carp (1) and Brown Trout (1). Three Common Carp were harvested. The Bighead Carp was euthanized and transferred the U.S. Fish and Wildlife Service where the otolith micro-chemistry will be used to determine early life history environments. Bighead Carp are one of the more recent invasive species to upper Mississippi River watershed which includes the LWR. Natural reproduction of Bighead Carp in the LWR has yet to be documented. Brown Trout will frequent the LWR from local coldwater tributaries but do not permanently reside in the LWR. Common Carp are self-sustaining and present throughout the LWR.

Anglers Targeting "Anything"

Anglers fishing for "anything" had the second highest effort behind Walleye/Sauger anglers. Anglers fishing for anything made up 14.4% of the total effort with 9,591.2 angler hours or 32.0 hours/acre. Resident anglers made up 65.9% of the total effort fishing for anything. Nonresident anglers made up 33.6% of the total effort with anglers of unknown residency making up the remaining 0.5%.

Anglers fishing for anything caught 26 different species of fish and harvested 19 different species. Species with number caught and harvest reported during interviews by anglers fishing for anything are displayed in Table 3. Freshwater Drum was the most abundant species reported caught by anglers fishing for anything with 441 Freshwater Drum caught. This was followed by Bluegill (240), White Bass (211), Walleye (164), Channel Catfish (116) and Lake Sturgeon (106). Freshwater Drum was also the most abundant species harvested by anglers fishing for anything with 98 Freshwater Drum harvested. This was followed by Bluegill (98), White Bass (79), Channel Catfish (30), redhorse spp. (15), and Mooneye (15).

Angler Management Preference

Angler preferences can often guide management decisions, particularly when setting regulations. To assist in future management decisions, anglers were asked what their management preference was for Muskellunge, Walleye and

Smallmouth Bass. Anglers viewed Muskellunge and Smallmouth Bass as trophy fisheries to be managed with restrictive harvest regulations. Walleye were viewed as a food fish but a population with larger fish present was preferred. Percent angler response is depicted in Figure 12.

Angler management preferences:

Walleye

- 57.8% percent of anglers preferred to manage Walleye for larger size with some harvest allowed
- 14.7% did not care or had no interest
- 14.0% wanted to harvest Walleye with size unimportant
- 13.5% preferred trophy management with restricted harvest

Muskellunge:

- 61.8.% percent of anglers preferred trophy management with restricted harvest
- 34.4% did not care or had no interest
- 2.9% preferred to manage Muskellunge for larger size with some harvest allowed
- 0.9% wanted to harvest Muskellunge with size unimportant.

Smallmouth Bass:

- 55.7% percent of anglers preferred trophy management with restricted harvest
- 31.1% did not care or had no interest
- 10.8% preferred to manage Smallmouth Bass for larger size with some harvest allowed
- 2.4% wanted to harvest Smallmouth Bass with size unimportant

Guided Angler Trips

Twenty anglers interviewed utilized a guide service. They totaled 13 trips for an average of 1.5 anglers per guided trip. Trips averaged six hours per day. Resident anglers made up 92% of the anglers using a guide service with non-residents making up 8%. Muskellunge were targeted in 50% of the guided trips. Guided anglers averaged one Muskellunge caught every 14.2 hours compared to non-guided anglers who averaged one Muskellunge caught every 26.5 hours. Walleye/Sauger were targeted in 30% of the guided trips. Other fish species targeted during guided trips were panfish (15% of trips) and Smallmouth Bass (5% of trips). Catch rates and harvest rates for Walleye/Sauger, panfish and Smallmouth Bass were similar for guided and nonguided anglers.

Recreational Use Value

In 2016, the recreation use value of freshwater fishing in the Midwest region was $47.83 per person, per day (Rosenberger 2016). Using the U.S. Bureau of Labor Statistics Consumer Price Index calculator for all consumers, $47.83 in 2016 is equivalent to $54.00 in 2021 (U.S. Bureau of Labor Statistics, 2022). There were an estimated 15,470.85 angler trips from Nov. 1, 2020 through Oct. 31, 2021. Using a recreational use value of $54.00 per trip, the yearly recreational use value for the Prairie du Sac tailwater fishery was estimated at $835,425.90.

Discussion

The tailwater fishery below the Prairie du Sac Dam continues to support a diverse fishery that is an important recreational resource for resident and nonresident anglers. Rasmussen et al. (1994) conducted an angler creel in 1990 and 1991. One of the management recommendations from their report was to conduct another creel for the entire LWR, or at minimum the Prairie du Sac area within the next five years. This creel survey was conducted 20 years after their initial creel. Creels of this magnitude require a substantial investment of funds and staff time, hence the many years between surveys. This creel would not have been possible if not for the funding provided by the Aquatic Resources Enhancement Fund and the Wisconsin Department of Natural Resources. The Aquatic Resources Enhancement fund is a monetary fund established by Alliant Energy and managed by the Natural Resources Foundation. Information from this creel survey is of significant value to resource managers and will be used in management decisions, protection and sustainability of this aquatic resource for many years to come. Objectives for this creel were to quantify angler effort, catch, harvest, determine exploitation rates of Walleye, Sauger, Smallmouth Bass and Muskellunge, and define angler management preferences for Walleye, Muskellunge and Smallmouth Bass for the Prairie du Sac Dam tailwater fishery.

Angler Effort

Rasmussen et. al. (1994) described the Prairie du Sac zone as one of the most heavily fished resources in Wisconsin with 170.6 angler hours/acre of effort during the 1990-1991 creel. The Prairie du Sac tailwater fishery continues to be one of the most heavily fished resources in Wisconsin with angler effort at 222.0 angler hours per acre. Angler effort from various local waterbodies and waterbodies with high angler effort are listed in Table 4. The high angler effort can be attributed to several factors: concentration of desirable fish species at the dam, diversity of fish species, open season year-round (except Lake Sturgeon, Muskellunge, Channel Catfish and Flathead Catfish), ample shore and boat access, riverine and lake-like environments, available overnight camping, proximity to populated areas and ease of access via state highways. Together, these factors create a desirable destination for anglers.

One variable that may have contributed to a slight increase in angler effort for this creel is the COVID-19 pandemic. With layoffs, work from home opportunities, travel bans and many indoor recreational activities suspended, people were looking for opportunities to spend time recreating outdoors. The COVID-19 pandemic could have attributed to more time on the water for seasoned anglers and increased the recruitment of new anglers. The data collected does not allow an estimation of percent increase of angler effort due to the COVID-19 pandemic nor will it allow us to predict if any increase in angler effort will remain stable or subside. Wisconsin fishing license sales may be an indicator of the degree of increased effort. Total fishing license sales for Wisconsin averaged 1,355,379 in the four years prior to COVID-19 (2016-2019). Fishing license sales averaged 1,423,084 in the two years during COVID-19 (2020-2021). This was a 5% increase in the average number of fishing licenses sold. Even without the pandemic increase, the Prairie du Sac tailwater fishery would still be one of the more heavily fished resources in the state.

Targeted angler effort for this creel was similar to the 1990-1991 creel. Walleye and Sauger remain the most sought species having the highest targeted effort in both the 2020-2021 creel and the 1990-1991 creel. Walleye and Sauger combined received 44.7% of angler effort in 2020-2021 and 51% of angler effort in 1990-1991. Channel Catfish received 7% of angler effort in 1990-1991, while catfish species received a combined angler effort of 6.4% in 2020-2021. Smallmouth Bass received 4.1% of angler effort in 2020-2021 and 6% of angler effort in 1990-1991. Panfish received 3.9% of angler effort in 2020-2021, and Bluegill received 9% of angler effort in 1990-1991. White Bass received 2.3% angler effort in 2020-2021, and 9% angler effort in 1990-1991. Anglers targeting everything made up 14.4% of the angler effort in 2020-2021 and 17% in 1990-1991. Angler effort for Walleye, Sauger, catfish, Smallmouth Bass and anglers targeting anything have remained similar in percent of total angler effort. Effort for panfish and White Bass have decreased from 1990-1991. Decrease in White Bass effort is most likely a reflection of a decrease in White Bass abundance. Many of the White Bass anglers interviewed during the 2020-2021 creel made mention of the dismal number of White Bass compared to previous seasons. Panfish still remain abundant below the Prairie du Sac Dam. Decrease in angler effort for panfish from 1990-1991 creel to the 2020-2021 creel may be due to angler preference.

Angling for Lake Sturgeon, Shovelnose Sturgeon and Muskellunge was not mentioned in the 1990-1991 creel. Muskellunge and Lake Sturgeon were not as prevalent in 1990-1991 as they are now. Muskellunge received 6% of the total angler effort during this creel. Fishing for Muskellunge below the Prairie du Sac Dam has become more popular in recent years. This is evident with 50% of the guided trips targeting Muskellunge. Lake Sturgeon effort was limited to the September hook and line season. Only open for one month, angler effort for Lake Sturgeon was 11.5% of the total angler effort. This indicates a fishery of high

importance to anglers. Nonresident anglers participated in the Lake Sturgeon season more than resident anglers. Nonresident effort made up 73.9% of the effort targeting Lake Sturgeon. Shovelnose Sturgeon received 5% of the total angler effort. Resident and nonresident effort was equally distributed with residents making up 55.2% of the effort and nonresidents contributing 40.3% of the effort. The remaining effort was from anglers of unknown residency. Shovelnose Sturgeon fishing is becoming more popular on the LWR. Creel Clerks observed groups of anglers targeting Shovelnose Sturgeon throughout the creel. There was one instance of group harvesting observed.

Angler effort for Lake Sturgeon, Shovelnose Sturgeon and catfish species is likely to have been underestimated. Much of the angler effort for these species occurs at night. This creel did not have any night shifts scheduled.

Angler Catch And Harvest

The diversity of the LWR fishery continued to be evident during this creel with 35 species of fish being reported caught by anglers. This diversity lends to a variety of angling opportunities throughout the year, leading to increased angler effort. Combined, Walleye and Sauger made up 53.2% of the total catch. The remainder of the top ten most caught species with percent of total catch in parenthesis were Bluegill (9.6), Freshwater Drum (8.7), White Bass (6.5), Lake Sturgeon (4.6), Smallmouth Bass (4.4), buffalo spp. (2.8), Channel Catfish (2.8), and Shovelnose Sturgeon (1.5).

The 1990-1991 creel survey reported many of the same species caught. Bluegill made up the highest percent of catch in the 1990-1991 creel with 31.2%. Walleye and Sauger made up 19% of the total catch in 1990-1991. The most significant increase in angler catch from 1990-1991 to 2020-20201 was that of Lake Sturgeon. During the 1990-1991 creel, anglers reported catching 82 Lake Sturgeon. During the 2020-2021 creel, anglers reported catching 835 Lake Sturgeon. This 10-fold increase from the 1990-1991 creel is most likely attributed to a more robust Lake Sturgeon management program and growing popularity of fishing for Lake Sturgeon. Total estimated catch for this creel was a full 12 months, while the 1990-1991 creel only estimated total catch from March thru October. Other species with an increase in total estimated catch compared to the 1990-1991 creel were the Walleye and Sauger. In 1990-1991, the total estimated catch was 11,028 for Walleye and 4,412 for Sauger. Total estimated catch during this creel was 24,781 for Walleye and 14,614 for Sauger. More restrictive regulations protecting the smaller size classes could be the primary reason catch has increased since 1990-1991. Other factors influencing the increase in catch could be advancement in gear technologies and more anglers targeting Walleye and Sauger.

Notable species with a decrease in total estimated catch are Bluegill, Smallmouth Bass and White Bass. Total catch in the 1990-1991 creel was estimated at 55,170 for Bluegill, 33,696 for White/Yellow Bass and 6,924 for Smallmouth Bass. Total catch during this creel was estimated at 7,078 for Bluegill, 4,822 for White Bass and 3,276 for Smallmouth Bass. Abundance data is not available for White Bass or Bluegill as they are not a targeted species in current survey rotations. Speaking with anglers who historically targeted Bluegill, they are still satisfied and feel the population is healthy. However, catch rate of Bluegill by all anglers was 0.42 during the 1990-1991 creel. This dropped to 0.12 per hour during the 2020-2021 creel for all anglers. Anglers targeting Bluegill in 2020-2021 had a catch rate of 2.5 per hour which could explain their satisfaction with the Bluegill population. Multiple factors may be contributing to lower overall catch and catch rate of Bluegill by anglers. With the installation of one inch trash racks on the intake of the hydro facility, fewer Bluegill may be coming through the hydro facility from Lake Wisconsin. Muskellunge are a top piscivorous predator species that was not present in 1990-1991. Increased predation could also contribute to fewer Bluegill present in the tailwater fishery. Bluegill remain in the top three species harvested. Anglers historically targeting White Bass mentioned that they do not see as many White Bass in their creels or observe White Bass actively chasing bait fish compared to historic levels. DNR sampling crews share the same observations with anglers targeting White Bass. While White Bass are not collected during surveys, DNR sampling crews have observed fewer White Bass during electrofishing surveys. Catch rate of White Bass by all anglers was 0.25 per hour during 1990-1991. This dropped to 0.07 per hour during 2020-2021. Anglers targeting White Bass in 2020-2021 had a catch rate of 1.6 per hour. White Bass often utilize Gizzard Shad as forage. DNR sampling crews have observed fewer Gizzard Shad during sampling events. Factors influencing the decrease in White Bass and Gizzard Shad are unknown and should be studied. Even though the total estimated catch is down for Smallmouth Bass, they continue to be common to abundant in DNR surveys. Reduced numbers in catch could be attributed to the difference in creel survey areas. The 1990-1991 creel survey extended downstream of State Highway 12 where Smallmouth Bass fishing begins to become more prevalent. Catch rate of Smallmouth Bass by all anglers was the same for 1990-1991 and 2020-2021 at 0.05 per hour. Anglers targeting Smallmouth Bass in 2020-2021 had a catch rate of 0.6 per hour.

The top three species harvested in this creel were Bluegill, Walleye/Sauger and White Bass. Bluegill made up 33.9% of the total number of fish harvested with Walleye/Sauger and White Bass making up 18.3% and 16.8% respectively. Freshwater Drum made up 10.3% of the harvest, fourth highest among all fish species harvested. During the 1990-1991 creel, Bluegill made up 43.4% of the total number of fish harvested, followed by White Bass and Channel Catfish making up 27.7% and 11.5% respectively. Walleye/Sauger only made up 2.9% of the harvest in 1991-1990. This is much lower than the 18.3% reported in this creel. Lake Sturgeon and Shovelnose Sturgeon harvest has increased since the 1990-1991 creel. The number of Lake Sturgeon and Shovelnose Sturgeon

reported harvested was zero during the 1990-1991 creel. During this creel 15 Lake Sturgeon and 110 Shovelnose Sturgeon were reported harvested with an estimated total harvest of 395 Shovelnose Sturgeon.

Species with the highest percentage of fish caught that are harvested include crappie spp., Shovelnose Sturgeon, Bluegill, Channel Catfish and White Bass. Anglers targeting these species harvested 90.4% of the crappie caught, 70.9% of Shovelnose Sturgeon caught, 60.1% of Bluegill caught, 57.5% of the Channel Catfish caught and 50.8% of the White Bass caught. Having a regulation where there is no size restriction for harvest and being viewed as a desirable food fish attributes to the high percentage of catch that is harvested for these species.

Exploitation

Muskellunge exploitation rate was zero. Very few Muskellunge obtain the legal size of 50 inches total length. This, combined with the catch and release practice of most Muskellunge anglers, leads to exploitation rates at or approaching zero. Smallmouth Bass ≥ 14 inches had an exploitation rate of 4.6%. Many of the Smallmouth Bass anglers are catch and release anglers as well. The majority (87%) gave catch and release as the reason for not harvesting Smallmouth Bass. During this creel, exploitation rates of Walleye ≥ 18 inches and Sauger ≥ 15 inches were estimated at 67.0% and 33.3% respectively. Walleye and Sauger exploitation rates were high during the in 1990-1991 creel as well, with estimates of 51% for Walleye and 56% for Sauger. The regulation in 1990-1991 was a minimum length limit of 15 inches for Walleye and no length limit for Sauger with a daily combined bag limit of five total. The minimum length limit of 15 inches for Sauger was implemented in 1991. In 2002, the Walleye minimum length limit was raised to 18 inches and the total combined daily bag limit was reduced to three. This regulation change may have helped lower the exploitation rate of Sauger. The exploitation rate of Walleye remains high even with a minimum length limit of 18 inches and a combined daily bag limit of three in total. Walleye and Sauger are concentrated below the dam from October through late April. The tailwater fishery is fairly protected from north, east and west winds with ample accessibility. Open season year-round, concentration of fish, protection from winds and ample accessibility are all factors which contribute to high exploitation rates for Walleye and Sauger.

Management Preference

Management preferences by anglers follows what we found with exploitation rates. Anglers prefer the management of Muskellunge and Smallmouth Bass to be that of restrictive harvest and trophy management while preference for Walleye management was harvest with quality size structure. Anglers expressed satisfaction with current regulations below the Prairie du Sac Dam. Some anglers would like to see the DNR consider the same regulation that is in place upstream

of the dam, where Walleye and Sauger over 15 inches but less than 20 inches and only one fish over 28 inches may be kept. Daily bag limit is five in total. With high angler effort and an exploitation rate of 67%, the slot limit with a daily bag limit of five may function as a 15-inch minimum length limit.

Observations And Angler Concerns

After spending 198 days observing and conversing with anglers, there are other areas of resource management that are brought to light. During interviews, anglers would often want to discuss items that were not listed on our standard interview form. Two areas of concern were law enforcement presence and posting of fishing regulations and information. Surprisingly, anglers requested more law enforcement presence. Anglers communicated they have observed an increase in illegal harvest and felt that law enforcement presence has decreased from historic levels. Creel clerks observed group bagging of both sturgeon species, harvest of misidentified Lake Sturgeon and Walleye, and harvest of undersized Walleye. During the Lake Sturgeon season, anglers would fish in groups utilizing one tag. If this tag was filled, one of the anglers not having a tag would then purchase one. This was revealed to creel clerks by the participating anglers.

Anglers would express concern of not knowing the regulations and the DNR should improve posting fishing regulations in this area. While not often an issue, there were times anglers were not familiar with the identification of fish species. Walleye/Sauger, Blue Suckers, Paddlefish and Lake Sturgeon/Shovelnose Sturgeon were species that anglers misidentified or were unaware they existed. Signage identifying similar species or threatened and endangered species should be posted. Many anglers do not speak English as their first language. Signage written in multiple languages like Spanish, Hmong, Russian and Ukrainian would be beneficial.

Management Recommendations

1) DNR, Wisconsin Power & Light Company, Village of Sauk City and Village of Prairie du Sac continue maintaining current shore and watercraft access while expanding angler access when opportunities arise.

2) Maintain the current regulation for Walleye and Sauger: Three in total of Walleye, Sauger or their hybrids may be kept. Walleye must be at least 18.0 inches and Sauger or hybrids must be at least 15.0 inches.

3) With the diversity of angling effort, monitoring of the Prairie du Sac tailwater fishery should be designed for multiple species.

4) Conduct movement studies to determine the contribution of fish populations in Lake Wisconsin to the LWR Walleye and Lake Sturgeon Populations.

5) Conduct angler preference survey for the rest of the LWR to determine if angler management preferences expressed in this survey are indicative for the rest of the LWR.

6) Quantify Shovelnose Sturgeon abundance and angler exploitation.

7) Work with the Wisconsin Sturgeon Species Team to evaluate closing hook and line Lake Sturgeon harvest tag sales at 11:59 p.m. on the day prior to the start of the open hook and line Lake Sturgeon season. Group fishing for Lake Sturgeon and Shovelnose Sturgeon was observed by creel clerks.

8) Stocking of extended growth Muskellunge should be considered if stocking of Lake Wisconsin would ever be discontinued.

9) Most of the catfish, Lake Sturgeon and Shovelnose Sturgeon anglers fished during night hours. This creel did not have night shifts, therefore, effort, catch and harvest of these species were underestimated. Future creels should include night shifts to accurately reflect angling statistics for these species.

10) Conduct creel surveys to monitor angler effort targeting Lake Sturgeon during the open hook and line season.

11) Work with Law Enforcement to monitor and reduce illegal harvest of Shovelnose Sturgeon and Lake Sturgeon. Group fishing for Lake Sturgeon and Shovelnose Sturgeon was observed by creel clerks.

12) Maintain adequate regulation signage

- Provide signage to educate anglers on Threatened, Endangered and Species of Special Concern.
- Provide signage to educate anglers on proper identification of like species such as Walleye/Sauger and Lake Sturgeon/Shovelnose Sturgeon.
- Provide signage in multiple languages.

Acknowledgments

We would like to acknowledge the Prairie du Sac Dam Mitigation Fund, managed by the Wisconsin Natural Resources Foundation and overseen by Wisconsin Power and Light, a subsidiary of Alliant Energy, and the Wisconsin Department of Natural Resources, for funding this project; Gene Hatzenbeler for providing the creel schedule and recommendations on creel design; Adam Nickel for providing methods for Walleye exploitation and angler tag return rates; Chris Stockner for managing the project account; David Winston for providing mapping information; and Samantha Brose, Cole Douglas, Claire Gaber, Scott Harpold, Justin Haglund, Kimberly Kuber, Alexander Latzka, Colton Loeffelholz, John Lyons, Lloyd Meng, Andrew Notbohm, Nathan Nye, Clayton Roberts, David Rowe, Tim Simonson, Lori Tate and Casey Weber for assisting with the creel survey, tagging surveys and/or document review.

References

Koenigs, R.P., R. M. Bruch, and K.K. Kamke, 2013. Impacts of anchor tag loss on walleye management in the Winnebago system, North American Journal of Fisheries Management, 33:5, 909-916.

Nickel A., 2018. Winnebago system walleye report 2017. Wisconsin Department of Natural Resources Fisheries Management Report.

Rasmussen, P.W., J.L. Unmuth, J. Lyons, and E. Van Dyck, 1994. A creel survey of the lower Wisconsin River, 1990-1991. Wisconsin Department of Natural Resources Research Report. No. 160.

Rosenberger, R.S., 2016. Recreation use values database summary. Available: https://recvaluation.forestry.oregonstate.edu/database. (November, 2016).

U.S. Bureau of Labor Statistics, 2022. CPI inflation calculator Available: https://www.bls.gov/data/inflation_calculator.htm (January, 2022).

Additional Resources for Lower Wisconsin River Fisheries

Lyons, J.F., D. Walchak, J. Haglund, B.M. Prachei, 2016. Habitat use and population characteristics of potentially spawning shovelnose sturgeon Scaphirhynchus platorynchus (Rafinesque, 1820), blue sucker (Cycleptus elongatus (Lesueur, 1817), and associated species in the lower Wisconsin River, USA, Journal of Applied Ichtyology, 32(6):1003-1015.

Lyons, J.F., K. Welke, 1996. Abundance and growth of young-of-year walleye (Stizostedion vitreum) and sauger (S. canadense) in pool 10, upper Mississippi River, and at Prairie du Sac dam, lower Wisconsin River, 1987-1994, Journal of Freshwater Ecology, 11(1):39-50

Pellett, T.D., G.J. Van Dyck, J.V. Adams, 1998. Seasonal migration and homing of channel catfish in the lower Wisconsin River, Wisconsin, North American Journal of Fisheries Management, 18(1):85-95

Runstrum A.L., B. Vondracek, C,A, Jennings, 200. Population statistics for paddlefish in the Wisconsin River, Transactions of the American Fisheries Society, 130(4), 546-556.

Figure 1. *Study area for the Prairie du Sac Dam tailwater creel survey. Prairie du Sac Dam downstream to State Highway 12. Three river miles and 300 acres.*

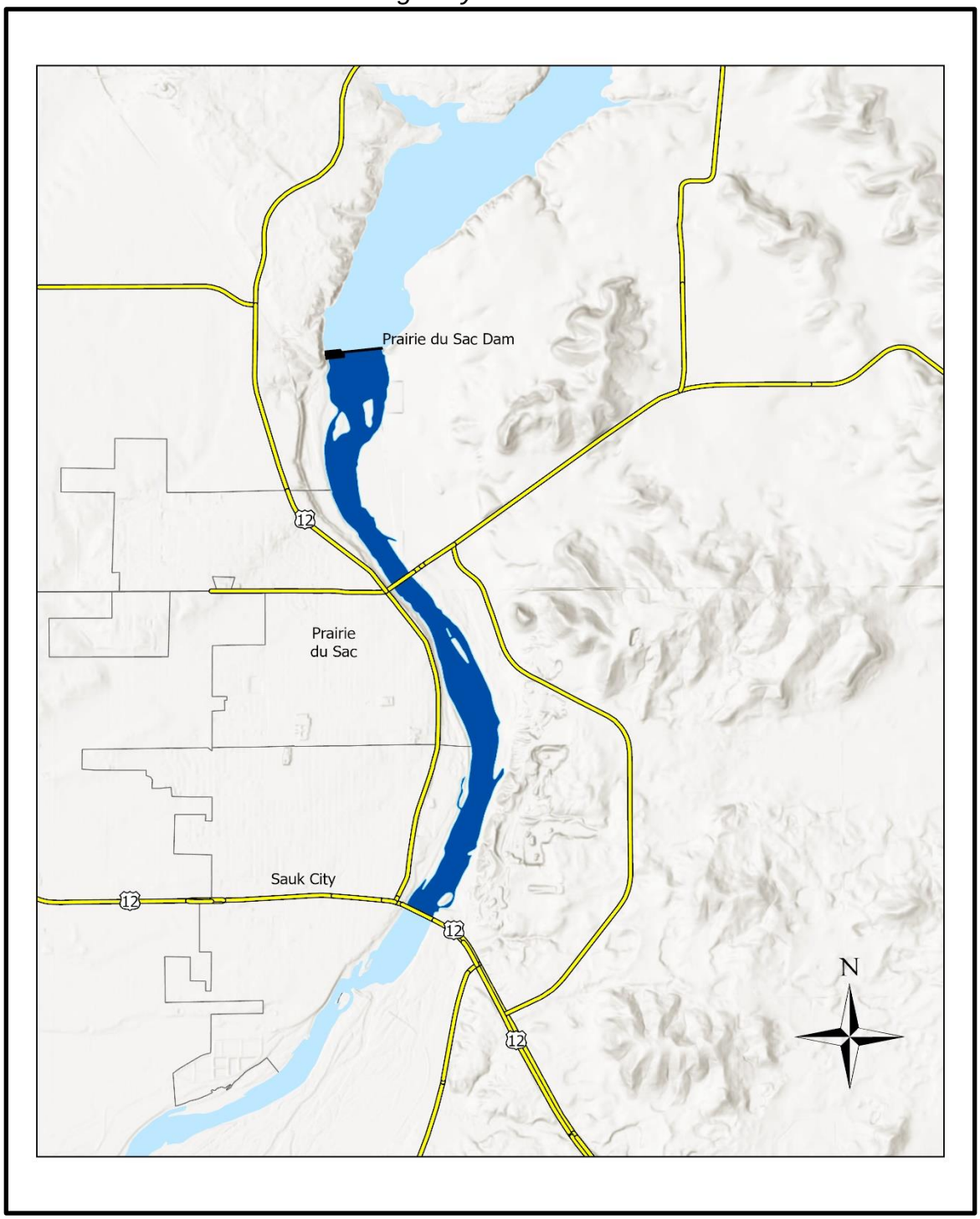

Figure 2. *Alliant Energy hydroelectric facility and Prairie du Sac Dam.*

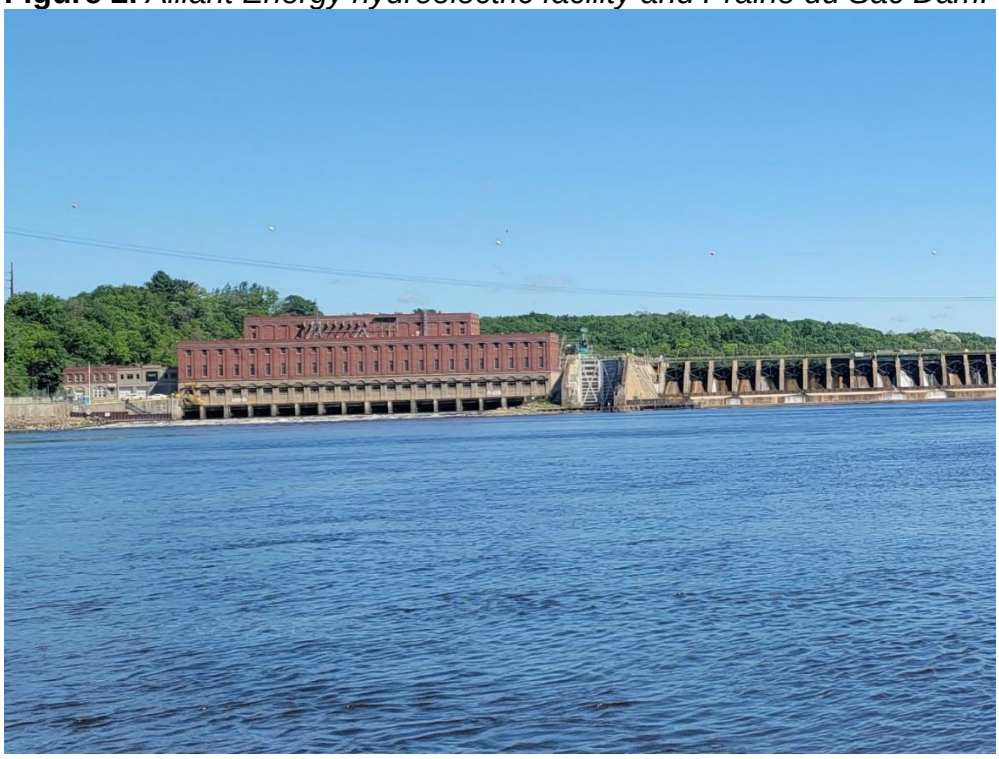

Photo by (Bradd Sims/DNR)

Figure 3. *Temporal distribution of total angler effort, shore angler effort, and boat angler effort below the Prairie du Sac Dam to State Highway 12 bridge, Wisconsin River, Nov. 1, 2020 – Oct. 31, 2021.*

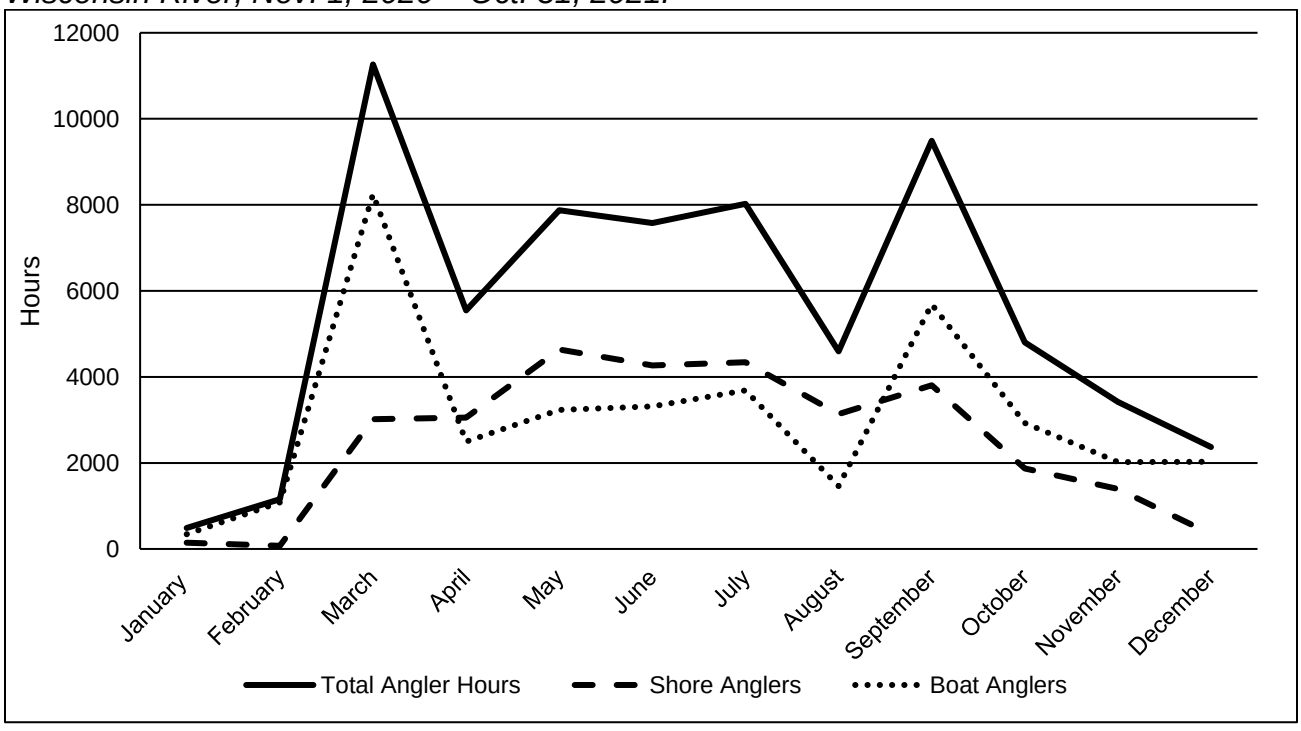

Figure 4. *Temporal distribution of resident and nonresident angler effort below the Prairie du Sac Dam to State Highway 12 bridge, Wisconsin River, Nov. 1, 2020 – Oct. 31, 2021.*

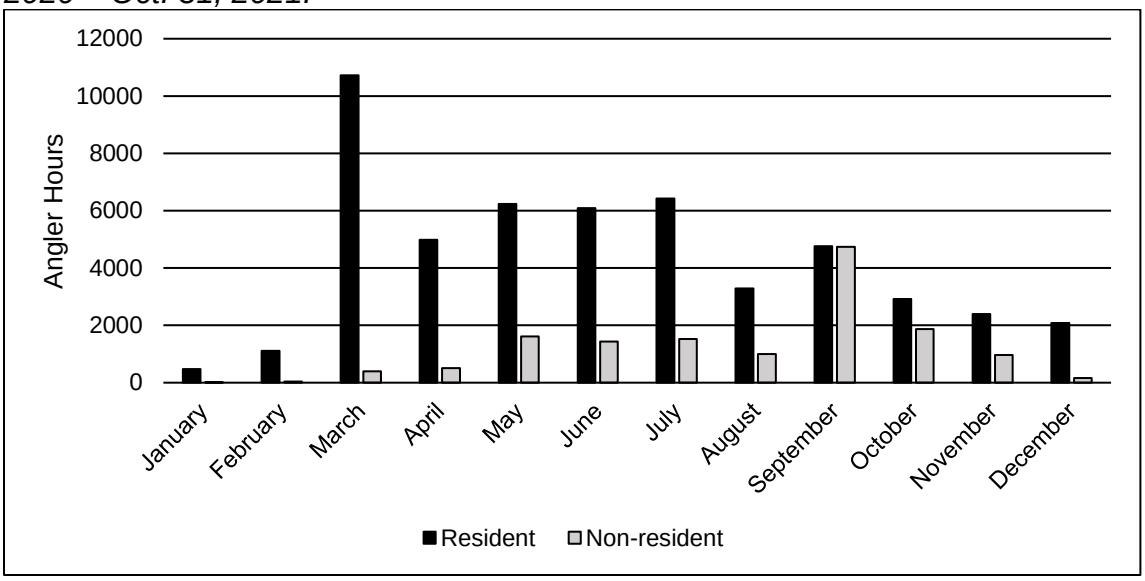

Figure 5. *Percent angler effort for targeted species below the Prairie du Sac Dam to State Highway 12 bridge, Wisconsin River, Nov. 1, 2020 – Oct. 31, 2021. "Other spp." includes the following from greatest to least effort: buffalo spp., Northern Pike, gamefish, Freshwater Drum, Roughfish, redhorse spp., Largemouth Bass, gar spp., Bowfin and Common Carp.*

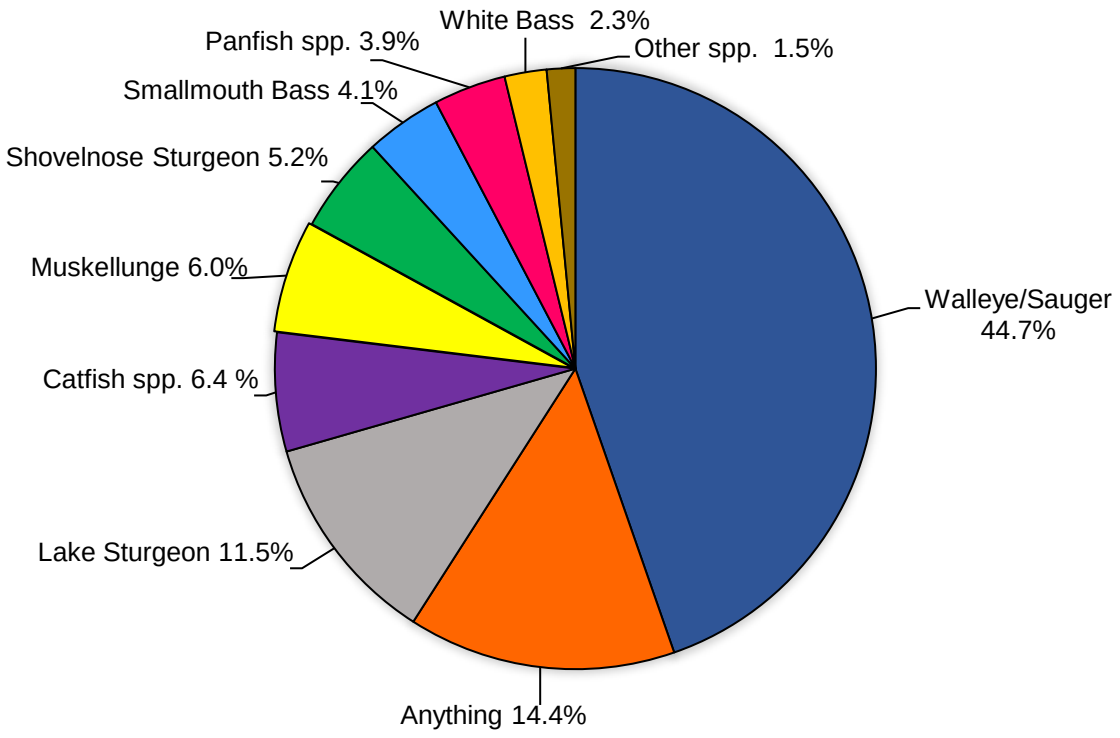

Figure 6. *Temporal distribution Walleye and Sauger angler effort below the Prairie du Sac Dam to State Highway 12 bridge, Wisconsin River, Nov. 1, 2020 – Oct. 31, 2021.*

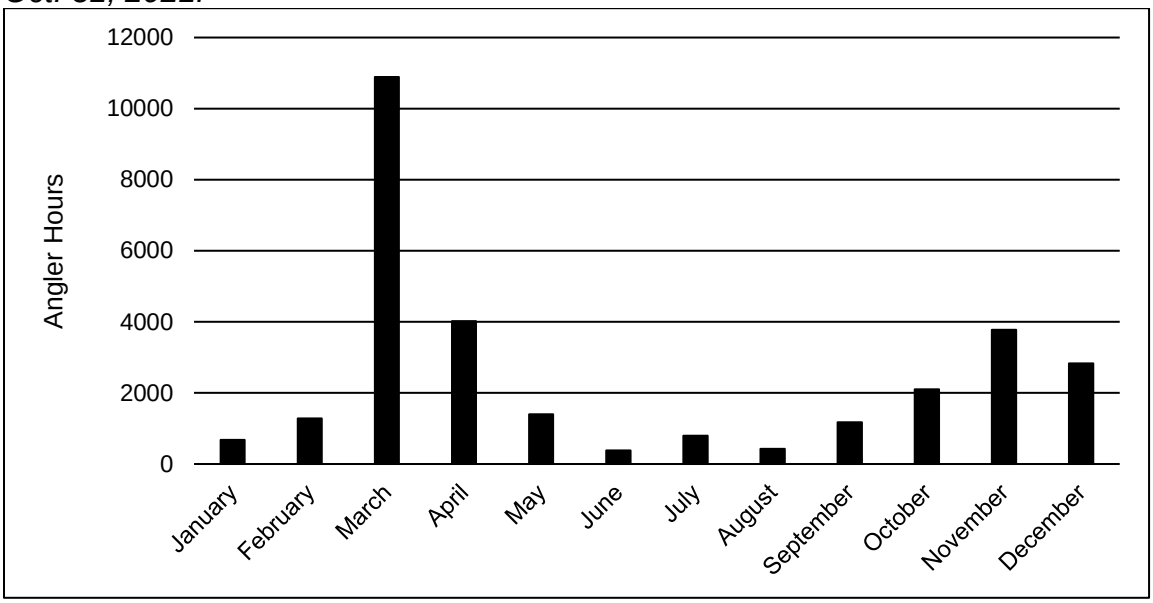

Figure 7. *Length distribution of Walleye harvested below the Prairie du Sac Dam to State Highway 12 bridge, Wisconsin River, Nov. 1, 2020 – Oct. 31, 2021.*

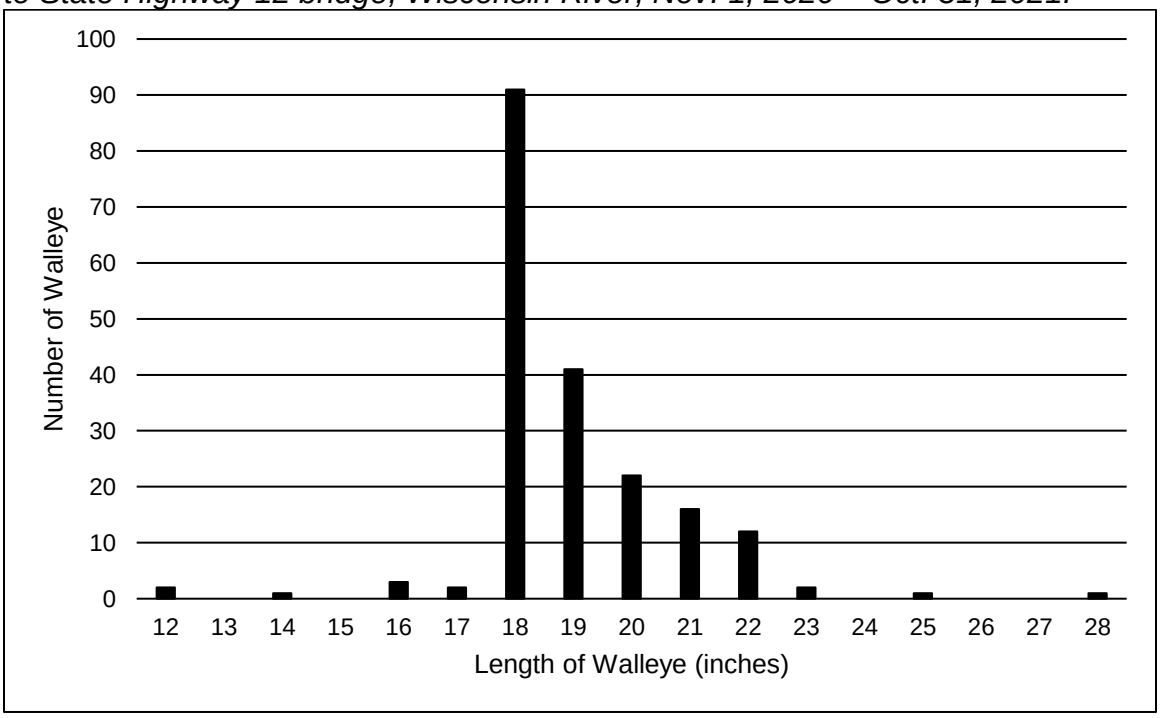

Figure 8. *Length distribution of Sauger harvested below the Prairie du Sac Dam to State Highway 12 bridge, Wisconsin River, Nov. 1, 2020 – Oct. 31, 2021.*

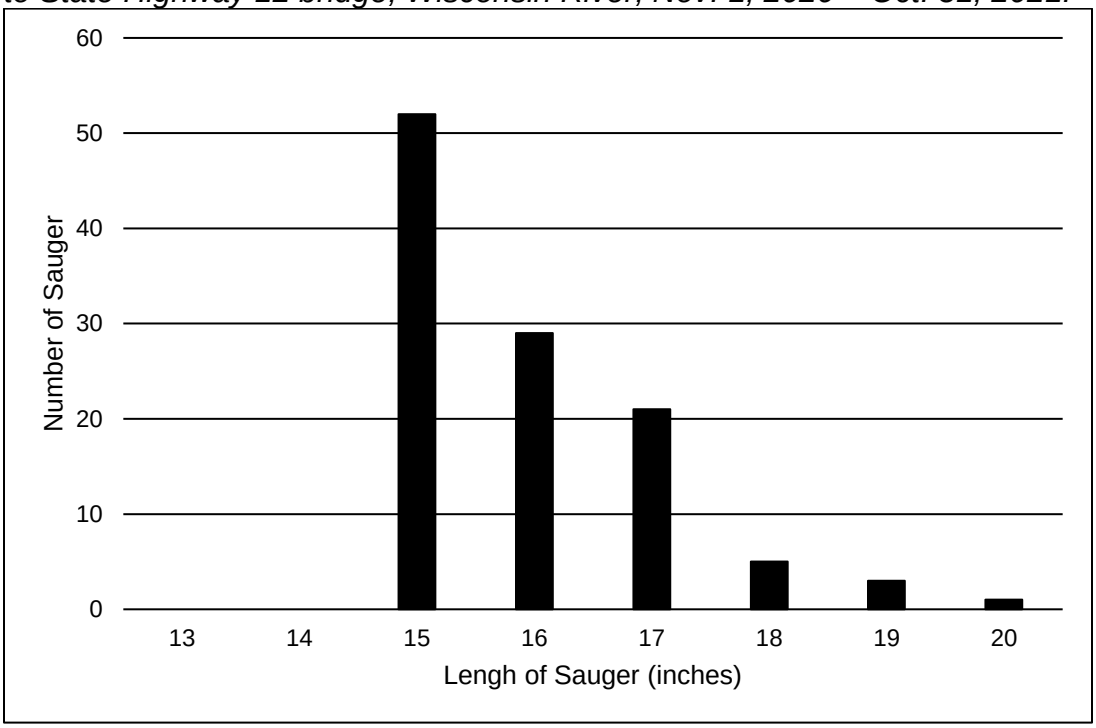

Figure 9. *Temporal distribution of Channel Catfish and Flathead Catfish angler effort below Prairie du Sac Dam to State Highway 12 bridge, Wisconsin River, Nov. 1, 2020 – Oct. 31, 2021.*

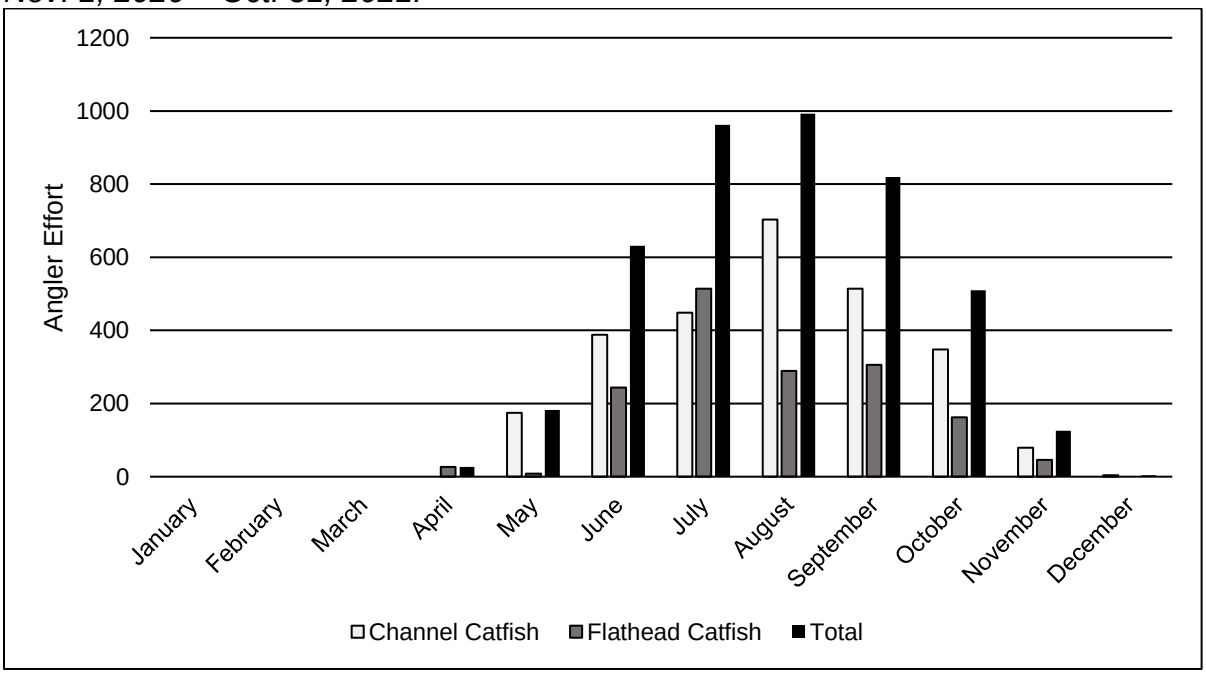

Figure 10. *Temporal distribution of Muskellunge angler effort below the Prairie du Sac Dam to State Highway 12 bridge, Wisconsin River, Nov. 1, 2020 – Oct. 31, 2021.*

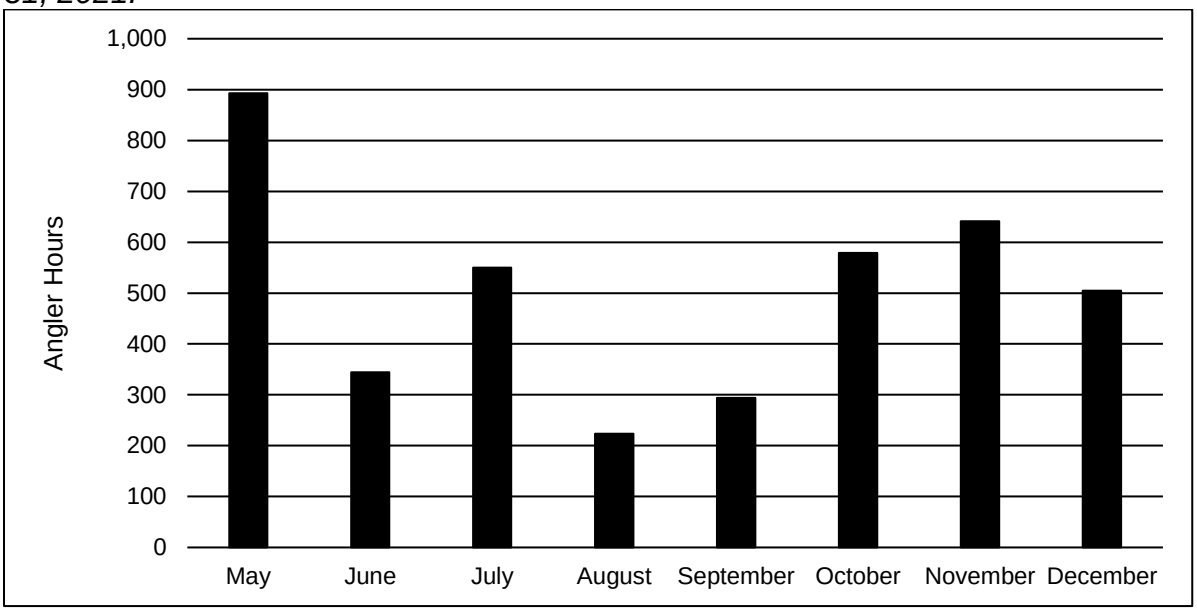

Figure 11. *Temporal distribution of Smallmouth Bass angler effort below the Prairie du Sac Dam to State Highway 12 bridge, Wisconsin River, Nov. 1, 2020 – Oct. 31, 2021.*

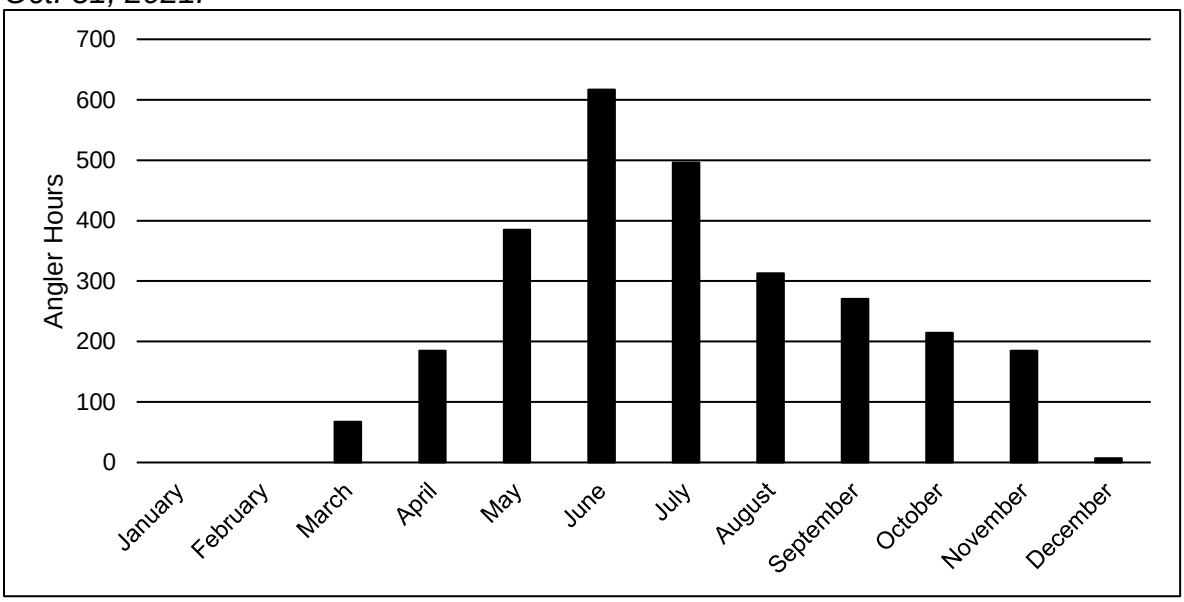

Figure 12. *Angler management preferences for Walleye, Muskellunge, and Smallmouth Bass below the Prairie du Sac Dam to State Highway 12 bridge, Wisconsin River, Nov. 1, 2020 – Oct. 31, 2021.*

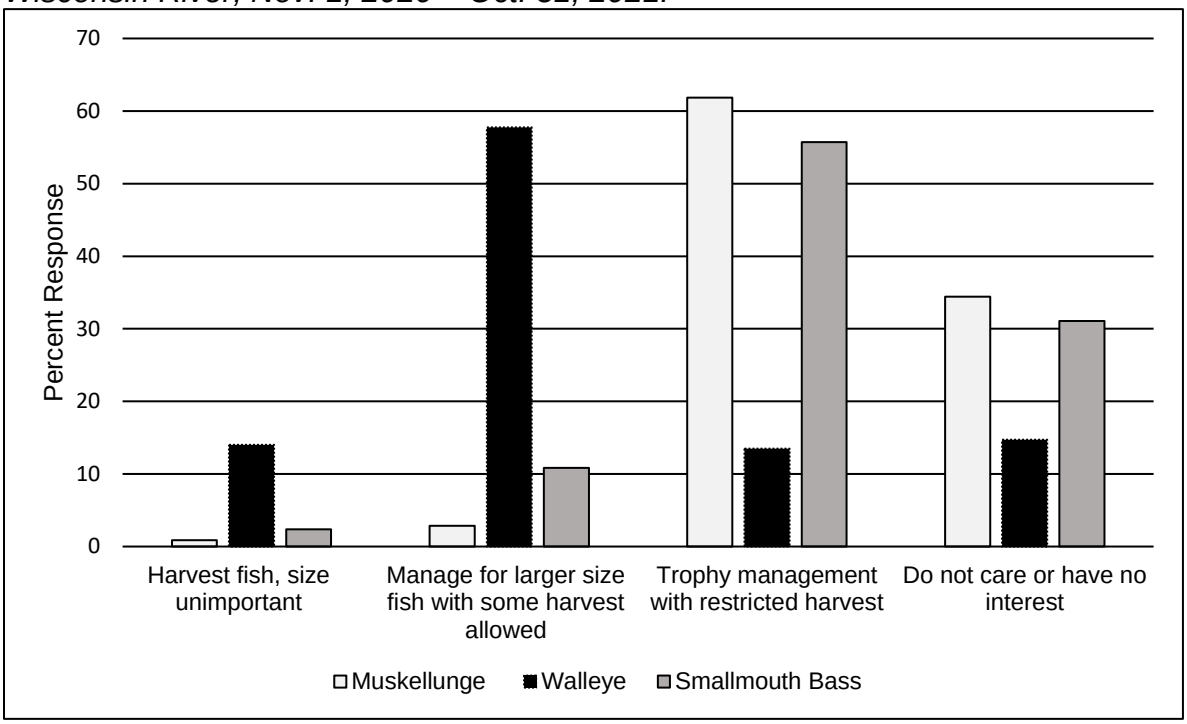

Table 1. *Fish species, number caught and number harvested reported by anglers in creel interviews below the Prairie du Sac Dam to State Highway 12 bridge, Wisconsin River, Nov. 1, 2020 – Oct. 31, 2021. Listed in order of abundance caught from greatest to least.*

Species	Scientific name	Number caught	Number Harvested
Walleye	*Stizostedion vitreum vitreum*	6,074	203
Sauger	*Stizostedion canadense*	3,582	115
Bluegill	*Lepomis macrochirus*	1,735	961
Freshwater Drum	*Aplodinotus grunniens*	1,580	292
White Bass	*Morone chrysops*	1,182	477
Lake Sturgeon	*Acipenser fulvescens*	835	15
Smallmouth Bass	*Micropterus dolomieu*	803	22
Buffalo spp.	*Ictiobus spp.*	508	44
Channel Catfish	*Ictalurus punctatus*	503	128
Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	274	110
Crappie	*Pomoxis spp.*	222	158
Flathead Catfish	*Pylodictis olivaris*	130	21
Gizzard Shad	*Dorosoma cepedianum*	112	0
Paddlefish	*Polyodon spathula*	98	0
Redhorse spp.	*Moxostoma spp.*	82	22
Common Carp	*Cyprinus carpio*	72	3
Muskellunge	*Esox masquinongy*	63	0
Mooneye	*Hiodon tergisus*	60	17
Yellow Perch	*Perca flavescens*	55	22
Largemouth Bass	*Micropterus salmoides*	35	1
Quillback	*Carpiodes cyprinus*	34	13
Gar spp.	*Lepisosteus spp.*	27	6
Northern Pike	*Esox lucius*	21	0
Bowfin	*Amia calva*	20	1
Rock Bass	*Ambloplites rupestris*	17	0
Burbot	*Lota lota*	7	2
Lamprey spp.	*Ichthyomyzon spp.*	5	0
Warmouth	*Lepomis gulosus*	3	0
Pumpkinseed	*Lepomis gibbosus*	2	0
Bullhead	*Ameiurus spp.*	2	0
American Eel	*Anguilla rostrata*	2	0
White Sucker	*Morone chrysops*	2	2
Blue Sucker	*Cycleptus elongatus*	1	0
Brown Trout	*Salmo trutta*	1	0
Bighead Carp	*Hypophthalmichthys nobilis*	1	0

Table 2. *Estimated total yearly catch and harvest of fish species below the Prairie du Sac Dam to State Highway 12 bridge, Wisconsin River, Nov. 1, 2020 – Oct. 31, 2021. Listed in order of abundance caught from greatest to least.*

Species	Scientific name	Number caught	Number Harvested
Walleye	*Stizostedion vitreum vitreum*	24,781	828
Sauger	*Stizostedion canadense*	14,614	469
Bluegill	*Lepomis macrochirus*	7,078	3921
Freshwater Drum	*Aplodinotus grunniens*	6,446	1191
White Bass	*Morone chrysops*	4,822	1946
Lake Sturgeon	*Acipenser fulvescens*	3,407	61
Smallmouth Bass	*Micropterus dolomieu*	3,276	90
Buffalo spp.	*Ictiobus spp.*	2,073	180
Channel Catfish	*Ictalurus punctatus*	2,052	522
Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	1,118	449
Crappie	*Pomoxis spp.*	906	645
Flathead Catfish	*Pylodictis olivaris*	530	86
Gizzard Shad	*Dorosoma cepedianum*	457	0
Paddlefish	*Polyodon spathula*	400	0
Redhorse spp.	*Moxostoma spp.*	335	90
Common Carp	*Cyprinus carpio*	294	12
Muskellunge	*Esox masquinongy*	257	0
Mooneye	*Hiodon tergisus*	245	69
Yellow Perch	*Perca flavescens*	224	90
Largemouth Bass	*Micropterus salmoides*	143	4
Quillback	*Carpiodes cyprinus*	139	53
Gar spp.	*Lepisosteus spp.*	110	24
Northern Pike	*Esox lucius*	86	0
Bowfin	*Amia calva*	82	4
Rock Bass	*Ambloplites rupestris*	69	0
Burbot	*Lota lota*	29	8
Lamprey spp.	*Ichthyomyzon spp.*	20	0
Warmouth	*Lepomis gulosus*	12	0
Pumpkinseed	*Lepomis gibbosus*	8	0
Bullhead	*Ameiurus spp.*	8	0
American Eel	*Anguilla rostrata*	8	0
White Sucker	*Morone chrysops*	8	8
Blue Sucker	*Cycleptus elongatus*	4	0
Brown Trout	*Salmo trutta*	4	0
Bighead Carp	*Hypophthalmichthys nobilis*	4	0

Table 3. *Fish species, number caught and number harvested reported by anglers targeting "anything" in creel interviews below the Prairie du Sac Dam to State Highway 12 bridge, Wisconsin River, Nov. 1, 2020 – Oct. 31, 2021. Listed in order of abundance caught from greatest to least.*

Species	Scientific name	Caught	Harvested
Freshwater Drum	*Aplodinotus grunniens*	441	98
Bluegill	*Lepomis macrochirus*	240	95
White Bass	*Morone chrysops*	211	79
Walleye	*Stizostedion vitreum vitreum*	164	6
Channel Catfish	*Ictalurus punctatus*	116	30
Lake Sturgeon	*Acipenser fulvescens*	106	0
Smallmouth Bass	*Micropterus dolomieu*	91	4
Redhorse spp.	*Moxostoma spp.*	44	15
Mooneye	*Hiodon tergisus*	41	15
Sauger	*Stizostedion canadense*	24	2
Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	21	4
Buffalo spp.	*Ictiobus spp.*	21	3
Common Carp	*Cyprinus carpio*	19	1
Crappie	*Pomoxis spp.*	17	12
Flathead Catfish	*Pylodictis olivaris*	15	4
Gar spp.	*Lepisosteus spp.*	13	6
Quillback	*Carpiodes cyprinus*	11	3
Bowfin	*Amia calva*	11	1
Largemouth Bass	*Micropterus salmoides*	11	0
Yellow Perch	*Perca flavescens*	6	2
Rock Bass	*Ambloplites rupestris*	5	0
Burbot	*Lota lota*	3	2
Muskellunge	*Esox masquinongy*	3	0
Northern Pike	*Esox lucius*	2	0
Pumpkinseed	*Lepomis gibbosus*	2	0
Paddlefish	*Polyodon spathula*	1	0

Table 4. *Angler effort (hours/acre) for local waterbodies, waterbodies with high angler effort and mean angler effort for the Ceded Territory waters.*

Waterbody	County	Year(s)	Angler hours/acre	Reference
LWR- Prairie du Sac	Sauk	2020-2021	223.0	current study
LWR- Prairie du Sac	Sauk	1990-1991	170.6	Rasmussen et al., 1994
Otter Lake	Chippewa	2014	160.2	DNR unpublished data
Lynx-Eagle Chain	Vilas	2013	137.2	DNR unpublished data
Fawn - Manitowish Chain	Vilas	2004	113.7	DNR unpublished data
Lake Mendota	Dane	1989	56.2	Johnson and Staggs, 1992*
Lake Waubesa	Dane	2006	46.6	DNR unpublished data
Ceded Territory		1990-2020	30.7**	DNR unpublished data

**Cited by Rasmussen et al., 1994*

***Mean value of all creels conducted for the Ceded Territory 1990-2020.*