2023-24 COMPREHENSIVE SURVEY REPORT

WATER: BRULE RIVER FLOWAGE COUNTY: FLORENCE

INTRODUCTION AND SURVEY OBJECTIVES

The Wisconsin Department of Natural Resources conducted a comprehensive survey of the Brule River Flowage (WI)/ Paint Pond (MI), Florence County, to analyze the health of its fishery. A comprehensive survey includes surveys designed to assess all the major fish populations within the flowage; for species-specific survey details see the table below. The summary that follows will detail the current fishery, changes observed in this fishery since the last 2015-2016 comprehensive survey and summary results from an open water angler creel survey conducted in conjunction with this survey. This flowage is located approximately 3 miles North of Florence, with boat access at the end of Brule Landing Road.

Acres: 550
Shoreline Miles: Unknown
Maximum Depth (feet): 64
Lake Type: Flowage
Public Access: Boat Landing
Lake Class: Complex - Cool - Dark
Regulations: WI/MI Boundary Water Regulations

WISCONSIN DNR CONTACT INFO.

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Table 1. Summary of all surveys conducted during 2023

SURVEY INFORMATION				
Species	**Survey Date(s)**	**Gear Used**	**Effort**	**Water Temp. (°F)**
Walleye, Northern Pike, Yellow Perch, Black Crappie	4/14-4/26/2023	Fyke Net	96 Net-Nights	35-45
Walleye (Marking)	4/18, 4/23, and 4/24/2023	Boomshocker	7.42 hours	38-40
Walleye (Recapture)	4/27/2023	Boomshocker	9.04 miles	44-46
Muskellunge	5/4-5/12/2023 & 4/16-4/24/2024	Fyke Net	64 Net-Nights & 76 Net-Nights	48-64
Smallmouth and Largemouth Bass	5/23/2023	Boomshocker	9.0 miles	63-66

FISH METRIC DESCRIPTIONS

Population estimate (PE) is estimated by marking a portion of the population, then capturing another sample of fish and using the ratio of new fish to previously marked fish to estimate the number of fish in the population.

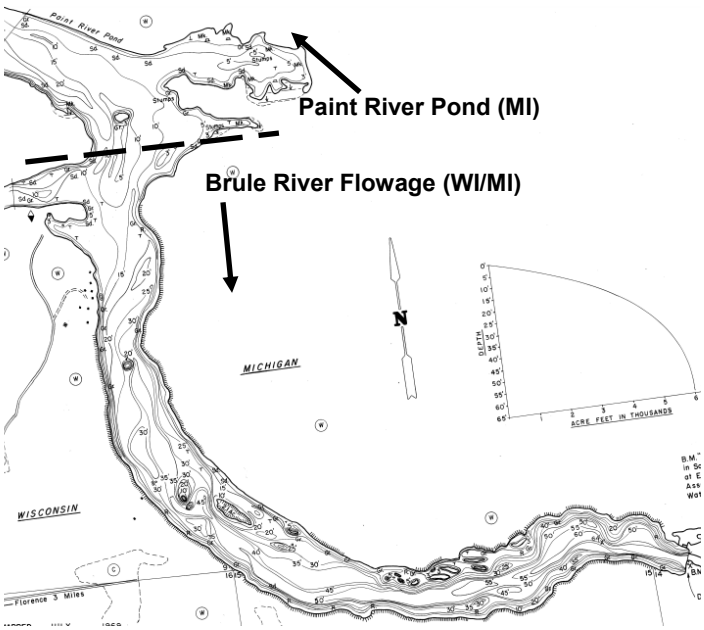
Catch per unit effort (CPUE) is the number of fish per mile (electrofishing) or per net -night (netting) and is used to index abundance when we are unable to get a PE.

Relative stock density (RSD) is an index used to describe the size structure of fish populations. It is calculated by dividing the number of fish larger than a certain length by the number of stock size fish for a given species. Stock size is a length set for each species and is used to offset potential large year classes of juvenile fish.

Length frequency distribution (LFD) is a graphical representation of the number of fish captured by inch group. Smaller fish (or younger age classes) may not always be represented in the length frequency due to different habitat usage or sampling gear limitations.

SURVEY METHODS

- Surveys are designed to evaluate each species when they are particularly vulnerable to our gear.
- Standard fyke nets and electrofishing gear is used to capture fish.
- Data is collected from the target species of each survey to gather population metrics.
- Fish metrics are compared to previous surveys of this water and the mean/median values for waters in this “area” (Florence and Forest Counties).
- Data collected is used to monitor the fishery, determine if stocking is necessary, evaluate fishing regulations, and determine how to improve the fishery.



GEAR USED DURING THIS SURVEY

- **Fyke Nets** are set in areas where we anticipate fish to congregate. Fish traveling along the shoreline will be met by a “lead,” which is similar to a fence. The lead directs the fish toward the trap end of the net. Fish travel through a series of funnels and eventually become trapped. Fish are then removed from the net and placed in holding tanks to gather data before being returned to the lake.

Photo Credit: Carl Sundberg

- **Boomshocker** is a specially designed boat that creates an electric current in the water immediately in front of the boat. The boat is driven along the shoreline and shallow areas of the lake. When the boat encounters fish, they are momentarily stunned. Once the fish is stunned, they can be netted out of the lake and placed in a holding tank. After data is collected, the fish are returned to the lake.

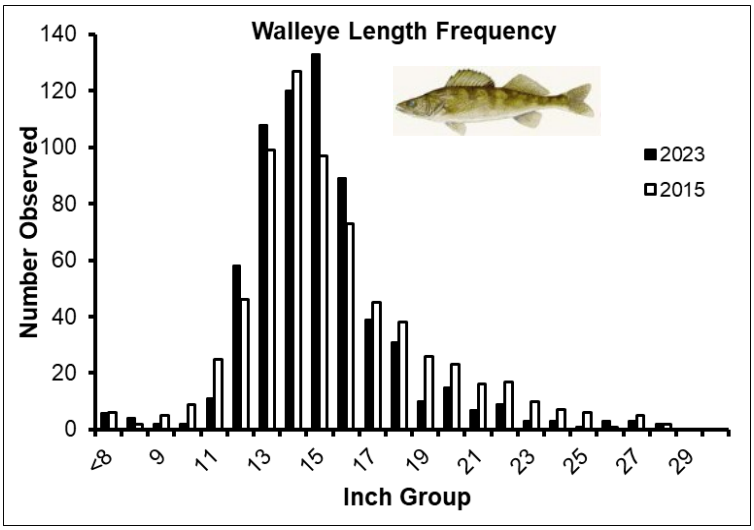
Photo Credit: Wisconsin DNR

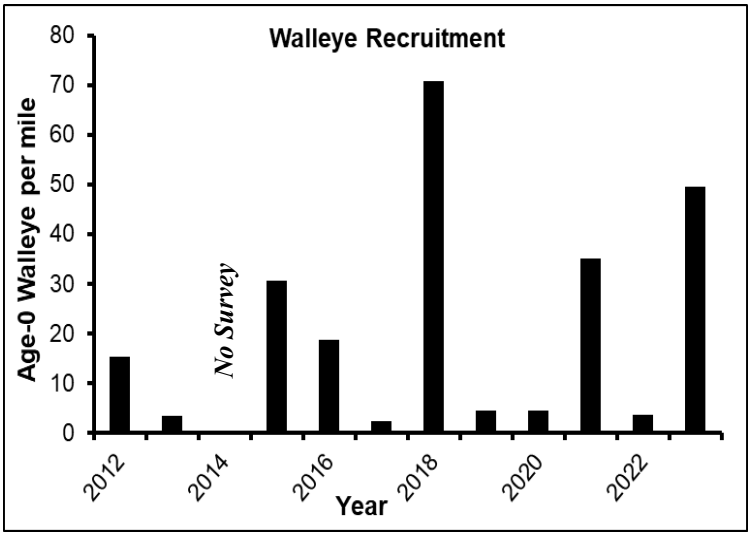
WALLEYE

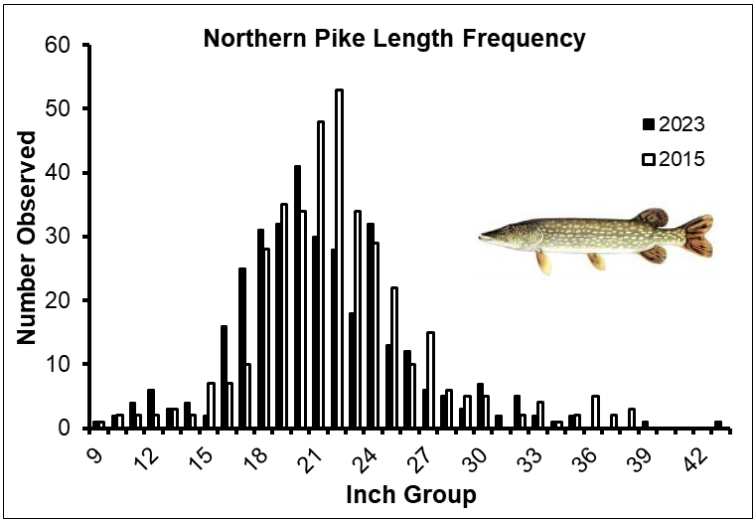
A mark-recapture survey was conducted to estimate the abundance of adult walleye in Brule River Flowage. We ran fyke nets for 12 days and electrofished 3 nights between 4/14-4/26 in an attempt to capture and mark as many adult walleye as possible. During this "marking period" we captured 433 different walleye, 404 of these fish were considered adults. On the night of 4/27 we electrofished 4 different stations on the flowage and captured 254 adult walleye, 62 of those fish (25.6%) were fish that we captured during the marking period. Based on our survey data, we estimate the adult walleye population in Brule River Flowage/Paint Pond to be approximately 1,735 fish (3.15/acre), which is considered an abundant population. The walleye population has increased by approximately 12.1% since the last survey, conducted in 2015, when the population was estimated at 2.81 adults/acre.

Every walleye captured was measured to assess the size structure of the population. The size structure of walleye in Brule River Flowage is below average, with approximately 53.8% being ≥ 15 inches and 7.1% ≥ 20 inches. Walleye size structure has decreased since 2015 when 54.5% were ≥ 15 inches and 13.0% ≥ 20 inches.

We monitor walleye recruitment (reproduction) annually on Brule River Flowage by electrofishing 2 stations every fall. During these surveys we capture all walleye and assess the recruitment using the number of age-0 walleye captured per mile electrofished. We generally consider a catch rate of ≥ 20 age-0 walleye per mile to be a strong year class. Typically, a fishery only needs 1 or 2 strong year classes every 5 years to maintain a healthy walleye population. As shown in the figure to the right, this flowage has had significant year classes of walleye 4 times in the last 11 years. This is considered strong walleye recruitment. The 2018 year class was particularly strong, those fish are now sexually mature and likely are the reason why abundance has increased over the last 8 years. The strong recruitment documented since 2018 is a great sign that this walleye population will remain abundant for the near future. With this many young fish in the population, it may take a few years before we see a substantial increase in size structure.







NORTHERN PIKE

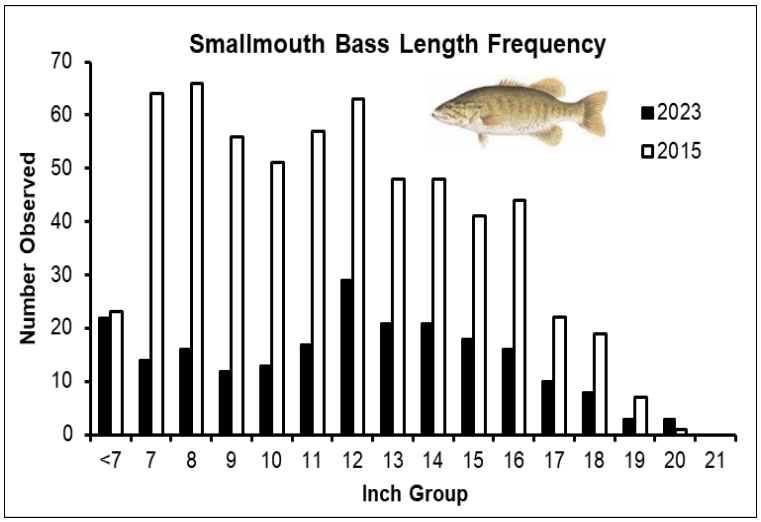
A mark–recapture survey was conducted to estimate the adult northern pike population in this flowage. Fyke nets were set on 4/14 and were ran for 12 days. The first 8 days of netting was the marking portion of our survey and all sexually mature northern pike (along with fish ≥ 12 inches of unknown sex) were given an identifiable fin clip. During the marking portion of this survey, we captured and marked 258 different adults. The recapture survey took place over the last 4 days of netting. During the recapture survey we captured 118 different adult northern pike, with 43 of these (36.4%) having the fin clip given during the marking survey. The data from this survey estimates the adult northern pike population to be approximately 696 fish (1.26/acre) . This suggests a very slight increase in adult northern pike abundance since 2015 when the population was estimated at 622 fish (1.13/acre). The current abundance is well below the area average and is considered a low density population.

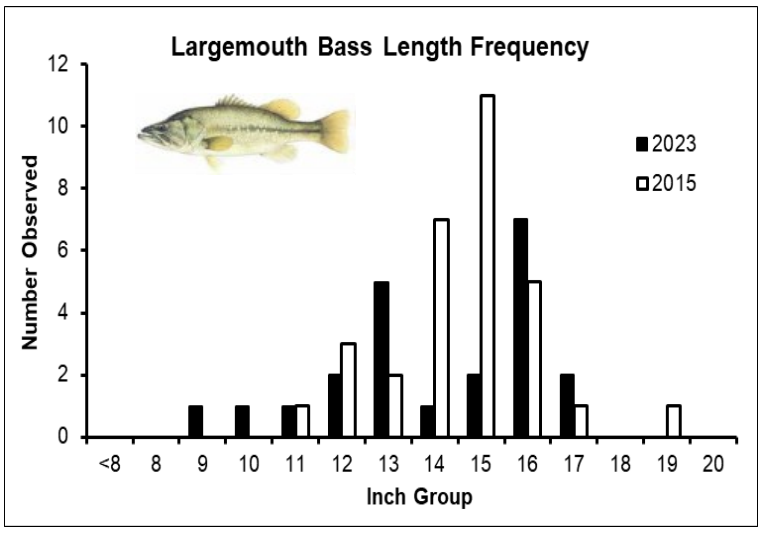
Every northern pike captured during our survey was measured and size structure was indexed using Relative Stock Density. After excluding fish less than 14 inches, approximately 52.7% of the fish captured were ≥ 21 inches and 9.1% were ≥ 28 inches. This is a slight decrease in size structure from the 2015 survey, when approximately 66.7% were ≥ 21 inches and 9.5% were ≥ 28 inches. When compared to other populations within our area, the size structure of this northern pike population is considered average. The largest northern pike captured during the 2023 survey was 43.8 inches long.

SMALLMOUTH BASS

On the night of 5/23 an electrofishing survey was conducted to assess the bass populations within the flowage. Four stations, covering 9 miles of shoreline, were electrofished covering all of the major habitat types. During this survey we captured a total of 223 smallmouth bass, 187 of these were ≥ 8 inches and considered adults, which is a relative abundance of 20.8 adults/mile. During the last comprehensive survey in 2015, relative abundance was measured at 24.6 adults/mile, suggesting that smallmouth bass abundance has decreased by approximately 15% in the last 8 years. Even though adult abundance has decreased recently, the adult population in this flowage is 87% higher than the average abundance of adult smallmouth bass in this area of the state, which is 11.1 adults/mile.

Every smallmouth bass captured during this year's bass survey was measured to assess size structure. After removing fish that were < 7 inches, 39.3% were larger than the minimum length limit of 14 inches, and 11.9% were ≥ 17 inches in length. The size structure of this population is considered average for this area of the state.





LARGEMOUTH BASS

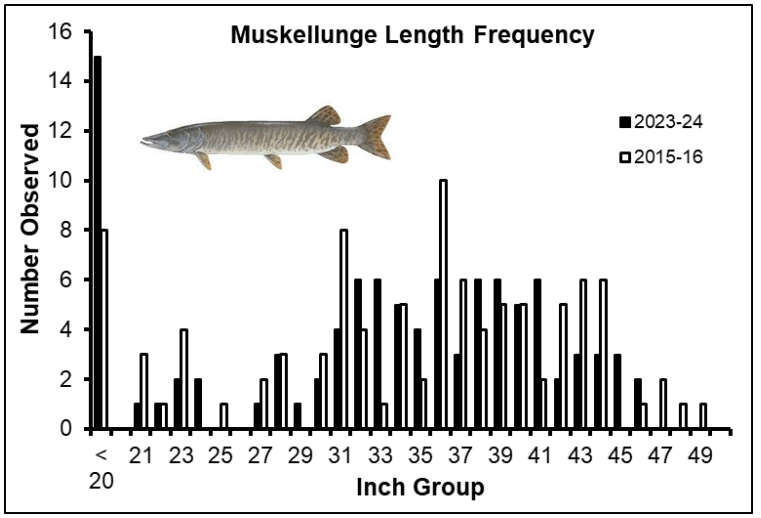
Largemouth bass were assessed during the same electrofishing survey as smallmouth bass during this year's survey. Only 22 largemouth bass were captured over 9 miles of electrofishing, all were considered adults, which is a relative abundance of 2.4 adults/mile. Abundance seems to have more than doubled since the 2015 survey when largemouth bass abundance was measured at 1.1 adults/mile. Even though this population appears to be increasing, adult abundance is well below the area average of 17.5/mile, which is typical of fisheries with dominant smallmouth bass populations.

Every largemouth bass captured during this year's bass survey was measured to assess size structure. Of the 22 largemouth bass captured, 54.6% were ≥ 14 inches, which is much lower than the 2015 survey when 80.7% were ≥ 14 inches. Even though this was a small sample size the size structure of largemouth bass in this flowage appears to be better than the area average of 43.8% ≥ 14 inches.

MUSKELLUNGE

Muskellunge were captured during the walleye/northern pike and bass surveys along with a directed survey for muskellunge from 5/4 to 5/12. All adult muskellunge were marked with a fin clip as part of a two year assessment of the population. In 2023 we captured 79 different muskellunge during spring surveys, ranging from 9.7 to 46.5 inches in length. There were 37 different fish sampled during directed netting efforts and the other 42 fish captured were from surveys designed for other species. Muskellunge were sampled again in 2024 using fyke nets from 4/16 to 4/24 capturing 33 different fish. Of the 33 fish captured during 2024, 13 were recaptured fish from the 2023 survey. These data estimate the musky population at approximately 153 fish ≥ 20 inches, and 123 fish (0.22/acre) ≥ 30 inches. This population has decreased slightly from the last assessment in 2015-2016, when abundance was estimated at 173 fish ≥ 20 inches, and 132 fish (0.24/acre) ≥ 30 inches in length. At 0.22 adults/acre this population is considered to be of moderate density, and is the most abundant muskellunge population in Florence County.

All muskellunge captured during this two year survey were measured to assess size structure, a total of 98 different fish. After removing all fish < 20 inches, 43.4% of the fish captured were ≥ 38 inches and 6.0% ≥ 45 inches in length. The 2023 size structure was very similar to the size structure during the 2015-16 survey when 41.8% were ≥ 38 inches and 5.5% were ≥ 45 inches in length. The biggest change in size structure is that the largest of the 98 muskellunge captured during 2023-24 was only 46.5", compared to the 2015-16 survey when 4 of the 99 fish captured were ≥ 47 inches.



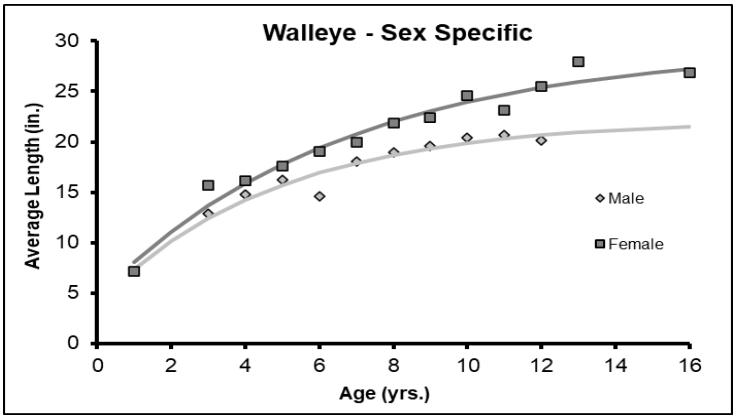
GROWTH

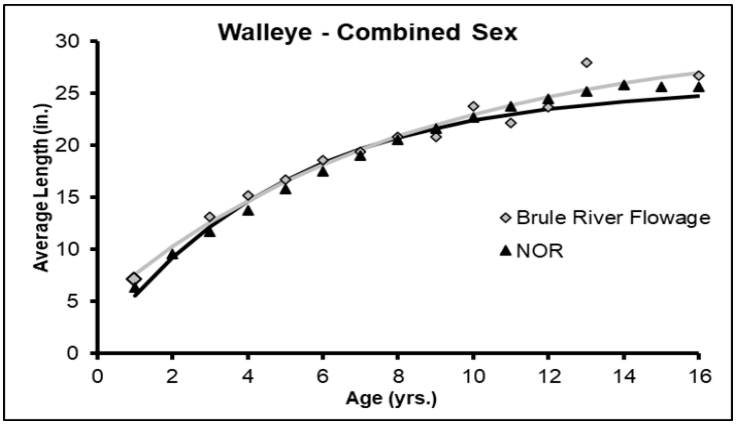
Throughout this comprehensive survey structures were removed from subsamples of the fish in order to estimate age. Growth is then inferred using average length at age. Walleye, northern pike, and muskellunge experience sexually dimorphic growth, with female fish growing faster and achieving a larger size than male fish. For these species growth is assessed for each sex in order to understand the protectiveness of harvest regulations as well as trophy potential. However, we also combine both sexes of fish to compare the growth of an individual population with the average growth for the given species in the Northern Region (NOR) of Wisconsin.

WALLEYE

Age was estimated from a subsample of 170 walleye during 2023. Male walleye are generally reaching the minimum size limit of 15 inches between age-4 and 5. Female fish are reaching the minimum length by age-3. In general female walleye are reaching 20 inches at age-7 and 25 inches between age-10 and 12.

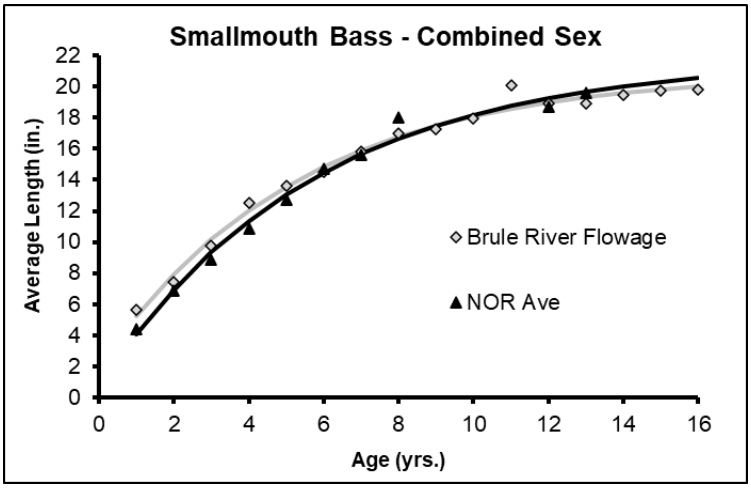
When compared to other walleye populations across northern Wisconsin, the Brule River Flowage population grows at a very average rate. The figure to the lower right gives the illusion of increased growth later in life, however this is strictly due to low sample size of older male fish.





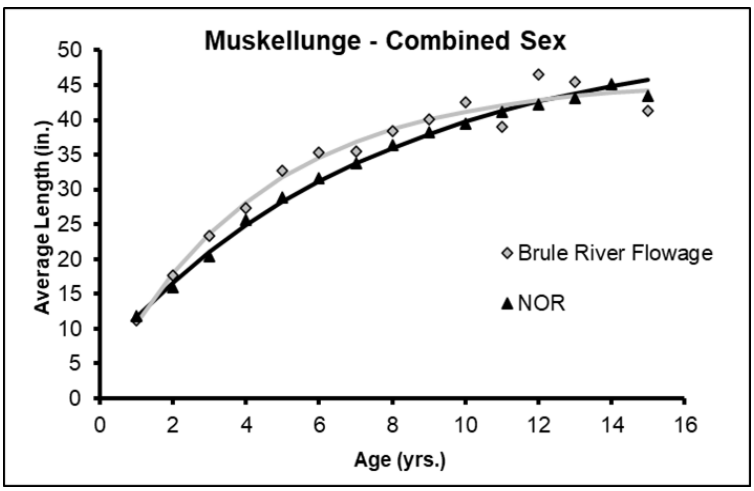
SMALLMOUTH BASS

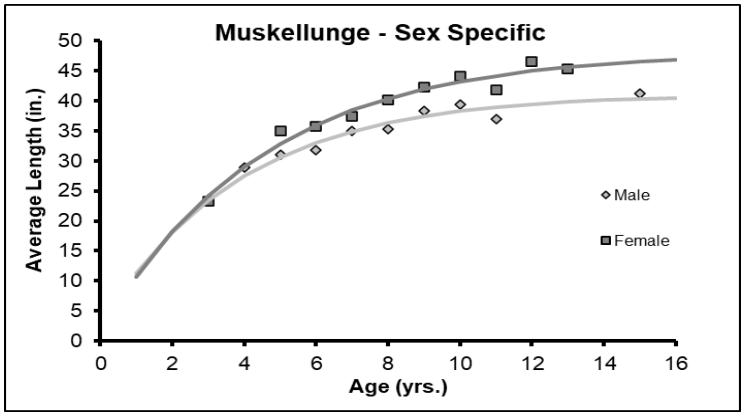
As you can see in the figure below, smallmouth bass growth is near the NOR average. Smallmouth appear to be growing slightly above average early in life, and slightly below average later in life. Smallmouth bass are reaching the minimum length limit of 14 inches in about 5.5 years.



MUSKELLUNGE

Every muskellunge captured during spring surveys in 2023, a total of 78 fish, had it's age estimated to assess growth. On average it takes 10 to 12 years for male fish to reach 40 inches in length, and then growth really slows down. Female fish are getting to 40 inches around age-8 and achieving 45 inches by age-12. When compared to other musky populations in northern Wisconsin, growth of the population in Brule River Flowage is above NOR average.



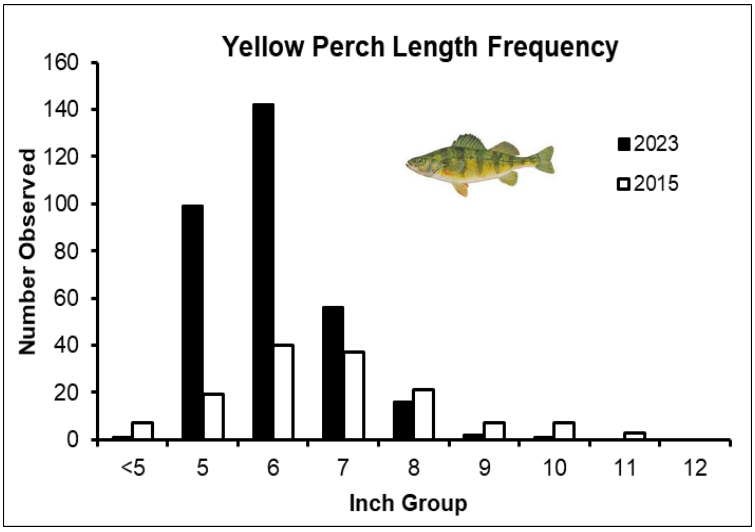


YELLOW PERCH

During the last comprehensive survey, yellow perch relative abundance was 0.6/ net-night during the walleye/northern pike netting survey and 0.4/net-night during the muskellunge netting survey. This years survey showed that the yellow perch population has increased in abundance to 1.3 and 13.5/net-night during those same surveys. Increased yellow perch abundance was a welcomed surprise as they are not only a desirable fish for anglers but also a great forage fish for all the predatory fish species in this flowage.

Every yellow perch captured during the walleye/northern pike netting and the first day of muskellunge netting was measured to assess size structure during 2023. After removing all fish less than 5 inches from the sample, approximately 23.7% and 0.3% were ≥ 7 and 10 inches respectively. This was a major decrease in size structure since the 2015 survey when 56.0% and 7.5% of our sample was ≥ 7 and 10 inches. The size structure of the current population is well below the area average of 35.0% and 2.9% larger than those same length categories. Poor size structure is not uncommon in expanding populations which are generally made up of younger fish and size structure is likely to improve as these fish continue to grow.

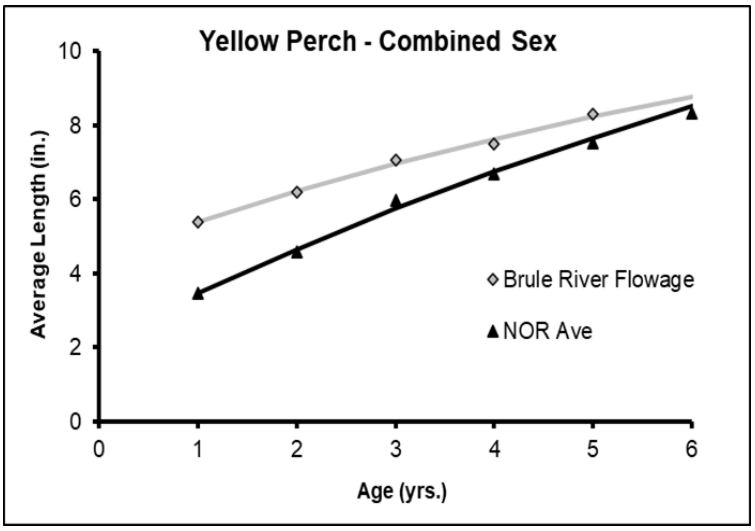
We did not sample any yellow perch older than age-5, however, the fish we did sample are growing well above the northern region average early in life.

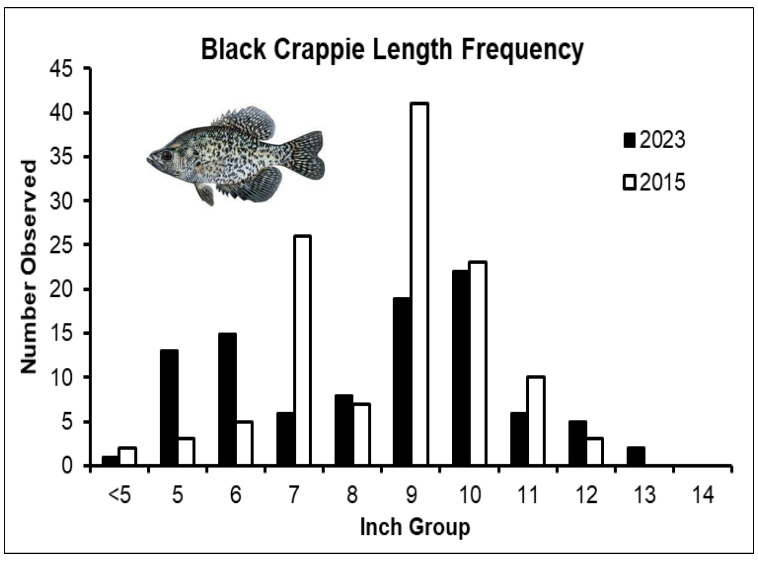


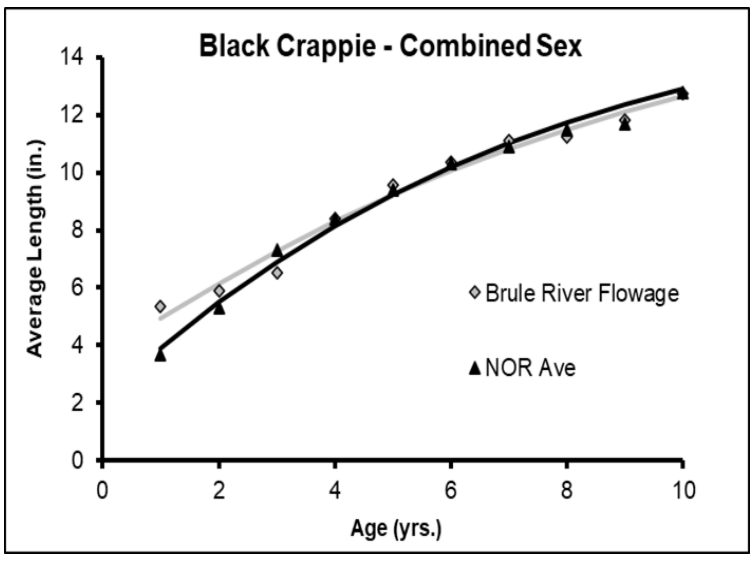
BLACK CRAPPIE

Like yellow perch, the black crappie population was also assessed during the two spring netting surveys conducted in 2023. Relative abundance was measured at 0.5 and 0.7 fish/net-night during the walleye/northern pike and muskellunge surveys. Black crappie abundance in the Brule River Flowage is well below the area average, however abundance has increased since the 2015 survey when black crappie were captured at a rate of 0.2 fish/net-night during both spring netting surveys.

Every black crappie captured during our spring netting surveys was measured to assess the size structure of this population. During 2023, 64.6% and 36.5% of our sample was ≥ 8 and 10 inches respectively. The size structure of the current population is similar to 8 years ago when 71.2% and 30.5% were ≥ 8 and 10 inches in length. Black crappie growth is average for northern Wisconsin, reaching a harvestable size for most anglers by age-4. This data shows that the size structure of the Brule River Flowage black crappie population is above average for our area, creating a quality fishing opportunity.







OPEN WATER CREEL SURVEY

START DATE: 5/6/2023 (OPENING DAY) END DATE: 11/22/2023 (LAST DOCUMENTED EFFORT)

OPEN WATER CREEL SURVEY

Typical fisheries surveys are intended to gather population level data to analyze abundance, size structure, body condition, growth and recruitment of fish. Survey data has proven to be an effective way to monitor fish populations and make management recommendations to improve our fisheries for the benefit of anglers. However, fish surveys do not provide data on the utilization of our fisheries. During 2023, a remote creel survey was conducted to gather the data which we can not obtain through a typical fish survey. Using a trail camera paired with a kiosk/questionnaire, we gathered data to assess overall fishing effort (pressure), what anglers are targeting, number of fish caught, harvested and angler exploitation. This remote survey has some limitations when compared to a traditional in-person creel survey. To account for these limitations this creel survey does not include anglers who fish from shore, reside in waterfront properties on the flowage, or access the flowage from access points other than the main Wisconsin boat launch. Due to this, all estimates are considered to be minimum estimates.

This is a photo of the kiosk which was used to gather angler catch data during the open water creel survey of Brule River Flowage in 2023.

Today's date: ___/___/2023 ***We ask that you fill out one survey for all the people in your boat****

How long did you fish today (to the nearest quarter hour, 1.25, 2.5, 3.75 etc.)?: _____ hour(s)

How many anglers were in your party today?: _____ People

Were you fishing from a boat today? ☐ Yes ☐ No

What species of fish were you targeting today?: ☐ Musky ☐ Pike ☐ Walleye ☐ Bass ☐ Panfish Other:_____

Check All That Apply*

How much time did you spend fishing for each species? How many did you catch, release, or harvest? Example: 4 catch = 3 release + 1 harvest

	# Hours Fished For	Catch	=	Released	+	Harvested
Musky	_____	_____		_____		_____
Northern Pike	_____	_____		_____		_____
Walleye	_____	_____		_____		_____
Largemouth Bass	_____	_____		_____		_____
Smallmouth Bass	_____	_____		_____		_____
Panfish	_____	_____		_____		_____
Other: _____	_____	_____		_____		_____

Additional Comments: _____

_____

This is the questionnaire that was voluntarily filled out by anglers fishing the Brule River Flowage during the open water season of 2023.

OPEN WATER CREEL SURVEY

START DATE: 5/6/2023 (OPENING DAY) END DATE: 11/22/2023 (LAST DOCUMENTED EFFORT)

GENERAL STATISTICS

The 2023 open water creel survey of the Brule River Flowage/Paint Pond began on May 6th, which was the general fishing opener for Wisconsin and ended with the last documented open water effort which occurred on November 22nd. A total of 990 watercrafts, containing 1,951 anglers, fished an estimated 7,947 hours (14.45 hours/acre) on this flowage during the open water season. Angling pressure was highest during the month of July and lowest during November, with fishing pressure being surprisingly consistent from May through September. The voluntary questionnaire which contained personal catch and harvest information was completed and returned by 210 of the 990 angling parties (21.2%). The data contained within these completed questionnaires was used to create the estimates that follow in this report.

Table 2. Fishing effort and voluntary angler compliance during the 2023 open water creel survey of Brule River Flowage.

	May	June	*July	August	September	October	November	Total
Total # Angling Parties	170	180	232	166	143	81	18	990
Total # of Anglers	315	350	485	320	311	146	24	1,951
Total Fishing Time (hrs)	1,338.35	1,493.87	1,913.11	1,188.63	1,213.50	699.42	100.17	7,947.05
Total Fishing Time (hrs/acre)	2.43	2.72	3.48	2.15	2.21	1.27	0.18	14.45
Complete Survey Returns	27	30	52	32	33	28	8	210
Parties/Survey Return	6.30	6.00	4.46	5.19	4.33	2.89	2.25	4.71
Return Rate (%)	15.88	16.67	22.41	19.28	23.08	34.57	44.44	21.21

*Camera was knocked down for 3 days in July, so July is an estimate for total parties/anglers/fishing time. Other months are true numbers.

WHAT ANGLERS WERE TARGETING

There were questions asked on the questionnaire that allowed us to estimate how much of the angler effort was directed at individual species or species groups. The sum of the percentage of angler effort directed at a certain species or species group is greater than 100% because anglers are capable of targeting more than one fish species or group at the same time (example: anglers can be fishing walleye while also fishing for panfish).

The most targeted species during 2023 was muskellunge with an estimated 57% of angling effort, followed by walleye (28%), panfish (15%), smallmouth bass (11.9%), northern pike (11.5%) and largemouth bass (3%). Muskellunge received the majority of angling effort every month, except during early spring (May) and late fall (November), when walleye received the most directed effort.

Table 3. What anglers were targeting on Brule River Flowage during 2023.

	May	June	July	August	September	October	November	Total
Muskellunge	14.7%	66.5%	55.7%	69.1%	57.2%	83.1%	14.2%	57.0%
Northern Pike	8.6%	7.6%	13.2%	18.9%	16.4%	5.1%	0.0%	11.5%
Walleye	76.9%	14.4%	27.6%	2.6%	29.0%	8.6%	85.8%	28.0%
Largemouth Bass	0.0%	1.7%	4.3%	5.5%	4.8%	1.2%	0.0%	3.0%
Smallmouth Bass	2.5%	8.5%	14.0%	13.1%	16.2%	14.2%	0.0%	11.9%
Panfish	4.8%	13.2%	25.1%	18.3%	19.8%	2.4%	0.0%	15.0%

Photo Credit: Wisconsin DNR

Photo Credit: Wisconsin DNR

ANGLER SUCCESS — CATCH RATES

For most anglers, a successful trip is based on the number of fish caught. One way to assess angler success is by looking at the catch rates during the 2023 open water season. Catch rates can be calculated in many different ways. For this survey, we looked at "total catch rate" and "directed catch rate". Total catch rate is the calculated number of fish captured of the indicated species per angling hour by all anglers, regardless of the targeted species, whereas directed catch rate is calculated using only the data from anglers targeting that particular species.

Total catch rate was greatest for panfish (0.6 fish/hour), followed by walleye (0.2 fish/hour) and least for largemouth bass (0.02 fish/hour). Most anglers specifically target a certain species and will use more defined methods to capture that particular species, improving their catch rate. This is why we typically pay closer attention to directed catch rates. The directed catch rate was greatest for panfish at just over 3 fish/hour, followed by smallmouth bass (0.9 fish/hour), walleye (0.7 fish/hour), northern pike (0.3 fish/hour), largemouth bass (0.2 fish/hour) and lowest for muskellunge (0.05 fish/hour).

Muskellunge and walleye were the two most targeted species during the open water season. Directed catch rates for muskellunge peaked in August when muskellunge anglers caught a muskellunge at a rate of approximately 1 fish for every 9 hours fished. Directed catch rates for walleye were the opposite, with the best catch rates occurring during fall and spring.

	Total Catch Rate (fish/hr)					
	MU	NP	WE	LMB	SMB	Panfish
May	0.010152	0.096447	0.766497	0.045685	0.182741	0.086294
June	0.022535	0.118310	0.033803	0.028169	0.067606	0.264789
July	0.044145	0.058860	0.134887	0.029430	0.080932	1.120785
August	0.079148	0.188737	0.006088	0.018265	0.249619	0.828006
September	0.015984	0.051948	0.067932	0.007992	0.223776	0.607393
October	0.028084	0.028084	0.096289	0.000000	0.176530	0.012036
November	0.000000	0.035398	1.097345	0.000000	0.000000	0.141593
Open Water Total	0.032559	0.078684	0.193319	0.021028	0.150585	0.553502

	Directed Catch Rate (fish/hr)					
	MU	NP	WE	LMB	SMB	Panfish
May	0.037037	0.411765	0.996700	N/A	4.000000	1.157895
June	0.025424	0.444444	0.235294	0.333333	0.733333	0.893617
July	0.079295	0.093023	0.462222	0.457143	0.331878	3.911980
August	0.114537	0.903226	0.000000	0.222222	1.395349	4.500000
September	0.027923	0.170732	0.179310	0.000000	1.086420	2.202020
October	0.033776	0.156863	1.116279	0.000000	1.070423	0.333333
November	0.000000	N/A	1.278351	N/A	N/A	N/A
Open Water Total	0.054762	0.325444	0.672330	0.247191	0.927039	3.071348

ANGLER SUCCESS — CATCH

Total catch is estimated by projecting the catch rate to the total fishing effort. The table below shows the estimated catch by species for the 2023 open water fishing season. Panfish made up the largest portion of total catch (52.5%), followed by walleye (19.1%), smallmouth bass (14.2%), northern pike (8.7%), muskellunge (3.2%) and the smallest portion of the catch belonged to largemouth bass (2.3%).

	Estimated Total Catch (fish):							
	May	June	July	August	September	October	November	Total
Muskellunge	13.6	33.7	84.5	93.5	19.4	19.6	0.0	**264.3**
Northern Pike	129.1	176.7	112.6	223.0	63.0	19.6	3.5	**727.6**
Walleye	1,025.8	50.5	258.1	7.2	82.4	67.3	109.9	**1,601.3**
Largemouth Bass	61.1	42.1	56.3	21.6	9.7	0.0	0.0	**190.8**
Smallmouth Bass	244.6	101.0	154.8	295.0	271.6	123.5	0.0	**1,190.4**
Panfish	115.5	395.6	2,144.2	978.4	737.1	8.4	14.2	**4,393.3**

ANGLER SUCCESS — HARVEST RATES

Understanding how much harvest takes place is arguably the most important part of a creel survey. Harvest rates are calculated the same way as catch rates with "total harvest rate" being indiscriminate of what anglers are targeting and "direct harvest rate" using only the data from anglers targeting that specific species of fish.

Some species of fish have more restrictive angling regulations which can drastically affect harvest rate (example: minimum length limit for muskellunge is 50 inches). Other species may not have as restrictive regulations, but anglers choose not to harvest that species and release the majority of the catch (example: very low harvest of bass even though the minimum length limit is 14 inches). The tables below give the harvest rates by species and month during the 2023 open water season.

The direct harvest rate of walleye is approximately 1 walleye harvested for every 10 hours spent fishing for walleye, while the direct catch rate suggests that nearly 7 walleye are caught for every 10 hours of walleye fishing. The current angling regulation for walleye (15 inches) and the current state of the walleye population (high recruitment in recent years), are likely reasons why we estimate that only 14% of the walleye caught were harvested.

	Total Harvest Rate (fish/hr)					
	MU	NP	WE	LMB	SMB	Panfish
May	0.000000	0.005076	0.101523	0.000000	0.005076	0.050761
June	0.000000	0.011268	0.011268	0.000000	0.000000	0.005634
July	0.000000	0.004905	0.022072	0.002452	0.000000	0.230533
August	0.000000	0.006088	0.000000	0.000000	0.000000	0.164384
September	0.000000	0.007992	0.000000	0.000000	0.000000	0.315684
October	0.000000	0.000000	0.012036	0.000000	0.000000	0.000000
November	0.000000	0.000000	0.212389	0.000000	0.000000	0.070796
Open Water Total	0.000000	0.005426	0.027132	0.000678	0.000678	0.144480

	Direct Harvest Rate (fish/hr)					
	MU	NP	WE	LMB	SMB	Panfish
May	0.000000	0.000000	0.132013	N/A	0.000000	0.842105
June	0.000000	0.000000	0.078431	0.000000	0.000000	0.000000
July	0.000000	0.018605	0.080000	0.057143	0.000000	0.919315
August	0.000000	0.032258	0.000000	0.000000	0.000000	0.900000
September	0.000000	0.048780	0.000000	0.000000	0.000000	1.474747
October	0.000000	0.000000	0.139535	0.000000	0.000000	0.000000
November	0.000000	N/A	0.247423	N/A	N/A	N/A
Open Water Total	0.000000	0.023669	0.097087	0.022472	0.000000	0.915062

ANGLER SUCCESS — HARVEST

The data collected during this survey allows us to estimate the total number of fish harvested. The table below shows the estimated harvest by species for the 2023 open water fishing season. Just like total catch, panfish made up the largest portion of total harvest (79.4%), followed by walleye (16.2%), northern pike (3.6%) and very low harvest of all other fish species. The majority of panfish harvest (92%) occurred from July through September, while 60% of the walleye harvest occurred in May.

	Estimated Total Harvest (fish):							
	May	June	July	August	September	October	November	Total
Muskellunge	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Northern Pike	6.8	16.8	9.4	7.2	9.7	0.0	0.0	**49.9**
Walleye	135.9	16.8	42.2	0.0	0.0	8.4	21.3	**224.7**
Largemouth Bass	0.0	0.0	4.7	0.0	0.0	0.0	0.0	**4.7**
Smallmouth Bass	6.8	0.0	0.0	0.0	0.0	0.0	0.0	**6.8**
Panfish	67.9	8.4	441.0	194.2	383.1	0.0	7.1	**1,101.9**

MANAGEMENT RECOMMENDATIONS

The fishery in Brule River Flowage continues to provide an excellent angling opportunity for a variety of species. The walleye population appears to be quite steady, which is becoming more uncommon across northern Wisconsin. There is a lack of historical data on this fishery, and it should be a goal to conduct adult walleye population estimates at regular intervals going forward. Properly assessing the adult walleye population in this flowage can be challenging, and going forward all adult walleye population estimates should include electrofishing and netting surveys during the marking period. Walleye recruitment surveys should continue to be conducted annual for at least the next 10 years to gain a better understanding of walleye natural reproduction. From the data we do have, the population appears to have enough natural recruitment to maintain a quality adult walleye population (≥ 3 adults/acre). Compared to other walleye fisheries in Wisconsin, the Brule River Flowage has a very liberal harvest regulation, with the bag limit being higher, and the harvest season open year round for portions of this flowage. These regulations allow for increased angler usage, and should be allowed as long as the population continues to perform at a high level. If concerns do arise in regards to walleye recruitment or decreased adult abundance, these liberal regulations on Brule River Flowage would be the obvious first place to make a change, but at this time, walleye regulations appear to be appropriate.

Brule River Flowage also has one of the best populations of smallmouth bass and muskellunge in Florence County. At this time the harvest regulations for both of these species are appropriate. Future comprehensive surveys should include proper assessments of both of these species. Smallmouth bass surveys are relatively straightforward, but similar to walleye, muskellunge assessments are difficult in flowages. Catch rates during muskellunge fyke net surveys fluctuate dramatically from one year to the next, and for that reason it will be important to assess muskellunge by estimating adult abundance rather than relying on relative abundance. Electrofishing for muskellunge is a necessity to capture enough muskellunge to get an accurate population estimate and should continue to be used in at least one year of the two year process to estimate abundance.

The northern pike population is also quite desirable with average size structure, and trophy potential. It is in the best interest of anglers to maintain a low abundance northern pike population in this flowage. Maintaining a low abundance will continue to provide trophy potential of northern pike, and minimize any negative impacts on the walleye, smallmouth bass, and muskellunge populations, which make this fishery special. The current no minimum length limit and 5 fish daily bag limit is appropriate to maintain a low density population going forward.

As is the case with most walleye dominated fisheries, panfish abundance as a whole is relatively low. As long as the gamefish populations stay strong, predation will likely have more impact on panfish populations than angler harvest regulations, so I recommend no change to panfish regulations. Size structure and growth of panfish are acceptable, which offers a decent angling experience.

Photo Credit: Wisconsin DNR