

STUDY PERFORMANCE REPORT

State: Michigan

Project No.: F-81-R-16

Study No.: 230488

Title: Status of the Lake St. Clair fish community and sport fishery

Period Covered: October 1, 2014 to September 30, 2015

Study Objectives: The objectives of this survey are: (1) to measure the relative abundance of Yellow Perch *Perca flavescens*, forage fish, and juvenile game fish species in Lake St. Clair; (2) to assess the status of adult game fish populations in the lake; (3) to document the abundance, growth, mortality rates, and movements of Smallmouth Bass *Micropterus dolomieu* in the St. Clair system; and (4) to monitor trends in sport fish catch rates for the Lake St. Clair sport fishery for selected species.

Summary: Fish populations were sampled with trap nets and 10-m headrope bottom trawls during 2014 and 2015. Data entry and analysis for all 2014 trawls and trap nets are completed. Smallmouth Bass were tagged and tag recovery data were compiled and analyzed. Sport fishing catch and effort information were collected with a voluntary Lake St. Clair Angler Diary Program in 2014 and 2015. Data entry and analysis for all 2014 angler diaries are complete. All field sampling continued as scheduled in 2015.

Findings: Jobs 1 through 5 were scheduled for 2014-15, and progress is reported below.

Job 1. Survey design and coordination.—No changes were made to any of the field collection portions of the survey. All sampling locations, gear, and protocols were consistent with previous years. Coordination with the Ontario Ministry of Natural Resources was ongoing throughout the year, as the joint Lake St. Clair Angler Diary Program requires frequent interactions to maintain consistency, ensure adequate supplies of materials, and verify data quality assurance and control. Other value-added sample coordination included collection of tissue samples for viral hemorrhagic septicemia (VHS) testing by University of Toledo staff and selected fish species for parasite and disease investigations at Michigan State University.

Job 2. Conduct surveys and process samples.—Index trap nets were fished in Anchor Bay of Lake St. Clair to capture predator fish species and collect biological data on their populations. In 2015, four trap nets were fished from April 27 to May 18. A total of 36 index net lifts captured 113 Northern Pike *Esox lucius*, 164 Smallmouth Bass, and 73 Walleye *Sander vitreus*. A total of 153 Smallmouth Bass were tagged with monel metal jaw tags in 2015. Also during 2015, fish were collected at the Anchor Bay index site with a 10-m headrope bottom trawl with three tows in June and three tows in September.

The voluntary Lake St. Clair Angler Diary Program was used to collect catch and effort data for recreational fishing on Lake St. Clair. In 2014, the MDNR distributed 45 angler diaries to Michigan resident sport anglers interested in participating in the diary program. A total of 34 diaries were returned by cooperating Michigan resident anglers during fall and early winter. The Lake St. Clair Angler Diary Program provides annual estimates of catch rates for the major sport fish species in the lake.

Sampling continued on schedule in 2015. Scale and spine samples collected for age determination in 2015 will be processed by March 2016.

Job 3. Manage data and maintain databases.—Data from the 2014 index trawl survey, 2014 angler diary program, and 2014 trap-net survey were scanned or transferred from original data sheets to relational databases. All data files were proofed against the original data sheets for scanning or data-entry errors. The 2014 data for the Lake St. Clair trap-net survey were added to the Access database for Lake St. Clair trap-net data, which contains all trap-net survey data from 2002 to 2014. The Lake St. Clair – Lake Erie tag return database and web reporting form were redesigned to improve reporting, processing, and storage of tag recovery data.

Tagging data on individual Smallmouth Bass were entered into computer files and added to the Lake St. Clair – Lake Erie tag return database. In 2014-15, tag recovery data were collected from anglers and added to the database. Reported capture locations were converted to geographic coordinates and combined with appropriate tagging data. Acknowledgement letters were sent to each angler to thank them for their cooperation. Since the trap-net survey began in 2002, anglers have recovered and reported a total of 178 Walleye tags and 604 Smallmouth Bass tags (through September 31, 2015). In 2015 alone, 24 Smallmouth Bass and 1 Walleye tag recoveries have been reported. Across all years, recaptures of tagged Walleye have been more dispersed compared to Smallmouth Bass tag recaptures.

Lake St. Clair Angler Diary Program data were shared with the Ontario Ministry of Natural Resources to allow merging the US and Ontario angler data into a single complete diary dataset for Lake St. Clair in 2014. New angler diaries were distributed to 35 volunteers in April and May 2015 and will be recalled in November 2015.

Job 4. Analyze data.—Analyses for the most recent data available for the various components of this survey are presented below.

- a. Trap-net survey: In 2014, the MDNR surveyed adult fish populations in Anchor Bay, Lake St. Clair with trap nets from April 24 to May 19. A total of 2,360 fish representing 25 species were captured during the survey. The catch also included six Mudpuppies *Necturus maculosus*. Rock Bass *Ambloplites rupestris* were numerically dominant, accounting for 34% of the total. Other common species in the nets included Channel Catfish *Ictalurus punctatus* (18%), Smallmouth Bass (15%), and Northern Pike (8%). Ages were estimated for Smallmouth Bass, Walleye, and Northern Pike based on interpretation of dorsal spine samples. The dominant Walleye year class was the 2011 year class (Age 3), accounting for 38% of the total catch. The 2010 year class was also a component of the Walleye catch, accounting for 21% of the total. For Smallmouth Bass, the 2011 (25%), 2010 (19%), 2009 (10%), and 2008 (18%) year classes, in combination, accounted for 72% of the catch. The trap-net survey again documented an abundant population of Channel Catfish in Anchor Bay with many trophy size individuals. The high abundance of large Channel Catfish suggests that this population is currently experiencing low exploitation.
- b. Trawl survey: A total of nine trawl tows were conducted at the Anchor Bay index trawling site in 2014. The spring samples were dominated by Yellow Perch and Spottail Shiner *Notropis hudsonius*. The species with highest mean densities in the fall samples were Sand Shiner *Notropis stramineus*, Trout-perch *Percopsis omiscomaycus*, Round Goby *Neogobius melanostomus*, and Logperch *Percina caprodes*. Alewife *Alosa pseudoharengus* catches have been low since 2003, likely a result of the Alewife population crash in Lake Huron. Yellow Perch age-specific catch rates from the trawl survey indicate highly variable recruitment in Lake St. Clair (Table 1). Yellow Perch recruitment in 1998, 2003, 2007, 2008, 2010, and 2013

was strong, with total CPE values for those year classes all over 1,000 fish per tow. Alternatively, recruitment was poor in 1999, 2000, and 2002, 2011, and 2012. September trawling in Anchor Bay provides early indications of spawning success for Yellow Perch and Smallmouth Bass. Catch rates for young-of-year Yellow Perch from September trawls indicate the 2014 year class was a weak cohort, similar to those produced in 2011 and 2012. For Smallmouth Bass, the fall trawl catch rate indicated the 2014 year class was below the long-term average, but improved over the low rates recorded in 2009, 2011, and 2012.

- c. Lake St. Clair Angler Diary Program: Angler catch rates were calculated for the combined Ontario and Michigan data, for the four major sport fish species sought by Lake St. Clair anglers: Walleye, Yellow Perch, Smallmouth Bass, and Muskellunge *Esox masquinongy* (Table 2). For the four species combined, 534 fishing trips were recorded by participants. Catch rates for all four species declined for a second consecutive year in 2014. While the Walleye and Yellow Perch fishery remain harvest-oriented, anglers reported releasing 80% of the Smallmouth Bass and 100% of the Muskellunge caught during targeted fishing effort in 2014.

Job 5. Write annual performance report.—This progress report was prepared. In addition, a study summary was completed (Attachment 1).

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Date: September 30, 2015

Table 1.—Catch rate by age for Yellow Perch in June index trawl tows on Lake St. Clair.

Year class	Total CPUE	Survey year														
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1987	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1988	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1989	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1990	24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1991	117	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1992	51	0.1	0.5	—	0.7	—	—	—	—	—	—	—	—	—	—	—
1993	581	1.5	3.3	—	1.3	—	—	—	—	—	—	—	—	—	—	—
1994	903	8.3	10.6	1.3	0.7	—	0.7	—	—	—	—	—	—	—	—	—
1995	148	12.3	21.1	10.4	2.7	0.6	0.0	—	—	—	—	—	—	—	—	—
1996	280	11.3	35.3	9.7	9.4	0.6	1.3	—	—	—	—	—	—	—	—	—
1997	218	5.5	52.8	61.3	44.4	3.6	7.9	0.8	—	—	—	—	—	—	—	—
1998	1,355	114.1	347.7	83.7	118.4	22.7	17.7	0.4	—	—	—	—	—	—	—	—
1999	103	4.8	25.8	17.6	24.9	22.7	3.9	2.5	0.4	—	—	—	—	—	—	—
2000	82	—	2.7	4.6	5.4	43.0	20.5	1.6	4.3	—	—	—	—	—	—	—
2001	312	—	—	131.3	89.5	50.2	25.3	11.7	3.6	0.4	—	—	—	—	—	—
2002	89	—	—	—	8.7	11.4	6.1	11.7	51.0	0.4	—	—	—	—	—	—
2003	1,373	—	—	—	—	705.3	396.6	174.8	26.4	45.8	21.7	0.7	—	1.8	—	—
2004	284	—	—	—	—	—	9.0	158.3	17.8	77.7	16.9	0.5	3.4	0.0	—	—
2005	265	—	—	—	—	—	—	33.6	25.8	149.9	36.1	9.9	6.1	3.4	—	—
2006	338	—	—	—	—	—	—	—	4.5	108.2	98.6	31.5	84.0	10.4	0.3	—
2007	3,585	—	—	—	—	—	—	—	—	1,003.3	1,717.5	646.6	197.8	17.4	2.2	—
2008	2,400	—	—	—	—	—	—	—	—	—	1,264.5	625.3	393.2	91.3	24.1	1.3
2009	432	—	—	—	—	—	—	—	—	—	—	63.5	152.5	192.5	22.8	0.3
2010	1,094	—	—	—	—	—	—	—	—	—	—	—	532.6	434.4	113.8	13.2
2011	198	—	—	—	—	—	—	—	—	—	—	—	—	72.6	99.4	25.6
2012	190	—	—	—	—	—	—	—	—	—	—	—	—	—	72.1	117.8
2013	1,928	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,927.7
Total		158	500	320	306	860	489	395	134	1,386	3,155	1,378	1,370	824	335	158

Table 2.—Angler effort, catch, and catch rates from the voluntary Lake St. Clair Angler Diary Program.

Year	Trips seeking	Effort (rod-hours)	Number caught	Number kept	Catch per rod-hour	% released
Walleye						
2006	436	4,204	2,373	2,046	0.56	14
2007	376	3,633	1,479	1,290	0.41	13
2008	291	2,819	704	596	0.25	15
2009	425	4,142	1,580	1,387	0.38	12
2010	305	3,008	933	867	0.31	7
2011	323	3,373	1,149	918	0.34	20
2012	352	3,587	1,985	1,611	0.55	18
2013	350	3,446	1,678	1,412	0.49	16
2014	275	2,630	1,171	882	0.44	25
Yellow Perch						
2006	231	2,456	13,261	6,785	5.40	49
2007	275	3,399	14,901	10,322	4.38	31
2008	154	2,143	3,380	2,223	1.58	34
2009	157	2,494	5,801	3,146	2.33	46
2010	157	2,051	6,669	3,456	3.25	48
2011	165	2,525	7,439	4,107	2.95	45
2012	143	2,318	7,047	4,340	3.04	38
2013	102	1,753	3,901	2,952	2.22	24
2014	134	2,081	3,969	2,371	1.90	40
Smallmouth Bass						
2006	84	828	564	72	0.68	87
2007	90	742	518	75	0.70	86
2008	88	731	425	103	0.58	76
2009	42	378	279	29	0.74	90
2010	88	964	280	96	0.29	66
2011	84	1,255	639	58	0.51	91
2012	71	1,009	732	167	0.72	77
2013	101	1,288	787	202	0.61	74
2014	103	1,415	419	85	0.30	80
Muskellunge						
2006	89	1,838	130	0	0.071	100
2007	65	1,264	149	0	0.118	100
2008	81	1,752	105	4	0.060	96
2009	79	2,746	283	1	0.103	100
2010	53	1,650	148	1	0.090	99
2011	28	994	89	0	0.090	100
2012	31	853	117	0	0.137	100
2013	19	498	33	0	0.066	100
2014	22	431	19	0	0.044	100