A synthesis of sport fishing activity In the St. Marys River

May through October 2017

Neal Godby[1*], Tracy Claramunt[2], David G. Fielder[3], Stephen Chong[4], Anjanette Bowen[5], Eric Morrow[6]

St. Marys River Fisheries Task Group
Lake Huron Technical Committee
Lake Huron Committee
Great Lakes Fishery Commission

[1]Michigan Department of Natural Resources, Northern Lake Huron Management Unit, 1732 W. M-32, Gaylord, Michigan 49735
[2]Michigan Department of Natural Resources, Oden Interpretive Center, 8258 South Ayr Road, Alanson, Michigan 49706
[3]Michigan Department of Natural Resources, Alpena Fisheries Research Station, 160 E. Fletcher, Alpena, Michigan 49707
[4]Ontario Ministry of Natural Resources and Forestry, 1235 Queen St. East, Sault Ste. Marie, Ontario P6A 2E5
[5]United States Fish and Wildlife Service, Alpena Fish and Wildlife Conservation Office, 480 W Fletcher St., Alpena, Michigan 49707
[6]Michigan Department of Natural Resources, Statewide Angler Survey Program, 1732 W. M-32, Gaylord, Michigan 49735

Introduction

The St. Marys River provides world-class fishing opportunities for a variety of species. The river is unique in the diversity of recreational sport fisheries and the magnitude of the fishery. In order to quantify the sport fisheries, the Michigan Department of Natural Resources (MDNR) and the Ontario Ministry of Natural Resources and Forestry (OMNRF) undertook an open water creel survey of sport anglers in 2017. The survey covered both Ontario and Michigan waters from the compensating works downstream to Lake Huron at DeTour. This is only the second whole-river creel study of the St. Marys River, with the first conducted in 1999-2000 (Fielder et al. 2002). Partial river creel surveys were conducted during a number of years, but extrapolation to whole-river estimates proved difficult (Greenwood et al. 2011). The 2017 creel survey was also accompanied by a fish community gillnet survey of the river that same year by the St. Marys River Fisheries Task Group (SMRFTG) and its member agencies (O'Connor et al. 2019).

This survey is intended to quantify angler harvest and effort in the St. Marys River and identify any trends in the river recreational sport fishery. This information will supplement other individual management agency data, and the joint river-wide fish community gillnet survey, and it will be used to help inform management of the river. Fish Community Objectives for the St. Marys River are being developed, and common sport fishing regulations for this binational waterbody remain a goal of the St. Marys River Fisheries Task Group. These surveys equip managers with data necessary to make informed decisions about the world-class fisheries the river supports.

The St. Marys River is the connecting channel between Lakes Superior and Huron (Figure 1). The river flows southeasterly from Lake Superior's Whitefish Bay for 112 km and empties into northern Lake Huron at DeTour, Michigan, and into the North Channel of Lake Huron in Ontario at St. Joseph Island. The river holds the international boundary line between Ontario, Canada and Michigan, United States of America. Although the fish community has been described as percid dominated (Duffy and Batterson 1987, Ryder and Kerr 1978), the river supports a diverse mix of migratory and resident warm, cool, and coldwater species (St. Marys River RAP Team 1992). Resident species of interest to anglers include Northern Pike (*Esox Lucius*), Smallmouth Bass (*Micropterus dolomieu*), Walleye (*Sander vitreus*), and Yellow Perch (*Perca flavescens*). These species are well distributed throughout the river and its numerous bays. These four species, along with Cisco (*Coregonus artedii*) will be highlighted throughout this report. The river, main rapids in Sault Ste. Marie, the Little Rapids adjacent to Sugar Island, and several St. Marys tributaries are also seasonally used by salmonid species, providing popular fisheries. Aquatic habitats vary throughout the river's length, often changing abruptly from one habitat type to another. Habitats are generally characterized as open water, embayments, sand and gravel beaches, rapids and emergent wetlands (Duffy and Batterson 1987). The lower reaches of the river, Potagannissing Bay, Raber Bay, and Lake Munuscong, are more lacustrine in form and at least seasonally contain feeding aggregations of Cisco or migrating Pacific salmons and Rainbow Trout (*Oncorhynchus mykiss*) resulting in short term, seasonal fisheries. Considerable shoreline and channel alteration and hardening, dredging, and flow control and flow redirection have occurred over the past two centuries. Both the distribution of habitat types and anthropogenic stresses influence the species angler target in the various river reaches and the intensity and seasonality of fishing effort.

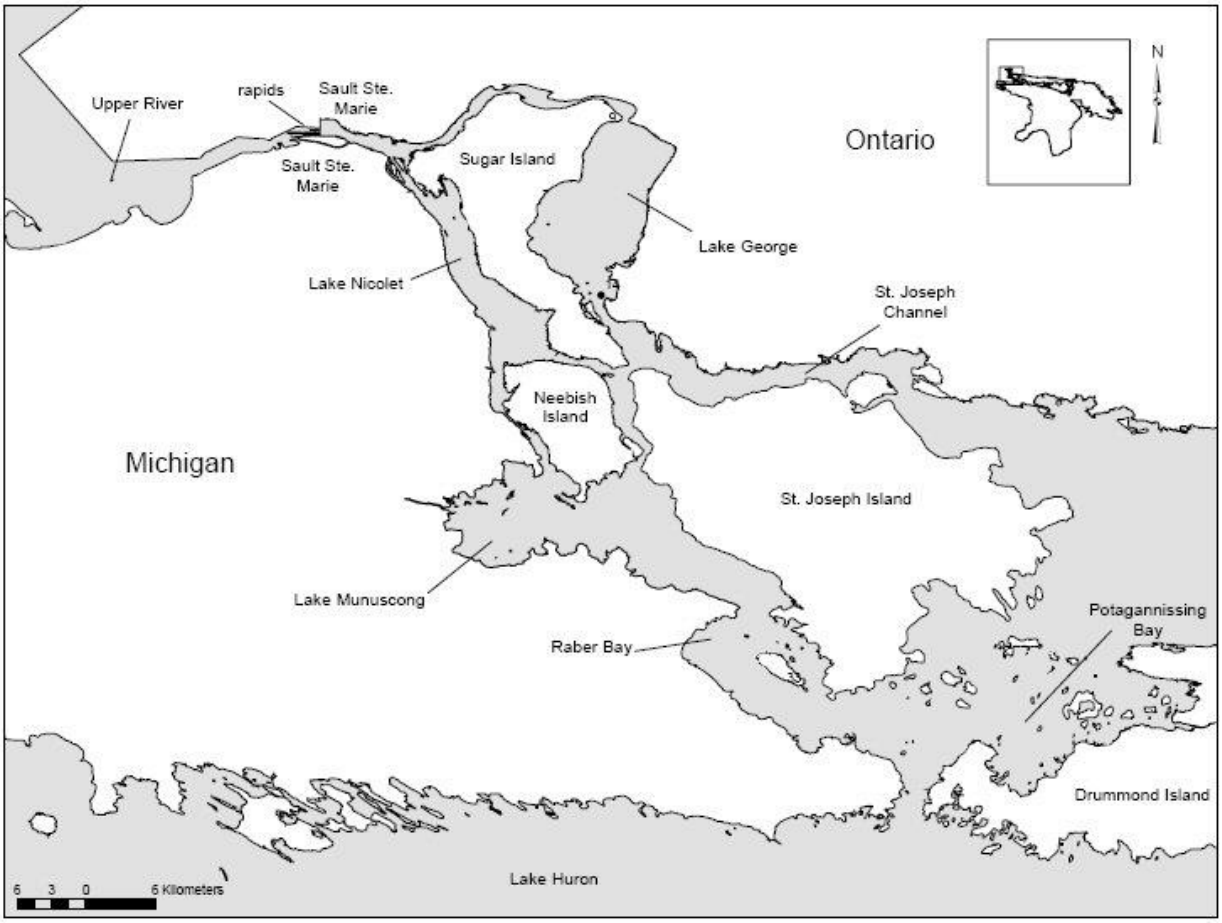

Figure 1. Map of the St. Marys River
Methods

Creel Methodology

In 2017 the MDNR, in conjunction with Ontario Ministry of Natural Resources and Forestry (OMNRF), the Environmental Protection Agency (EPA), and the United States Fish and Wildlife Service (USFWS) performed a river-wide survey of the St. Mary's River employing MDNR creel census methodology. The results in this report are derived from the survey performed during the open water season (May 1st - October 31st). Due to hiring delays creel census did not begin in Michigan until May10th.

The creel survey was based on a stratified design using three-stage sampling within the strata: i) days; ii) shifts; and iii) count times, and followed the methods detailed by Lockwood et al. (1999) and Su and Clapp (2013). Strata included 'sites' (Figure 2) fished by month, by day-type (weekday-weekend/holiday), and by mode of fishing (e.g, boat, pier/dock, shore). Catch and effort estimates were made for each stratum and then combined to give monthly and seasonal figures. The estimation sites were:

- Site 403; the northernmost sampling location. The area includes the St. Mary's River rapids on the Canadian side of the river, north of the Locks in Sault Ste. Marie, USA.
- Site 209; the river from the Locks in Sault Ste. Marie moving south to include Lake Nicolet and the middle Neebish Channel ending at Oak Point on Neebish Island and east to Harwood Point.
- Site 208; the river branch north of Sugar Island and all of Lake George, including Echo Bay and ending on a line north from Harwood Point to the Canadian mainland.
- Site 405; the river south of Lake George to the North Channel of Lake Huron, including the St. Joseph Channel.

- Site 207; the river south of Neebish Island and west of St. Joseph Island to the village of Detour, including Munuscong Lake and Raber Bay.
- Site 210; the river east of the village of Detour including Potagannissing Bay extending from Milford Haven on St. Joseph Island to Chippewa Point on Drummond Island.

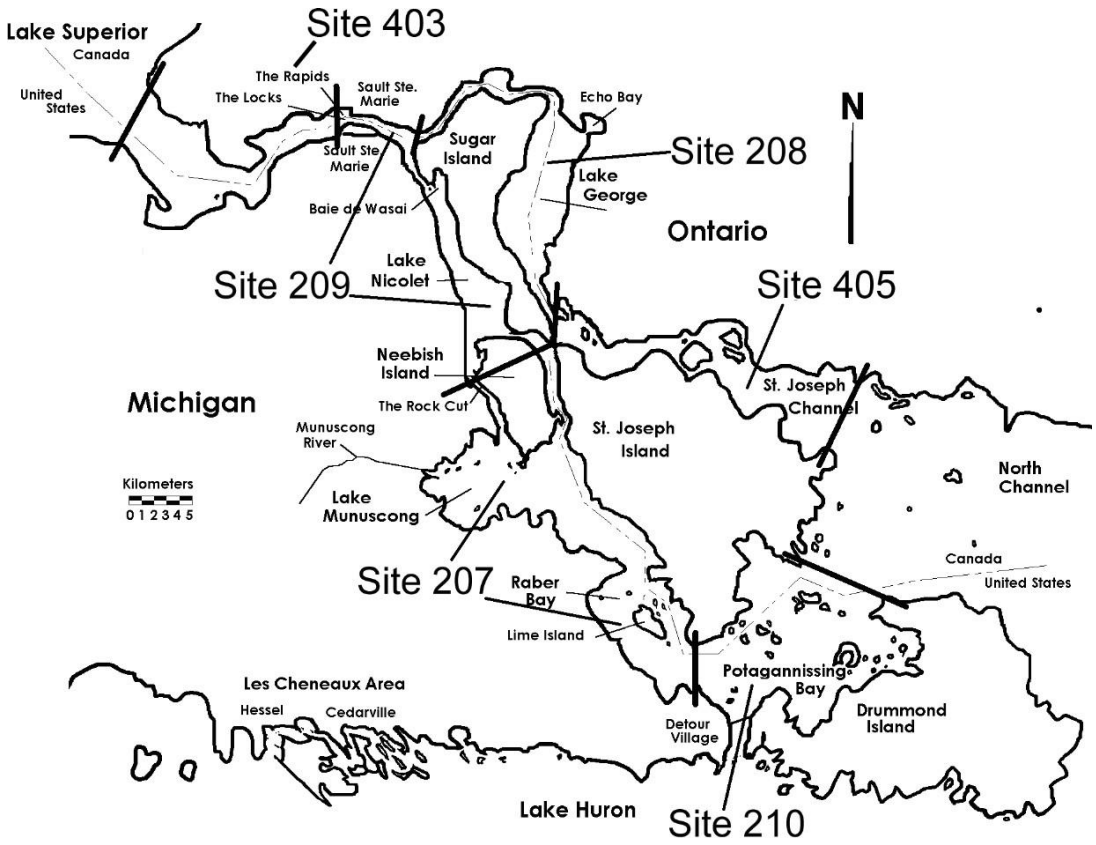

Figure 2. Creel Survey sites sampled in 2017.

Both weekend days and three randomly selected weekdays were sampled each week. The entire angling day from dawn to dusk was covered in each month. This was accomplished by breaking each day into two 8-hour work shifts, then randomly selecting one shift to be worked. The first shift began at daylight and ended in the afternoon; the second shift began in the afternoon and ended at sunset. Shift hours varied by month due to varying length of daylight among months. Each individual clerk was responsible for sampling more than one area, thus the interview site for each clerk was also randomly selected for each shift. Two types of data were collected for each area sampled: angler party interviews for catch rates and angler (boat, pier and shore) counts for effort. An angler party was defined as one or more anglers who fished together.

Two seasonal clerks were employed by the MDNR and two seasonal clerks were employed by the OMNR to perform the survey. All four clerks were trained by MDNR Fisheries personnel at the beginning of the field season to ensure the consistency of data collected. Data was submitted monthly by all clerks for review by the MDNR.

Clerks interviewed as many anglers as possible by encountering boats that returned to access sites or shore and pier anglers that fished during a scheduled shift. If the boater did not fish, that was recorded on the form as a non-fishing party and the interview was ended. If fishing did take place, anglers were queried as to their mode of fishing (i.e., boat, pier, shore), where they fished (site and grid number), how long they fished, what they fished for, the number of lines fished, how often they fished the area, the numbers (by species) of fish they caught and kept, the numbers (by species) of fish released, and the number of fishing trips they made or intended to make that day. Additional data were collected for one member of each party such as age and sex, zip code, and the types of angling method used (casting, still fishing, trolling, etc.).

Fishing effort was determined through instantaneous counts of boats and fishing piers made from airplanes. Five flights were made each week at randomly selected starting times; one each weekend day, and one on each of three randomly selected week days. Flights were also randomly started at the northern and southern end of the route. The proportion of boaters interviewed by creel clerks who indicated they were not fishing was used to adjust the aerial counts for non-fishing effort. Creel clerks also recorded a ratio of anglers to non-anglers that were present on fishing piers at randomly selected times of day. This angler ratio was applied to the airplane count of total people present on any piers. Shore anglers present at Site 403 (the Canadian rapids) were counted by the clerk twice daily at randomly assigned times on scheduled shifts.

Effort estimates were made for each site and mode by month. Harvest estimates were made for each site and mode by month for all fish species observed in the harvest by creel clerks. Catch estimates were made for each site and mode by month and included numbers harvested and numbers of legal-sized fish released for those selected species. Standard mathematical formulas for creel survey (Lockwood et al. 1999) were used to calculate all estimates. Three measures of fishing effort were calculated: angler hours, angler trips, and angler days. An angler trip is one completed fishing excursion and an angler day is composed of one or more fishing excursions during a 24-hour period. Uncertainty estimates for all catch and effort estimates in this report are defined as two standard errors of their mean estimates (2 times the square root of the variance for an estimate).

Creel clerks also collected biological data from harvested fish (total length and weight and fin clip information) encountered during on-site angler interviews. Dorsal fin spines or rays were also collected for certain species for age estimation. Monthly target sample sizes for age analysis were based on a minimum number needed to provide a reasonable representation of the age structure of the harvest each month, balanced with the logistical feasibility of the creel clerk to collect biological data samples without negatively impacting angler interview numbers.

Results

Interview and Angling Effort

A total of 3,558 anglers were interviewed on the St. Marys River by the creel clerks from May 1-October 31, 2017.

Total annual effort for the entire river was 232,921 angler hours in 2017 (Table 1). This does not include site 403 (the Rapids), since it was not surveyed in all years. This is the lowest value of the seven years for which we have estimated effort, down from a high of 565,095 angler hours in 2001. In 2017, site 210 (Potagannissing Bay) had the most effort, followed by site 207 (Munuscong and Raber Bays) and site 208 (Lake George). Anglers targeting walleye contributed a total of 118,484 hours of angling effort (Table 2), or approximately 51% of the effort on the river.

Table 1. Estimated recreational effort (in hours) for all species from open-water sport fisheries in the St. Marys River 1999-2001, 2005-2007, and 2017. Italics denotes data obtained through extrapolation methods described in the Methods section (Greenwood et al. 2011). Note that site 403 (Rapids) is not included, as it was not surveyed every year. Two standard errors are in parentheses.

Year	207	208	209	210	404	405	Total
1999	112,283	96,732	68,441	140,743	58,561	65,307	556,399
	(19,570)	(16,256)	(11,010)	(27,674)	(11,454)	(12,611)	(42,820)
2000	93, 301	60,816	60,564	131,107	*55,616*	*61,572*	462,976
	(15,420)	(12,794)	(11,511)	(20,871)	*(46,434)*	*(76,874)*	(183,904)
2001	124,823	97,111	76,694	123,878	*67,671*	*74,918*	565,095
	(28,135)	(17,919)	(14,401)	(17,646)	*(64,802)*	*(106,689)*	(249,592)
2005	68,289	51,245	*54,378*	131,887	*47,410*	74,105	427,314
	(12,840)	(10,260)	(*232,480*)	(35,124)	*(60,886)*	(14,371)	(365,960)
2006	93,025	70,944	84,845	152,254	*58,378*	*52,984	512,430
	(24,502)	(14,685)	(15,437)	(36,035)	*(72,178)*	*(9,645)	(172,483)
2007	139,310	35,273	*71,430*	183,668	*62,276*	45,112	537,069
	(34,103)	(8,859)	*(313,367)*	(60,215)	*(107,502)*	(11,057)	(535,103)
2017	45,491	33,122	24,332	98,966	*Not*	31,010	232,921
	(26,153)	(17,306)	(9,559)	(47,311)	*Surveyed*	(12,455)	(112,784)

* In 2006, no interviews were conducted for Site 405, see Greenwood et al. (2011) for methods.

**In 2017, site 404 was not surveyed.

Table 2. Estimated targeted effort (in hours) for selected species for the open-water sport fisheries in the St. Marys River 1999-2001, 2005-2007, and 2017. Two standard errors are in parentheses.

	Year						
	1999	**2000**	**2001**	**2005**	**2006**	**2007**	**2017**
Walleye	126,988	119,122	161,526	168,031	168,333	200,006	118,484
	(25,083)	(24,654)	(28,699)	(53,463)	(37,817)	(63,957)	(16,713)
Yellow Perch	89,238	60,607	78,869	32,414	58,191	65,326	39,885
	(18,255)	(16,698)	(20,924)	(14,026)	(23,031)	(30,758)	(6,648)
Salmonids	122,280	56,988	79,529	76,419	49,241	66,488	29,635
	(20,238)	(14,007)	(21,306)	(43,360)	(14,674)	(44,801)	(3,985)

Harvest

Twenty-four species were reported as caught during the 2017 St. Marys River creel survey. Harvest estimates for 16 of these species are presented in Table 3, with some rarely encountered species grouped together in the "other" category. White Bass (*Morone chrysops*) was reported as harvested in 2017 as it had been previously, but the invasive White Perch (*Morone Americana*) was not reported during this survey. Estimated harvest numbers and harvest rates by species for the survey series are reported in Appendix 1, Table 1.

Table 3. Estimated harvest per hour and total number harvested by species for each month. Angler effort (angler hours, trips, and days) for the St. Marys River system (Michigan and Ontario), for all sites including Site 403 (Rapids) and all non-charter modes of sportfishing, for each month in 2017. Two standard errors are in parentheses.

All Sites								
	Month							
Species	Harvest per hour	May	June	July	August	September	October	Season
Atlantic Salmon	0.0042	28	124	492	275	99	7	1,025
	(0.0064)	(50)	(133)	(275)	(197)	(90)	(12)	(756)
Brown Trout	0.0000	0	0	0	2	0	0	2
	(0.0000)	(0)	(0)	(0)	(5)	(0)	(0)	(5)
Channel Catfish	0.0003	0	38	0	0	31	0	69
	(0.0012)	(0)	(76)	(0)	(0)	(60)	(0)	(136)
Chinook Salmon	0.0006	0	16	9	18	73	22	138
	(0.0018)	(0)	(32)	(18)	(36)	(87)	(36)	(209)
Coho Salmon	0.0003	63	0	0	0	1	0	64
	(0.0009)	(103)	(0)	(0)	(0)	(2)	(0)	(105)
Freshwater Drum	0.0004	0	75	0	0	0	20	95
	(0.0016)	(0)	(149)	(0)	(0)	(0)	(38)	(187)
Cisco	0.1313	0	0	32,267	0	0	0	32,267
	(0.1545)	(0)	(0)	(18,255)	(0)	(0)	(0)	(18,255)
Lake Trout	0.0000	0	0	0	0	9	0	9
	(0.0002)	(0)	(0)	(0)	(0)	(18)	(0)	(18)
Lake Whitefish	0.0245	457	457	4,962	25	73	37	6,011
	(0.0409)	(600)	(515)	(3,506)	(26)	(117)	(71)	(4,836)
Northern Pike	0.0161	899	1,543	755	302	430	39	3,968
	(0.0329)	(1,384)	(635)	(938)	(310)	(539)	(80)	(3,885)
Other	0.0001	0	16	0	0	16	0	32
	(0.0005)	(0)	(32)	(0)	(0)	(31)	(0)	(62)
Pink Salmon	0.0005	0	0	0	30	93	0	123
	(0.0013)	(0)	(0)	(0)	(44)	(114)	(0)	(158)
Pumpkinseed	0.0009	0	161	0	59	0	0	220
	(0.0027)	(0)	(244)	(0)	(76)	(0)	(0)	(320)
Rainbow Trout	0.0033	241	190	218	49	80	29	807
	(0.0074)	(267)	(193)	(210)	(67)	(74)	(58)	(870)
Smallmouth Bass	0.0125	174	1,262	1,228	88	321	0	3,073
	(0.0286)	(294)	(1,318)	(1,121)	(101)	(545)	(0)	(3,379)
Walleye	0.0568	3,076	4,629	2,718	1,167	1,495	878	13,963
	(0.1174)	(3,998)	(3,865)	(3,019)	(921)	(1,168)	(893)	(13,865)
Yellow Perch	0.1597	942	2,220	2,963	2,043	18,145	12,928	39,241
	(0.2510)	(1,388)	(2,252)	(2,515)	(2,518)	(10,492)	(10,492)	(29,657)
Angler hours		23,718	55,467	82,113	29,882	40,604	13,991	245,775
		(17,400)	(30,830)	(34,796)	(11,805)	(14,857)	(8,445)	(118,134)
Angler trips		5,692	13,326	19,791	6,428	10,018	3,115	58,370
		(4,029)	(5,731)	(8,901)	(3,275)	(3,822)	(1,931)	(27,688)
Angler Days		5,293	12,838	18,353	6,146	9,714	3,060	55,404
		(3,740)	(5,546)	(8,368)	(3,163)	(3,738)	(1,902)	(26,456)

Harvest numbers for the survey series are presented in Table 4 below for Cisco, Northern Pike, Smallmouth Bass, Walleye, and Yellow Perch. Site-specific harvest numbers for each species are detailed in Appendix 2. Total catch by species, including released fish, is listed in Appendix 3.

Table 4. Estimated harvest (numbers of fish) for Cisco, Northern Pike, Smallmouth Bass, Walleye, and Yellow Perch from open-water sport fisheries in the St. Marys River 1999-2001 and 2005-2007. Two standard errors are in parentheses.

	Species				
Year	Cisco	Northern Pike	Smallmouth Bass	Walleye	Yellow Perch
1999	31,258	5,408	1,188	9,890	62,646
	(40,040)	(5,170)	(1,797)	(8,255)	(32,274)
2000	113,621	12,402	3,235	17,064	86,098
	(182,114)	(17,744)	(9,001)	(17,768)	(100,284)
2001	131,662	14,336	3,653	39,568	91,120
	(199,643)	(22,768)	(10,371)	(30,643)	(96,696)
2005	48,163	1,547	4,216	32,134	84,097
	(92,339)	(3,516)	(10,329)	(24,882)	(96,889)
2006	168,988	14,894	5,322	38,743	118,214
	(211,690)	(18,288)	(10,567)	(46 ,952)	(150,617)
2007	158,141	4,231	4,030	60,733	125,391
	(372,281)	(5,322)	(7,691)	(56,668)	(180,500)
2017	32,267 (18,255)	3,968 (3,885)	3,073 (3,379)	13,963 (13,865)	39,241 (29,657)

Harvest Rates

River-wide, species-specific harvest rates (harvest per hour) based on total effort for all species, Cisco, Northern Pike, Smallmouth Bass, Walleye, and Yellow Perch - for the survey series are presented in Table 5. These rates are presented for all species by site specific locations in Appendix 2 (Tables 1-7).

Table 5. Mean annual harvest per hour for Cisco, Northern Pike, Smallmouth Bass, Walleye, and Yellow Perch (based on total effort) from open-water sport fisheries in the St. Marys River (from all sites including Potagannissing Bay), 1999-2001, 2005-2007, and 2017. Two standard errors are in parentheses.

Year	Cisco	Northern Pike	Smallmouth Bass	Walleye	Yellow Perch
1999	0.0562	0.0097	0.0021	0.0178	0.1126
	(0.0721)	(0.0093)	(0.0032)	(0.0149)	(0.0586)
2000	0.1631	0.0284	0.0069	0.0376	0.1314
	(0.1688)	(0.1626)	(0.1167)	(0.1606)	(0.3123)
2001	0.1790	0.0269	0.0055	0.0687	0.1462
	(0.1766)	(0.1685)	(0.1568)	(0.1872)	(0.3438)
2005	0.0708	0.0037	0.0072	0.0747	0.1297
	(0.2116)	(0.1457)	(0.1302)	(0.2265)	(0.3742)
2006	0.2303	0.0305	0.0108	0.0830	0.1705
	(0.2176)	(0.1775)	(0.1794)	(0.2294)	(0.4210)
2007	0.1587	0.0093	0.0080	0.0997	0.1686
	(0.5180)	(0.1829)	(0.2191)	(0.3410)	(0.3787)
2017	0.1313	0.0161	0.0125	0.0568	0.1597
	(0.1545)	(0.0329)	(0.0286)	(0.1174)	(0.2510)

Biological Summary of Angler Harvest

In 2017, a total of 745 fish were sampled by creel clerks. Biological data collected from those samples are summarized in Table 6. Aging structures (e.g., scales or fin spines) were not collected for all samples because a much larger sample size of fish were aged during the 2017 fish community gillnet survey. That companion survey was fishery-independent, and provides a much better view of the age and size structure of the population. See O'Connor et al. (2019) for the additional biological data.

Table 6. Summary of biological data collected from the St. Marys River during the open water sport fishery of 2017, by capture sites. N = sample size and appears in parentheses if different than reported. Data for species with a sample size smaller than 5 were not included in this table. A complete list of biological data for 2017 and previous creel surveys can be found in Appendix 4.

Species	Year	Capture sites	N	Mean Age	Mean Length (cm)	Mean Wt (g)
Atlantic Salmon	2017	208, 209, 403	117	2.2 (41)	56.6	2174 (116)
Chinook Salmon	2017	208, 403	6	2.8 (5)	78.1	5934
Cisco	2017	209, 210	92		38.5	605 (91)
Northern Pike	2017	207, 208, 209, 210	74	4.6	67.6	1876
Pink Salmon	2017	208, 209, 403	31	2 (7)	50.5	1283
Rainbow Trout	2017	208, 209, 403	32	2.5	48.5	1549
Smallmouth Bass	2017	207, 208, 209, 210	57	4 (2)	39.6	1012 (32)
Walleye	2017	207, 208, 209, 210, 403	157	5.3 (21)	46.3	1019 (116)
Yellow Perch	2017	207, 208, 209, 210	170	5.3 (3)	22.9	165 (155)

Angler Interview Summary

Angler Origin – Although most anglers were from Michigan and Ontario, the St. Marys River draws anglers from throughout the continent (Figure 3). Approximately 26% of the anglers were considered "local", defined as those whose reported home zip code is within 40 or 80 kilometers of the river. In addition to Michigan and Ontario, anglers were from 17 other states and 3 other provinces. American anglers comprised 68% of the anglers interviewed. Anglers hailed from as far away as Hawaii, Washington, British Columbia, and the maritime provinces.

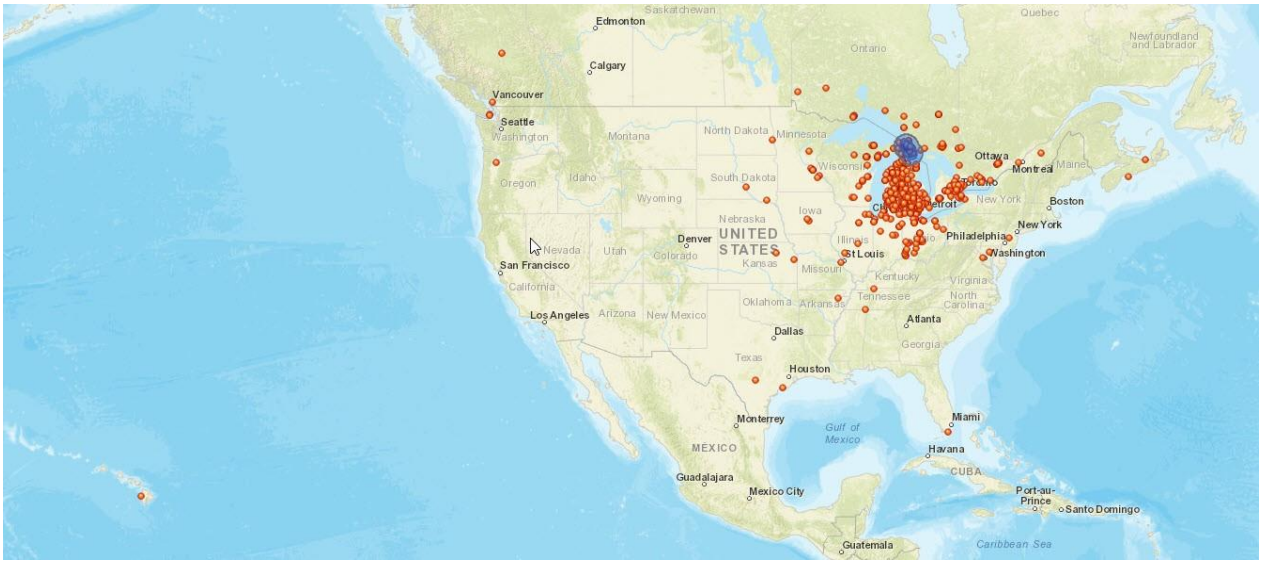

Figure 3. Map of angler origin for those fishing the St. Marys River in 2017, based on U.S. Zip/Canadian postal codes provided during the interviews.

Angling target species, angling method, mode, and party size

The St. Marys River presents diverse angling opportunities in terms of the species that can be targeted and the angling methods that can be used. Anglers targeted a variety of species throughout the season (Table 7). Walleye were the most frequently targeted species (28.2%), followed by general salmon and salmon or trout (totaling 11.5%), Rainbow Trout (11.0%) and Atlantic Salmon (10.9%). A fair percentage (14.2%) indicated they were fishing for anything.

Table 7. Percent of angling parties in the St. Marys River open water (May-Oct.) sport fishery reporting target species, by location as reported during angler interviews. N denotes number of respondents.

TARGET		207	208	209	210	403	404	405	Total
ANY		15.9%	12.3%	11.3%	17.0%	9.2%	0.0%	64.6%	14.2%
Atlantic Salmon		0.0%	4.6%	32.9%	0.0%	10.2%	0.0%	0.0%	10.9%
Chinook Salmon		0.0%	1.5%	0.7%	0.0%	2.3%	0.0%	0.0%	0.9%
Coho Salmon		0.0%	0.3%	0.0%	0.0%	0.5%	0.0%	0.0%	0.2%
Cisco		1.4%	0.0%	0.0%	3.7%	0.0%	0.0%	0.0%	0.9%
Largemouth Bass		0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.1%
Muskellunge		0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Northern Pike		6.1%	13.8%	5.3%	8.0%	0.0%	50.0%	12.5%	6.5%
Other		2.4%	0.0%	1.8%	6.2%	4.1%	0.0%	0.0%	2.8%
Pink Salmon		0.3%	5.2%	1.8%	0.0%	1.8%	0.0%	0.0%	1.8%
Rainbow Trout		0.0%	4.3%	0.2%	0.0%	47.3%	0.0%	0.0%	11.0%
Salmon		0.0%	11.4%	0.0%	0.0%	10.7%	0.0%	0.0%	4.3%
Salmon or Trout		0.0%	1.5%	17.3%	0.0%	13.5%	50.0%	0.0%	7.4%
Smallmouth Bass		2.4%	0.9%	0.5%	6.5%	0.0%	0.0%	4.2%	1.9%
Walleye		65.1%	33.8%	19.8%	35.9%	0.3%	0.0%	18.8%	28.2%
Walleye and Perch		0.3%	0.3%	0.0%	0.6%	0.0%	0.0%	0.0%	0.2%
Yellow Perch		5.8%	9.8%	8.3%	22.0%	0.0%	0.0%	0.0%	8.6%
N		295	325	434	323	393	2	48	1820

The St. Marys River Rapids (site 403) continues to be a popular fishing location, where the target species changes based on seasonal migration patterns (Table 8). Rainbow Trout (steelhead) are the most sought after species in May, June, and October, but Atlantic Salmon are the preferred target in July and August.

Table 8. Percent of angler parties reporting species targeted in the St. Marys River rapids sport fishery (Site 403) by month in 2017. N denotes sample size.

	May	June	July	August	September	October
ANY	2%	6%	14%	9%	18%	12%
Atlantic Salmon			38%	34%	3%	
Chinook Salmon				5%	8%	
Coho Salmon					1%	2%
Largemouth Bass					1%	
Other	2%	11%	6%	2%		5%
Pink Salmon				2%	8%	
Rainbow Trout	95%	73%	14%	11%	10%	41%
Salmon	1%	3%	2%	16%	34%	10%
Salmon and Trout		7%	26%	21%	15%	29%
Walleye					1%	
N	103	70	50	56	73	41

Additional, customized queries of the dataset may be run from the open data portal at: http://gis-midnr.opendata.arcgis.com/search?q=creel.

Discussion

Fishing Effort

Overall fishing effort in the St. Marys River was 232,921 angler hours in 2017. While this is approximately 50% less than it has been in previous creel surveys, the overall magnitude of the fishery remains substantial. Based on number of angler hours, the amount of fishing effort in the St. Marys River in 2017 was 34.5% as much as all the fishing effort in the Michigan waters of Lake Huron (Table 9). Although the amount of effort is down, that level of effort tracks consistent with the Michigan waters of Lake Huron.

The amount of fishing effort in the St. Marys River is even more impressive when examined based on surface acreage compared to other popular fisheries in the region. In 2017, the St. Marys River had more fishing effort per unit surface area than Big Bay de Noc and Saginaw Bay, and compared favorably with the fishing pressure per surface area in Little Bay de Noc (Figure 4).

Table 9. Comparison of fishing effort expressed as hours in the St. Marys River (excluding site 403 – the Rapids) to the lake wide fishery in the Michigan waters of Lake Huron and for Saginaw Bay. Site 403, the St. Marys rapids is excluded.

Year	St. Marys River effort (Hours)	% as much of Lake Huron effort (Hours)	% as much of Saginaw Bay effort (hours)
1999	542,067	27.7	60.0
2000	462,976	26.7	61.2
2001	565,095	31.4	70.0
2005	427,314	32.3	57.3
2006	512,430	44.8	79.7
2007	537,069	38.7	62.7
2017	232,921	34.5	53.2

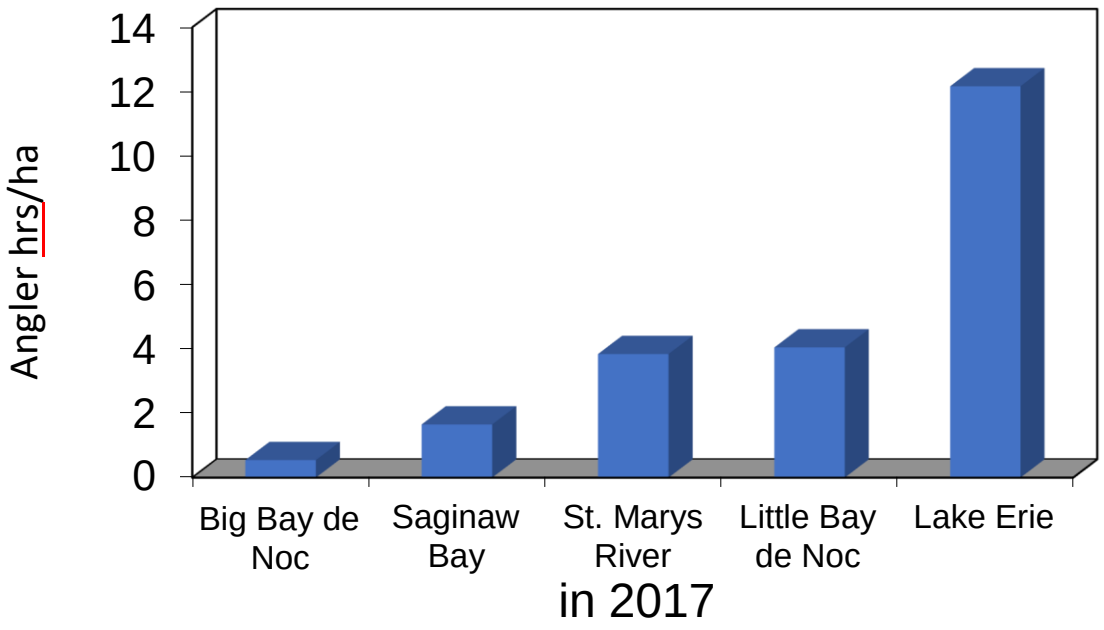

Figure 4. Angler hours per hectare in 2017 for a number of popular fishing locations in Michigan. Note that the Lake Erie estimate is for Michigan waters only.

Harvest and Harvest Rates

Cisco

Cisco harvest and harvest rates were down by approximately 80% in 2017 compared with previous years (2006, 2007), with harvest the lowest since 1999. Harvest rates were approximately the same as they were in 2005.

The Cisco fishery in the St. Marys River is often driven by an early summer feeding congregation of these fish in sites 207, 209, and 210. The feeding congregation of Cisco is keying in on emerging mayflies and can create substantial fishing effort in these areas of the river.

Cisco harvest is highly variable and is dependent upon factors such as weather conditions during the feeding congregation, as well as the timing and duration of that feeding congregation. Both harvest and harvest rate are within their historical range. The fish community gillnet survey also conducted in 2017 indicated cisco were at a low abundance for that time series (O'Connor et al. 2019). This suggests that cisco may genuinely be at a lower abundance that year and affecting the fishery.

The only notable change in fishing regulations for the river since the last creel survey were for Cisco. Ontario regulations for Cisco changed in 2008, when it went from no daily possession limit to a daily possession limit of 25 Cisco for a Sportfishing licnese or 12 Cisco for a Conservation license. Although Cisco harvest was down in 2017, it is likely not entirely attributable to the Ontario change in daily possession limit since harvest rate was also down. The SMRFTG is working towards developing common regulations between Ontario and Michigan for the remaining sport fisheries.

Northern Pike and Muskellunge

Northern Pike harvest and harvest rate are still much lower than they were historically, but are trending upwards. Coastal wetlands provide critical spawning and nursery habitat for Northern Pike. Great Lakes water levels, and therefore St. Marys River water levels, have increased since 2013. Lake Superior outflows, (St. Marys River flows) are partially controlled through the compensating gates at the head of the rapids. River flows in recent years have been higher than they've been in decades and these higher water levels have led to more spawning and nursery habitat resulting in improved pike numbers. Good numbers of Age-5 and younger pike captured in the companion survey (O'Connor et al. 2019) support the idea that the higher water levels since 2013 have helped the Northern Pike population. Higher water levels likely also improved survival of Northern Pike, as evidenced by the lowest total annual mortality rates seen in the survey series.

The mean age of Northern Pike captured in the sport fishery was 4.6, while the mean age in the fish community gillnet survey was 4.0. Mean length in the sport fishery was 676mm and was 552mm in the 2017 gillnet survey (O'Connor et al. 2019). These differences could point to gear selectivity; i.e., gill nets aren't effectively sampling older/larger Northern Pike, however it is also likely that the sport fishery selects for larger (older) pike. Northern Pike regulations differ between Michigan and Ontario. Michigan has a 610 mm (24 in) minimum size limit, while Ontario has no minimum size limit. In 2017, approximately 12% of the Northern Pike sampled during the creel survey were less than 610 mm. It is important to continue both the fishery-independent (gill net) survey and the creel survey of the sport fishery in order to get a complete picture of the fish community.

Muskellunge remain an important part of the fish community and provide a popular fishery. An estimated 214 muskies were caught in the St. Marys River during the open-water season in 2017.

Smallmouth Bass

Overall harvest of Smallmouth Bass is down slightly from the 2007 estimate, but is higher than the estimate from our last full-river creel in 1999. While harvest rate has increased by almost 67%, Smallmouth Bass are plentiful in the river and can provide a good fishery, though it remains an untapped resource. Only 1.9% of angling parties river-wide reported targeting Smallmouth Bass in 2017, with Potagannissing Bay, Site 210, having the highest percentage (6.5%) of angling parties reporting they were targeting Smallmouth Bass. Angler harvest and harvest rate remain substantially higher than in 1999, and harvest rate is above the mean 1999-2017harvest rate of 0.008.

Walleye

Walleye continue to be an important sport fish in the St. Marys River, and were the species most targeted by anglers. Overall harvest and harvest rate of Walleye in the river declined since 2007, but both are higher than they were in 1999 during our last full-river creel. The 2017 harvest rate (0.0568), however, is slightly lower than the mean harvest rate of 0.064 (1999-2017). Current estimates of harvest and harvest rate are within the historical range of this survey series.

Walleye were harvested from every creel site in 2017, but by far the most harvest (50%) came from site 207-Lake Munuscong and Raber Bay. That was followed by site 210-Potagannissing Bay (20.9%), site 208-Lake George (12.6%), and site 405-St. Joseph Channel (11.6%).

Walleye have been stocked in the St. Marys River since about 1985 at varying levels and by different entities. It is unknown, however, to what extent that stocking contributes to the fishery. To answer that question and others, a 10-year Walleye Stocking and Evaluation Plan was developed by the St. Marys River Fisheries Task Group and was implemented 2009-2018. The plan called for the annual stocking of 290,000 to 400,000 spring fingerling OTC-marked Walleye in different reaches and follow-up evaluations each fall. 2018 is the last year of evaluation under that plan, and results are expected soon to help inform the Walleye stocking strategy for the river.

Yellow Perch

Yellow Perch support a popular fishery in the St. Marys River, with 8.6% of angling parties targeting Yellow Perch river-wide throughout the open water season. They were the target species of 22% of the angling parties in site 210-Potagannissing Bay, second only to Walleye in popularity at that site. Although overall harvest of Yellow Perch is down in 2017 compared to previous years, harvest rate has remained relatively stable over the survey series.

Economic Value

The 2016 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, conducted by the U.S. Fish and Wildlife Service, estimated daily expenditures for hunters and anglers (USDI 2016). For Great Lakes anglers in 2016, USDI 2016 reports that Great Lakes anglers spend $153 per day on fishing trip-related expenses. The 2017 survey of the St. Marys River estimates 55,404 angler days of fishing effort were spent on the river, with a value of approximately $8.5 million US Dollars.

Supplemental Questions

MDNR was considering a change to the statewide regulations for Yellow Perch at the time of this survey. The daily possession limit for Yellow Perch at the time of the survey was 50; and the MDNR was considering changing the daily possession limit to 25 perch. In order to gage public opinion about the potential change, a supplement question was included in the creel survey. The following questions was asked: Would you support a decreased bag limit of 25 Yellow Perch?

Angler responses indicated support for the regulation change. In the Upper St. Marys River, 72% of those respondents with a definite opinion supported the change (28% did not support). In the Lower St. Marys River, 93% of those with a definite opinion supported the reduced bag limit. Overall, anglers in the St. Marys River supported going to a 25 fish bag limit for Yellow Perch. The reduced bag limit was subsequently approved and will be implemented on a statewide basis in 2019.

Recommendations

The river-wide creel survey should be conducted every five years in conjunction with the fish community gillnet survey on the same frequency. Recreational harvest regulations should be aligned between Ontario and Michigan waters of the river.

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The St. Marys River Fisheries Task Group is organized under the Great Lakes Fishery Commission's Lake Huron Committee, and coordinates fisheries management among the various agencies with jurisdiction over the St. Marys River (Fielder 2002).

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Appendixes

Appendix 1, Table 1. Estimated species harvest numbers and harvest rate (in italics) from open-water sport fisheries in the St. Marys River, 1938 to 2017.

Species	1938	1987	1991	1999	2000	2001	2005	2006	2007	2017
Atlantic Salmon	0	6	64	509	95	787	0	716	2,039	1,025
	0	*<0.0001*	*0.0001*	*0.0009*	*0.0002*	*0.0014*	*0*	*0.0014*	*0.0038*	*0.0042*
Bluegill				107	0	0	0	0	0	
				0.0002	*0*	*0*	*0*	*0*	*0*	
Brown Trout										2
										0
Channel Catfish				109	5	12	131	0	13	69
				0.0002	*0*	*0*	*0.0003*	*0*	*0*	*0.0003*
Chinook Salmon	0	4,662	469	6 249	5,707	6,785	1,619	3,632	4,042	138
	0	*0.0062*	*0.0008*	*0.0112*	*0.0123*	*0.012*	*0.0038*	*0.0071*	*0.0075*	*0.0006*
Cisco	289	141,386	14,528	31,258	113,620	131,662	48,163	168,988	158,141	32,267
	0.15	*0.1880*	*0.0244*	*0.0562*	*0.2454*	*0.233*	*0.1127*	*0.3298*	*0.2945*	*0.1313*
Coho Salmon				381	65	42	129	104	321	64
				0.0007	*0.0001*	*0.0001*	*0.0003*	*0.0002*	*0.0006*	*0.0003*
Freshwater Drum				0	19	0	1,180	1,729	1,168	95
				0	*0*	*0*	*0.0028*	*0.0034*	*0.0022*	*0.0004*
Lake Trout				1	0	0	162	0	454	9
				0	*0*	*0*	*0.0004*	*0*	*0.0008*	*0*
Lake whitefish	16	25,187	204	19,769	13,154	16,594	17,877	37,880	50,973	6,011
	0.008	*0.0335*	*0.0003*	*0.0355*	*0.0284*	*0.0294*	*0.0418*	*0.0739*	*0.0949*	*0.0245*
Largemouth Bass				114	202	51	0	0	0	0
				0.0012	*0.0004*	*0.0001*	*0*	*0*	*0*	*0*

Appendix 1, Table 1. Cont.

Muskellunge				34	8	56	110	0	0	0
				0.0001	*0*	*0.0016*	*0.0003*	*0*	*0*	*0*
Northern Pike	184	20,965	26,116	5,408	12,402	14,336	1,547	14,894	4,231	3,968
	0.09	*0.0279*	*0.0438*	*0.0097*	*0.0268*	*0.0254*	*0.0036*	*0.0291*	*0.0079*	*0.0161*
Other				1,124	995	2,427	138	338	4,832	32
				0.002	*0.0021*	*0.0043*	*0.0003*	*0.0007*	*0.009*	*0.0001*
Pink Salmon	0	5.699	17,573	2,073	1,899	5,042	1,437	3,719	2,743	123
	0	*0.0076*	*0.0295*	*0.0037*	*0.0041*	*0.0089*	*0.0034*	*0.0073*	*0.0051*	*0.0005*
Pumpkinseed				161	0	0	175	0	1	220
				0.0003	*0*	*0*	*0.0004*	*0*	*0*	*0.0009*
Rainbow Trout	13	1,990	192	380	133	89	220	449	359	807
	0.007	*0.0026*	*0.0003*	*0.0007*	*0.0003*	*0.0002*	*0.0005*	*0.0009*	*0.0007*	*0.0033*
Rock Bass	166	13,708	19,718	70	105	0	720	428	448	0
	0.08	*0.0182*	*0.0311*	*0.0003*	*0.0002*	*0*	*0.0017*	*0.0008*	*0.0008*	*0*
Round whitefish				516	1,651	0	1,348	1,416	1,603	
				0.0009	*0.0036*	*0*	*0.0032*	*0.0028*	*0.003*	
Smallmouth Bass	3	2,779	9,497	1,188	3,235	3,653	4,216	5,322	4,030	3,073
	0.002	*0.0036*	*0.0159*	*0.0032*	*0.007*	*0.0065*	*0.0099*	*0.0104*	*0.0075*	*0.0125*
Walleye	102	25,602	26,435	9,898	17,064	39,568	32,134	38,743	60,733	13,963
	0.05	*0.0340*	*0.0443*	*0.0178*	*0.0369*	*0.07*	*0.0752*	*0.0756*	*0.1131*	*0.0568*
White bass					0	127	280	1,396	70	
					0	*0.0002*	*0.0007*	*0.0027*	*0.0001*	
White perch					0	229	0	0	578	
					0	*0.0004*	*0*	*0*	*0.0011*	
Yellow Perch	2,465	316,436	91,019	62,646	86,098	91,120	84,097	118,214	125,391	39,241
	1.25	*0.4207*	*0.1526*	*0.1126*	*0.186*	*0.1612*	*0.1968*	*0.2307*	*0.2335*	*0.1597*

Appendix 2, Table 1. Estimated harvest per hour, number harvested, and effort (angler hours, trips, and days) of sport fishing for all sites combined on the St. Marys River, by all modes (non-charter) in 2017. Area covered is from the compensating works at the head of the rapids to DeTour (including Potagannissing Bay). Two standard errors in parentheses.

All Sites								
	Month							
Species	Harvest per hour	May	June	July	August	September	October	Season
Atlantic Salmon	0.0042	28	124	492	275	99	7	1,025
	(0.0064)	(50)	(133)	(275)	(197)	(90)	(12)	(756)
Brown Trout	0.0000	0	0	0	2	0	0	2
	(0.0000)	(0)	(0)	(0)	(5)	(0)	(0)	(5)
Channel Catfish	0.0003	0	38	0	0	31	0	69
	(0.0012)	(0)	(76)	(0)	(0)	(60)	(0)	(136)
Chinook Salmon	0.0006	0	16	9	18	73	22	138
	(0.0018)	(0)	(32)	(18)	(36)	(87)	(36)	(209)
Coho Salmon	0.0003	63	0	0	0	1	0	64
	(0.0009)	(103)	(0)	(0)	(0)	(2)	(0)	(105)
Freshwater Drum	0.0004	0	75	0	0	0	20	95
	(0.0016)	(0)	(149)	(0)	(0)	(0)	(38)	(187)
Cisco	0.1313	0	0	32,267	0	0	0	32,267
	(0.1545)	(0)	(0)	(18,255)	(0)	(0)	(0)	(18,255)
Lake Trout	0.0000	0	0	0	0	9	0	9
	(0.0002)	(0)	(0)	(0)	(0)	(18)	(0)	(18)
Lake Whitefish	0.0245	457	457	4,962	25	73	37	6,011
	(0.0409)	(600)	(515)	(3,506)	(26)	(117)	(71)	(4,836)
Northern Pike	0.0161	899	1,543	755	302	430	39	3,968
	(0.0329)	(1,384)	(635)	(938)	(310)	(539)	(80)	(3,885)
Other	0.0001	0	16	0	0	16	0	32
	(0.0005)	(0)	(32)	(0)	(0)	(31)	(0)	(62)
Pink Salmon	0.0005	0	0	0	30	93	0	123
	(0.0013)	(0)	(0)	(0)	(44)	(114)	(0)	(158)
Pumpkinseed	0.0009	0	161	0	59	0	0	220
	(0.0027)	(0)	(244)	(0)	(76)	(0)	(0)	(320)
Rainbow Trout	0.0033	241	190	218	49	80	29	807
	(0.0074)	(267)	(193)	(210)	(67)	(74)	(58)	(870)
Smallmouth Bass	0.0125	174	1,262	1,228	88	321	0	3,073
	(0.0286)	(294)	(1,318)	(1,121)	(101)	(545)	(0)	(3,379)
Walleye	0.0568	3,076	4,629	2,718	1,167	1,495	878	13,963
	(0.1174)	(3,998)	(3,865)	(3,019)	(921)	(1,168)	(893)	(13,865)
Yellow Perch	0.1597	942	2,220	2,963	2,043	18,145	12,928	39,241
	(0.2510)	(1,388)	(2,252)	(2,515)	(2,518)	(10,492)	(10,492)	(29,657)
Angler hours		23,718	55,467	82,113	29,882	40,604	13,991	245,775
		(17,400)	(30,830)	(34,796)	(11,805)	(14,857)	(8,445)	(118,134)
Angler trips		5,692	13,326	19,791	6,428	10,018	3,115	58,370
		(4,029)	(5,731)	(8,901)	(3,275)	(3,822)	(1,931)	(27,688)
Angler Days		5,293	12,838	18,353	6,146	9,714	3,060	55,404
		(3,740)	(5,546)	(8,368)	(3,163)	(3,738)	(1,902)	(26,456)

Appendix 2, Table 2. Estimated harvest per hour, number harvested, and effort (angler hours, trips, and days) of sport fishing for the area from Sweets Point to the Neebish Island Ferry (includes the Michigan and Ontario waters of Raber Bay, Munuscong Lake, and Neebish Channel), by all modes (non-charter) in 2017. Two standard errors in parentheses.

Site 207								
	Month							
Species	Harvest per hour	May	June	July	August	September	October	Season
Channel Catfish	0.0013	0	38	0	0	23	0	61
	(0.0046)	(0)	(76)	(0)	(0)	(44)	(0)	(121)
Freshwater Drum	0.0021	0	75	0	0	0	20	95
	(0.0071)	(0)	(149)	(0)	(0)	(0)	(38)	(187)
Northern Pike	0.0100	144	95	76	8	118	12	453
	(0.0271)	(298)	(142)	(109)	(16)	(120)	(24)	(709)
Smallmouth Bass	0.0015	0	0	68	0	0	0	68
	(0.0041)	(0)	(0)	(107)	(0)	(0)	(0)	(107)
Walleye	0.1543	2,482	2,402	1,091	348	572	123	7,018
	(0.2493)	(3,261)	(1,905)	(628)	(204)	(373)	(150)	(6,520)
Yellow Perch	0.1121	431	1,301	1,888	160	570	749	5,099
	(0.1753)	(857)	(1,354)	(1,152)	(141)	(528)	(552)	(4,584)
Angler hours		7,409	15,682	11,545	3,369	5,560	1,926	45,491
		(6,997)	(11,312)	(4,062)	(1,280)	(1,545)	(957)	(26,153)
Angler trips		1,852	3,634	2,860	664	1,532	461	11,003
		(1,599)	(2,538)	(1,110)	(266)	(460)	(258)	(6,230)
Angler Days		1,634	3,444	2,730	650	1,532	458	10,448
		(1,454)	(2,414)	(1,087)	(259)	(460)	(253)	(5,928)

Appendix 2, Table 3. Estimated harvest per hour, number harvested, and effort (angler hours, trips, and days) of sport fishing for Lake George to Green Point (includes Little Lake George, and the area from Bellview Marina to Stribling Point in Ontario, Canada), by all modes (non-charter) in 2017. Two standard errors in parentheses.

Site 208								
	Month							
Species	Harvest per hour	May	June	July	August	September	October	Season
Atlantic Salmon	0.0010	10	0	11	11	0	0	32
	(0.0038)	(22)	(0)	(23)	(21)	(0)	(0)	(66)
Chinook Salmon	0.0009	0	0	0	8	21	0	29
	(0.0027)	(0)	(0)	(0)	(17)	(30)	(0)	(47)
Coho Salmon	0.0009	31	0	0	0	0	0	31
	(0.0025)	(43)	(0)	(0)	(0)	(0)	(0)	(43)
Lake Whitefish	0.0053	166	0	0	0	11	0	177
	(0.0167)	(267)	(0)	(0)	(0)	(21)	(0)	(288)
Northern Pike	0.0491	88	1,184	42	243	70	0	1,627
	(0.0457)	(102)	(226)	(88)	(210)	(165)	(0)	(791)
Pink Salmon	0.0002	0	0	0	8	0	0	8
	(0.0010)	(0)	(0)	(0)	(17)	(0)	(0)	(17)
Rainbow Trout	0.0040	36	0	65	8	0	23	132
	(0.0110)	(46)	(0)	(76)	(17)	(0)	(51)	(190)
Smallmouth Bass	0.0027	0	14	76	0	0	0	90
	(0.0080)	(0)	(30)	(109)	(0)	(0)	(0)	(139)
Walleye	0.0532	144	992	225	85	64	252	1,762
	(0.0963)	(207)	(683)	(254)	(108)	(129)	(286)	(1,667)
Yellow Perch	0.1504	511	499	610	913	230	2,218	4,981
	(0.3252)	(532)	(485)	(628)	(1,362)	(447)	(2,175)	(5,629)
Angler hours		2,321	9,441	6,898	5,789	5,567	3,106	33,122
		(1,752)	(5,699)	(2,755)	(2,813)	(2,415)	(1,870)	(17,306)
Angler trips		489	2,293	1,533	1,267	1,183	554	7,319
		(376)	(738)	(755)	(686)	(575)	(332)	(3,463)
Angler Days		458	2,293	1,511	1,228	1,183	554	7,227
		(356)	(738)	(752)	(670)	(575)	(332)	(3,423)

Appendix 2, Table 4. Estimated harvest per hour, number harvested, and effort (angler hours, trips, and days) of sport fishing for the area from the Neebish Island Ferry to the rapids in Sault Ste. Marie (includes Lake Nicolet, the St. Marys River below the rapids and the area from the rapids to Bellview Marina in Ontario, Canada), by all modes (non-charter) in 2017. Two standard errors in parentheses.

Site 209								
	Month							
Species	Harvest per hour	May	June	July	August	September	October	Season
Atlantic Salmon	0.0402	18	124	481	255	94	7	979
	(0.0700)	(29)	(133)	(252)	(163)	(81)	(12)	(669)
Channel Catfish	0.0003	0	0	0	0	8	0	8
	(0.0016)	(0)	(0)	(0)	(0)	(15)	(0)	(15)
Chinook Salmon	0.0028	0	16	9	0	43	0	68
	(0.0099)	(0)	(32)	(18)	(0)	(45)	(0)	(95)
Coho Salmon	0.0005	13	0	0	0	0	0	13
	(0.0025)	(24)	(0)	(0)	(0)	(0)	(0)	(24)
Cisco	0.0025	0	0	62	0	0	0	62
	(0.0087)	(0)	(0)	(83)	(0)	(0)	(0)	(83)
Lake Trout	0.0004	0	0	0	0	9	0	9
	(0.0019)	(0)	(0)	(0)	(0)	(18)	(0)	(18)
Lake Whitefish	0.0634	291	457	708	25	62	0	1,543
	(0.1401)	(333)	(515)	(369)	(26)	(96)	(0)	(1,339)
Northern Pike	0.0086	0	50	100	7	52	0	209
	(0.0303)	(0)	(48)	(153)	(14)	(75)	(0)	(289)
Other	0.0013	0	16	0	0	16	0	32
	(0.0065)	(0)	(32)	(0)	(0)	(31)	(0)	(62)
Pink Salmon	0.0028	0	0	0	22	47	0	69
	(0.0083)	(0)	(0)	(0)	(27)	(52)	(0)	(79)
Rainbow Trout	0.0149	98	117	113	0	35	0	363
	(0.0433)	(144)	(141)	(93)	(0)	(35)	(0)	(414)
Smallmouth Bass	0.0011	0	16	10	0	0	0	26
	(0.0054)	(0)	(32)	(19)	(0)	(0)	(0)	(51)
Walleye	0.0263	0	185	27	286	141	0	639
	(0.0622)	(0)	(154)	(54)	(259)	(127)	(0)	(595)
Yellow Perch	0.1032	0	278	135	334	1,418	347	2,512
	(0.2841)	(0)	(245)	(273)	(361)	(1,242)	(595)	(2,716)
Angler hours		1,357	4,718	8,166	4,009	5,729	353	24,332
		(1,071)	(1,931)	(2,828)	(1,352)	(2,104)	(274)	(9,559)
Angler trips		373	1,006	1,854	976	1,276	77	5,562
		(309)	(418)	(729)	(392)	(493)	(60)	(2,400)
Angler Days		356	984	1,565	850	1,230	77	5,062
		(295)	(411)	(628)	(361)	(475)	(60)	(2,229)

Appendix 2, Table 5. Estimated harvest per hour, number harvested, and effort (angler hours, trips, and days) of sport fishing for Potagannissing Bay (Michigan and Ontario), by allmodes (non-charter), in 2017. Two standard errors in parentheses.

Site 210								
	Month							
Species	Harvest per hour	May	June	July	August	September	October	Season
Cisco	0.3254	0	0	32,205	0	0	0	32,205
	(0.3841)	(0)	(0)	(18,172)	(0)	(0)	(0)	(18,172)
Lake Whitefish	0.0430	0	0	4,254	0	0	0	4,254
	(0.0663)	(0)	(0)	(3,138)	(0)	(0)	(0)	(3,138)
Northern Pike	0.0140	372	214	537	44	190	27	1,384
	(0.0356)	(570)	(220)	(588)	(70)	(179)	(56)	(1,682)
Pumpkinseed	0.0022	0	161	0	59	0	0	220
	(0.0068)	(0)	(244)	(0)	(76)	(0)	(0)	(320)
Smallmouth Bass	0.0268	174	1,232	1,074	88	86	0	2,654
	(0.0562)	(294)	(1,257)	(885)	(101)	(121)	(0)	(2,658)
Walleye	0.0295	450	569	232	448	718	499	2,916
	(0.0570)	(531)	(507)	(320)	(349)	(539)	(450)	(2,697)
Yellow Perch	0.2636	0	142	58	636	15,637	9,614	26,087
	(0.3301)	(0)	(169)	(118)	(654)	(7,506)	(7,170)	(15,616)
Angler hours		6,754	17,346	43,507	8,756	16,342	6,261	98,966
		(6,172)	(10,342)	(18,686)	(2,556)	(5,801)	(3,755)	(47,311)
Angler trips		1,520	3,978	10,682	1,473	4,040	1,395	23,088
		(1,382)	(1,647)	(4,741)	(642)	(1,455)	(866)	(10,734)
Angler Days		1,409	3,805	9,727	1,378	3,791	1,350	21,460
		(1,278)	(1,593)	(4,358)	(587)	(1,392)	(845)	(10,054)

Appendix 2, Table 6. Estimated harvest per hour, number harvested, and effort (angler hours, trips, and days) of sport fishing for the Rapids in Sault Ste. Marie, Ontario, by all modes (non-charter) in 2017. Two standard errors in parentheses.

Site 403								
	Month							
Species	Harvest per hour	May	June	July	August	September	October	Season
Atlantic Salmon	0.0011	0	0	0	9	5	0	14
	(0.0040)	(0)	(0)	(0)	(12)	(9)	(0)	(21)
Brown Trout	0.0002	0	0	0	2	0	0	2
	(0.0009)	(0)	(0)	(0)	(5)	(0)	(0)	(5)
Chinook Salmon	0.0032	0	0	0	10	9	22	41
	(0.0125)	(0)	(0)	(0)	(19)	(12)	(36)	(67)
Coho Salmon	0.0016	19	0	0	0	1	0	20
	(0.0071)	(36)	(0)	(0)	(0)	(2)	(0)	(38)
Lake Whitefish	0.0029	0	0	0	0	0	37	37
	(0.0132)	(0)	(0)	(0)	(0)	(0)	(71)	(71)
Pink Salmon	0.0036	0	0	0	0	46	0	46
	(0.0116)	(0)	(0)	(0)	(0)	(62)	(0)	(62)
Rainbow Trout	0.0243	107	73	40	41	45	6	312
	(0.0498)	(77)	(52)	(41)	(50)	(39)	(7)	(266)
Walleye	0.0003	0	0	0	0	0	4	4
	(0.0012)	(0)	(0)	(0)	(0)	(0)	(6)	(6)
Angler hours		4,604	2,469	1,796	869	1,641	1,475	12,854
		(1,338)	(1,342)	(752)	(460)	(732)	(727)	(5,350)
Angler trips		1,164	700	573	302	544	434	3,717
		(363)	(390)	(258)	(164)	(251)	(226)	(1,653)
Angler Days		1,142	694	531	294	535	427	3,623
		(356)	(389)	(237)	(161)	(247)	(224)	(1,614)

Appendix 2, Table 7. Estimated harvest per hour, number harvested, and effort (angler hours, trips, and days) of sport fishing for the St. Joseph Channel, Ontario, Canada, by all modes (non-charter) in 2017. Two standard errors in parentheses.

Site 405								
	Month							
Species	Harvest per hour	May	June	July	August	September	October	Season
Northern Pike	0.0095	295	0	0	0	0	0	295
	(0.0332)	(414)	(0)	(0)	(0)	(0)	(0)	(414)
Smallmouth Bass	0.0076	0	0	0	0	235	0	235
	(0.0340)	(0)	(0)	(0)	(0)	(424)	(0)	(424)
Walleye	0.0524	0	481	1,143	0	0	0	1,624
	(0.1910)	(0)	(616)	(1,763)	(0)	(0)	(0)	(2,379)
Yellow Perch	0.0181	0	0	272	0	290	0	562
	(0.0893)	(0)	(0)	(344)	(0)	(769)	(0)	(1,112)
Angler hours		1,273	5,811	10,201	7,090	5,765	870	31,010
		(70)	(204)	(5,714)	(3,344)	(2,261)	(862)	(12,455)
Angler trips		294	1,715	2,289	1,746	1,443	194	7,681
		(0)	(0)	(1,307)	(1,124)	(589)	(189)	(3,209)
Angler Days		294	1,618	2,289	1,746	1,443	194	7,584
		(0)	(0)	(1,307)	(1,124)	(589)	(189)	(3,209)

Appendix 3, Table 1. Estimated catch including legal and nonlegal release plus harvest for all sites combined on the St. Marys River in 2017. Two standard errors are in parentheses.

Site All Sites - 2017								
	Month							
Species	Catch per hour	May	June	July	August	September	October	Season
Atlantic Salmon	0.0071	185	219	761	454	116	18	1,753
	(0.0021)	(38)	(30)	(82)	(57)	(26)	(12)	(244)
Brown Trout	0.0000	0	0	0	2	4	0	6
	(0.0001)	(0)	(0)	(0)	(3)	(4)	(0)	(7)
Channel Catfish	0.0031	91	353	201	13	89	23	770
	(0.0014)	(19)	(51)	(48)	(10)	(24)	(10)	(162)
Chinook Salmon	0.0013	0	16	28	21	94	165	324
	(0.0008)	(0)	(8)	(11)	(13)	(32)	(26)	(89)
Coho Salmon	0.0004	63	0	0	0	1	46	110
	(0.0004)	(27)	(0)	(0)	(0)	(2)	(14)	(43)
Freshwater Drum	0.0007	0	75	23	37	0	43	178
	(0.0005)	(0)	(17)	(10)	(16)	(0)	(19)	(62)
Cisco	0.1369	0	0	33,658	0	0	0	33,658
	(0.0034)	(0)	(0)	(404)	(0)	(0)	(0)	(404)
Lake Trout	0.0001	0	0	0	0	9	9	18
	(0.0001)	(0)	(0)	(0)	(0)	(6)	(6)	(12)
Largemouth Bass	0.0001	0	0	0	21	0	4	25
	(0.0002)	(0)	(0)	(0)	(14)	(0)	(4)	(18)
Lake Whitefish	0.0262	506	536	5,232	25	111	37	6,447
	(0.0030)	(63)	(46)	(192)	(10)	(27)	(12)	(349)
Musky	0.0009	48	116	0	0	15	35	214
	(0.0006)	(14)	(32)	(0)	(0)	(8)	(12)	(66)
Northern Pike	0.0963	3,395	7,832	6,088	2,809	2,794	754	23,672
	(0.0133)	(238)	(414)	(354)	(225)	(225)	(114)	(1,569)
Other	0.0110	175	874	1,102	185	343	27	2,706
	(0.0029)	(37)	(110)	(87)	(41)	(51)	(10)	(338)
Pink Salmon	0.0047	0	0	0	30	512	624	1,166
	(0.0011)	(0)	(0)	(0)	(15)	(60)	(50)	(125)
Pumpkinseed	0.0033	12	224	215	342	0	27	820
	(0.0011)	(7)	(41)	(29)	(40)	(0)	(10)	(128)
Rainbow Trout	0.0181	2,327	1,131	437	131	130	285	4,441
	(0.0035)	(127)	(100)	(71)	(35)	(32)	(50)	(415)
Rock Bass	0.0077	0	1,256	495	52	51	41	1,895
	(0.0019)	(0)	(121)	(65)	(14)	(14)	(13)	(227)
Smallmouth Bass	0.0691	1,048	8,037	5,889	498	1,414	104	16,990
	(0.0083)	(93)	(350)	(283)	(79)	(147)	(32)	(985)
Walleye	0.1583	10,563	16,121	5,063	3,712	2,220	1,218	38,897
	(0.0134)	(272)	(472)	(286)	(269)	(171)	(120)	(1,589)
White Bass	0.0001	0	0	0	31	0	0	31
	(0.0001)	(0)	(0)	(0)	(11)	(0)	(0)	(11)
Yellow Perch	0.4034	2,069	5,624	11,041	5,454	44,131	30,827	99,146
	(0.0202)	(146)	(297)	(419)	(286)	(664)	(579)	(2,391)

Appendix 3, Table 1. Cont.

Angler hours		23,718	55,467	82,113	29,882	40,604	13,991	245,775
		(17,400)	(30,830)	(34,796)	(11,805)	(14,857)	(8,445)	(118,134)
Angler trips		5,692	13,326	19,791	6,428	10,018	3,115	58,370
		(4,029)	(5,731)	(8,901)	(3,275)	(3,822)	(1,931)	(27,688)
Angler Days		5,293	12,838	18,353	6,146	9,714	3,060	55,404
		(3,740)	(5,546)	(8,368)	(3,163)	(3,738)	(1,902)	(26,456)

Appendix 3, Table 2. Estimated catch including legal and nonlegal release plus harvest for Site 207. Two standard errors are in parentheses.

Site 207-2017								
	Month							
Species	Catch per hour	May	June	July	August	September	October	Season
Channel Catfish	0.0077	0	264	0	5	81	0	350
	(0.0021)	(0)	(32)	(0)	(4)	(18)	(0)	(55)
Freshwater Drum	0.0023	0	75	0	8	0	20	103
	(0.0012)	(0)	(17)	(0)	(6)	(0)	(9)	(32)
Cisco	0.0027	0	0	122	0	0	0	122
	(0.0008)	(0)	(0)	(22)	(0)	(0)	(0)	(22)
Largemouth Bass	0.0001	0	0	0	5	0	0	5
	(0.0002)	(0)	(0)	(0)	(4)	(0)	(0)	(4)
Musky	0.0042	48	95	0	0	15	35	193
	(0.0020)	(14)	(19)	(0)	(0)	(8)	(12)	(53)
Northern Pike	0.1493	1,046	2,377	1,756	401	841	371	6,792
	(0.0146)	(65)	(98)	(84)	(40)	(58)	(39)	(383)
Other	0.0046	0	152	43	13	0	0	208
	(0.0017)	(0)	(25)	(13)	(7)	(0)	(0)	(45)
Rock Bass	0.0155	0	623	43	0	0	41	707
	(0.0029)	(0)	(50)	(13)	(0)	(0)	(13)	(76)
Smallmouth Bass	0.0295	95	436	437	51	295	29	1,343
	(0.0064)	(19)	(42)	(46)	(14)	(34)	(11)	(167)
Walleye	0.5692	9,842	11,547	2,792	653	862	196	25,892
	(0.0251)	(198)	(215)	(106)	(51)	(59)	(28)	(657)
Yellow Perch	0.2256	526	3,171	3,518	470	1,012	1,565	10,262
	(0.0182)	(46)	(113)	(123)	(43)	(64)	(86)	(475)
Angler hours		7,409	15,682	11,545	3,369	5,560	1,926	45,491
		(6,997)	(11,312)	(4,062)	(1,280)	(1,545)	(957)	(26,153)
Angler trips		1,852	3,634	2,860	664	1,532	461	11,003
		(1,599)	(2,538)	(1,110)	(266)	(460)	(258)	(6,230)
Angler Days		1,634	3,444	2,730	650	1,532	458	10,448
		(1,454)	(2,414)	(1,087)	(259)	(460)	(253)	(5,928)

Appendix 3, Table 3. Estimated catch including legal and nonlegal release plus harvest for Site 208. Two standard errors are in parentheses.

Site 208 - 2017								
	Month							
Species	Catch per hour	May	June	July	August	September	October	Season
Atlantic Salmon	0.0032	73	0	23	11	0	0	107
	(0.0019)	(17)	(0)	(10)	(7)	(0)	(0)	(33)
Channel Catfish	0.0055	91	0	67	0	0	23	181
	(0.0026)	(19)	(0)	(16)	(0)	(0)	(10)	(45)
Chinook Salmon	0.0009	0	0	0	8	21	0	29
	(0.0009)	(0)	(0)	(0)	(6)	(9)	(0)	(15)
Coho Salmon	0.0009	31	0	0	0	0	0	31
	(0.0006)	(11)	(0)	(0)	(0)	(0)	(0)	(11)
Freshwater Drum	0.0014	0	0	23	0	0	23	46
	(0.0011)	(0)	(0)	(10)	(0)	(0)	(10)	(19)
Largemouth Bass	0.0001	0	0	0	0	0	4	4
	(0.0002)	(0)	(0)	(0)	(0)	(0)	(4)	(4)
Lake Whitefish	0.0053	166	0	0	0	11	0	177
	(0.0019)	(26)	(0)	(0)	(0)	(7)	(0)	(32)
Musky	0.0004	0	14	0	0	0	0	14
	(0.0004)	(0)	(7)	(0)	(0)	(0)	(0)	(7)
Northern Pike	0.2095	461	3,396	1,589	942	449	101	6,938
	(0.0241)	(43)	(160)	(90)	(61)	(42)	(20)	(417)
Other	0.0071	71	143	0	11	11	0	236
	(0.0031)	(17)	(24)	(0)	(7)	(7)	(0)	(54)
Pink Salmon	0.0002	0	0	0	8	0	0	8
	(0.0003)	(0)	(0)	(0)	(6)	(0)	(0)	(6)
Rainbow Trout	0.0056	43	28	65	25	0	23	184
	(0.0034)	(13)	(11)	(16)	(10)	(0)	(10)	(59)
Smallmouth Bass	0.0441	46	360	931	78	43	4	1,462
	(0.0085)	(14)	(38)	(61)	(18)	(13)	(4)	(147)
Walleye	0.1251	189	2,519	735	349	85	268	4,145
	(0.0161)	(27)	(100)	(61)	(37)	(18)	(33)	(278)
Yellow Perch	0.3309	1,377	885	1,239	1,876	925	4,659	10,961
	(0.0282)	(74)	(59)	(70)	(87)	(61)	(137)	(488)
Angler hours		2,321	9,441	6,898	5,789	5,567	3,106	33,122
		(1,752)	(5,699)	(2,755)	(2,813)	(2,415)	(1,870)	(17,306)
Angler trips		489	2,293	1,533	1,267	1,183	554	7,319
		(376)	(738)	(755)	(686)	(575)	(332)	(3,463)
Angler Days		458	2,293	1,511	1,228	1,183	554	7,227
		(356)	(738)	(752)	(670)	(575)	(332)	(3,423)

Appendix 3, Table 4. Estimated catch including legal and nonlegal release plus harvest for Site 209. Two standard errors are in parentheses.

Site 209 - 2017								
	Month							
Species	Catch per hour	May	June	July	August	September	October	Season
Atlantic Salmon	0.0648	112	219	708	419	111	7	1,576
	(0.0187)	(21)	(30)	(61)	(41)	(21)	(5)	(179)
Channel Catfish	0.0007	0	0	0	8	8	0	16
	(0.0012)	(0)	(0)	(0)	(6)	(6)	(0)	(11)
Chinook Salmon	0.0042	0	16	28	0	59	0	103
	(0.0036)	(0)	(8)	(11)	(0)	(15)	(0)	(34)
Coho Salmon	0.0005	13	0	0	0	0	0	13
	(0.0008)	(7)	(0)	(0)	(0)	(0)	(0)	(7)
Cisco	0.0025	0	0	62	0	0	0	62
	(0.0016)	(0)	(0)	(16)	(0)	(0)	(0)	(16)
Lake Trout	0.0004	0	0	0	0	9	0	9
	(0.0006)	(0)	(0)	(0)	(0)	(6)	(0)	(6)
Lake Whitefish	0.0779	340	536	895	25	100	0	1,896
	(0.0181)	(37)	(46)	(60)	(10)	(20)	(0)	(173)
Musky	0.0003	0	7	0	0	0	0	7
	(0.0006)	(0)	(5)	(0)	(0)	(0)	(0)	(5)
Northern Pike	0.0434	27	521	191	70	195	53	1,057
	(0.0161)	(10)	(46)	(39)	(17)	(28)	(15)	(154)
Other	0.0020	0	16	9	0	23	0	48
	(0.0025)	(0)	(8)	(6)	(0)	(10)	(0)	(24)
Pink Salmon	0.0028	0	0	0	22	47	0	69
	(0.0028)	(0)	(0)	(0)	(9)	(17)	(0)	(26)
Rainbow Trout	0.0238	107	231	167	7	43	24	579
	(0.0110)	(21)	(30)	(26)	(5)	(13)	(10)	(105)
Smallmouth Bass	0.0159	0	336	10	26	16	0	388
	(0.0064)	(0)	(37)	(6)	(10)	(8)	(0)	(61)
Walleye	0.0502	0	532	46	443	201	0	1,222
	(0.0142)	(0)	(46)	(14)	(48)	(28)	(0)	(136)
Yellow Perch	0.2065	0	574	480	1,076	2,378	517	5,025
	(0.0314)	(0)	(48)	(44)	(66)	(98)	(45)	(300)
Angler hours		1,357	4,718	8,166	4,009	5,729	353	24,332
		(1,071)	(1,931)	(2,828)	(1,352)	(2,104)	(274)	(9,559)
Angler trips		373	1,006	1,854	976	1,276	77	5,562
		(309)	(418)	(729)	(392)	(493)	(60)	(2,400)
Angler Days		356	984	1,565	850	1,230	77	5,062
		(295)	(411)	(628)	(361)	(475)	(60)	(2,229)

Appendix 3, Table 5. Estimated catch including legal and nonlegal release plus harvest for Site 210. Two standard errors are in parentheses.

Site 210 - 2017								
	Month							
Species	Catch per hour	May	June	July	August	September	October	Season
Channel Catfish	0.0004	0	0	41	0	0	0	41
	(0.0003)	(0)	(0)	(13)	(0)	(0)	(0)	(13)
Freshwater Drum	0.0003	0	0	0	29	0	0	29
	(0.0002)	(0)	(0)	(0)	(11)	(0)	(0)	(11)
Cisco	0.3382	0	0	33,474	0	0	0	33,474
	(0.0077)	(0)	(0)	(366)	(0)	(0)	(0)	(366)
Largemouth Bass	0.0002	0	0	0	16	0	0	16
	(0.0002)	(0)	(0)	(0)	(10)	(0)	(0)	(10)
Lake Whitefish	0.0438	0	0	4,337	0	0	0	4,337
	(0.0028)	(0)	(0)	(132)	(0)	(0)	(0)	(132)
Northern Pike	0.0559	1,271	851	1,635	523	1,074	180	5,534
	(0.0074)	(71)	(58)	(81)	(48)	(66)	(27)	(351)
Other	0.0222	104	552	1,047	161	309	27	2,200
	(0.0043)	(20)	(47)	(65)	(27)	(35)	(10)	(205)
Pumpkinseed	0.0076	12	161	215	342	0	27	757
	(0.0024)	(7)	(25)	(29)	(40)	(0)	(10)	(112)
Rock Bass	0.0120	0	633	452	52	51	0	1,188
	(0.0032)	(0)	(71)	(52)	(14)	(14)	(0)	(152)
Smallmouth Bass	0.1010	907	4,166	4,069	343	438	71	9,994
	(0.0087)	(60)	(129)	(128)	(37)	(42)	(17)	(413)
Walleye	0.0510	532	836	347	1,506	1,072	750	5,043
	(0.0072)	(46)	(58)	(37)	(78)	(65)	(55)	(339)
White Bass	0.0003	0	0	0	31	0	0	31
	(0.0002)	(0)	(0)	(0)	(11)	(0)	(0)	(11)
Yellow Perch	0.7278	166	925	5,532	2,032	39,291	24,086	72,032
	(0.0218)	(26)	(61)	(149)	(90)	(396)	(310)	(1,032)
Angler hours		6,754	17,346	43,507	8,756	16,342	6,261	98,966
		(6,172)	(10,342)	(18,686)	(2,556)	(5,801)	(3,755)	(47,311)
Angler trips		1,520	3,978	10,682	1,473	4,040	1,395	23,088
		(1,382)	(1,647)	(4,741)	(642)	(1,455)	(866)	(10,734)
Angler Days		1,409	3,805	9,727	1,378	3,791	1,350	21,460
		(1,278)	(1,593)	(4,358)	(587)	(1,392)	(845)	(10,054)

Appendix 3, Table 6. Estimated catch including legal and nonlegal release plus harvest for Site 403. Two standard errors are in parentheses.

Site 403-2017								
	Month							
Species	Catch per hour	May	June	July	August	September	October	Season
Atlantic Salmon	0.0054	0	0	30	24	5	11	70
	(0.0060)	(0)	(0)	(11)	(10)	(4)	(7)	(32)
Brown Trout	0.0005	0	0	0	2	4	0	6
	(0.0013)	(0)	(0)	(0)	(3)	(4)	(0)	(7)
Channel Catfish	0.0142	0	89	93	0	0	0	182
	(0.0071)	(0)	(19)	(19)	(0)	(0)	(0)	(38)
Chinook Salmon	0.0149	0	0	0	13	14	165	192
	(0.0075)	(0)	(0)	(0)	(7)	(7)	(26)	(40)
Coho Salmon	0.0051	19	0	0	0	1	46	66
	(0.0045)	(9)	(0)	(0)	(0)	(2)	(14)	(24)
Lake Trout	0.0007	0	0	0	0	0	9	9
	(0.0011)	(0)	(0)	(0)	(0)	(0)	(6)	(6)
Lake Whitefish	0.0029	0	0	0	0	0	37	37
	(0.0023)	(0)	(0)	(0)	(0)	(0)	(12)	(12)
Other	0.0011	0	11	3	0	0	0	14
	(0.0019)	(0)	(7)	(3)	(0)	(0)	(0)	(10)
Pink Salmon	0.0847	0	0	0	0	465	624	1,089
	(0.0174)	(0)	(0)	(0)	(0)	(43)	(50)	(93)
Pumpkinseed	0.0049	0	63	0	0	0	0	63
	(0.0030)	(0)	(16)	(0)	(0)	(0)	(0)	(16)
Rainbow Trout	0.2861	2,177	872	205	99	87	238	3,678
	(0.0468)	(93)	(59)	(29)	(20)	(19)	(31)	(250)
Walleye	0.0003	0	0	0	0	0	4	4
	(0.0007)	(0)	(0)	(0)	(0)	(0)	(4)	(4)
Angler hours		4,604	2,469	1,796	869	1,641	1,475	12,854
		(1,338)	(1,342)	(752)	(460)	(732)	(727)	(5,350)
Angler trips		1,164	700	573	302	544	434	3,717
		(363)	(390)	(258)	(164)	(251)	(226)	(1,653)
Angler Days		1,142	694	531	294	535	427	3,623
		(356)	(389)	(237)	(161)	(247)	(224)	(1,614)

Appendix 3, Table 7. Estimated catch including legal and nonlegal release plus harvest for Site 405. Two standard errors are in parentheses.

Site 405 - 2017								
	Month							
Species	Catch per hour	May	June	July	August	September	October	Season
Northern Pike	0.1081	590	687	917	873	235	49	3,351
	(0.0213)	(49)	(52)	(61)	(59)	(31)	(14)	(265)
Smallmouth Bass	0.1226	0	2,739	442	0	622	0	3,803
	(0.0158)	(0)	(105)	(42)	(0)	(50)	(0)	(197)
Walleye	0.0836	0	687	1,143	761	0	0	2,591
	(0.0141)	(0)	(52)	(68)	(55)	(0)	(0)	(175)
Yellow Perch	0.0279	0	69	272	0	525	0	866
	(0.0077)	(0)	(17)	(33)	(0)	(46)	(0)	(95)
Angler hours		1,273	5,811	10,201	7,090	5,765	870	31,010
		(70)	(204)	(5,714)	(3,344)	(2,261)	(862)	(12,455)
Angler trips		294	1,715	2,289	1,746	1,443	194	7,681
		(0)	(0)	(1,307)	(1,124)	(589)	(189)	(3,209)
Angler Days		294	1,618	2,289	1,746	1,443	194	7,584
		(0)	(0)	(1,307)	(1,124)	(589)	(189)	(3,209)

Appendix 4. Summary of biological data collected from the St. Marys River during the open water sport fishery for the years 1999-2000, 2005-2009 and 2017, by capture sites. N = sample size and appears in parentheses if different than reported.

Species	Year	Capture sites	N	Mean Age	Mean Length (cm)	Mean Wt (g)
Atlantic Salmon	1999	209, 210	15	3.2 (14)	73.0	4 810
	2001	209	13	2.5 (13)	65.7	3 148
	2006	209	11	3.5 (11)	65.3	3 336
	2007	210	1	3.0 (1)	59.7	2 041
	2008	208, 209	109	2.6 (95)	65.8	3 247
	2009	403	6	2.8 (6)	67.1	2 895
	2017	208, 209, 403	117	2.2 (41)	56.6	2174 (116)
Brown Trout	2017	403	1	3	46.0	1202
Channel Catfish	2017	207	2		49.9	1429
Chinook Salmon	1999	208, 209	214	3.0 (205)	84.0	6 698
	2000	208	14	3.1	86.0	7 355
	2001	208, 209, 210	14	2.9	81.0	5 621
	2006	208, 209, 210	56	3.5 (41)	77.0	4 248
	2007	208, 210, 405	62	2.7	75.0	4 090
	2008	208, 209, 403	47	2.7 (36)	75.4	4 611
	2009	207, 403	7	2.9	82.4	5 242
	2017	208, 403	6	2.8 (5)	78.1	5934
Coho Salmon	1999	209	18	2.7 (16)	60.2	2 694
	2006	208, 209	5	2.0 (4)	52.1	1 760
	2007	208, 405	6	2.7	69.6	3 145
	2008	208, 209, 403	36	2	57.4	1 971
	2009	403	18	2.1	64.9	2 389
	2017	403	1	2	43.4	1202
Cisco	1999	207, 209, 210	138	4.2	33.8	540 (110)
	2000	207, 209, 210	88	3.8 (85)	31.6	469
	2001	207, 209, 210	58	4	33.8	
	2005	207, 210	53	3	32.4	358
	2006	210	70	5.3	36.8	526
	2007	207, 210	65	4.1	34.9	447
	2008	209	23	4.2	36.4	531
	2009	207, 210	95	4.9 (93)	38.0	606
	2017	209, 210	92		38.5	605 (91)
Freshwater Drum	2017	207	1		50.8	2540
Lake Whitefish	1999	209, 404	157	4.6 (154)	41.5	614 (156)
	2000	210	2	5	49.5	1 270
	2006	209	7	3.3	41.2	719
	2007	207, 210	12	4.9	42.9	794
	2008	209	60	3.7	38.3	584
	2009	210	6		41.6	726
	2008	208, 405	11	3.1	36.3	920
	2009	210	6	5.7	41.6	726
	2017	208, 210, 403	4	4 (3)	46.4	1008
Largemouth Bass	2008	208, 405	11	3.2	36.3	920
	2009	210	1		38.1	771

Appendix 4, Cont.

Species	Year	Capture sites	N	Mean Age	Mean Length (cm)	Mean Wt (g)
Muskellunge	2000	207	8		108.4	8 541
	2007	207	1		94.5	
	2008	209	1	10	108.0	8 618
	2009	207	3	4	76.7	33 817
		207, 208, 209,				
Northern Pike	1999	210	88	4.6 (86)	66.8 (87)	1 852 (87)
		207, 208, 209,				
	2000	210	42	4.3	66.8	1 702
	2001	207, 208, 210	22	5.6	69.6	2 208
	2005	207, 210	15	5.1	73.4	2 734
	2006	208, 207, 209	83	3.8	65.1	1 855
		207, 208, 210,				
	2007	405	70	4.4	67.3	2 223
	2008	208, 209, 405	146	4.0	69.8	2 224
	2009	207, 210, 405	45	5.6 (44)	66.5	1 878
	2017	207, 208, 209, 210	74	4.6	67.6	1876
Pink Salmon	1999	208, 209	82	2.0 (56)	52.1	1 398
	2000	209	1	1	49.3	907
	2008	209, 403	31	1 (14)	44.3	661
	2009	403	2		47.2	1 089
	2017	208, 209, 403	31	2 (7)	50.5	1283
Rainbow Trout	1999	209	29	2.5 (28)	50.3	1 595 (28)
	2000	208, 209	2	2	74.2	2 381
	2001	208, 209	2	3	61.0	2 041
	2006	209	11	2.5	44.9	1 064
	2008	208, 209, 403	25	3.5 (16)	54.6	1 970
	2009	403	69	4.8 (63)	63.7	2 757
	2017	208, 209, 403	32	2.5	48.5	1549
Smallmouth Bass	1999	208	10	6.3	36.5	809
	2000	207, 210	22	6.5	39.4	1 000
	2001	207, 210	12	5.6	21.9	1 104
	2005	207, 210	52	4.7	39.2	1 010
	2006	207, 208, 209	44	5.7	41.3	1 334
	2007	207, 210, 405	57	4.8 (56)	36.5	909
	2008	208, 209	52	5.3 (51)	40.1	1 225
	2009	207, 210, 405	63	5.7	40.0	1 172
	2017	207, 208, 209, 210	57	4 (2)	39.6	1012 (32)
		207, 208, 209,				

Appendix 4, Cont.

Species	Year	Capture sites	N	Mean Age	Mean Length (cm)	Mean Wt (g)
Walleye	1999	210	205	5.4 (203)	47.1	1 042
	2000	207, 209, 210	78	5.7	48.5	1 135
	2001	207, 209, 210	211	4.1	47.7	1 046
	2005	207, 210	189	5.3	45.9	987
	2006	207, 208, 209	148	4	44.5	1 000
		207, 210, 208.				
	2007	405	259	4.7 (257)	44.7	1 026
	2008	208, 209	183	4.8	46.7	1 095
	2009	207, 210, 405	173	5.7 (172)	46.1	1 083
	2017	207, 208, 209, 210, 403	157	5.3 (21)	46.3	1019 (116)
Yellow Perch	1999	207, 209, 210	258	5.5 (255)	21.9 (257)	151 (250)
	2000	207 210	127	3.4	24.2	321
		207, 208, 209,				
	2001	210	100	3.8	23.0	180
	2005	207, 210	150	3.7 (142)	21.2	125
		207, 208, 209,				
	2006	210	160	3.1 (159)	22.2	223
	2007	207, 210, 405	199	3.2 (195)	22.7	198
	2008	208, 209	174	3.3	21.5	135
	2009	207, 210, 405	190	3.5 (189)	21.3	128
	2017	207, 208, 209, 210	170	5.3 (3)	22.9	165 (155)