

Green Bay Walleye Tagging Survey 2017

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WDNR-Green Bay

Large annual spring spawning migrations of Walleye have been documented by WDNR on major Green Bay tributaries for many years (Kapusinski et al. 2010). These rivers along with several other spawning locations scattered around Green Bay likely sustain the large Walleye population that is found in southern Green Bay. Some Walleye spawning populations have been studied intensively in the past such as those found in the Fox River, while Walleye that utilize the Menominee, Oconto or Peshtigo Rivers have had little evaluation.

In an effort to gain a more complete understanding of Walleye use of tributary streams and determine Walleye movement throughout Green Bay, daytime electroshocking surveys have been conducted annually since 2012 to assess spring spawning runs in major Green Bay tributary streams. These surveys have been conducted just below dams in Marinette (Menominee River), Peshtigo (Peshtigo River), Stiles (Oconto River) and Green Bay (Fox River) to capture Walleye during the estimated peak of the spring spawning run (Figure 1).

This report updates previous Walleye tagging reports of Hogler et al. (2014, 2015, 2017) that described results from previous years of this project.

Methods

The yearly goal for each river was to capture as many Walleye as possible over the course of 2 or 3 work days, to collect biological data on all captured Walleye and to tag 500 Walleye (250-male and 250 female) with individually numbered anchor tags from each of the four tributaries.

To capture Walleye in the rivers, a standard electroshocking boat with two netters was utilized at each location. During each shocking event, captured Walleye were sexed and measured. One fish per ten tagged was double tagged to estimate tag loss. To gain more insight on Walleye movement throughout the bay, along an individual tag number, an address or telephone number was imprinted on the tag so anglers could report their capture location of a tagged fish. A dorsal spine was collected from each walleye tagged for age determination. Each spine was cross sectioned and mounted on glass slide and read with a compound microscope.

Results

During the spring Walleye run in 2017, three of the four tributaries were electroshocked. The Menominee, Peshtigo and Fox Rivers were surveyed, but a short spawning period and scheduling issues prevented the Oconto River from being surveyed.

Menominee River

The Menominee River below the Hattie Street Dam was surveyed on March 31, April 4 and April 7 to catch spawning Walleye with a total effort of 4.3 hours. A total of 462

Walleye (336 male and 126 female) were captured with a CPE of 107.4 Walleye per hour shocked (Table 1). Water temperature ranged from 36°F to 42°F during shocking.

A total of 336 male Walleye were captured during electroshocking. These Walleye ranged in length from 353 mm to 682 mm (13.9" to 26.9") and had an average length of 502 mm (19.8") (Table 2). Age 3 through Age 12 and ages 13, 14 and 19 were present in the sample. Age 4 was the most common aged male Walleye, with Age 9 and Age 6 Walleye also commonly identified. Average length at age was greater than statewide averages at all ages (Table 4).

126 female Walleye from the Menominee River were captured during electroshocking (Table 1). Female Walleye ranged in length from 443 mm to 737 mm (17.4" to 29.0") and had an average length of 583 mm (23.0") (Table 2). Age 4 through 14 were encountered in our aged sample. Age 4 was the most common followed by age 7 and age 8 female Walleye. Similar to male Walleye, the average length at each age was above statewide averages (Table 4).

Peshtigo River

Walleye were shocked and tagged below the Peshtigo Dam on April 13 and April 18. During shocking runs, water temperatures varied between 44°F and 48°F. During this period, we captured 287 Walleye (240 male, 36 female and 11 unknown sex) in 2.3 hours of electroshocking (Table 1). Total CPE was 124.8 Walleye per hour shocked.

Male Walleye ranged in length from 370 mm to 670 mm (14.6" to 26.4") and had an average length of 494 mm (19.4") (Table 6). For male Walleye captured on the Peshtigo River, Ages 2 through 14 were present in our age sample. Age 4 Walleye were the most common followed by age 7 fish (Table 7). Average length at age was above statewide averages at all ages for male Walleye (Table 4).

The 36 female Walleye that were captured ranged in length from 462 mm to 752 mm (18.2" to 29.6") and had an average length of 610 mm (24.0") (Table 6). Ages 4 through 8 and ages 10 to 13 were identified in the samples collected from female Walleye from the Peshtigo River (Table 8). Age 7 was the most common with other ages represented in near equal number. Average length at age was above statewide averages at all ages for female Walleye (Table 4).

The 11 unknown sex Walleye ranged in length from 431 mm to 558 mm (17.0" to 22.0") and had an average length of 484 mm (19.1") (Table 6).

Fox River

The Fox River below the DePere Dam was electroshocked to capture Walleye on March 28, April 3 and April 4. A total of 513 Walleye (159 male, 351 female and 3 unknown sex) were captured during sampling (Table 1). Water temperature during shocking events ranged from 39°F to 42°F. Total effort was 4.7 hours for a CPE of 109.1 Walleye per hour shocked.

The 159 male Walleye captured ranged in length from 378 mm to 686 mm (14.9" to 27.0") and had an average length of 503 mm (19.8") (Table 9). Ages 3 to 10, age 12 and 14 were identified in age sample for Fox River male Walleye (Table 10). Age 5 was the most

common followed by age 6. Other ages were less abundant (Table 10). Average length at age was above statewide averages at all ages for male Walleye (Table 4).

A total of 351 female Walleye were captured during shocking. Female Walleye ranged in length from 461 mm to 749 mm (18.1” to 29.5”) and had an average length of 630 mm (24.8”) (Table 9). Age 4 through 14 female Walleye were identified from our samples (Table 11). Age 8 and age 9 were the most common ages with other aged Walleye occurring in lower abundances. Average length at age was above statewide averages at all ages for male Walleye (Table 4).

The 3 unknown sex Walleye ranged in length from 479 mm to 515 mm (18.9” to 20.3”) and had an average length of 497 mm (19.6”) (Table 9).

Tagging Summary 2017

During spring electroshocking in 2017, 1247 Walleye (724 male, 509 female and 14 unknown sex) were tagged in all three rivers that were surveyed. We tagged 457 Walleye (332 male and 125 female) from the Menominee River, 283 Walleye (240 male, 36 female and 11 unknown sex) from the Peshtigo River and 507 Walleye (156 male, 348 female, and 3 unknown sex) from the Fox River (Table 1).

Tag Returns 2017

Angler Returns

During calendar year 2017, we received tag return information from anglers for 172 Walleye that were tagged as part of this study from 2012 through 2017 (Table 12). Of these returns, 54 were from fish tagged in 2017, 57 for Walleye tagged in 2016, 29 were from fish tagged in 2015, 13 from 2014 tagging, 17 Walleye tagged in 2013 and 2 were from Walleye tagged in 2012.

From the tag returns received in 2017, 46 were Walleye that were tagged from the Menominee River from 2013 through 2017 (Table 12). Of the 46 tags returned in 2017, 29 were from male Walleye and 17 from female Walleye. Three returns (1 male and 2 female) were from Walleye tagged in 2013, 4 from 2014 (all male), 6 from 2015 (2 male and 4 female), 14 (9 male and 4 female) were from 2016 and 19 (13 male and 6 female) were from Walleye tagged in 2017. The year of tagging return rate for Walleye tagged in the Menominee River in 2017 was 4.2%. Returns from all Walleye that were double tagged in 2017 were returned with both tags present although one Walleye double tagged in 2016 was missing one tag. Return information indicates that the average time from the tagging date to angler capture date for Walleye tagged in 2017 was 43 days for males and 55 days for female Walleye (Table 5). Anglers have returned tags from Walleye tagged in the Menominee River from 2012 to 2017 from throughout Green Bay, with the majority of tags returned from anglers fishing in the Menominee River or off the river mouth (Figures 4, 8, 12, and 16). Returns in 2017 were scattered along the west shore of Green Bay from Little Point northward to the Cedar River in Michigan (Figure 20).

During 2017, anglers returned 62 tags from Walleye that were tagged from the Peshtigo River as part of this project (Table 12). 42 of the tag returns were from male Walleye and 20 from female Walleye. All double tagged fish had both tags returned by anglers. Of the 62 Walleye tagged in the Peshtigo River and returned in 2017, 1 was tagged in 2012

(female), 6 from 2013 (4 male and 2 female), 4 from 2014 (all male), 14 from 2015 (7 male and 7 female), 20 from 2016 (11 male and 9 female) and 17 (16 male and 1 female) from Walleye tagged in 2017. Based on 2017 returns of 2017 Peshtigo River tagged Walleye, we had a return rate of 6.0%. The days at large for Walleye tagged in 2017 was 73 days and 20 days for male and female Walleye respectively (Table 5). Anglers have sent in tag return information from throughout Green Bay for Peshtigo River tagged fish from 2012 through 2016 (Figures 2, 5, 9, 13 and 17). Most of the 2017 returns from 2017 tagged Walleye were from the west shore of Green Bay although one tag was caught near Bayshore County Park and one tag was returned from Little Sturgeon Bay both located on the east shore (Figure 21).

In 2017, anglers sent in information regarding 28 Walleye (17 male and 11 female) that were tagged from the Oconto River from 2012 through 2016 (Table 12). All double tagged fish had both tags returned by anglers. Fourteen (7 male and 7 female) of these returns were from fish tagged in 2016, 7 from Walleye tagged in 2015 (6 male and 1 female), 1 (male) from 2014, 5 (2 male and 3 female) from 2013 and 1 (male) from Walleye tagged in 2012 (Table 12). Anglers sent in tag return information from throughout Green Bay in 2017 (Figures 3, 6, 10, 14 and 18). Most of the returns came from anglers fishing the Oconto River or from along the west shore of Green Bay north of the Suamico River.

Of the tag returns received in 2017, 34 (11 male and 23 female) were Walleye that were tagged from the Fox River as part of this project (Table 12). All double tagged fish had both tags returned by anglers. Eighteen returns (5 male and 13 female) were from Walleye tagged in 2017, 9 (4 male and 5 female) were from Walleye tagged in 2016, 2 (both female) from fish tagged in 2015, 4 (1 male and 3 female) from 2014 tagging and 1 (male) from Walleye tagged in 2013 (Table 5). Based on 2017 returns of 2017 tagged Walleye, we had a return rate of 3.6%. The days at large for Walleye tagged in 2017 was 87 days and 109 days for male and female Walleye respectively (Table 12). Time at large for Walleye tagged in 2017 was similar to average time at large for male Walleye but much longer than the average time for first year tagged female Walleye compared to other initial years of tagging for Fox River tagged Walleye. In 2017, anglers sent in tag return information from throughout Green Bay for Fox River tagged Walleye (Figures 7, 11, 15 and 19). For 2017 tagged Walleye, most of the returns came from anglers fishing in southern Green Bay south of a line from the Pensaukee River on the west side of the bay to Chadoirs Dock on the East side of the bay.

DNR Survey Returns

During spring Walleye tagging surveys or during fall young of year Walleye assessment surveys in 2017, DNR staff recaptured fourteen Walleye that were tagged as part of this project (Table 13). Four recaptured Walleye were captured on the Menominee River, 4 from the Peshtigo River and 6 were captured from surveys on the Fox River. Of these 14 recaptured Walleye, all were recaptured in the rivers from which they were tagged.

Tags were recovered from tagging years 2012 through 2017 during DNR surveys (Table 13). One tag was encountered from 2012, 3 from 2013, 1 from 2014, 3 from 2015, 5 from 2016 and 1 from fish tagged in 2017. Fewer tags were recaptured during 2017 surveys than in previous survey years (Hogler et al. 2017 and Hogler et al. 2018).

Discussion

Electroshocking in 2017 was conducted later in the year than in past survey years because water temperatures were slow to warm following a late ice-out. Additionally, in 2017 surveys were shorter and overlapping in each river because once warming began, river water temperature spiked leading to a narrow spawning window. This abbreviated spring run resulted in fewer Walleye being tagged in the Menominee and Peshtigo Rivers and prevented survey crews from tagging Walleye from the Oconto River altogether. Despite difficult conditions, 1,247 Walleye were tagged in 2017. 724 of the tagged fish were males, 509 were females and 14 were unknown sex Walleye (Table 1). Crews tagged 457 Walleye from the Menominee River, 283 from the Peshtigo River and 513 from the Fox River (Table 1). Crews tagged many more male Walleye as female Walleye from the Menominee and Peshtigo Rivers, while the crew on the Fox River tagged more than twice as many female as male Walleye.

Results from the six years of surveys indicate that adult Walleye utilize the large west shore rivers and the Fox River in spring for spawning (Hogler et al. 2018) as well as large bays on the east side of Green Bay (Hansen and Royseck 2016). Walleye runs into Green Bay tributaries are like spring runs seen in other Great Lakes tributaries that are similar in size (Roseman et al. 2010).

Comparing biological data between rivers indicates that Walleye returning to these rivers are similar. In 2017, the largest Walleye were captured on the Fox River with fish from the other rivers similar in size (Table 1). It is likely the differences in size was caused by the large number of female Walleye captured in the Fox River compared to the other rivers. Despite the size difference between the Fox River and other rivers, similar ages were seen in each river. The growth of Walleye from each river continues to be greater than statewide average (Table 4). Although growth is still above average, but based on 2017 average length at age, it could be slowing. This could be due to the abundant Walleye population competing for resources or from the difficulty of aging old Walleye.

Tag return information has been gathered from anglers during the first six years of this project. In 2017, anglers returned information from 172 tagged Walleye. This total was lower than experienced in 2015 when 262 tags were returned and the 214 returned in 2016 (Hogler et al. 2017). Despite a good number of returns the past three years, the low overall number of tag returns each year has hampered our ability to track fine scale movements around Green Bay. In general, during the first year of tagging most Walleye remain near the river in which they were tagged. In succeeding years more returns are received throughout the Wisconsin waters of Green Bay south of a line from Marinette to Sturgeon Bay with few Walleye recaptures north of that line. It is clear that Walleye movement throughout Green Bay during non-spawning periods does occur, but the amount and direction of movement appears to be dependent on the river and year. In some years, it appears that most tagged fish stayed near their tagging river (2012 through 2014); however, in other years (2015-2017) Walleye quickly spread throughout southern Green Bay. However, since tag return numbers have been low; these results should be viewed with caution. In addition, DNR survey recaptures also show that in general fish tagged in a river will be most likely be recaptured from that river in following years. Subsequent

annual spring movement patterns will likely provide the greatest amount of information about site fidelity.

Many questions remain regarding the Walleye population in Green Bay including those regarding stream/river use, site fidelity, contributions to the sport fishery from unique spawning locations and the need for supplemental stocking in some locations. Further detailed survey work, increased tagging or cooperative studies that utilize acoustic telemetry will be necessary to answer these and other questions regarding Walleye management in Wisconsin waters of Green Bay.

References

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Figure 1. The tagging locations for Walleye in Green Bay and the Fox River, 2012-2017. Walleye from the Oconto and Peshtigo Rivers were tagged in 2012 through 2017, while walleye from the Fox River, Menominee River were tagged in 2013-2017.

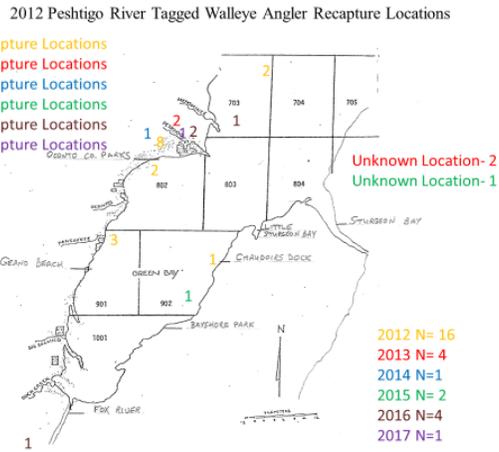


Figure 2. Angler recapture location of Walleye tagged in the Peshtigo River in 2012. Returns from calendar year 2012 are in gold, returns from 2012 tagged fish from 2013 are in red, 2014 returns are in blue, 2015 returns are in green, 2016 returns are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

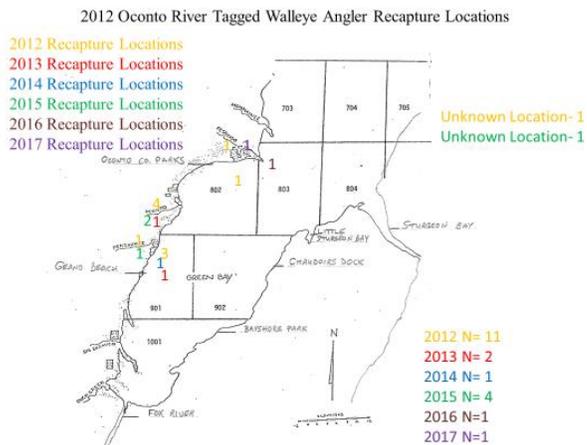


Figure 3. Angler recapture location of Walleye tagged in the Oconto River in 2012. Returns from calendar year 2012 are in gold, returns from 2012 tagged fish from 2013 are in red, 2014 returns are in blue, 2015 returns are in green, 2016 returns are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

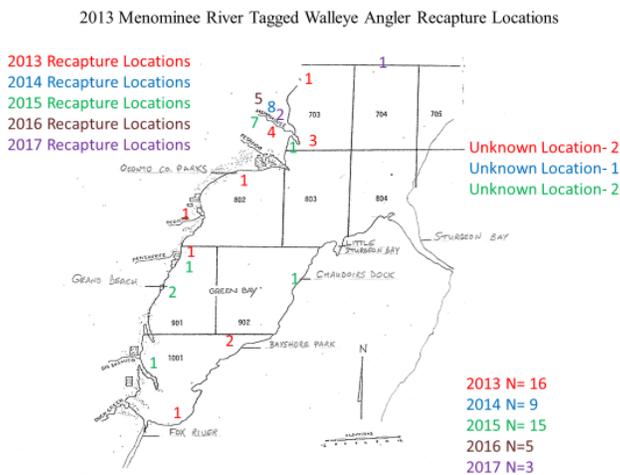


Figure 4. Angler recapture location of Walleye tagged in the Menominee River in 2013. Returns from calendar year 2013 are in red, returns from 2014 are in blue, 2015 returns are in green, 2016 returns are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2013 Peshtigo River Tagged Walleye Angler Recapture Locations

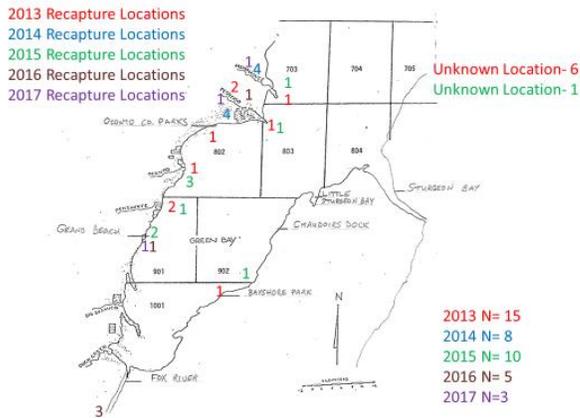


Figure 5. Angler recapture location of Walleye tagged in the Peshtigo River in 2013. Returns from calendar year 2013 are in red, 2014 returns are in blue, 2015 returns are in green, 2016 returns are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2013 Oconto River Tagged Walleye Angler Recapture Locations

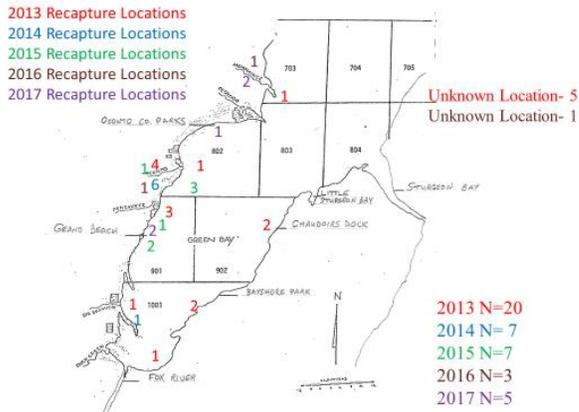


Figure 6. Angler recapture location of Walleye tagged in the Oconto River in 2013. Returns from calendar year 2013 are in red, 2014 returns are in blue, 2015 returns are in green, 2016 returns are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2013 Fox River Tagged Walleye Angler Recapture Locations

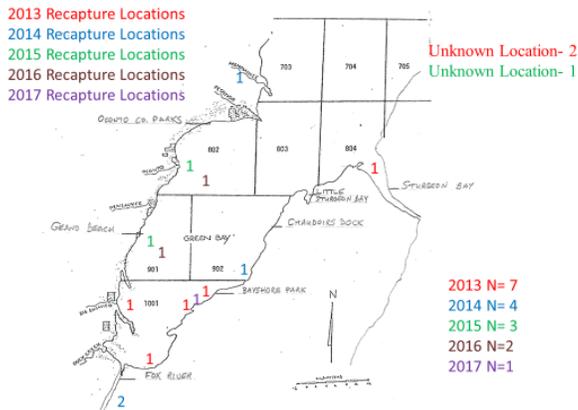


Figure 7. Angler recapture location of Walleye tagged in the Fox River in 2013. Returns from calendar year 2013 are in red, 2014 returns are in blue, 2015 returns are in green, 2016 returns are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2014 Menominee River Tagged Walleye Angler Recapture Locations

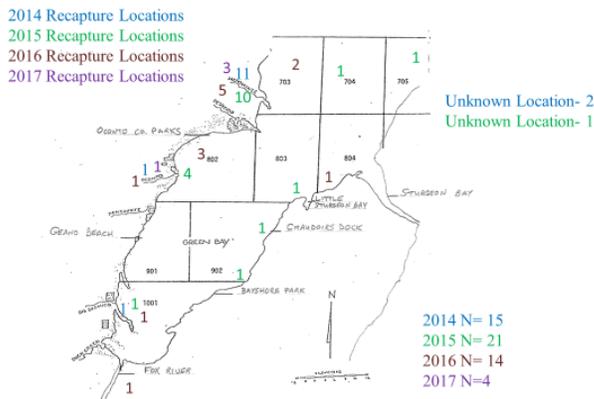


Figure 8. Angler recapture location of Walleye tagged in the Menominee River in 2014. Returns from calendar year 2014 returns are in blue, 2015 returns are in green, 2016 returns are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2014 Peshtigo River Tagged Walleye Recapture Locations

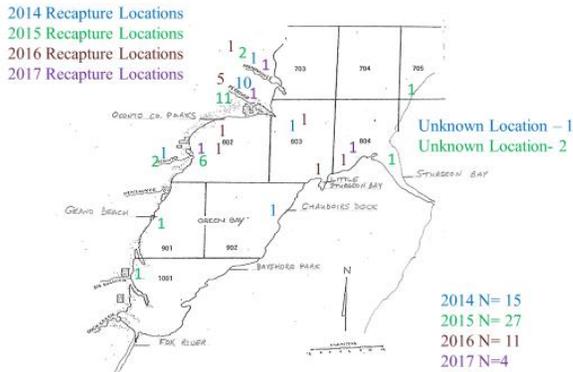


Figure 9. Angler recapture location of Walleye tagged in the Peshtigo River in 2014. Returns from calendar year 2014 returns are in blue, 2015 returns are in green, 2016 returns are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2014 Oconto River Tagged Walleye Angler Recapture Locations

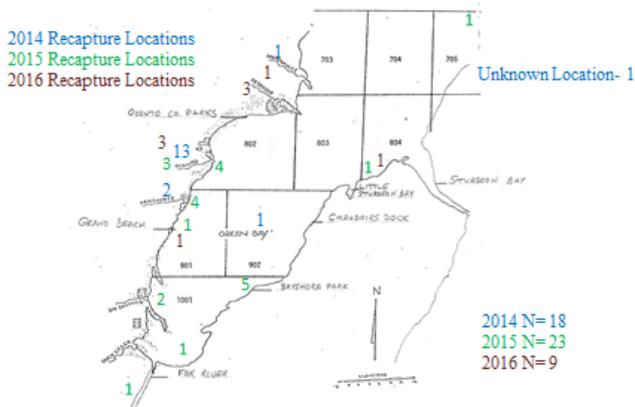


Figure 10. Angler recapture location of Walleye tagged in the Oconto River in 2014. Returns from calendar year 2014 returns are in blue, 2015 returns are in green, 2016 returns are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2014 Fox River Tagged Walleye Angler Recapture Locations

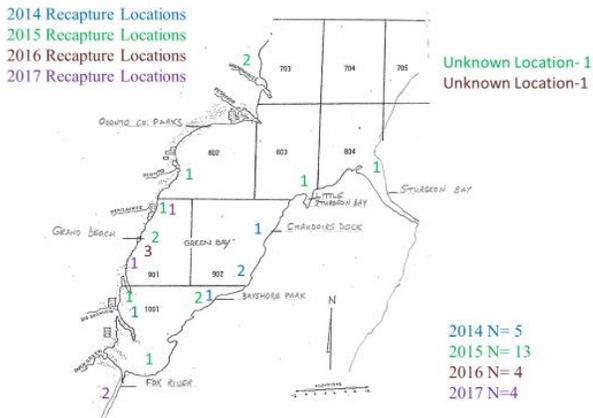


Figure 11. Angler recapture location of Walleye tagged in the Fox River in 2014. Returns from calendar year 2014 returns are in blue, 2015 returns are in green, 2016 returns are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2015 Menominee River Tagged Walleye Angler Recapture Locations

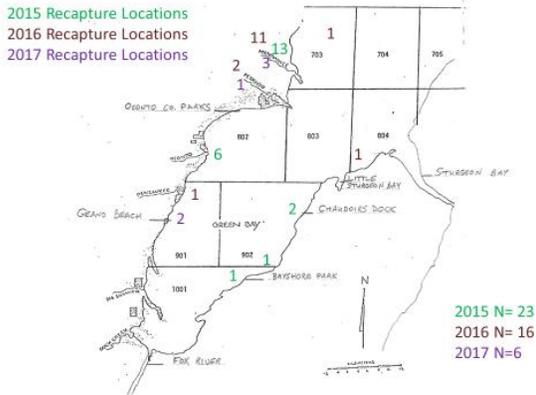


Figure 12. Angler recapture location of Walleye tagged in the Menominee River in 2015. Returns from calendar year 2015 are in green, 2016 returns are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2015 Peshtigo River Tagged Walleye Angler Recapture Locations

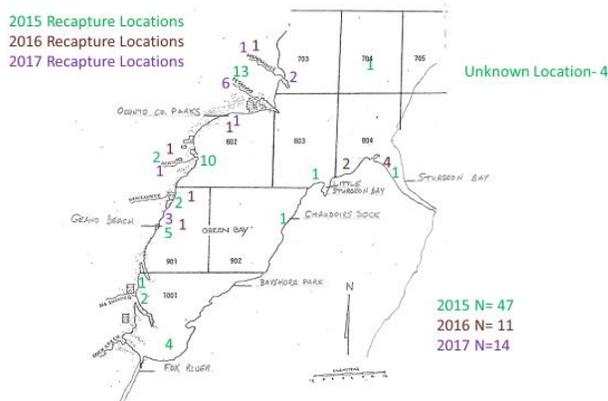


Figure 13. Angler recapture location of Walleye tagged in the Peshtigo River in 2015. Returns from calendar year 2015 are in green, 2016 returns are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2015 Oconto River Tagged Walleye Angler Recapture Locations

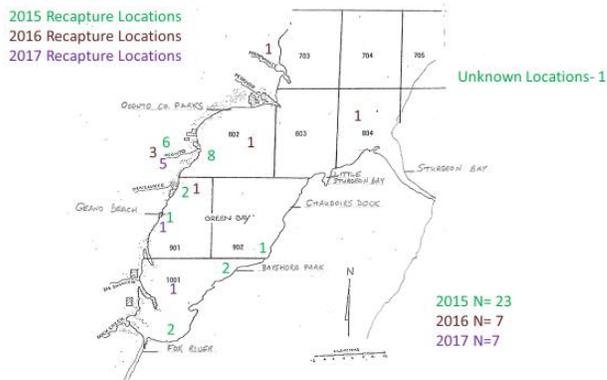


Figure 14. Angler recapture location of Walleye tagged in the Oconto River in 2015. Returns from calendar year 2015 are in green, 2016 returns are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2015 Fox River Tagged Walleye Angler Recapture Locations

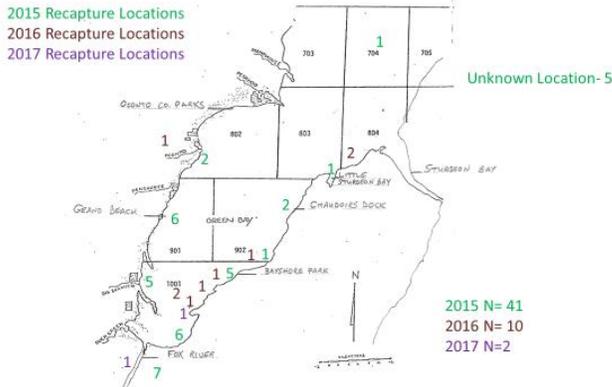


Figure 15. Angler recapture location of Walleye tagged in the Fox River in 2015. Returns from calendar year 2015 are in green, 2016 returns are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2016 Menominee River Tagged Walleye Angler Recapture Locations

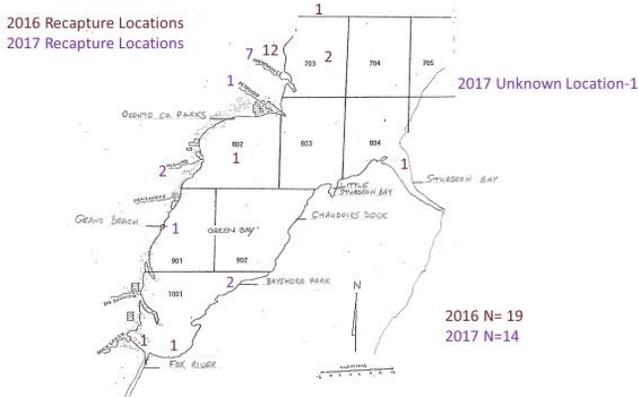


Figure 16. Angler recapture location of Walleye tagged in the Menominee River in 2016. Returns from calendar year 2016 are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2016 Peshtigo River Tagged Walleye Angler Recapture Locations

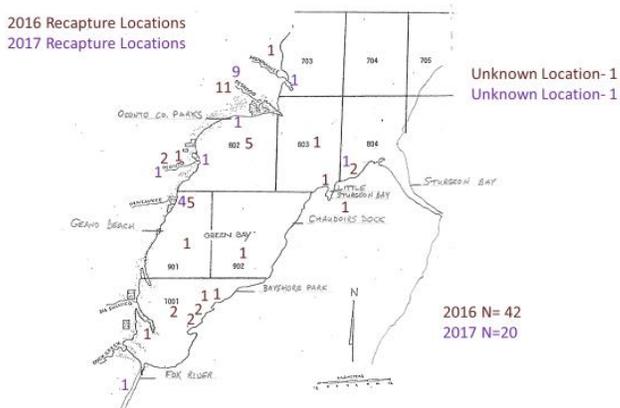


Figure 17. Angler recapture location of Walleye tagged in the Peshtigo River in 2016. Returns from calendar year 2016 are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2016 Oconto River Tagged Walleye Angler Recapture Locations

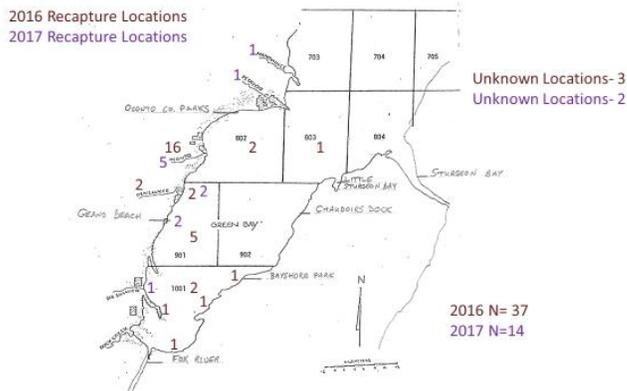


Figure 18. Angler recapture location of Walleye tagged in the Oconto River in 2016. Returns from calendar year 2016 are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2016 Fox River Tagged Walleye Angler Recapture Locations

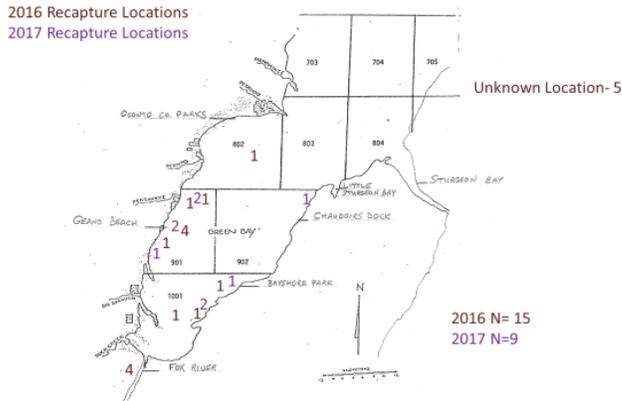


Figure 19. Angler recapture location of Walleye tagged in the Fox River in 2016. Returns from calendar year 2016 are in brown and 2017 returns are in purple. The number indicates how many recaptures were from that location.

2017 Menominee River Tagged Walleye Angler Recapture Locations

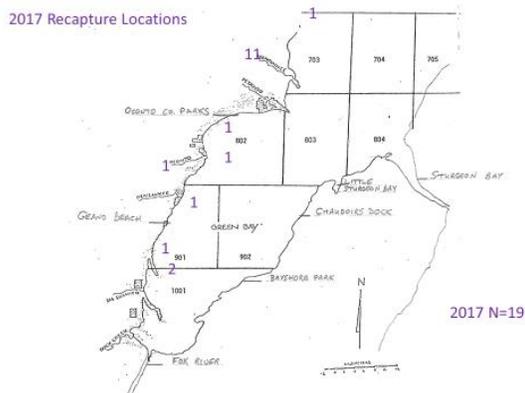


Figure 20. Angler recapture location of Walleye tagged in the Menominee River. Returns from calendar year 2017 are in purple. The number indicates how many recaptures were from that location.

2017 Peshtigo River Tagged Walleye Angler Recapture Locations

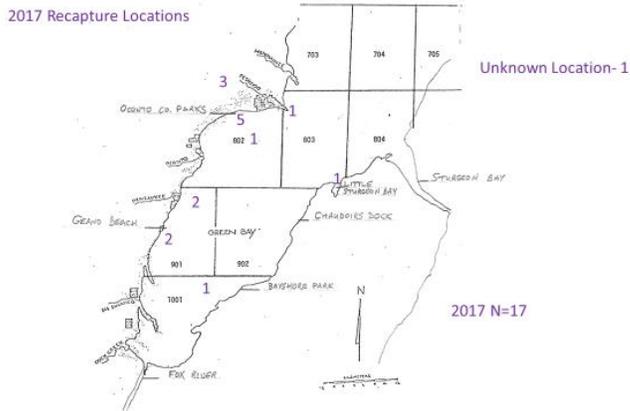


Figure 21. Angler recapture location of Walleye tagged in the Peshtigo River. Returns from calendar year 2017 are in purple. The number indicates how many recaptures were from that location.

2017 Fox River Tagged Walleye Angler Recapture Locations

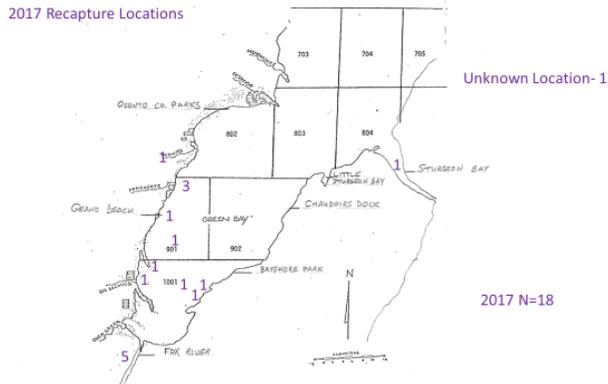


Figure 22. Angler recapture location of Walleye tagged in the Fox River. Returns from calendar year 2017 are in purple. The number indicates how many recaptures were from that location.

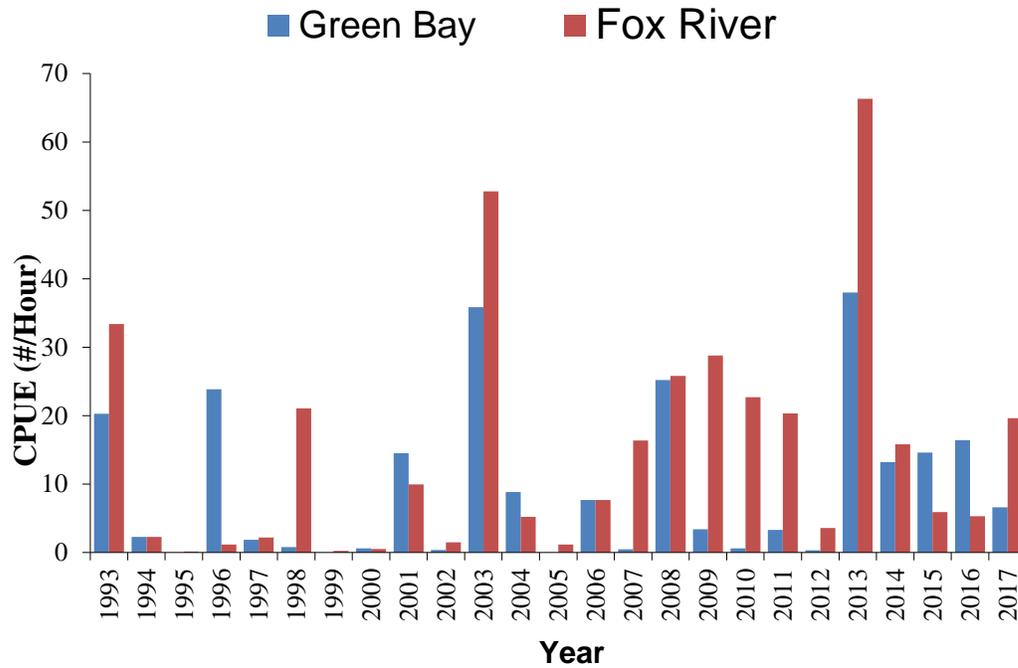


Figure 20. Walleye young of year CPUE from the Fox River and lower Green Bay from 1993 through 2017. YOY data is collected during annual fall index surveys conducted during nighttime hours. The average YOY CPE from 1993 through 2016 is 11 YOY per hour shocked.

Table 1. Spring Walleye capture summary from electroshocking surveys below Hattie Street Dam, Menominee River, Marinette County, Peshtigo Dam, Peshtigo River, Marinette County, Wisconsin, below Stiles Dam, Oconto River, Oconto County Wisconsin, and the DePere Dam, Fox River, Brown County from 2012 to 2017.

Year	Menominee River			Peshtigo River			Oconto River			Fox River			
	Captured	Tagged	Ave. Length	Captured	Tagged	Ave. Length	Captured	Tagged	Ave. Length	Captured	Tagged	Ave. Length	
2012	Male			428	289	537 mm (21.1")	114	112	459 mm (18.1")				
	Female			71	71	593 mm (23.3")	90	90	580 mm (22.8")				
	Unknown			0	0		8	7	472 mm (18.6")				
	Total			499	360		212	209					
2013	Male	205	204	507 mm (20")	305	305	519 mm (20.4")	401	401	478 mm (18.8")	422	422	472 mm (18.6")
	Female	250	250	606 mm (23.9")	148	148	606 mm (23.9")	131	131	579 mm (22.8")	62	62	613 mm (24.1")
	Unknown	0	0		0	0		0	0		0	0	
	Total	455	454		453	453		532	532		484	484	
2014	Male	258	258	507 mm (20")	295	295	527 mm (20.7")	272	272	477 mm (18.8")	201	201	480 mm (18.9")
	Female	236	236	589 mm (23.2")	133	133	592 mm (23.3")	177	177	551 mm (21.7")	315	315	591 mm
	Unknown	1	1		0	0		0	0		0	0	(23.3")
	Total	495	495		428	428		449	449		516	516	
2015	Male	339	339	521 mm (20.5")	310	310	515 mm (20.3")	210	201	497 mm (19.6")	179	179	477 mm (18.8")
	Female	95	95	577 mm (22.7")	154	154	595 mm (23.4")	60	60	565 mm (22.2")	379	379	589 mm (23.2")
	Unknown	0	0		0	0		0	0		0	0	
	Total	434	434		464	464		270	270		558	558	
2016	Male	346	337	511 mm (20.1")	299	287	493 mm (19.4")	342	335	467 mm (18.4")	199	191	496 mm (19.2")
	Female	124	122	598 mm (23.5")	165	162	634 mm (25")	116	116	580 mm (22.8")	213	210	632 mm (24.9")
	Unknown	0	0		1	1	391 mm (15.4")	1	1	345 mm (13.6")	1	1	517 mm (20.4")
	Total	470	459		465	450		459	452		413	402	
2017	Male	336	332	502 mm (19.8")	240	236	494 mm (19.4")	0			159	156	503 mm (19.8")
	Female	126	125	583 mm (23.0")	36	36	610 mm (24.0")	0			351	348	630 mm (24.8")
	Unknown	0	0		11	11	484 mm (19.1")	0			3	3	497 mm (19.6")
	Total	462	457		287	283		0			513	507	

Table 2. The length frequency of Walleye captured from the Menominee River during spring electroshocking in 2017.

Length (in)	mm	Male	Female	Unknown
(14")	350	1		
	360			
	370	1		
	380	1		
	390	2		
(16")	400	2		
	410	5		
	420	13		
	430	19		
	440	18	1	
(18")	450	27		
	460	27	1	
	470	19		
	480	19	6	
	490	22	4	
(20")	500	22	6	
	510	20	5	
	520	16	5	
	530	15	8	
	540	16	6	
(22")	550	12	8	
	560	15	5	
	570	12	9	
	580	6	8	
	590	7	7	
(24")	600	3	4	
	610	7	6	
	620	4	8	
	630	1	2	
	640		8	
(26")	650	2	2	
	660	1	2	
	670		3	
	680	1	3	
	690		4	
(28")	700		1	
	710		1	
	720			
	730		3	
	740			
Total		336	126	
Ave. Length		502 mm (19.8")	583mm (23.0")	
S.D.		57.2 mm (2.3")	64.8 mm (2.6")	

Table 3. The length and age frequency of male Walleye captured from the Menominee River during spring electroshocking in 2017.

Length (in) mm	Age									
	3	4	5	6	7	8	9	10	11	12+
(14") 350	1									
360										
370		1								
380	1									
390	2									
(16") 400	1	1								
410	2	2								
420	1	4								
430	3	2								
440		6								
(18") 450		6		1		1				
460		2	1	2		1				
470		3	1	1						
480		1	2	1			2			
490		1	3	1		2				
(20") 500		1	1	2	1					
510			1	1	1	1				
520				2	1		2			
530				1	1	3	1			
540					1		4	1		
(22") 550			1	1		2	1	1		
560				1	1			1	2	
570				1				1	2	
580							3			
590							2	2		1
(24") 600						1		1	1	
610						1	2	1		
620					1		1			2
630										1
640										
(26") 650										2
660										1
670										
680										1
690										
(28") 700										
Total	11	30	10	15	7	12	18	8	5	8
Ave. Length	408 (16.1")	446 (17.6")	496 (19.5")	509 (20.0")	545 (21.5")	529 (20.8")	560 (22.0")	581 (22.9")	575 (22.6")	642 (22.3")
S.D.	24.5 (0.9")	26.7 (1.1")	25.3 (1.0")	38.7 (1.5")	40.8 (1.6")	50.2 (2.0")	42 (1.7")	25.3 (1.0")	19.8 (0.8")	25.6 (1.0")

Table 4. A comparison of average length at age of Walleye captured during spring electroshocking surveys on the Peshtigo, Oconto, Menominee and Fox River in 2012 through 2015 and from the Fox River in 2016 to statewide averages. All measurements are in millimeters.

Location	Year/Sex	AGE										
		2	3	4	5	6	7	8	9	10	11	12
State Average		250 (10")	356 (14")	371 (14.6")	420 (16.6")	460 (18.1")	494 (19.4")	524 (20.6")	553 (21.8")	571 (22.5")	594 (23.4")	622 (24.6")
Peshtigo River	2012											
	Male		434 (17.1")	494 (19.4")	520 (20.5")	553 (21.8")	577 (22.8")	594 (23.4")				
	Female			525 (20.7")	567 (22.3")	595 (23.4")	605 (23.8")	631 (24.8")	681 (26.8")	655 (25.8")		
	2013											
	Male		430 (16.9")	466 (18.3")	494 (19.5")	540 (21.3")	544 (21.4")	576 (22.7")	605 (23.8")	622 (24.5")		
	Female		465 (18.3")	524 (20.6")	533 (21")	604 (23.8")	591 (23.3")	631 (24.8")	670 (26.4")	681 (26.8")	700 (27.6")	
	2014											
	Male		461 (18.1")	449 (17.7")	504 (19.8")	516 (20.3")	548 (21.6")	541 (21.3")	597 (23.5")	586 (23.1")	571 (22.5")	
	Female		460 (18.1")	516 (20.3")	545 (21.4")	558 (22")	623 (24.4")	603 (23.7")	632 (24.9")	672 (26.5")	691 (27.2")	651 (25.7")
	2015											
	Male		432 (17.0")	487 (19.2")	481 (19.9")	509 (20")	553 (21.8")	551 (21.7")	596 (23.5")	601 (23.7")	648 (25.5")	645 (25.4")
	Female			507 (20")	540 (21.2")	550 (21.7")	569 (22.4")	634 (25")	610 (24")	656 (25.8")	696 (27.4")	692 (27.2")
	2017											
	Male	382 (15.0")	415 (16.3")	446 (17.6")	465 (18.3")	512 (20.2")	522 (20.6")	546 (21.5")	559 (22.0")	596 (23.5")	556 (21.9")	583 (22.9")
Female			505 (19.9")	530 (20.9")	547 (21.5")	579 (22.8")	611 (24.1")		661 (26.0")	682 (26.9")	701 (27.6")	
Oconto River	2012											
	Male		419 (16.5")	465 (18.3")	500 (19.7")	539 (21.3")	555 (21.9")	550 (21.7")				
	Female		495 (19.5")	515 (20.3")	572 (22.5")	573 (22.6")	605 (23.8")	619 (24.4")	648 (25.5")			
	2013											
	Male		423 (16.7")	458 (18")	476 (18.7")	517 (20.4")	513 (20.2")	500 (19.7")	545 (21.5")	543 (21.4")		655 (25.8")
	Female			518 (20.4")	540 (21.3")	593 (23.4")	594 (23.4")	611 (24.1")	615 (21.3")	639 (25.1")	640 (25.2")	
	2014											
	Male		434 (17.1")	458 (18")	479 (22.8")	511 (20.1")	516 (20.2")	557 (21.9")	542 (21.3")	605 (23.8")		
	Female		505 (19.9")	510 (20.1")	539 (21.3")	572 (22.6")	608 (23.9")	565 (22.3")	605 (23.8")	678 (26.7")	659 (26")	
	2015											
	Male		437 (17.1")	459 (18.1")	484 (19.1")	496 (19.5")	535 (21.1")	572 (22.5")	560 (22")	605 (23.8")		
	Female		535 (21.1")	518 (20.4")	528 (20.8")	555 (21.9")	600 (23.6")	661 (26.1")	638 (25.1")	720 (28.3")		
	2017											
	Male											
Female												

Table 4. Cont.

Location	Year/Sex	Age										
		2	3	4	5	6	7	8	9	10	11	12
Menominee River	2013											
	Male		433 (17.1")	469 (18.5")	492 (19.4")	535 (21.1")	530 (20.9")	537 (21.2")	588 (23.1")	571 (22.5")	555 (21.9")	640 (25.2")
	Female			519 (20.5")	553 (21.8")	596 (23.5")	615 (24.3")	633 (25")	620 (24.4")	656 (25.8")	675 (26.6")	725 (28.5")
	2014											
	Male		432 (17.1")	457 (18")	477 (18.8")	521 (20.5")	539 (21.3")	528 (20.8")	572 (22.5")	576 (22.7")		
	Female			506 (19.9")	540 (21.3")	567 (22.4")	611 (24.1")	643 (25.4")	625 (24.6")	657 (25.9")	636 (25")	653 (25.7")
	2015											
	Male	345 (13.6")	428 (16.9")	461 (18.2")	486 (19.1")	522 (20.5")	545 (21.5")	560 (22")	574 (22.6")	570 (22.4")	644 (25.4")	650 (25.6")
	Female			513 (20.2")	537 (21.2")	548 (21.6")	581 (22.9")	624 (24.6")	622 (24.6")	655 (25.8")	655 (25.8")	680 (26.8")
	2017											
	Male		408 (16.1")	446 (17.6")	496 (19.5")	509 (20.0")	545 (21.5")	529 (20.8")	560 (22.0")	581 (22.9")	575 (22.6")	642 (22.3")
	Female			503 (19.8")	543 (21.3")	580 (22.8")	583 (23.0")	587 (23.1")	603 (23.7")	667 (26.2")	631 (24.8")	
Fox River	2013											
	Male		424 (16.7")	458 (18")	468 (18.4")	499 (19.7")	554 (21.8")	550 (21.7")	465 (18.3")	542 (21.3")	533 (21")	
	Female			499 (19.7")	594 (23.4")	605 (23.8")	621 (24.4")	620 (24.4")	651 (25.6")	678 (26.7")	670 (26.4")	705 (27.7")
	2014											
	Male	365 (14.4")	432 (17")	460 (18.1")	480 (18.9")	491 (19.3")	528 (20.8")	578 (22.8")	557 (21.9")	585 (23")	525 (20.6")	
	Female		455 (18")	518 (20.4")	548 (21.6")	558 (22.4")	628 (24.7")	625 (24.6")	650 (25.6")	669 (26.3")	665 (26.2")	672 (26.5")
	2015											
	Male		434 (17.1")	450 (17.7")	467 (18.4")	482 (19")	502 (19.8")	550 (21.7")	590 (23.2")	515 (20.3")		
	Female			502 (19.8")	538 (21.2")	563 (22.1")	570 (22.4")	637 (25")	634 (25.5")	652 (25.7")	672 (26.5")	706 (27.7")
	2016											
	Male		403 (15.9")	466 (18.3")	490 (19.3")	517 (20.3")	540 (21.3")	541 (21.3")				
	Female			506 (19.9")	534 (21")	582 (22.9")	607 (23.9")	627 (24.7")	647 (25.5")	659 (25.9")	677 (26.6")	688 (27.1")
2017												
Male		422 (16.6")	466 (19")	498 (19.6")	520 (20.5")	536 (21.2")	561 (22.1")	573 (22.6")	621 (24.5")		618 (24.3")	
Female			492 (19.4")	552 (21.7")	588 (23.1")	602 (23.7")	617 (24.3")	623 (24.5")	655 (25.8")	679 (26.7")	678 (26.7")	

Table 5. The length and age frequency of female Walleye captured from the Menominee River during spring electroshocking in 2017.

Length (in) mm	Age										
	4	5	6	7	8	9	10	11	12	13	14
430	1										
440											
(18") 450											
460	1										
470											
480	4	1									
490	3										
(20") 500	3	1									
510	3			1	1						
520	5			1							
530	2	2		1	1						
540		2	1	1	1						
(22") 550		2	1	1	1						
560			1	2	1						
570		3		1	1						
580			1	1	1	2					
590				1	3			1			
(24") 600				1	1	1	1				
610			2	2		1					1
620				1	2	1					1
630							1				
640				1	1		1	2			
(26") 650					1		1				
660				1			1				
670											1
680							1			2	
690							1			1	2
(28") 700							1				
710							1				
720											
730											3
Total	22	11	6	16	15	5	9	3	0	3	8
Ave. Length	503 (19.8")	543 (21.3")	580 (22.8")	583 (23.0")	587 (23.1")	603 (23.7")	667 (26.2")	631 (24.8")	--	688 (27.1")	687 (27.0")
S.D	23 (0.9")	28.3 (1.1")	29.3 (1.2")	43.3 (1.7")	39.2 (1.5")	17.6 (0.7")	35.6 (1.4")	28.9 (1.1")		9.2 (0.4")	47.2 (1.9")

Table 6. The length frequency of Walleye captured from the Peshtigo River during spring electroshocking in 2017.

Length (in) mm	Male	Female	Unknown
370	1		
380	2		
390	2		
(16") 400	4		
410	3		
420	13		
430	15		1
440	15		2
(18") 450	21		
460	14	2	
470	12	1	3
480	14		
490	18		2
(20") 500	19	1	
510	11		1
520	15		1
530	10	1	
540	13	3	
(22") 550	5	4	1
560	8		
570	6	1	
580	5	2	
590	3		
(24") 600	2	1	
610	5	3	
620	2	2	
630	1	3	
640		1	
(26") 650		2	
660			
670	1		
680		3	
690		1	
(28") 700		1	
710		1	
720			
730		1	
740		1	
(30") 750		1	
Total	240	36	11
Ave. Length	494 mm (19.4")	610 mm (24.0")	484 mm (19.1")
S.D.	55.3 mm (2.2")	77 mm (3.0")	39.1 mm (1.5")

Table 7. The length and age frequency of male Walleye captured from the Peshtigo River during spring electroshocking in 2017.

Length (in) mm	Age												
	2	3	4	5	6	7	8	9	10	11	12	13	14
370	1												
380	1	1											
390		2											
(16") 400		1	2	1									
410		2	1										
420		5	8										
430		6	9										
440			12	3									
(18") 450			6	15									
460			3	11									
470			6	2	2	2							
480			3		8	3							
490			12		3	3							
(20") 500					4	11	4						
510					4	4	3						
520					3	9		3					
530					2	5	2		1				
540					3	5	3			2			
(22") 550				1		1		3					
560					2			6					
570							1		4	1			
580						1	1		2		1		
590								1	1				1
(24") 600							2						
610									5				
620													2
630									1				
640													
(26") 650													
660													
670													1
680													
690													
Total	2	17	62	33	31	44	16	13	14	3	1	2	2
Ave. Length	382 (15.0")	415 (16.3")	446 (17.6")	465 (18.3")	512 (20.2")	522 (20.6")	546 (21.5")	559 (22.0")	596 (23.5")	556 (21.9")	583 (22.9")	634 (25.0")	625 (24.6")
S.D.	11.3 (0.4")	17.3 (0.7")	32.7 (1.3")	35.7 (1.4")	27.5 (1.1")	26 (1.0")	36.4 (1.4")	18.4 (0.7")	28.1 (1.1")	21.9 (0.9")	--	50.9 (2.0")	--

Table 8. The length and age frequency of female Walleye captured from the Peshtigo River during spring electroshocking in 2017.

Length (in) mm	Age									
	4	5	6	7	8	9	10	11	12	13
(18") 450										
460	2									
470				1						
480										
490										
(20") 500	1									
510										
520										
530		1								
540	1		2							
(22") 550				3	1					
560										
570				1						
580				2						
590										
(24") 600				1						
610				1	1		1			
620				1					1	
630				1	1		1			
640					1					
(26") 650							2			
660										
670										
680								1	1	1
690							1			
(28") 700										1
710										1
720										
730										1
740									1	
(30") 750									1	
Total	4	1	2	11	4	0	5	1	4	4
Ave. Length	505 (19.9")	530 (20.9")	547 (21.5")	579 (22.8")	611 (24.1")		661 (26.0")	682 (26.9")	701 (27.6")	708 (27.9")
S.D.	40.7 (1.6")	--	0.7 (.02")	48.3 (1.9")	41.2 (1.6")	--	45.6 (1.8")	--	59.1 (2.3")	20.3 (0.8")

Table 9. The length frequency of Walleye captured from the Fox River during spring electroshocking in 2017.

Length (in)	mm	Male	Female	Unknown
	370	1		
	380			
	390			
(16")	400	1		
	410	2		
	420	6		
	430	6		
	440	6		
(18")	450	4		
	460	4	2	
	470	9		1
	480	16	5	
	490	15	3	1
(20")	500	17		
	510	20	4	1
	520	12	3	
	530	12	2	
	540	9	3	
(22")	550	4	6	
	560	5	7	
	570	2	14	
	580	1	19	
	590	1	26	
(24")	600	1	31	
	610	1	36	
	620	2	28	
	630		18	
	640		22	
(26")	650		17	
	660		18	
	670		18	
	680	1	15	
	690		12	
(28")	700		5	
	710		10	
	720		9	
	730		10	
	740		8	
Total		159	351	3
Ave. Length		503 mm (19.8")	630 mm (24.8")	497 mm (19.6")
S.D.		46.3 mm (1.8")	56.0 mm (2.2")	18.0 mm (0.7")

Table 10. The length and age frequency of male Walleye captured from the Fox River during spring electroshocking in 2017.

Length (in) mm		Age											
		3	4	5	6	7	8	9	10	11	12	13	14
370		1											
380													
390													
(16")	400	1											
	410	1											
	420	6											
	430	3	2										
	440	1	5										
(18")	450		4										
	460		4										
	470		4	4		1							
	480		6	10	1								
	490		3	10	2								
(20")	500			8	8		1						
	510			9	9	1		1					
	520			2	4	6	1						
	530				7	5							
	540				3	5					1		
(22")	550				2	2	1						
	560					2	1						
	570					1	1						
	580						1						
	590							1					
(24")	600							1					
	610						1						
	620								1				1
	630												
	640												
(26")	650												
	660												
	670												
	680										1		
	690												
(28")	700												
Total		13	28	43	36	23	7	3	1	0	2	0	1
Ave. Length		422 (16.6")	466 (19")	498 (19.6")	520 (20.5")	536 (21.2")	561 (22.1")	573 (22.6")	621 (24.5")		618 (24.3")		625 (24.6")
S.D.		15.7 (0.6")	18.2 (0.7")	14 (0.6")	18.1 (0.7")	20.7 (0.8")	37.4 (1.5")	50.1 (2.0")	--		96.8 (3.8")		--

Table 11. The length and age frequency of female Walleye captured from the Fox River during spring electroshocking in 2017.

Length		Age										
(in)	mm	4	5	6	7	8	9	10	11	12	13	14
(18")	460	2										
	470	1										
	480	4										
	490	3										
(20")	500											
	510	4										
	520		2									
	530		3									
	540		1		2							
(22")	550		1	1	3	1						
	560		3	3		1						
	570			5	5	4	1					
	580		1	2	3	6	6					
	590			1	8	7	10					
(24")	600			1	12	8	9	1				
	610				7	15	7	4	1	2		
	620			2	4	6	9	5	2	1		
	630			1	2	7	5	1	1	2		
	640				3	5	6	1	3	4		
(26")	650				1	2	5	2	4	2		
	660				1	4	1	6		3	1	2
	670					1	3	3	3	6	2	2
	680					2	1	3	3	3		3
	690						1	2	2	5		
(28")	700						1	2			2	
	710							1	2	3	2	2
	720								3	1	4	1
	730							1		4	1	4
	740								4		3	2
Total		14	11	16	51	69	65	32	28	36	15	16
Average Length		492 (19.4")	552 (21.7")	588 (23.1")	602 (23.7")	617 (24.3")	623 (24.5")	655 (25.8")	679 (26.7")	678 (26.7")	716 (28.2")	708 (27.9")
S.D.		18.9 (0.7")	21.4 (0.8")	24.3 (0.9")	26.1 (1.0")	28 (1.1")	29.3 (1.2")	39.3 (1.5")	38.7 (1.5")	34 (1.3")	21.7 (0.9")	29.8 (1.2")

Table 12. Angler tag return locations from Walleye tagged from 2012-2017 on the Peshtigo, Oconto, Menominee and Fox Rivers as well as those tagged in the Sturgeon Bay area in 2013.

Tag Location	Sex	2012	2012 in 2013	2012 in 2014	2012 in 2015	2012 in 2016	2012 in 2017	2013	2013 in 2014	2013 in 2015	2013 in 2016	2013 in 2017
Fox River												
Tagged												
	Male							422				
	Female							62				
Recaptured												
	Male							5	4	2	2	1
	Female							2	0	1	0	0
Days at Large												
	Male							82	365	784	1131	1600
	Female							45	0	836	0	0
Menominee River												
Tagged												
	Male							204				
	Female							250				
Recaptured												
	Male							8	7	2	3	1
	Female							8	2	13	2	2
Days at Large												
	Male							38	382	855	1128	1608
	Female							54	376	770	1082	1452
Oconto River												
Tagged												
	Male	112						401				
	Female	97						131				
Recaptured												
	Male	5	0	0	2	1	1	11	5	4	2	2
	Female	6	2	1	2	0	0	9	2	3	1	3
Days at Large												
	Male	45	0	0	1097	1483	1851	55	373	812	1084	1525
	Female	42	457	800	1173	0	0	46	372	797	1229	1523
Peshtigo River												
Tagged												
	Male	289						305				
	Female	71						148				
Recaptured												
	Male	9	3	1	2	2	0	12	3	8	0	4
	Female	8	1	0	0	2	1	3	5	2	5	2
Days at Large												
	Male	55	408	767	1258	1556	0	57	353	796	0	1552
	Female	22.8	Unk.	0	0	1530	1842		372	840	1128	1524
Sturgeon Bay												
Tagged												
	Male							354				
	Female							284				
Recaptured												
	Male							4	4	5	1	1
	Female							6	3	14	1	1
Days at Large												
	Male							49	350	856	1196	1493
	Female							19	362	773	1098	1460

Table 12. Angler tag return locations from Walleye tagged from 2012-2017 on the Peshtigo, Oconto, Menominee and Fox Rivers as well as those tagged in the Sturgeon Bay area in 2013 (Cont).

Tag Location	Sex	2014 in 2015	2014 in 2016	2014 in 2017	2015	2015 in 2016	2015 in 2017	2016	2016 in 2017	2017
Fox River										
Tagged										
	Male				179			209		156
	Female				379			194		348
Recaptured										
	Male	3	2	1	28	2	0	9	4	5
	Female	10	2	3	13	8	2	6	5	13
Days at Large										
	Male	479	799	1224	64	465	0	99	448	87
	Female	434	858	1137	80	412	753	76	436	109
Menominee River										
Tagged										
	Male				339			371		332
	Female				95			131		125
Recaptured										
	Male	9	4	4	17	10	2	13	9	13
	Female	12	10	0	6	6	4	6	5	6
Days at Large										
	Male	391	822	1132	50	379	805	62	424	43
	Female	371	736	0	38	405	808	51	429	55
Oconto River										
Tagged										
	Male				210			134		
	Female				60			84		
Recaptured										
	Male	12	5	1	14	7	6	27	7	0
	Female	11	4	0	9	0	1	10	7	0
Days at Large										
	Male	440	749	1031	118	393	775	65	438	
	Female	440	731	0	18	0	845	61	406	
Peshtigo River										
Tagged										
	Male				310			290		236
	Female				154			162		36
Recaptured										
	Male	15	8	4	27	8	7	21	11	16
	Female	12	3	0	20	3	7	20	9	1
Days at Large										
	Male	371	723	1104	85	387	741	77	398	73
	Female	420	760	0	59	468	781	75	418	20
Sturgeon Bay										
Tagged										
	Male									
	Female									
Recaptured										
	Male									
	Female									
Days at Large										
	Male									
	Female									

Table 13. The recapture of tagged Walleye in 2017 during DNR surveys by year and river. The number indicates the number recaptured in that location. All recaptures were made utilizing the boom shocker boat.

River Tagged	Year Tagged	Recapture River			
		Oconto River	Peshtigo River	Menominee River	Fox River
Menominee River	2013			2	
	2014			1	
	2015			1	
	2016				
	2017				
Peshtigo River	2012		1		
	2013				
	2014				
	2015				
	2016		3		
	2017				
Oconto River *	2012				
	2013				
	2014				
	2015				
	2016				
	2017				
Fox River	2013				1
	2014				
	2015				2
	2016				2
	2017				1