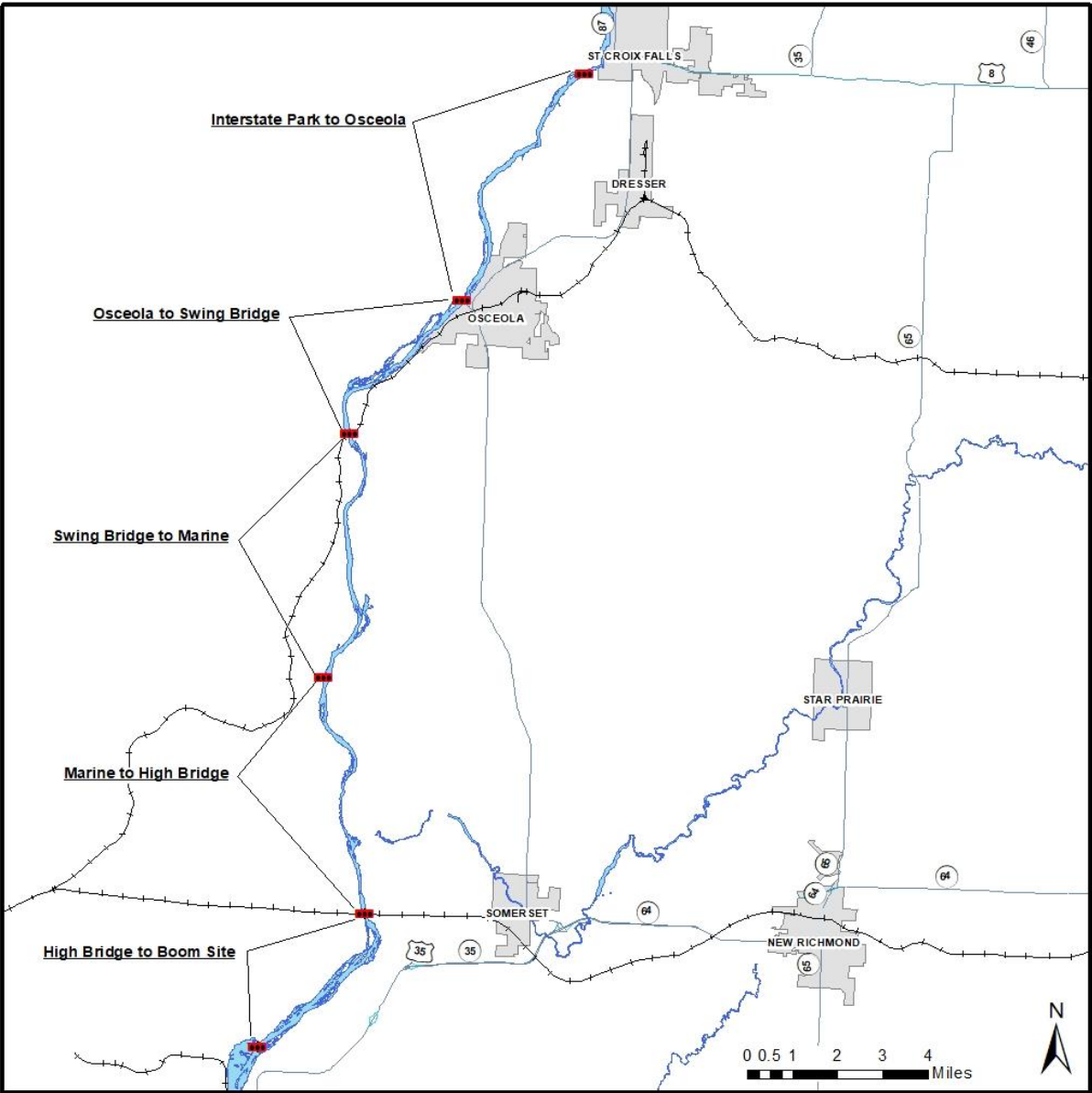


WISCONSIN DEPARTMENT OF NATURAL RESOURCES
Fisheries Survey Report for St. Croix River, Polk and St. Croix Counties,
Wisconsin 2021

WATERBODY IDENTIFICATION CODE 2601400



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Introduction

The St. Croix River is a large fertile river located in western Wisconsin that forms the boundary between part of Wisconsin and Minnesota. The river is designated the St. Croix River National Wild and Scenic Riverway. It originates in Douglas County in the Upper St. Croix Flowage near Solon Springs, Wisconsin and joins the Mississippi River near Prescott, Wisconsin. The total length of the St. Croix River is 150 miles. The downstream 52 miles are referred to as the Lower St. Croix River. The Lower St. Croix River can be further defined as a free-flowing river from the St. Croix Falls Dam downstream for 27 miles. The remaining 25 miles are deep and wide, a natural water body that forms Lake St. Croix from Stillwater, Minnesota to Prescott, Wisconsin. This report covers the free-flowing portion of the St. Croix River from Stillwater to the St. Croix Falls Dam. The riparian corridor consists of wooded bluffs intermixed within floodplain forests, islands and backwater complexes. Development pressure is present near Marine on St. Croix, especially on the Minnesota side of the river. The Wisconsin side has less development pressure and is mostly wild land. Interstate State Park spans both states and is located just downstream of St. Croix Falls/Taylor's Falls and provides additional access to the river.

The St. Croix River is home to highly diverse native fish, mussel and invertebrate communities. Historically, over 110 fish species and 39 freshwater mussel species inhabited the St. Croix River, most of which are still present. The mussel community in the St. Croix River is one of the most diverse and abundant within the United States. Several endangered fish species, including the Crystal Darter *Crystallaria asprella* and Goldeye *Hiodon alosoides*, and several threatened species, including the Blue Sucker *Cycleptus elongatus*, Black Buffalo *Ictiobus niger*, River Redhorse *Moxostoma carinatum*, Gilt Darter *Percina evides* and Paddlefish *Polyodon spathula*, can be found in the river. Species of concern include Lake Sturgeon *Acipenser fulvescens*, American Eel *Anguilla rostrata*, Mud Darter *Etheostoma asprigene* and Least Darter *Etheostoma microperca*. There are 41 species of native freshwater mussels within the river, with 17 of those being state listed as either threatened or endangered in Wisconsin and five of which are federally listed. Non-wadable stream electrofishing surveys are completed on the river every 12 years. Previous surveys were completed in 2001, 2011 and 2013, while targeted Lake Sturgeon dip net surveys are completed annually below the St. Croix Falls dam. Objectives of the 2021 survey included evaluation of current species assemblages within four sections of the Lower St. Croix River and obtaining relative abundance estimates for gamefish and threatened and endangered species.

Methods

Sampling was conducted in September and October 2021 using standard DNR non-wadable rivers sampling protocol. A total of four stations were sampled targeting all gamefish, threatened, endangered or species of concern (GET stations). Within those GET stations, a 1-mile Index of Biotic Integrity (IBI) substation was sampled targeting all species. Pulsed DC daytime electrofishing was conducted using a mini-boomshocker in which main channel border habitats on the Wisconsin side were sampled. GET stations were sampled using two booms, and IBI substations were sampled using a single boom. All gamefish were measured to the nearest tenth of an inch, and all Smallmouth Bass, Walleye and Catfish were weighed to the nearest gram. Lake Sturgeon were measured, weighed and tagged with an external floy

and internal PIT tag, and a pectoral fin ray was removed for age analysis. All other fish species captured within the IBI substations were identified to species and counted.

Analysis

Data analysis included the calculation of catch rates for each species (CPE-Catch Per Effort) as a measure of relative abundance. The condition of individual Smallmouth Bass, Walleye and Channel Catfish was estimated by computing relative weight (W_r) for each fish based on the length and weight, where a value of 100 or higher indicates very good condition and values less than that resulting in poorer condition. The size structure of each gamefish species was evaluated by creating length frequency distributions and computing Proportional Size Distribution (PSD), which is a measure of the proportion of fish equal to or larger than stock size compared to fish equal to or larger than quality size in the population. Relative Stock Density (RSD-Preferred) was also calculated for Smallmouth Bass as a measure of the proportion of fish in the population larger than Preferred-size (14 inches).

The Lower St. Croix River is classified as a southern fine substrate river based on criteria for assessing Smallmouth Bass stream populations in Wisconsin (Lyons 2006). Assessments compare CPE and RSD-Preferred values to rate rivers as Exceptional, Acceptable or Below average. Management assessment categories are defined as:

1. Exceptional - unusually good Smallmouth Bass populations. Management - extra protection.
2. Acceptable - near (>75%) carrying capacity. Management - maintenance.
3. Below - under carrying capacity. Management - rehabilitation.

The relationship of river discharge rates to age-0 Smallmouth Bass CPE was evaluated using non-linear regression and single-factor ANOVA. June mean, minimum and maximum discharge rates were used in the analysis and were retrieved from the USGS database for the St. Croix River at St. Croix Falls. Discharge rates for the month of June were chosen based on previous studies that have documented the relationship of stream discharge and recruitment variability of Smallmouth Bass (Graham and Orth 1986; Smith et al. 2005).

Study Sites

A total of four stations were sampled, which included:

- Station 1-Boomsite (RM 25.0) to Highbridge (RM 28.6)-3.6 miles
- Station 2-Highbridge (RM 28.6) to Marine (RM 34.2)-5.6 miles
- Station 3-Marine (RM 34.2) to Swingbridge (RM 40.2)-6.7 miles
- Station 5-Osceola (RM 44.5) to Interstate State Park Landing (RM 50.5)-6 miles

Stations 1, 3 and 5 included a 1-mile IBI substation within the overall GET station.

Results

Gamefish

Smallmouth Bass were the most abundant gamefish species in all stations sampled collectively, except for Stations 2 and 3, in which Walleye were the most abundant gamefish.

Smallmouth Bass relative abundance ranged from 10.6-20.7/mile, with the highest catch rates in Station 5 and lowest in Station 1 (Figure 1). The mean catch rate for all stations combined resulted in 13.6/mile. According to long-term trend site data at Station 3, the mean relative abundance of Smallmouth Bass from 2003-2021 was 17.9/mile (Figure 2). The 2021 sampling resulted in total relative abundance slightly above the long-term mean at 18.5/mile. Catch rates of age-0 fish (<5 inches) were slightly above the long-term mean of 2.6/mile at Station 3, with 5.2/mile in 2021 (Figure 3). Age-0 abundance in 2021 varied between stations and was highest at Station 5 at 5.8/mile and lowest at Station 2 at 0.2/mile (Figure 4). Catch rates of age-1+ Smallmouth Bass were below the long-term mean (15.2/mile) at Station 3 with a CPE of 13.3/mile. In 2021, catch rates of age-1+ fish were similar between all stations and ranged from 9.7/mile at Station 1 to 14.8/mile at Station 5 (Figure 4).

Catch rates of legal size (14 inches and larger) or Preferred-size Smallmouth Bass ranged from 1.5-2.5/mile in Stations 3 and 2, respectively (Figure 5). Compared to long-term trend site data at Station 3, catch rates of ≥ 14 inches fish were at average levels of 1.8/mile. Smallmouth Bass larger than Preferred-size (≥ 17 inches) were only captured at Stations 2 and 3 and resulted in catch rates of 0.4/mile and 0.6/mile (Figure 5).

Categorization of the St. Croix River stations Smallmouth Bass catch rates for southern fine substrate streams resulted in ratings of Exceptional for all stations for catch rates of age-1+ fish (>5 inches). Ratings for catch rates of Preferred-size (≥ 14 inches) fish resulted in Exceptional ratings for all stations except for Station 1, which received an Acceptable rating. When comparing catch rates between other nearby rivers in Wisconsin, including the Red Cedar River and Chippewa River, the St. Croix River (13.9/mile) had higher total catch rates relative to the most recent catch rates from the Red Cedar (9.5/mile) and the Chippewa (6.7/mile; Figure 1).

Recruitment of Smallmouth Bass in terms of relative abundance of age-0 fish (<5 inches) was highly variable from year to year within Station 3 (Figure 3). The mean relative abundance of age-0 fish at Station 3 was 2.6/mile from 1999-2021, with the lowest in 2005 at 0.2/mile and highest in 2009 at 5.7/mile. Relative abundance in 2021 resulted in 5.2/mile. Non-linear regression of mean June discharge and age-0 CPE resulted in a significant relationship and described a high degree of the observed variability except for two years of discharge which included 2001 and 2008 ($r^2 = 0.75$, $P = 0.006$, $df = 10$; Figure 6). Regression of June minimum and maximum discharge rates did not result in significant relationships with age-0 CPE. Strong year classes were likely to occur when mean June discharge rates were less than 50% of the long-term mean June discharge (1999-2021) of 5620 cubic feet per second (cfs). Conversely, during years of high mean June discharge rates, Smallmouth Bass year classes were weak.

Smallmouth Bass ranged in length from 2-18 inches with a mean length of 9 inches (Figure 7). The size structure of Smallmouth Bass was fairly similar between stations, with PSD values ranging from 34 at Station 1 to 47 at Station 2 and a mean PSD of 42 for all stations. RSD-Preferred (14 inches) values ranged from 16 at Station 5 to 30 at Station 2, with a mean RSD-Preferred of 21. The condition of fish was good, with a mean relative weight for all stations combined of 99. The relative weight of fish was highest at Station 3 with a mean Wr of 104 and lowest at Station 2 with a mean Wr of 93. Larger fish tended to be in poorer condition, with a mean Wr of fish larger than 14 inches of 89 and a mean Wr of fish larger than 17 inches of 85.

Walleye were slightly less abundant than Smallmouth Bass overall but were more abundant at Stations 2 and 3 (Table 1). Mean Walleye relative abundance was 11.0/mile for all stations combined and ranged in relative abundance from 7.8/mile at Station 1 to 12.9/mile at Station 2. Walleye were much more abundant relative to the 2013 survey in which the average catch rate was 2.3/mile, with the highest catch rates at Station 4 of 4.9/mile (Table 2). Catch rates of larger fish in 2021 resulted in CPEs ranging from 0.8/mile at Station 5 to 2.2/mile at Station 1, with a mean catch rate for all stations of 1.3/mile for fish larger than 15 inches. Walleye larger than 20 inches were only captured at Stations 1 and 3, which resulted in catch rates of 0.6/mile and 0.7/mile, respectively. Lengths of Walleye ranged from 7-25 inches, with a mean length of 12.1 inches (Figure 8). The condition of Walleye was poor with an average Wr of 85 for all stations combined. Mean Wr values ranged from 78 at Station 1 to 95 at Station 3.

Other gamefish species, including Northern Pike and Channel Catfish, were much less abundant compared to Smallmouth Bass and Walleye, although catch rates were considerably higher for both species compared to the 2013 survey (Table 1; Table 2). Total CPE for all stations for Channel Catfish in 2013 was 0.3/mile, while CPE in 2021 was 2.9/mile. In 2021, catch rates were highest at Station 2, with 5/mile, and lowest at Station 1, with 1.7/mile. Lengths of Channel Catfish ranged from 16-30 inches, with a mean length of 22.8 inches (Figure 9). Since all fish that were captured were larger than stock length (11 inches) and quality length (16 inches), PSD resulted in a value of 100. RSD-Preferred (24 inches) for all Channel Catfish in all stations was 37. The overall condition of Channel Catfish for all stations was poor, with a mean Wr of 80. However, relative weights were higher in the downstream stations (Stations 1 and 2), with mean Wr values of 93 and 98, with lower values in the upstream stations, with Wr values of 67 and 62 at Stations 3 and 5. Catch rates of Northern Pike were also higher compared to the 2013 survey, with catch rates ranging from 1.9/mile at Station 3 to 2.5/mile at Stations 1 and 5, with an average CPE of 2.3/mile for all stations (Table 1). Lengths ranged from 9-36 inches, with a mean length of 18.4 inches (Figure 10). The overall condition of fish was poor, with a mean Wr value for all stations of 85. Relative weight was highest at Station 5, with a mean Wr of 96, and lowest at Station 2, with a mean Wr of 80. A total of 41 Largemouth Bass were captured throughout the surveys, resulting in a total CPE of 1.9/mile. Catch rates were highest in Station 1 with 5.8/mile, and no Largemouth Bass were captured in Station 5. Lengths of Largemouth Bass ranged from 3-15 inches.

Endangered, Threatened and Species of Concern

Several other endangered, threatened and species of concern were captured throughout the surveys. A total of five Lake Sturgeon were captured throughout the stations, with two each captured in Stations 2 and 3 and one captured in Station 5. A total of two Crystal Darter were captured in Station 5. River Redhorse were captured in all stations, with the highest catch rates in Station 1, with 1.4/mile, and lowest catch rates in Station 5, with 0.3/mile (Table 1). A total of two Blue Sucker were captured in Stations 2 and 5, and several others were observed during the surveys. A total of five Mooneye were captured in Station 3. Although not a listed species, a single 5.6-inch Flathead Catfish was captured in Station 2.

Discussion

The overall catch rates of Smallmouth Bass were similar to the 2013 survey and the long-term average CPE at the Station 3 trend site. Catch rates of all size classes of fish were also similar

to the long-term average at Station 3, including CPE for age-1 fish, fish larger than 8 inches and fish larger than 14 inches. Stations 2 and 3 exhibited the highest catch rates for fish larger than 14 inches. However, no trophy size fish (≥ 20 inches) were captured in any of the stations. These stations also produced the highest catch rates of this size class of fish in the 2013 survey, except Station 4, which was not sampled in 2021. Preferred-size fish (≥ 17 inches) were only captured in Stations 2 and 3. These stations generally offer the highest quality and most preferred habitat for Smallmouth Bass. This habitat was more limited in 2021 throughout the river with the extremely low water levels and drought conditions. Fine substrate rivers or rivers dominated by shifting sand habitats generally have limited habitat for gamefish species, including Smallmouth Bass. Large woody debris and pool habitats are limited because of the high sand load that reduces this type of cover and shifts pool habitats to different locations with high water events. Aquatic macrophyte growth is also restricted with this type of substrate, which can be an important habitat for Smallmouth Bass throughout portions of its life history. When comparing the St. Croix and other rivers dominated by fine substrates to rivers with coarse substrate, fine substrate rivers generally produce lower abundances of Smallmouth Bass and other gamefish species due to the less suitable habitats available.

Compared to other southern fine substrate streams, the St. Croix stations were rated as Exceptional for relative abundance of age-1 (≥ 5 inches) fish and fish larger than 14 inches. Catch rates of these size classes of fish were higher than recent catch rates from the upper and lower Red Cedar River stations as well as three stations in the lower Chippewa River. Catch rates from two stations on the Red Cedar River from above Tainter Lake and below Lake Menomin resulted in an average CPE of 9.5/mile. Recent catch rates from the Chippewa River at Eau Claire, Durand and Ella resulted in an average CPE of 6.7/mile, while the four St. Croix stations resulted in an average CPE of 13.6/mile. Catch rates between these rivers are dynamic and fluctuate considerably from year to year. Catch rates were much higher in the Chippewa River compared to the St. Croix during the previous 2013 survey. The size structure of Smallmouth Bass was higher within the lower stations (Stations 1 and 2), as evidenced by RSD-Preferred values. However, this was coupled with the fact that larger fish were in overall poorer condition compared to smaller fish. The lower stations generally contained more habitats suitable for larger bass, including more large pool habitat and scour holes along the banks with overhead cover. Continued annual monitoring of the trend site stations is recommended to detect any declines in the size structure and densities of Preferred-size Smallmouth Bass.

Smallmouth Bass in the St. Croix River exhibited high variability in annual recruitment. Catch rates of age-0 fish were negatively related to high flows during June. Discharge rates during June were chosen to evaluate year class strength based on the occurrence of optimal water temperatures for Smallmouth Bass spawning and larval stages (USGS; Graham and Orth 1986). Other studies in Virginia, Iowa, Tennessee, Alabama and Wisconsin have documented the influence of discharge and temperature on year class strength of Smallmouth Bass (Cleary 1956; Pflieger 1975; Mason et al. 1991; Slipke et al. 1998; Smith et al. 2005). According to these studies, high flows during and immediately after spawning were linked to reduced recruitment and subsequent weak year classes of Smallmouth Bass (Reynolds 1990; Mason et al. 1991; Reynolds and O'Bara 1991; Slipke et al. 1998; Buynak and Mitchell 2002; Smith et al. 2005). Within the St. Croix River, strong year classes were associated with flows that were less than 50% of the mean June discharge, or less than 3000 cfs, from 1999-2021. Years with high mean June discharges of approximately 7300 cfs or higher were associated with relatively

weak year classes. The timing of Smallmouth Bass spawning generally occurs during periods of stable stream flows, and high flows can be disruptive to spawning (Pflieger 1975). Streams and rivers regulated by dams, such as the St. Croix River, can experience extreme variability in flows and spring temperatures, which may negatively impact Smallmouth Bass populations (Graham and Orth 1986). Further investigation into the relationship between age-0 and age-1 abundances is needed to determine the timing of when year class strength becomes fixed in the St. Croix River. Current estimates of growth and mortality rates of Smallmouth Bass are also needed to fully evaluate population demographics.

Walleye were present in much higher abundances (11/mile) relative to the 2013 survey, in which CPE was only 2.3/mile throughout all stations. Station 1 exhibited the lowest catch rates for Walleye, Smallmouth Bass and Channel Catfish. This is likely indicative of the more degraded habitat present at this site which is likely influenced by the lake effects of Lake St. Croix. Stream gradient and subsequent flows are lower within this station and are likely more preferred habitat for larger fish according to the catch rates of adult Walleye (>15 inches) in 2013 and 2021. Walleye were in poor condition throughout all stations, similar to the 2013 survey.

Channel Catfish catch rates were considerably higher in this survey than in all previous electrofishing surveys. Catch rates were lowest within Station 1 and highest in the middle, followed by the upper station. This is likely a function of habitat, with more preferred habitat of large woody debris with small pools and adequate flows more prevalent in these stations. Channel Catfish condition was poor throughout all stations but was highest in the lower station. Continued surveys of catfish populations are needed to effectively manage these populations in light of new angling regulations that allow for the harvest of catfish by alternate methods. Channel Catfish, in particular, are essential to the sustainability of the federally critically endangered Winged Mapleleaf mussel *Quadrula fragosa*. This freshwater mussel species is only found within four river systems throughout the United States, and Channel Catfish are the primary host species.

Threatened and endangered species, including Crystal Darter and River Redhorse, were more prevalent than in previous surveys. The two Crystal Darters were captured within Station 5, within Interstate Park. Crystal Darters were also observed in this location during a 1998 mussel survey. This area is composed of shallow, cobble riffles with fast current velocities. Future sampling of this species is needed to better understand current densities. Sampling with a bottom trawl is intended in 2022 to better target small benthic species that are not easily sampled with other gear types. River Redhorse abundance at all stations was similar to abundances documented in the 2013 survey. Catch rates were higher in the lower stations. While Greater Redhorse are no longer listed as threatened, they are still a species of concern. Greater Redhorse relative abundance in 2021 (1.9/mile) was slightly higher than the 2013 survey of 0.9/mile, indicating stable densities throughout the years. While Mooneye are not threatened or endangered, their populations are listed as Rare (National Park Service nps.gov 2021). Mooneye are also an essential host species for the federally critically endangered Spectaclecase mussel *Cumberlandia monodonta*. Only five Mooneye were captured in Station 3. However, several others were observed during the surveys in other stations. Further sampling is needed to evaluate relative abundances.

Overall, the St. Croix River continues to support a highly diverse fish community due to its diversity in habitats and excellent water quality. Smallmouth Bass and other gamefish

populations remain stable. Current angling pressure for Smallmouth Bass is unknown but may be high due to limited preferred habitats that become easily identifiable and isolated during low water years. Continued investigation into factors affecting the recruitment of Smallmouth Bass is needed to determine the timing of year class determination. An annual sampling of trend sites is recommended to monitor Smallmouth Bass and endangered and threatened species abundances and demographics. Alternate methods of sampling, including bottom trawling and hoopnetting, are recommended to target and effectively monitor catfish and other vulnerable and rare benthic species populations.

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Figures and Tables

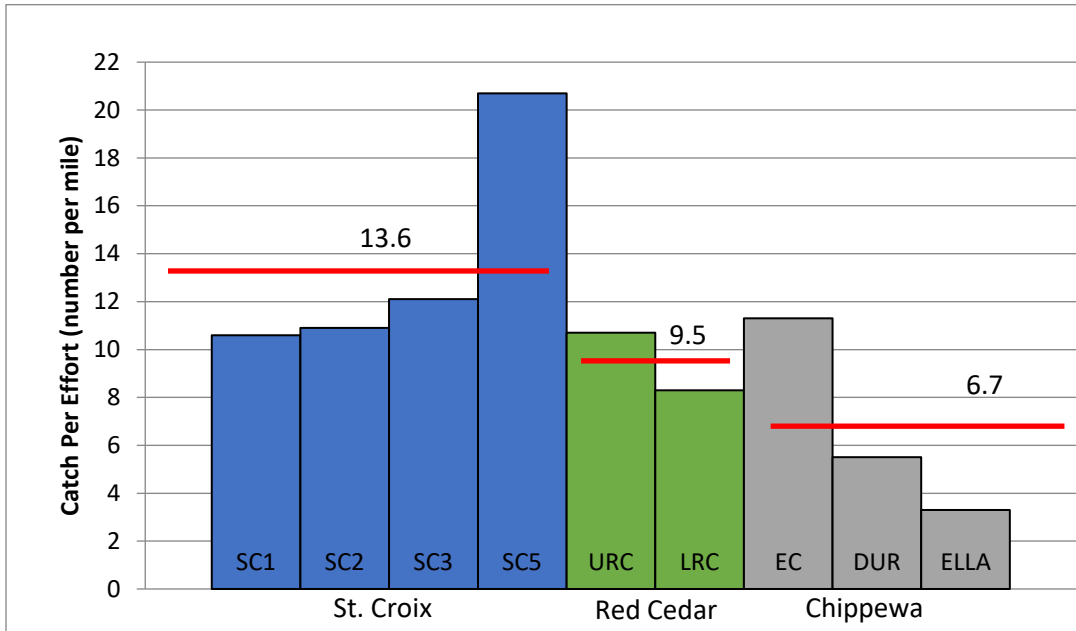


Figure 1. Total catch per effort (CPE; number per mile) of Smallmouth Bass collected from four stations in the St. Croix River in 2021, Red Cedar River in 2020 and Chippewa River at Eau Claire and Durand in 2021 and Ella in 2018.

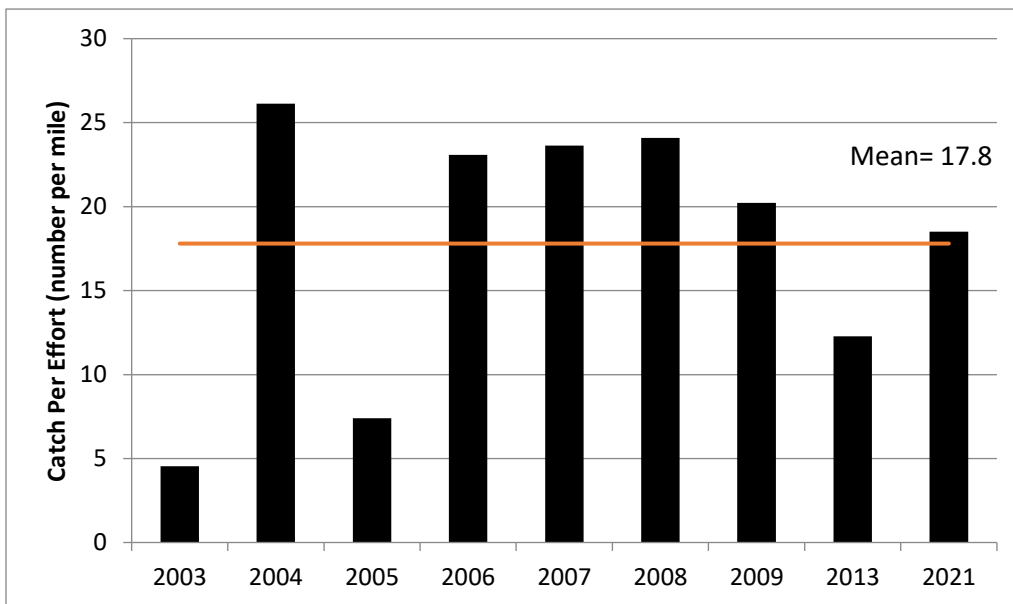


Figure 2. Total catch per effort (CPE; number per mile) of Smallmouth Bass from Station 3 (Marine to Swingbridge) on the St. Croix River from 2003-2021.

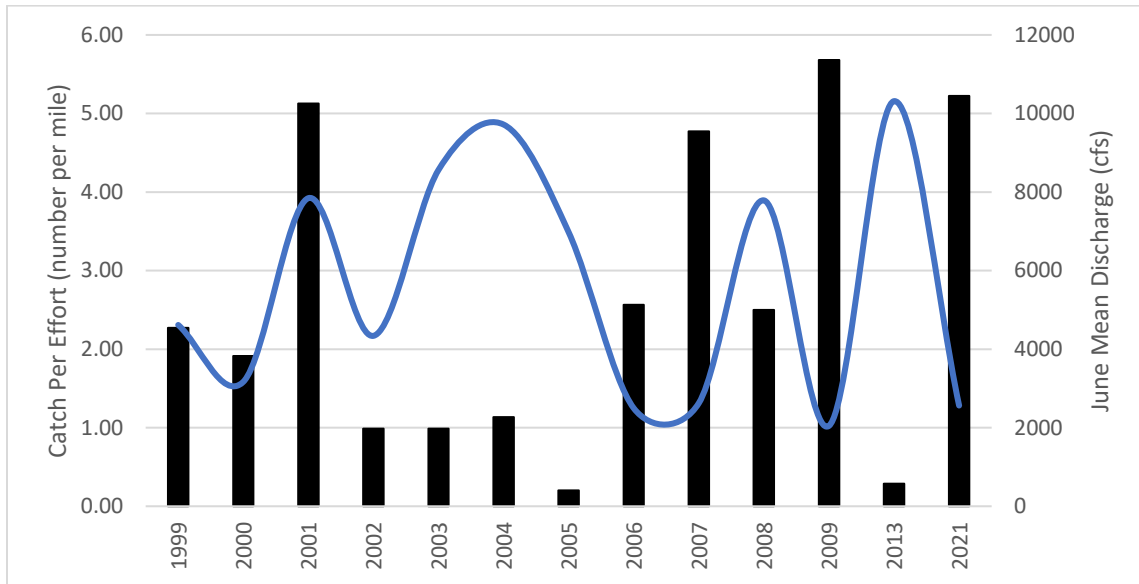


Figure 3. Catch per effort (CPE; number per mile) of age-0 Smallmouth Bass collected from Station 3 (Marine to Swingbridge) on the St. Croix River from 1999 to 2021 compared to June mean discharge rates (cubic feet per second) at St. Croix Falls.

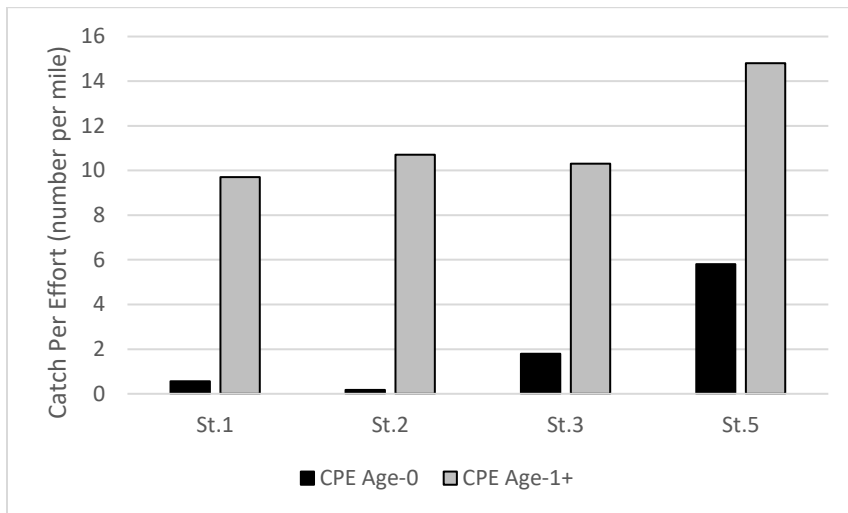


Figure 4. Relative abundance of age-0 and age-1+ Smallmouth Bass collected from four stations in the St. Croix River in 2021.

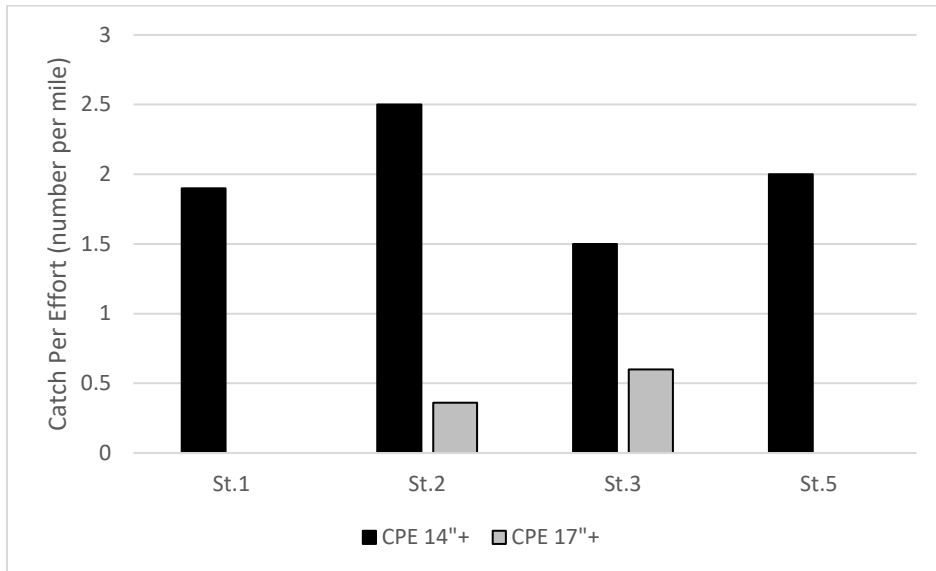


Figure 5. Relative abundance of Preferred-size (≥ 14 inches) and Memorable size (≥ 17 inches) Smallmouth Bass collected from four stations in the St. Croix River in 2021.

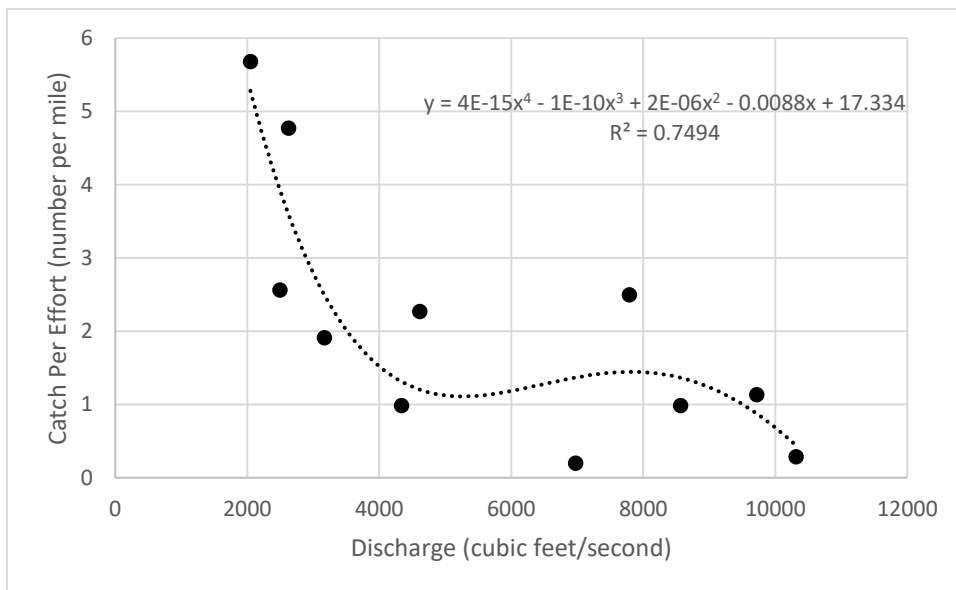


Figure 6. Plot of non-linear regression of catch per effort (CPE; number/mile) of age-0 Smallmouth Bass and mean June stream discharge (cfs) on the St. Croix River at St. Croix Falls.

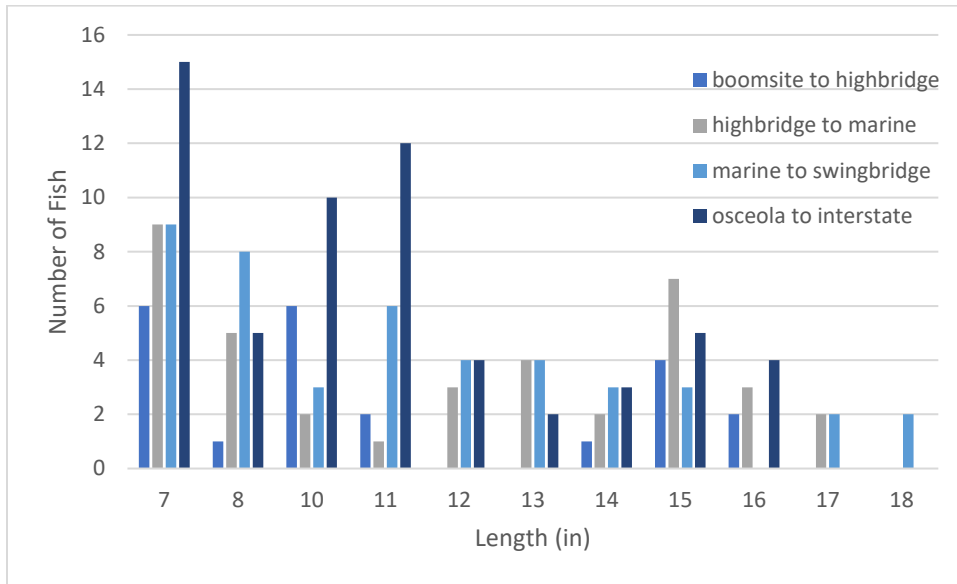


Figure 7. Length frequency distribution of Smallmouth Bass collected from four stations on the St. Croix River in 2021.

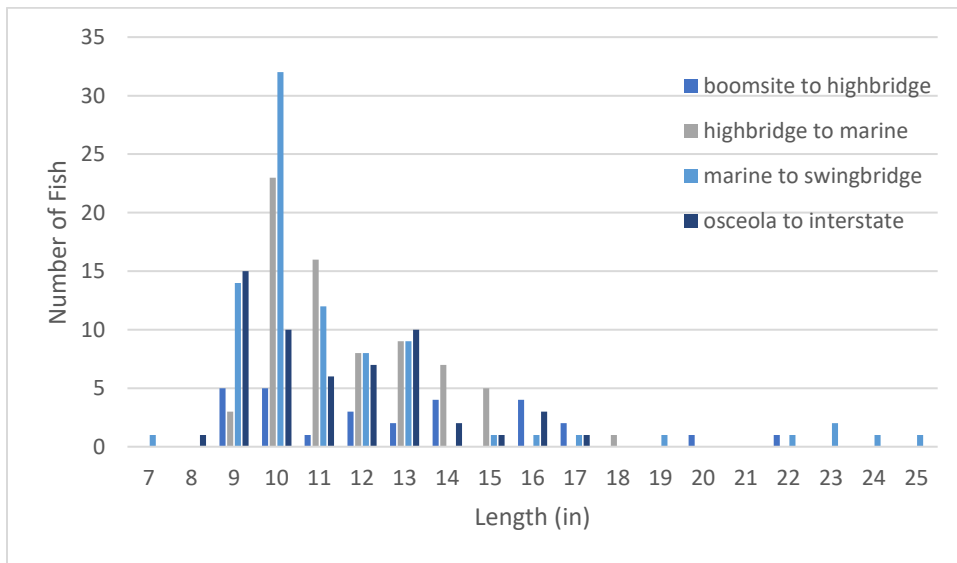


Figure 8. Length frequency distribution of Walleye collected from four stations on the St. Croix River in 2021.

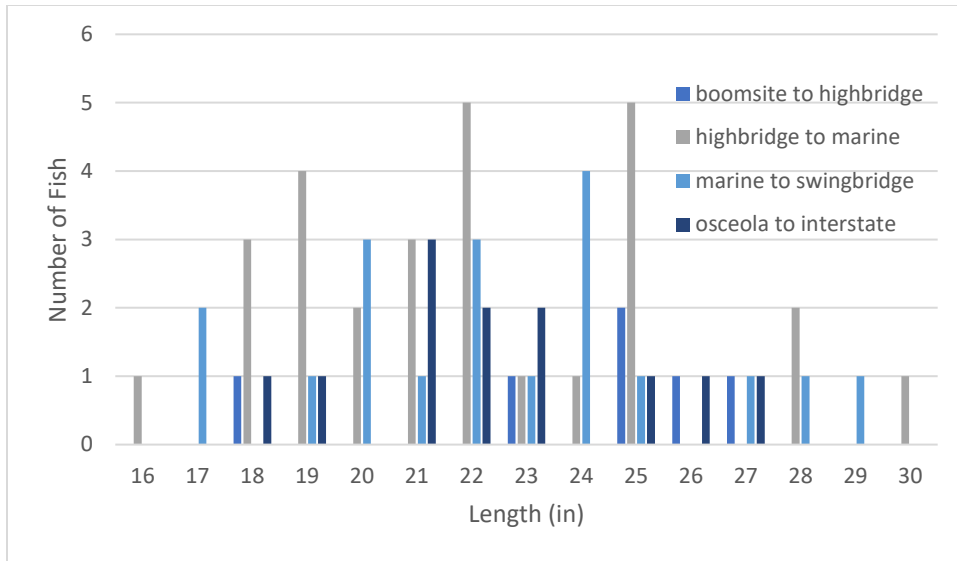


Figure 9. Length frequency distribution of Channel Catfish collected from four stations on the St. Croix River in 2021.

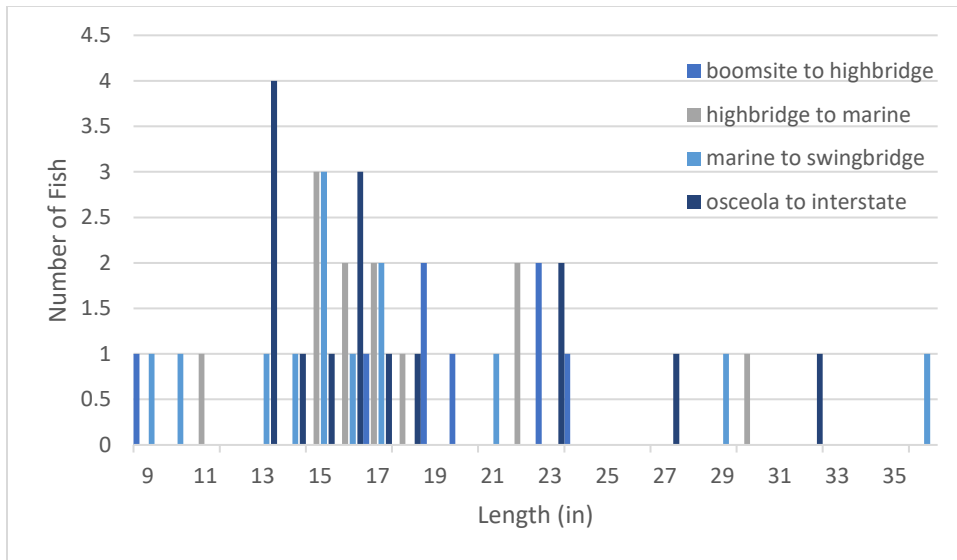


Figure 10. Length frequency distribution of Northern Pike collected from four stations on the St. Croix River in 2021.

Table 1. Total catch and catch rates (CPE; fish/mile) of each species captured in four stations on the St. Croix River in 2021. (- indicates species not targeted)

Species	St. 1 (CPE)	St. 2 (CPE)	St. 3 (CPE)	St. 5 (CPE)	Total (CPE)
Smallmouth Bass	38 (10.6)	61 (10.9)	81 (12.1)	124 (20.7)	304 (13.9)
Largemouth Bass	21 (5.8)	12 (2.1)	9 (1.2)	0	42 (1.9)
Northern Pike	9 (2.5)	12 (2.1)	13 (1.9)	15 (2.5)	49 (2.2)
Walleye	28 (7.8)	72 (12.9)	85 (12.7)	56 (9.3)	241 (11)
Sauger	1 (0.3)	0	0	0	1 (0.1)
Channel Catfish	6 (1.7)	28 (5)	19 (2.8)	12 (2)	65 (3.0)
Flathead Catfish	0	1 (0.2)	0	0	1 (0.1)
Lake Sturgeon	0	2 (0.4)	2 (0.3)	1 (0.2)	5 (0.2)
Bluegill	19 (19)	-	6 (5)	3 (3)	28 (9.3)
White Bass	5 (1.4)	3 (0.5)	1 (0.1)	0	9 (0.4)
Yellow Perch	26 (26)	-	8 (6.7)	0	34 (11.3)
Black Crappie	2 (2)	-	3 (2.5)	0	5 (1.7)
Blue Sucker	0	1 (0.2)	0	1 (0.2)	2 (0.1)
Greater Redhorse	3 (3)	9 (1.6)	2 (0.3)	16 (16)	30 (1.4)
River Redhorse	5 (1.4)	4 (0.7)	5 (0.7)	2 (0.3)	16 (0.7)
Golden Redhorse	67 (67)	-	101 (84.2)	22 (22)	190 (59.4)
Silver Redhorse	18 (18)	-	19 (15.8)	9 (9)	46 (14.4)
Shorthead Redhorse	29 (29)	-	11 (9.2)	25 (25)	65 (20.3)
Northern Hog Sucker	0	-	1 (0.8)	7 (7)	8 (2.5)
Spotted Sucker	2 (2)	3 (0.5)	2 (1.7)	1 (1)	8 (2.5)
Common Carp	2 (2)	-	5 (4.2)	1 (1)	8 (2.5)
Freshwater Drum	2 (2)	-	1 (0.8)	0	3 (0.9)
Crystal Darter	0	0	0	2 (0.3)	2 (0.1)
Logperch	5 (5)	-	1 (0.8)	4 (4)	10 (3.1)
Spotfin Shiner	2 (2)	-	5 (4.2)	2 (2)	9 (2.8)
Blacknose Shiner	1 (1)	-	0	0	1 (0.3)
Brook Silverside	2 (2)	-	4 (3.3)	0	6 (1.9)
Emerald Shiner	19 (19)	-	47 (39.2)	25 (25)	91 (28.4)
Gizzard Shad	1 (1)	-	0	0	1 (0.3)
Quillback	6 (6)	-	6 (5)	7 (7)	19 (5.9)
Spottail Shiner	2 (2)	-	3 (2.5)	0	5 (1.6)
Bluntnose Minnow	0	-	1 (0.8)	0	1 (0.3)
Highfin Carpsucker	0	-	1 (0.8)	1 (1)	2 (0.6)
Mooneye	0	-	5 (4.2)	0	5 (1.6)
Rock Bass	0	-	1 (0.8)	6 (6)	7 (2.2)
Smallmouth Buffalo	0	-	1 (0.8)	1 (1)	2 (0.6)

Table 2. Total catch and catch rates (CPE, fish/mile) of select species captured in electrofishing surveys in the St. Croix River in 2013 and 2021. A total of 5 stations were surveyed in 2013 while 4 were surveyed in 2021.

Species	2013	2021
Smallmouth Bass	298 (11.2)	304 (13.9)
Largemouth Bass	5 (0.2)	42 (1.9)
Northern Pike	15 (0.6)	49 (2.2)
Walleye	62 (2.3)	241 (11)
Channel Catfish	7 (0.3)	65 (3.0)
Blue Sucker	22 (0.8)	2 (0.1)
Greater Redhorse	23 (0.9)	30 (1.4)
River Redhorse	26 (0.9)	16 (0.7)
Silver Redhorse	53 (26.5)	46 (14.4)
Mooneye	0	5 (1.6)