

# WISCONSIN DEPARTMENT OF NATURAL RESOURCES

## Smallmouth Bass in Door County

2016, 2018 and 2023 – Rowley Bay – Population Assessments & Sport Fishery



*Picture: Submerged fyke net. Photo credit: Wisconsin DNR*

**Sturgeon Bay Fisheries Team  
Bureau of Fisheries Management  
Wisconsin Department of Natural Resources  
Sturgeon Bay Fisheries Office**



## Executive Summary

Smallmouth bass populations in Rowley Bay, Door County waters of Lake Michigan were evaluated during the pre-spawn period during the spring seasons of 2016, 2018 and 2023. The population index, as measured in number of fish caught per net night of fishing, was considerably lower during these three seasons compared to the catch rates in surveys conducted in 2004 and 2012. While the overall size composition of fish in the population is stable and well distributed, the percentage of large fish has declined somewhat since 2016. However, growth rates for smallmouth bass have continued to increase and the average size at age is the highest ever recorded. Mark-recapture information from tagging in Rowley Bay and North Bay suggests considerable bass movement between North Bay and the Mink River with some fish moving into northern Door County waters of Green Bay at times. Sport angler catch rates have declined over the past few years in Lake Michigan but have generally been at or above the long-term average over the last 10 years. Angler harvest continues to be low relative to historical levels. Concerns over the impacts of Largemouth Bass Virus, round goby nest predation, and ecological perturbations due to climate change remain as stressors to smallmouth bass populations in waters surrounding Door County.

## Introduction

The waters surrounding Door County are well known for their thriving smallmouth bass populations both in terms of fish size and abundance. Smallmouth bass have been assessed, primarily during the pre-spawn period, in selected areas of Door County periodically since 1991 to evaluate the condition of the populations in terms of relative abundance and size structure. Although the most productive areas for smallmouth bass are typically found along the Green Bay side of Door County, viable populations also exist along the Lake Michigan side. Most of the angling effort for smallmouth bass in Lake Michigan waters is directed toward Rowley Bay and the adjacent Mink River Estuary, near the tip of Door County. This area offers extensive shallow areas of prime smallmouth bass habitat that are generally protected from the high energy open waters of Lake Michigan. Beginning in spring 2020, the Mink River was designated a fish refuge from the period of the standard March fishing closure through June 15 to further protect spawning smallmouth bass. Since then, most of the effort has been directed to Rowley Bay proper. The sport fishery catch for smallmouth bass has been assessed annually in the outlying Door County waters since the 1970s using a randomized angler creel survey. Herein we report results from the 2016, 2018 and 2023 pre-spawn assessments of smallmouth bass populations in Rowley Bay. We also report recent Green Bay and Lake Michigan sport creel survey information and draw references to historical data to illustrate changes in the population over time.

## Methods

### POPULATION ASSESSMENT

Fyke nets (width = 6', height = 3', mesh size = 1.5" stretch; leads = 50'-75') were set in Rowley Bay (Figure 1). In 2016, sampling occurred between April 20, 2016, and May 27 for a total of 19 nights (between two and five nets were fished at a given time). During 2018, sampling occurred between May 2 and June 1 for a total of 21 nights (between two and six nets were fished at a given time). During 2023 sampling occurred between May 8 and June 8 for a total of 16 nights (between three and six nets were fished at a given time). Nets were removed from the water most weekends and when conditions were not conducive to netting. Smallmouth bass total length was measured to the nearest millimeter and the upper caudal fin was clipped to indicate the fish had been previously captured. In 2016 scales were used for ageing and were sampled from the left side of the fish, near the tip of the relaxed pectoral fin just below the lateral line. In 2018 and 2023, the second dorsal spine was used for aging. Age structures were



**Figure 1.** Door County peninsula and surrounding areas of Green Bay and Lake Michigan. Red box indicates Rowley Bay and North Bay.

taken from at least 10 fish per 10 mm length increment and were applied to an age-length key to examine age composition in the population. During the 2016 survey all fish were tagged along the left side, just below the dorsal fin with a yellow or orange plastic tag (Floy Tag<sup>®</sup>) which held a unique ID number and a phone number or address of the Sturgeon Bay fisheries office. In 2016 smallmouth bass were concurrently sampled and tagged in North Bay, the next bay south of Rowley Bay (Figure 1). Movement between these areas was evaluated during the spawning period primarily from survey mark-recapture data and additionally from angler reports during and outside the spawning period. Fish health was evaluated by examining for any external lesions or other abnormalities. Specifically, any lesions were counted, measured and attributed a level of severity. All other gamefish were measured, and a fin was clipped to indicate fish that were captured multiple times. Non-gamefish were identified and counted, although not clipped, so recording non-game fish multiple times was possible. While sampling sometimes occurred earlier and later, data during the first three weeks in May are analyzed herein for key metrics such as catch-per-effort (CPE), size and age structure. Data from this period comprises the majority of the sampling effort and generally encompasses the pre-spawn period, a time when smallmouth bass are active and fish are generally mixed in terms of size and sex (Becker 1983). Restricting data to this time period also helps ensure some consistency when making interannual comparisons.

## **CREEL SURVEY**

The sport fishery for smallmouth bass has been assessed annually in the outlying waters of Door County since the 1970s using a randomized angler creel survey. The creel season begins with the May opener and typically runs thru mid-October. Survey sites include most popular access points along the Door County shoreline. Standard creel survey interview data include effort, catch, harvest, biological data (length, weight, lamprey marks, tags) and angler demographics (Masterson and Eggold 2013).

## **Population Survey Results**

### **CATCH**

#### **2016**

Nets were fished for a total of 74 net nights (no. nets x no. nights fished). A total of 730 smallmouth bass and 285 fish of other species were caught during this survey (Table 1). Catch rates for smallmouth bass averaged 10.1 fish caught per net night (survey mean of daily CPE) between May 3 and May 27.

#### **2018**

Nets were fished for a total of 91 net nights (no. nets x no. nights fished). A total of 1,554 smallmouth bass and 864 fish of other species were caught during the entire survey (Table 1). Catch rates for smallmouth bass averaged 17 fish per net night (survey mean of daily CPE)

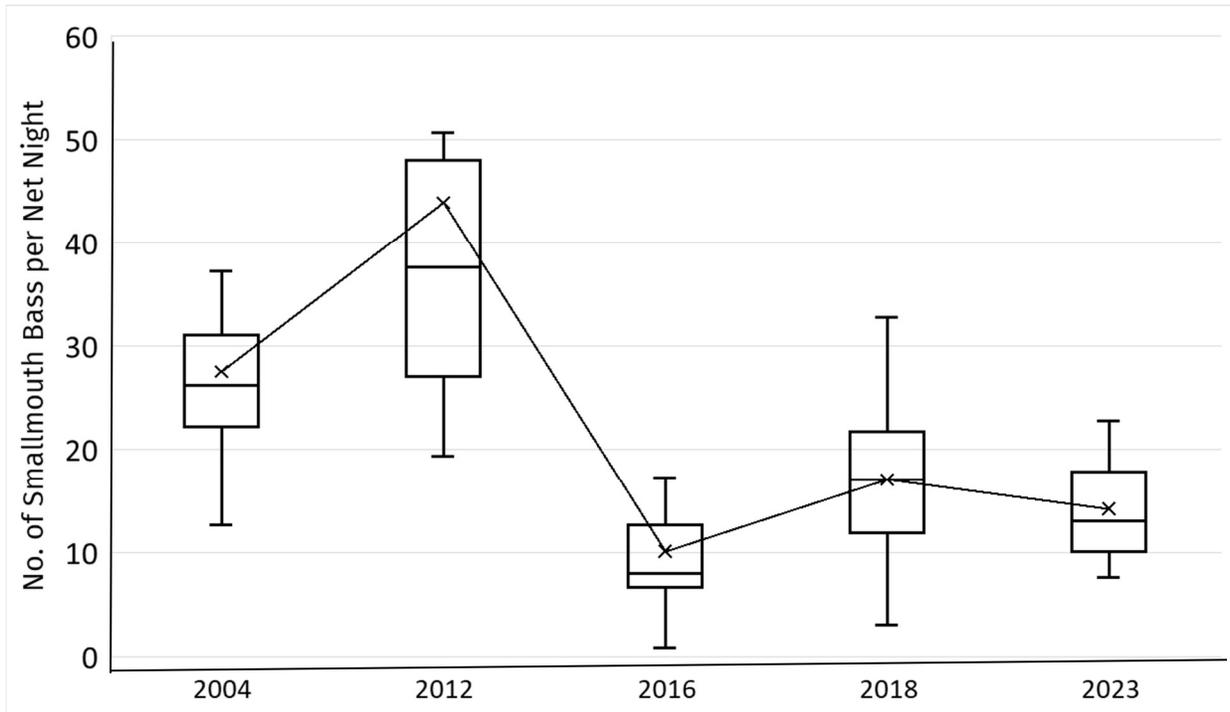
between May 2 and May 24.

**2023**

Nets were fished for a total of 73 net nights (no. nets x no. nights fished). A total of 905 smallmouth bass and 713 fish of other species were caught during the entire survey (Table 1). Catch rates for smallmouth bass averaged 14.2 fish per net night (survey mean of daily CPE) between May 9 and May 26.

**Table 1.** Total species catch composition from 2016, 2018 and 2023 smallmouth bass fyke net surveys in Rowley Bay, Lake Michigan.

<b>SPECIES</b>	<b>2016 (n)</b>	<b>2018 (n)</b>	<b>2023 (n)</b>
Alewife	1	0	125
Bullhead sp.	47	360	185
Bowfin	6	50	28
Brown Trout	8	0	0
Channel catfish	1	0	0
Common carp	4	7	4
Longnose gar	0	0	4
Longnose sucker	3	1	0
Northern pike	53	69	25
Pumpkinseed	1	4	1
Rainbow trout	0	1	0
Redhorse sp.	0	1	0
Rock bass	38	229	194
Round goby	34	14	68
Sea lamprey	0	0	3
Smallmouth bass	730	1,554	905
Walleye	0	0	2
White sucker	80	84	53
Yellow perch	9	44	21



**Figure 2.** Number of smallmouth bass caught per net night in Rowley Bay, Lake Michigan during surveys conducted between 2004 and 2023. CPE calculations generally include a 2–3-week period of sampling effort during May for each year, although the entire survey may be longer. The mean annual CPE is represented as an 'x' with a line connecting the means. The solid line within each box represents the median; lower and upper ends of the box represent the 25<sup>th</sup> and 75<sup>th</sup> percentiles, respectively.

Catch rates declined slightly between 2018 and 2023 but generally have remained at relatively stable but much lower levels than those measured a decade prior (Figure 2). Earlier surveys (2004, 2012) were somewhat more limited in effort and timing than recent surveys (Kroeff and Toney 2004; Hansen and Kroeff 2014).

## AGE COMPOSITION

### 2016

The smallmouth bass sampled in Rowley Bay in 2016 were from 4 to 16 years old with age-6 to age-8 fish most prevalent (Figure 3). There did not appear to be any relatively strong year classes present in the catch. Very few fish younger than age-5 were captured, suggesting poor recruitment over the last several years. The relatively robust number of fish age-10 and older reflects the recruitment from the relatively high numbers of age-6 and older fish from the 2012 survey into the older portion of the 2016 population. However, strong age-4 and age-5 year classes measured in the 2012 survey were not well-represented as age-8 and age-9 fish in 2016.

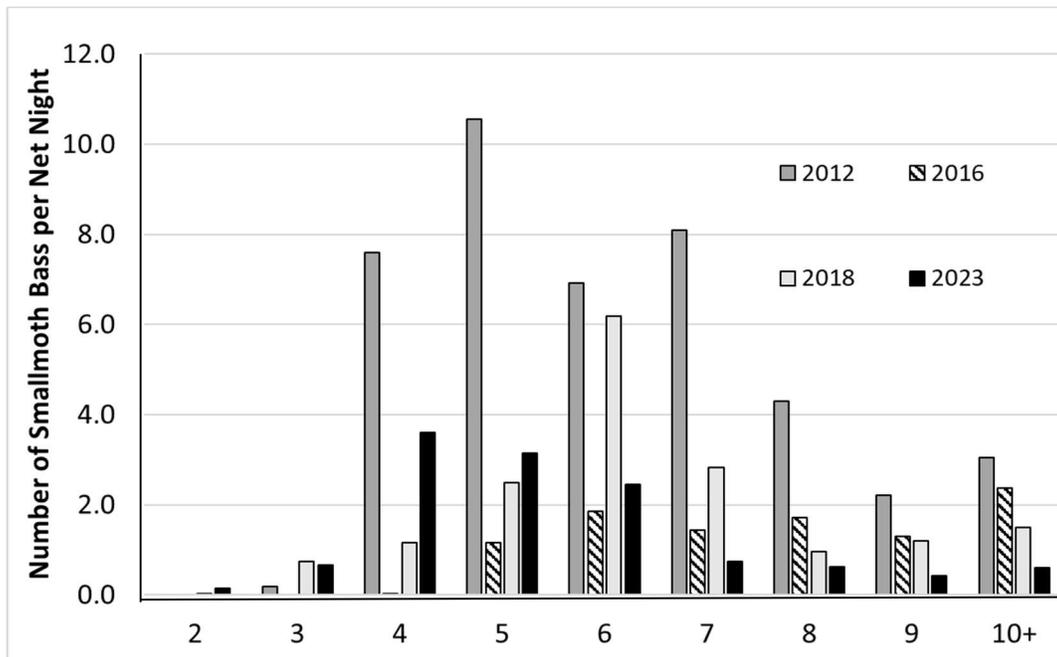
### 2018

Smallmouth bass sampled in Rowley Bay in 2018 were from 2 to 16 years old with age-5 to age-7 fish most prevalent (Figure 3). The 2012 year class (age-6) in 2018 appeared to be quite strong and accounted for 36% of the population. However, this same 2012 year class (as age-4

fish in the 2016 survey) was surprisingly almost non-existent in the 2016 catch. The increased catch of age-3 to age-5 since the last survey suggested that there was a modest amount of recruitment in recent years.

**2023**

Smallmouth bass sampled in Rowley Bay in 2023 were from 1 to 14 years old with age-4 to age-6 fish most prevalent (Figure 3). There did not appear to be a strong year class represented in the catch. Fish that were seven years or older were very poorly represented in the catch which is consistent with the overall drop in catch per effort the last three years in the time series (Figure 2).



**Figure 3.** Catch rates in number of smallmouth bass caught by age in 2012, 2016, 2018 and 2023 spawning surveys in Rowley Bay. Data include all fish from the entire survey which could include early April (2016) and early June (2018, 2023) sampling. (Beyond age-9 ageing accuracy likely decreases considerably so ages are pooled for age 10 and older fish.)

**SIZE COMPOSITION**

**2016**

The length composition of smallmouth bass in Rowley Bay during 2016 centered on mid to large size fish; a considerable shift from the predominance of smaller fish during the 2012 survey (Figure 4). The average length was 17 inches, and the largest fish measured 21.2 inches. Over 70% of the fish were between 15 and 18 inches while 30% were 18 inches or greater (increasing from only 17% in 2012).

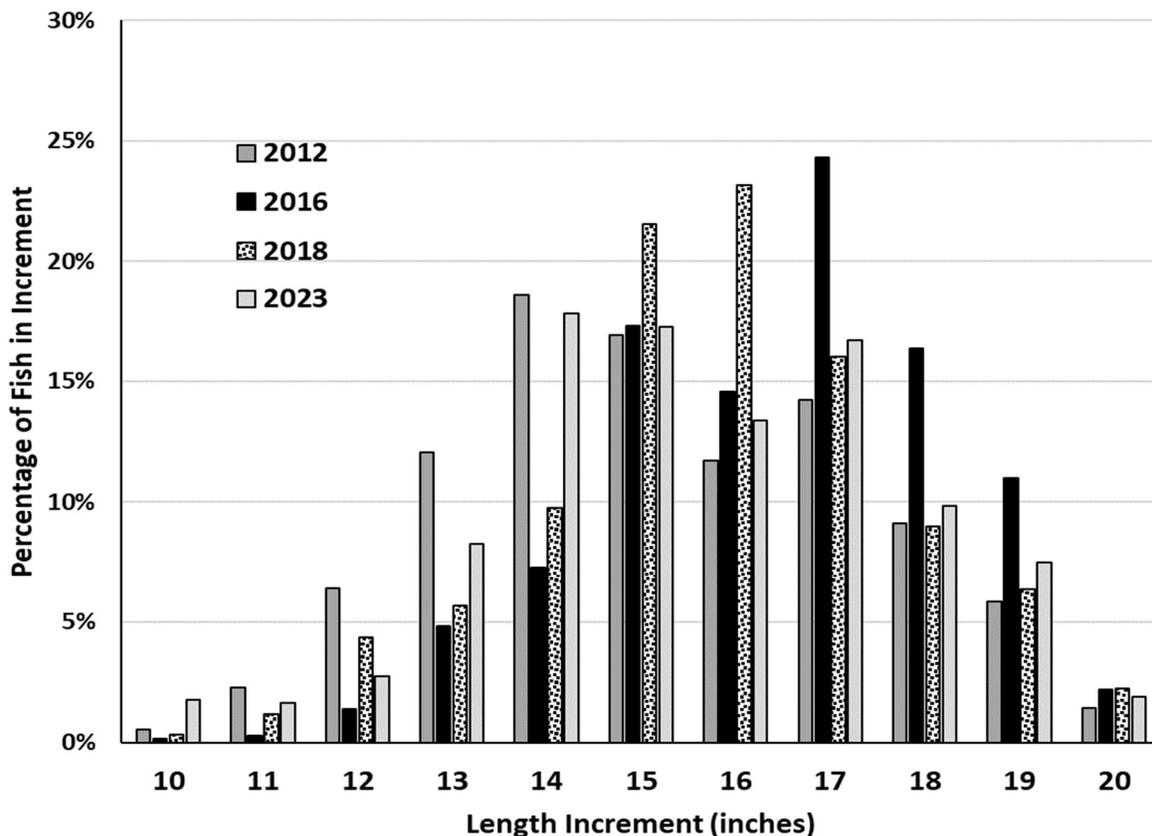
**2018**

The length composition of fish in 2018 shifted back to moderate sizes from the larger size structure measured in the 2016 survey (Figure 4). The average length was 16.3 inches, and the

largest fish measured 21.6 inches. Over 70% of the fish were between 14 and 17 inches and 18% were 18 inches or greater.

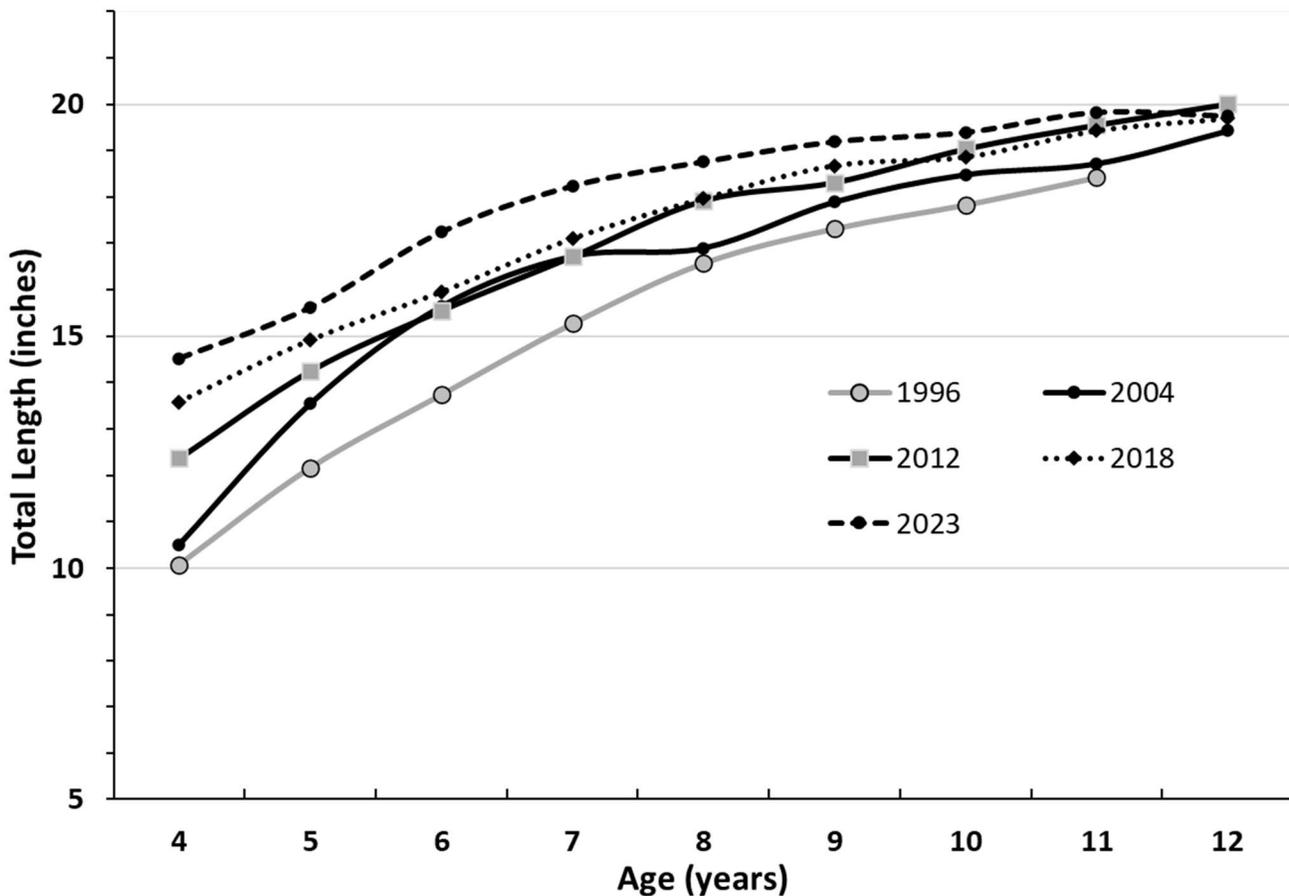
**2023**

The length composition of fish in 2023 was generally well distributed throughout the sampled population and was primarily made up of fish in the middle size range (Figure 4). Smaller and larger fish did not show any strong representation. The average length was 16 inches, and the largest fish measured 21.3 inches. Around 65% were between 14 and 17 inches and 19% were 18 inches or greater.



**Figure 4.** Length compositions for Rowley Bay smallmouth bass in 2012, 2016, 2018 and 2023 survey years. Length bins are delineated by any fish that fell within a particular inch group (e.g. a fish in the 16” bin could have been between 16 and 16.99 inches long).

Mean length at age has increased substantially between the 1996 and 2023 surveys (Figure 5). An age-4 smallmouth bass is now on average four to five inches longer than it was in the mid-1990s, and fish are on average at least several inches longer up to age-7. Growth has improved so much over the past 25 years that whereas historically a fish did not reach the 14” legal size limit until around age-7, fish now may reach the legal limit by age-4.



**Figure 5.** Mean length at age (inches) of Rowley Bay smallmouth bass ages 4-12 from surveys conducted between 1996 and 2023.

## FISH TAGGING 2016

### Survey Tag Recoveries

There were 297 and 700 smallmouth bass tagged in North Bay and Rowley Bay, respectively. Of the fish tagged in Rowley Bay, 46 were recaptured during the 2016 survey (~6.5%). All but two of them were recaptured in the same Rowley Bay area during the survey year. The two fish that left the tagging area were recaptured in North Bay (~ 9 miles distant) during the survey. One was tagged on May 3 and recaptured May 5, the other tagged May 5 and recaptured May 15.

Of the North Bay-tagged fish, 19 were recaptured during the survey (~ 6.5%). All but four of them were recaptured in the same North Bay area during the survey year. The four fish that left the tagging area were recaptured in Rowley Bay (~ 9 miles distant) during the survey. Three were tagged on May 3 and captured May 17, 20 and 27, the other tagged on May 12 and captured again May 14.

Very few 2016-tagged fish were recaptured two years later during the 2018 Rowley Bay survey (North Bay was not surveyed in 2018). Two fish tagged in North Bay in 2016 were captured in Rowley in 2018. There was considerable evidence of tag loss observed during the 2018 survey.

### Sport Angler Tag Recoveries

During 2016 only, a total of 74 fish from the two tagging locations were caught by sport anglers where the disposition (caught or kept) of the fish was provided. Four fish were reported as being kept by anglers (~5.5%) during that period. The proportion of tags reported after the tagging year dropped considerably as only 13% of the number of all tags reported by anglers were reported after 2016 supporting the premise that tag loss is high in smallmouth bass.

There were 60 Rowley Bay-tagged fish reported being caught by sport anglers between 2016 and 2018, most of them during 2016. Some fish were reported as caught multiple times. Most of the reported tags (n=31) were captured again in Rowley Bay. The next highest number came from the Mink River (n=22) which is an estuary of Rowley Bay. Rowley Bay-tagged fish were reported from three other locations: North Bay (n=3), Northport Ferry Dock area (n=3) and Little Sister Bay (n=1). See Table 2 for dates and distances traveled for some fish.

There were 33 North Bay-tagged fish reported by sport anglers between 2016 and 2020, most of them during 2016. Some fish were reported as caught multiple times. Most of the reported tags (n=20) were captured again in North Bay. Other locations included Gills Rock (Hedgehog Harbor) (n=1), Moonlight Bay (n=3), Mink River (n=3), and Northport Ferry Dock area (n=2). One of the Northport-caught fish was later caught in Wisconsin Bay near Gills Rock. There were several reports with not enough information on recapture location.

**Table 2.** Tagging and recapture locations, dates and approximate distance traveled for select angler report incidents for smallmouth bass that moved away from the general area in which they were tagged, as reported by sport anglers during 2016.

Tagging Site	Recapture Site (Dates)	Approx. Distance Between Sites (mi)
Rowley Bay	Northport Ferry Dock Area (June 8 – Oct. 15)	10
Rowley Bay	Little Sister Bay (Aug. 24)	23
North Bay	Hedgehog Harbor, Gills Rock (Nov. 30)	19
North Bay	Mink River (May 29)	10
North Bay	Northport Ferry Dock Area (Oct. 15)	10

### Fish Health

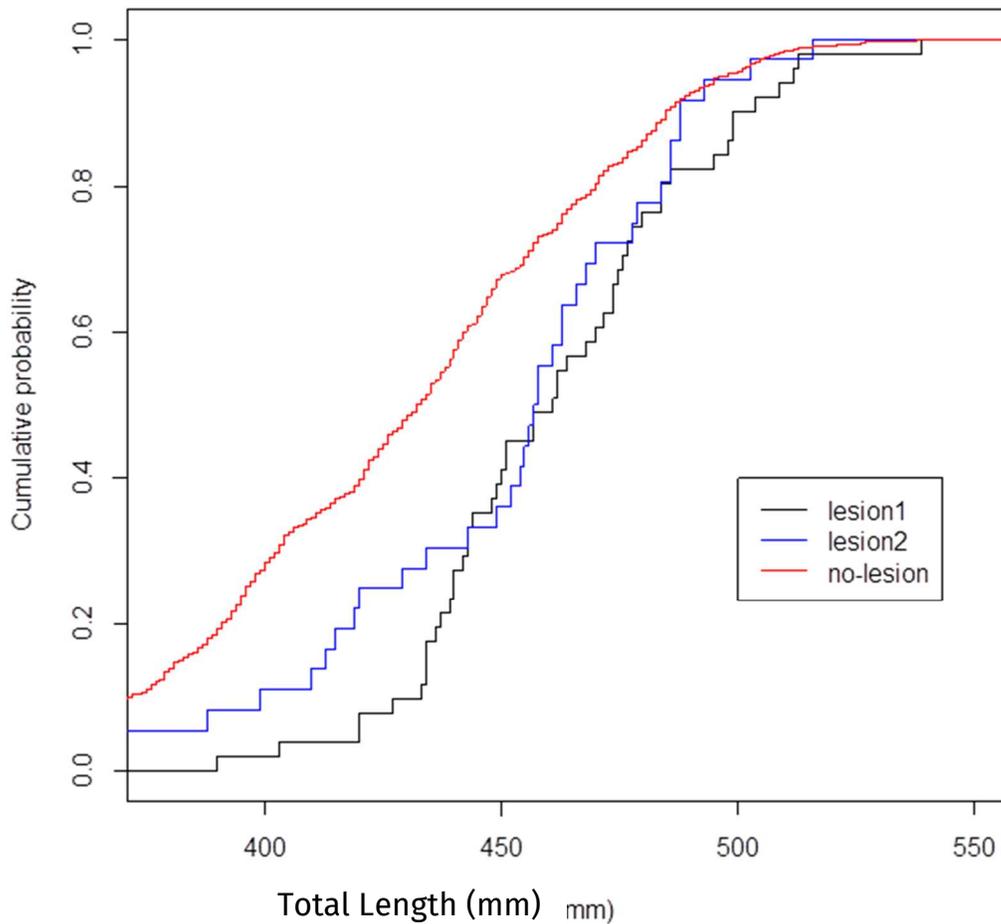
There have been episodes of elevated levels of smallmouth bass with substantial lesions observed over the past 10-15 years in Door County waters of Green Bay, and to a lesser extent, Lake Michigan (Figures 6/6a). The first angler reports and field survey observations of elevated lesion-affected fish occurred in late 2008 and into 2009. The incidence of lesions apparently subsided until reemerging in 2015/16 and again later in 2021. These specific lesions have typically been observed on the upper portion of the fish, are often circular in shape, and can severely erode the skin and muscle tissue. Wounds often resemble scars left by lamprey attacks which cannot necessarily be ruled out as a source of the wound. Aside from the extreme severity of some of the lesions, affected fish appeared to be in good condition. No large-scale fish kills involving smallmouth bass were reported during these outbreaks.

Evaluation of the fish in Rowley Bay in 2018 found that 7% had what were considered substantial lesions, and inclusion of fish with small or healed over lesions increased the prevalence to 12% of affected fish in the population. Despite extensive testing of these fish, no pathogens were isolated, and the specific cause of the lesions observed was undetermined. Anecdotal observations suggest the lesions tend to be found in “larger” fish in the population. Further analysis found that fish without lesions were significantly smaller than the two groups of fish that were categorized with either substantial lesions (lesion 1) or lesions that were healed or minor (lesion 2) (Kolmogorov-Smirnov test;  $p < 0.05$ ) (Figure 7). The average length of smallmouth in the population that were apparently unaffected (i.e., no lesions, based on  $n=617$  fish sampled) was 429 mm while the average lengths of fish with what appeared to be healed or minor lesions ( $n=38$ ) and fish with substantial lesions ( $n=51$ ) were 450 mm and 462 mm, respectively.

While it is not possible to compare rates of affected fish between spring field surveys and angler catch reports, it does appear that the prevalence (and possibly severity) of affected fish increases later in the season as waters warm. While testing done in previous years had been inconclusive, in Sept. 2021, 14 diseased fish collected from the waters surrounding Door County and examined by DNR fisheries staff tested positive for largemouth bass virus (LMBV; [Smallmouth Bass in Door County Waters Test Positive for Largemouth Bass Virus / https://dnr.wisconsin.gov/newsroom/release/50921](https://dnr.wisconsin.gov/newsroom/release/50921)). Aside from the extreme severity of some of the lesions, the affected fish appeared to be in physically good condition.



**Figures 6 and 6a.** Lesions observed in smallmouth bass in 2009 (left image) and 2015 (right image). Note: Not all lesions are consistent with these images. Photo credit: Wisconsin DNR.



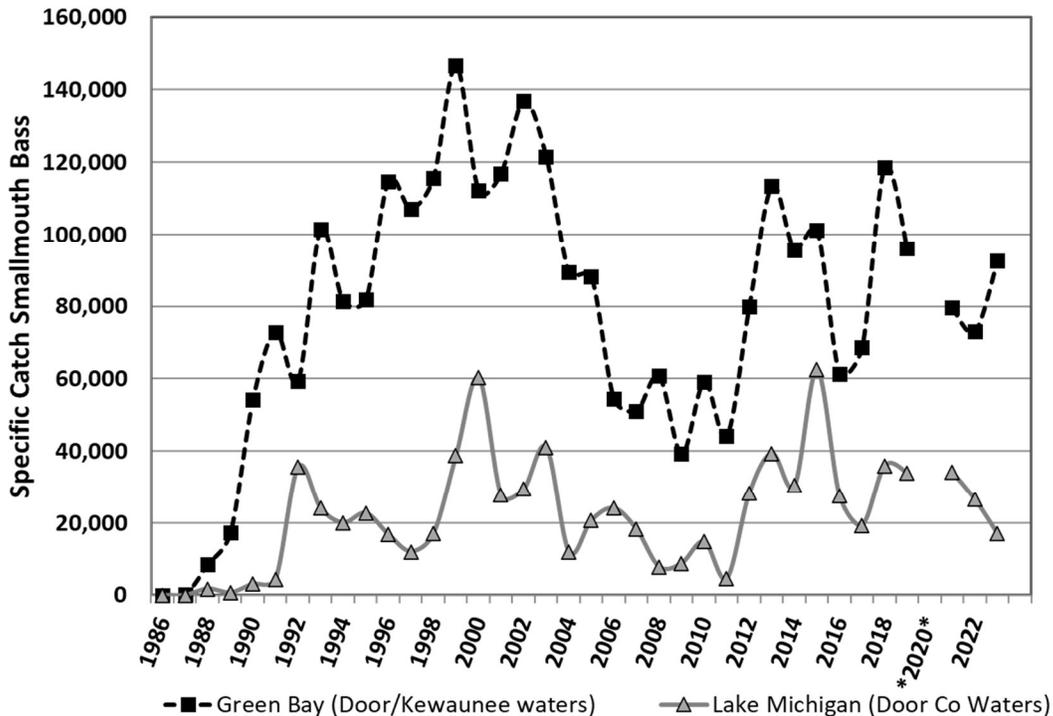
**Figure 7.** Proportion (cumulative probability) of smallmouth bass in the sample that are less than each observed length (x-axis) for each group of affected and unaffected fish in Rowley Bay, 2016. ‘Lesion 1’ fish were those with the most severe lesions and ‘lesion 2’ were fish that had healed or minor lesions.

## Creel Survey

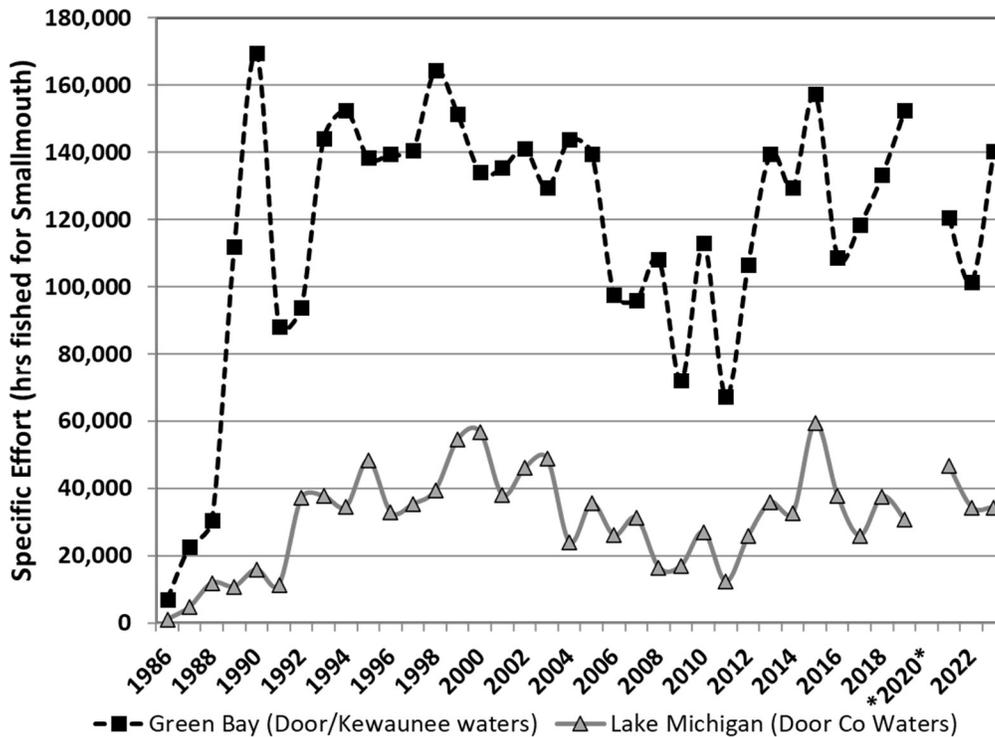
Angler fishing catch and effort for smallmouth bass in Door County waters of Green Bay and Lake Michigan increased rapidly beginning the late 1980s and early 1990s (Figures 6a-b). These values dropped somewhat through the mid-2000s and increased again during the early 2010s. While the last 10-15 years of catch and effort have shown considerable variation, there has been a generally declining trend over this time. Targeted catch rates (the number of smallmouth bass caught by anglers specifically targeting them) are generally consistent between Green Bay and Lake Michigan over time, although since 2012 they have typically been higher in Lake Michigan (Figure 6c). Catch rates in Lake Michigan in recent years have been lower now falling below the previous 15-year average of 0.78 fish per hour and are now again more consistent with Green Bay catch rates. Compared to Green Bay waters, the Lake Michigan sport fishery (particularly Rowley Bay) tends to be more focused during the spring and early summer months when fish are more accessible. It is also more dependent on

access opportunities and boat launch conditions than Green Bay waters.

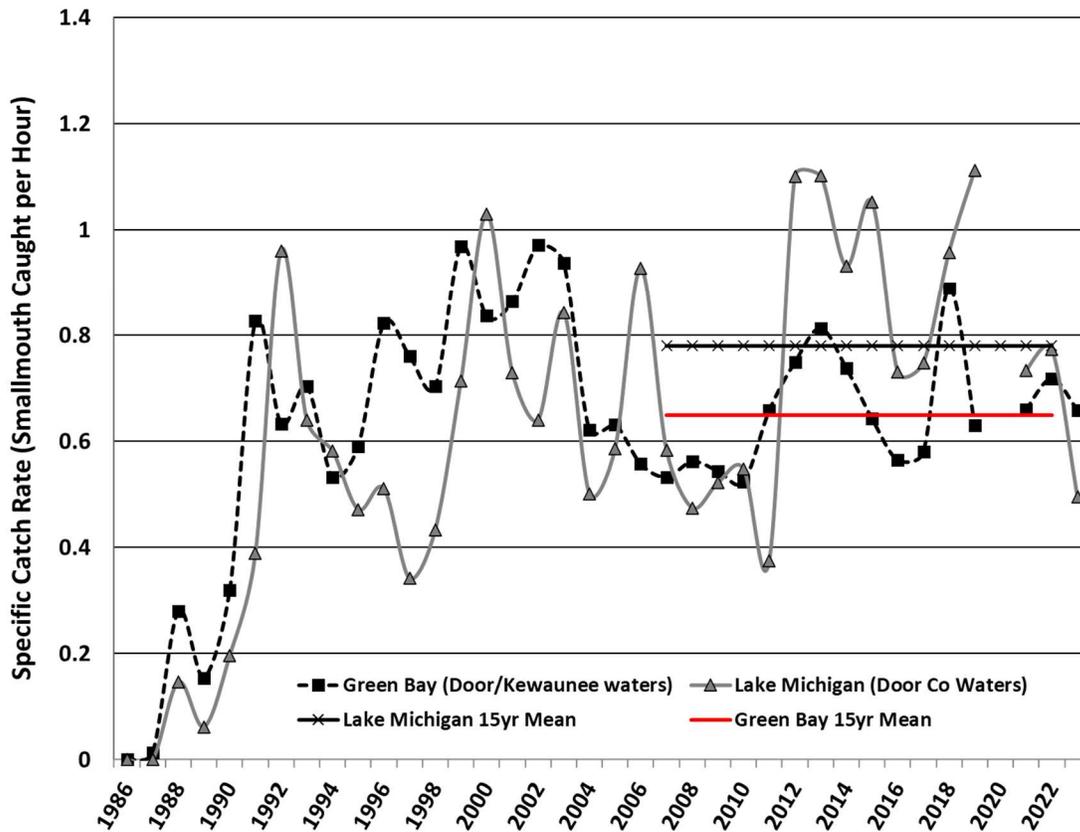
6a.



6b.

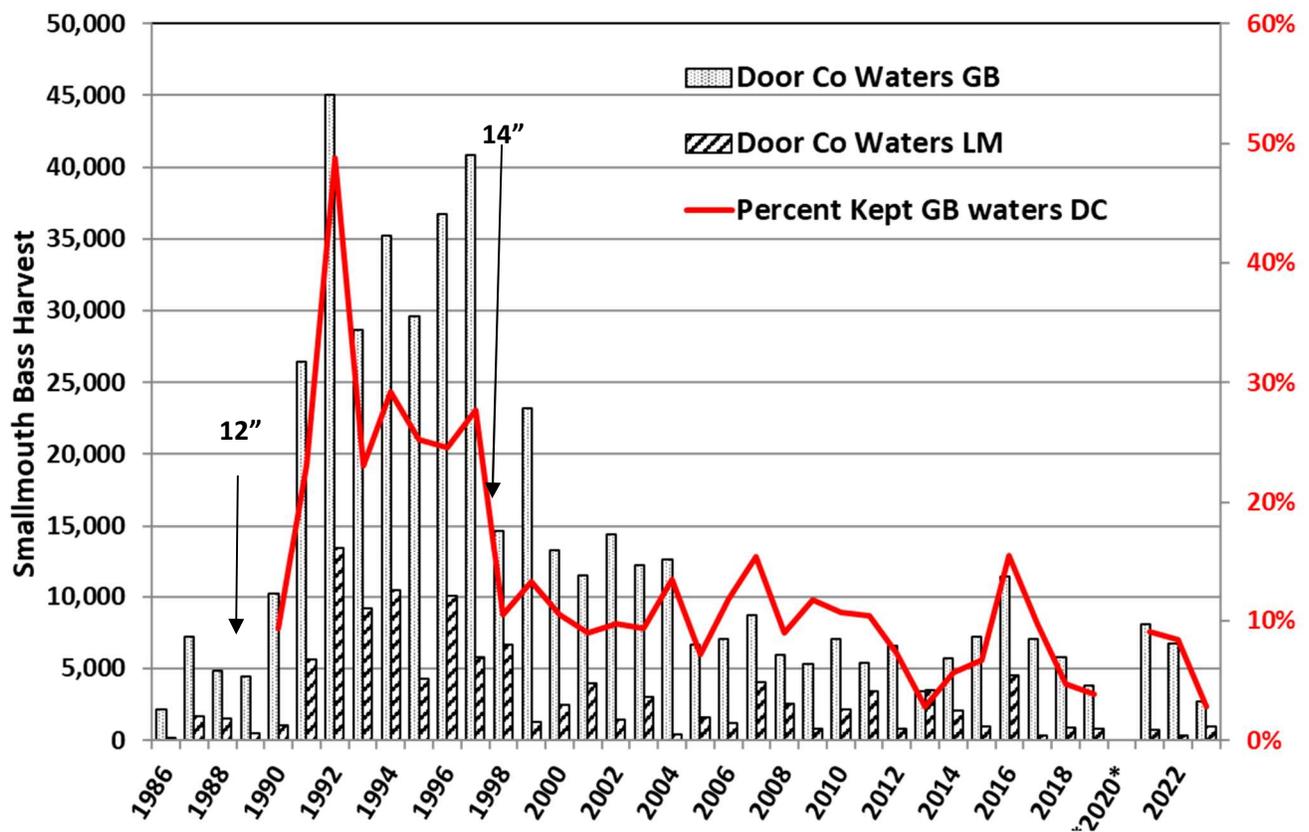


6c.



**Figure 6 a-c.** Creel survey results for Door County waters of Green Bay and Lake Michigan, 1986-2023. Catch, effort and catch rates are specific to anglers targeting smallmouth bass. 2020 data not shown due to incomplete creel survey year.

Harvest on Lake Michigan generally is substantially lower than the harvest in Green Bay again likely due to smaller and more concentrated smallmouth populations that characterize the fishery on the Lake Michigan side of Door County. During the middle to late 1980s, the harvest of smallmouth bass in Door County's outlying waters was relatively low, likely due to lower population abundance. However, smallmouth bass harvest increased dramatically in the early 1990s (Figure 7) with increasing population size. This occurred despite the implementation of a 12" size limit in 1989 (there was no size limit prior), increasing by more than five-fold between 1990 and 1991 in Lake Michigan waters of Door County. The mean annual harvest from 1991 to 1997 in Lake Michigan waters was  $8,215 \pm 2,904$  (1 SD). Implementation of the 14" size limit in 1998 was likely responsible for the dramatic harvest reduction beginning in 1999 and since then is generally less than an estimated 1,000 fish annually. Green Bay waters have followed a similar trend, demonstrating another decrease in harvest in 2005 that has perpetuated since and is likely a result of the increased practice of catch and release.



**Figure 7.** Smallmouth bass harvest history in the Door County waters of Green Bay and Lake Michigan, 1986-2023. Arrows indicate size limit changes in 1989 and 1998. 2020 data not shown due to incomplete creel survey year.

## Summary

While catch rates from spring surveys have decreased considerably in the last 10 years, angler catch rates have generally been at or above the previous 15-year average until very recently. This suggests the smallmouth population in the Rowley Bay area is still in good condition and there were moderate numbers of 4–6-year-old fish caught in the 2023 spring survey to provide for future angling opportunity. However, there was a clear reduction in recruitment over a number of years likely beginning in the early 2010s. With a few exceptions such as the strong presence of age-6 fish in the 2018 survey (2012 year class) and ages 5 and 6 in the 2023 survey (2018, 2019 year classes), there appeared to be few strong year classes produced since the 2000s. Given the apparently strong year classes between age-4 and age-7 in 2012 it is, however, confounding to not see stronger catches of older fish in the 2016 survey. One explanation could be that because the 2012 survey began somewhat later in the spring and the level of effort was lower (21 net nights and fewer, more focused nets in 2012 than in 2016), the 2012 numbers could have been artificially inflated. Additionally, an outlier CPE of 100 fish on one date during the 2012 survey skewed the catch rates higher. However, the three-week timing period of each survey was generally the same and the record high angler catch rates in 2012 support the high index abundance measured in the survey. While the number of fish declined since the late 2000s and early 2010s, there was evidence for a

general improvement in size structure, particularly in the 2016 survey. This provides some evidence of strong young year classes from the 2012 survey moving into the larger size classes. By 2023, the size of fish was relatively normally distributed in the population suggesting previous years' recruitment had been relatively consistent albeit at lower levels. Although the data are not shown in this report, the age and size composition of fish caught in North Bay in 2016 was very similar to the Rowley Bay population.

Growth continues to improve each year, with more fish reaching the legal-size limit at an earlier age than ever before. On average, fish size at age has increased as much as at 2-4 inches or more for fish between age-4 and age-8 since the mid-1990s. Size composition can vary with year class strength (large year classes can negatively affect growth). Consequently, with apparent poor recruitment in recent years and potential density-dependent effect (i.e., fewer but bigger fish due to reduced competition for resources), these factors may have contributed to changes toward increasing growth rates over time. Additionally, the prevalence of round goby as a food source may also be partially responsible for the increased growth. However, at the same time the impact of the round goby as a nest predator (Steinhart et al., 2004) could be a critical factor in the lower smallmouth bass recruitment measured over the last decade in Rowley Bay.

The presence of what is assumed to be a separate spawning population nearby in the Mink River estuary can confound the ability to produce a reliable index of abundance for Rowley Bay. Anecdotal observation suggests the spawn timing in the Mink River may be earlier given the relative protection from open water energy events and dark-stained nature of the estuary. This may result in the movement of fish in and out of the estuary and potential capture in nets set in Rowley Bay during the several weeks in May we sample. Mark-recapture information from the 2016 tagging study provides some evidence to support this premise. For example, 20 of the 55 angler-reported Rowley Bay-tagged fish in 2016 were caught in the Mink River, mostly in May and early June. Two additional fish were reported from the Mink River in later years, one each in May of 2017 and 2018. In addition, three of the 33 North Bay-tagged fish were caught later in the Mink River during the spring spawning period (May 2016, May 2017 and June 2017).

While our data indicated that some smallmouth bass tagged in Rowley Bay and North Bay will travel a considerable distance (Table 2), the long-held premise that fish from lake-side populations generally do not move into Green Bay was supported. Of the 99 sport angler reports from Rowley and North Bay fish, only three of them were caught in what would be considered Green Bay proper. Additionally, aside from one fish traveling to Little Sister Bay, these few fish did not move more than a few miles south into Green Bay. A few fish were captured at the tip of Door County where Green Bay and Lake Michigan waters meet. While this information is reliant upon angler effort and cooperation, it generally appears that smallmouth bass in Wisconsin waters of Lake Michigan maintain a relatively restricted home range, likely between Moonlight Bay and the tip of Door County, a distance of approximately 18 miles of open waters shoreline. This information is consistent with historical tagging done in Mink River/Rowley Bay where only a few tags returned were from fish that moved into northern Green Bay (Kroeff 1996, 1997). Our information is also consistent with the relatively limited movement patterns of Green Bay smallmouth bass populations tagged in the areas of Little Sturgeon Bay and Sturgeon Bay from other studies (Weigert 1966; Kroeff 1995; Hansen

and Kroeff 2014).

While it is suspected that LMBv was involved in the development of the skin lesions on the 14 smallmouth bass tested in 2021, little is definitively known about its ability to cause disease or death in the species. LMBv has been found throughout the Eastern United States and was previously identified in Wisconsin's Mississippi River Basin (Grizzle and Brunner 2011). The virus can cause weakness, skin lesions, abnormal swimming, swim bladder over-inflation and death in largemouth bass (Zilberg et al. 2000, Boonthai et al, 2018). While the appearance of LMBv in Door County smallmouth populations has been disconcerting, there is no evidence it has had any population-level effect. Affected fish seem to be in good condition, and what appear to be healed lesions have been observed. DNR staff will continue to monitor smallmouth bass populations and collect additional samples to confirm LMBv in future outbreaks. See the [DNR website \(https://dnr.wisconsin.gov/newsroom/release/50921\)](https://dnr.wisconsin.gov/newsroom/release/50921) for guidance and additional information on LMBv.

## Management Implications

In addition to lower fyke net catches during spring spawning surveys during this general time period for other Door County smallmouth bass populations in Green Bay and Washington Island (Hansen 2024 and 2024a), lower relative sport fishing catch rates for smallmouth bass over the past five to ten years in the waters surrounding Door County have raised concerns among some anglers. Cohorts from the strong year classes in the 2000s survived well into the 2010s, resulting in a fishery made up of excellent catch rates for large fish among most populations in Door County waters, an often-infrequent occurrence in sport fisheries. There are many variables that can impact fish abundance, with angler exploitation one that is often in the spotlight. In 2024 a rule was proposed to implement the extension of the catch and release season until July for Green Bay waters and Door County waters of Lake Michigan to protect smallmouth bass during the spawning period. Statewide voting from the 2025 Spring Conservation Congress hearings strongly supported this rule and the rule will be implemented during the spring of 2026. This rule will inherently protect fish from harvest during this critical period and reduce the artifacts from stressors of moving fish over long distances during catch-hold-release tournaments held during the spawning period.

Various other factors may play a role in smallmouth bass population dynamics and should be considered when managing for healthy smallmouth bass populations in Door County waters of Green Bay and Lake Michigan. This may include possible impacts from tournaments (Maynard et al 2013), disease (DNR Press Release, <https://dnr.wisconsin.gov/newsroom/release/50921>), invasive species (Steinhart et al 2004), frequent large-scale changes in Great Lakes water levels (NOAA, The Great Lakes Dashboard), shoreline development (Wensink and Tiegs 2016) and impacts from changing climate conditions (Steinhart et al 2005). See Hansen 2024 for further discussion of these topics as well as information regarding other current research studies concerning smallmouth bass in waters surrounding Door County.

## References

- Boonthai, T., Loch, T. P., Yamashita, C. J., Smith, G. D., Winters, A. D., Kiupel, M., Brenden, T. O., & Faisal, M. 2018. Laboratory investigation into the role of largemouth bass virus (*Ranavirus*, Iridoviridae) in smallmouth bass mortality events in Pennsylvania rivers. *BMC veterinary research*, 14(1), 62.
- Grizzle, J.M. and Brunner, C.J. 2003. Review of Largemouth Bass Virus. *Fisheries*, 28: 10-14
- Hansen, S. and T. Kroeff. 2014. Smallmouth Bass in Door County: 2009/2012 Population Assessments and Sport Fishery. Wisconsin Department of Natural Resources Fisheries Management Report. Sturgeon Bay, Wisconsin. 16 pp.
- Hansen, S. 2024. Smallmouth bass in Door County: 2017 and 2021 Sturgeon Bay/Little Sturgeon Bay population assessments and sport fishery. Wisconsin Department of Natural Resources Fisheries Management Report. Sturgeon Bay, Wisconsin. 12pp.
- Hansen, S. 2024a. Smallmouth bass in Door County: 2014 and 2022 Washington Island – Detroit Harbor Population Assessments. Wisconsin Department of Natural Resources Fisheries Management Report. Sturgeon Bay, Wisconsin. 17pp.
- Kroeff, T. 1995. Assessment of Spawning Populations and Early Life History of Smallmouth Bass at Several Locations Along the Door County Shoreline in 1995. Wisconsin Department of Natural Resources Fisheries Management Report. Sturgeon Bay, Wisconsin. 16 pp.
- Kroeff, T. and M. Toney. 2004. Summary of Smallmouth Bass Assessments in Selected Areas of Door County 2004. Wisconsin Department of Natural Resources Fisheries Management Report. Sturgeon Bay, Wisconsin. 5 pp.
- Masterson, C. and B. Eggold. 2013. Wisconsin's Open Water Sportfishing Harvest and Effort from Lake Michigan and Green Bay. Wisconsin Department of Natural Resources Fisheries Management Report. Milwaukee, Wisconsin. 12 pp.
- Maynard, G. A., T. B. Mihuc, R. E. Schultz, V. A. Sotola, A. J. Reyes, M. H. Malchoff, and D. E. Garneau. 2013. Use of external indicators to evaluate stress of largemouth (*Micropterus salmoides*) and smallmouth (*M. dolomieu*) bass at Tournaments. *Open Fish Science Journal* 6:78-86.
- NOAA. The Great Lakes Dashboard. Great Lakes Environmental Research Laboratory, [https://www.glerl.noaa.gov/data/dashboard/GLD\\_HTML5.html](https://www.glerl.noaa.gov/data/dashboard/GLD_HTML5.html)
- Steinhart, G.B., E.A. Marschall, and R. Stein. 2004. Round goby predation on smallmouth bass offspring in nests during simulated catch-and-release angling. *Trans. Am. Fish. Soc.* 133(1): 121-131.
- Steinhart, G. B., N. J. Leonard, R. A. Stein, and E. A. Marschall. 2005. Effects of storms, angling, and nest predation during angling on smallmouth bass (*Micropterus dolomieu*) nest success. *Canadian Journal of Fisheries and Aquatic Sciences* 62: 2649-2660.

- Wensink, S. and S.D. Tiegs. 2016. Shoreline hardening alters freshwater shoreline ecosystems. *Society for Freshwater Science*. 35, 764-777.
- Wiegert, L. 1966. A Four-year Study of the Smallmouth Bass in the Outlying Waters of Door County. Wisconsin Conservation Department Division of Fish Management Report No. 1, 11pp.
- Zilberg, D., Grizzle, J. M., & Plumb, J. A. 2000. Preliminary description of lesions in juvenile largemouth bass injected with largemouth bass virus. *Diseases of Aquatic Organisms*, 39(2), 143-146.

**For further information or questions, please contact:**

Scott Hansen  
DNR Senior Fisheries Biologist  
110 S. Neenah Avenue, Sturgeon Bay, WI 54235  
920-559-3474  
Scott.Hansen@wisconsin.gov