Martiny Flooding
T15N, R07W,06
2017

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Environment

Martiny Flooding was created in 1954 by the construction of the Winchester Dam on the South Branch Chippewa River, and flooding the following lakes: Boom Lake, Dogfish Lake, Big Evans Lake, Lower Evans Lake, Upper Evans Lake, Lost Lake, Manake Lake, Saddleback Lake, and Tubbs Lake. These basins range from approximately 10 to 40 feet in depth and are connected by shallow water. The 1,420 acres the dam impounds make up the flooded portion of the Martiny State Game Area. There are opportunities for hunting, fishing, camping, and boating within the state game area. The Winchester Dam is listed as a significant hazard dam as it is located upstream of Barryton. The dam is 13 ft in height, and has a hydraulic head of 8 ft. A legal lake level was established in 1961 and is set at 993.8 ft. NGVD. It is no longer possible to draw down the marsh or manipulate water levels to perform management. Inlets to the Martiny Flooding include Chippewa Creek and Roundybranch Creek to Lower Evans and Upper Evans, respectively. To be consistent with past surveys, the entire flooding was treated as one large lake.

The topography surrounding the flooding and within the game area boundaries is irregular, with poorly drained soils, and much of the surrounding area is wooded. Cover types can be characterized as 48% aspen, 20% water, 9% lowland hardwood, 5% marsh/bog, 4% grass, 4% lowland conifers, 3% oaks, 2% lowland brush, <1% northern hardwood, 1% red pine, and 4% non-stocked stands.

Since the Martiny Flooding is made up of several lakes, the shoreline is very convoluted. The flooding has several basins interconnected by channels and wetland emergent vegetation. Most of the surrounding land is part of the Martiny State Game Area, and therefore is undeveloped. The total game area encompasses over 6077 acres of state land, of which about 25% is in water or marsh. There are campgrounds and boat launches dispersed around the flooding. There are two state forest campgrounds on Tubbs Lake that are administered by Mecosta County Parks Commission. There are 6 boat launches listed in the Michigan Public Boat Launch Directory. Because of surrounding wetlands, shoreline development has been limited.

A limnological survey conducted in August 2017 showed a secchi depth of 13 feet indicating good water clarity, and an alkalinity of 142 mg/l. The temperature/oxygen meter was not available for the limnological survey. The flooding usually does not stratify. Limnological parameters measured in 2017 found characteristics of a mesotrophic lake. Measurements of secchi disk (13 ft.), total phosphorus (0.0204 mg/l), and total chlorophyll-a (3.4 ug/l) yielded a Carlson Trophic Status Index of 43.5 (Carlson 1996). Mesotrophic lakes are typically middle of the road, may go anoxic in the hypolimnion on occasion, and there may be some instances of increased macrophyte growth especially in the shallow water. They are typically medium in productivity and are dominated by warmwater fisheries (Fuller and Taricska 2012).

The total distance around the lake was 14.65 miles (and 6.43 around an island). In this distance there were 208 residences, 222 small docks, 6 large docks, 4.2% armored shoreline, and 29 submerged trees. Fish habitat was dominated by aquatic vegetation of abundant lily pads. Late timing of the survey and low water levels made it difficult to circumnavigate the impoundment. Most of the public ownership is on Tubbs Lake, and the residences and docks are concentrated there. There are no known lake associations.

History

Historically, fish were stocked into the individual lakes prior to the creation of the flooding. This occurred from roughly the 1930s to 1941 in Tubbs Lake, and prior to 1933 in the others. Records were limited prior to the 2005 survey.

Conservation officers reported winterkills at Tubbs Lake in 1956, and records also indicate a winterkill in 1961. The fish kills are most likely due to the shallowness of the flooding and the decaying organics from emergent vegetation.

A limited gill net survey and electrofishing survey was conducted in 1968 in Tubbs Lake. Largemouth Bass, Black Crappie, Northern Pike, Yellow Perch, Rock Bass, Warmouth, White Sucker, Lake Chubsucker, Black Bullhead, Yellow Bullhead, and Brown Bullhead were captured and gamefish species were aged. Black crappie, Bluegill and Yellow Perch were all growing slightly below State average. Management records of Tubbs Lake also indicated that a limited creel survey was conducted from 1965 to 1974. Winter shanty counts were done and species were recorded. Anglers were catching Largemouth Bass, Bluegill, Pumpkinseed Sunfish, Rock Bass, Black Crappie, Northern Pike and Yellow Perch.

The Martiny Flooding was first surveyed as a whole in 2005. Comparisons will be made with the 2017 survey in the discussion section.

In the past ten years, there have been 8 Master Angler entries for Martiny Lake including 3 Bowfin, 2 Black Crappie, 1 Bluegill, 1 Pumpkinseed Sunfish, and 1 Warmouth.

Current Status

This survey was in response to Fisheries Division's Status and Trends Monitoring Program. The Status and Trends Monitoring Program seeks to randomly sample various sized lakes, using similar protocol, to determine trends among lakes at the regional and statewide levels.

Status and Trends protocol incorporates a variety of gear to sample the fish community within a recommended temperature range (55º-80º F). Standard fyke nets, and supplementary trap nets are used to capture larger (>3 inches) species that inhabit the littoral zone or that move inshore at night. Gill nets are used to sample fishes that occupy offshore waters and are particularly effective at capturing perch, salmonids, and northern pike. Night electrofishing is used to capture all size ranges of species and life stages that inhabit the littoral zone or that move inshore at night. Seining and small mesh fyke nets are used to capture representative samples of small-bodied nongame species and smaller size classes (<3 inches) of sport fishes that inhabit the littoral zone. Collectively, the catch from these gears presents a general picture of the overall fish community.

The fish community of Martiny Flooding was sampled June 12-15 with a seine, trap, fyke, and gill nets (Figures 1 and 2). Night electrofishing stations were conducted June18. Habitat sampling occurred in August.

A total of 5138 fish representing 23 species were collected in this assessment (Table 1). By gear the catch percentages were smallmesh fyke (33), electroshocking (18), Largemesh fyke nets (23), trap nets (24), gill nets (3) and seine (0). Smallmesh fyke nets tend to catch large schools of young of the year fish or minnows which also show in the overall average sizes. Bluegill (26%), redear sunfish (18%,) and yellow perch (19%) were the most abundant species collected. Redear sunfish were not previously found, nor is there any record of stocking them in the flooding. Of moderate abundance were black crappie, pumpkinseed sunfish, largemouth bass, warmouth, brown bullhead, yellow bullhead, and bluntnose minnow. Species caught in lesser abundance included northern pike, rock bass, and other assorted non-game and minnow species (Table 1).

A total of 1333 bluegill were collected in this assessment (Table 1). Bluegills ranged from 1-9 inches and averaged 4.8 inches. Forty-two percent of the bluegill found were of acceptable size to anglers (> or = to 6 inches), but the catch was dominated by the catch of young bluegill by the smallmesh gear. Age and growth analysis indicated bluegill were growing slightly below average having a mean growth index of -0.5 (Table 2). Multiple year classes (ages 1-11) were found suggesting excellent natural reproduction and recruitment into the harvestable fishery. Bluegill longevity appears to peak at 6 years of age.

A new species showed up in the survey catch which had previously not been recorded nor stocked. A total of 919 redear sunfish were collected in this assessment (Table 1). The nearest water that is known to have redear sunfish is Pretty Lake, but these waters are not connected. Redear ranged from 1-11 inches and averaged 7.9 inches. Ninety-three percent of the redear found were of acceptable size to anglers (> or = to 6 inches). Age and growth analysis indicated redear were growing slightly above average having a mean growth index of +0.1(Table 2). Multiple year classes (ages 0-8) were found suggesting excellent natural reproduction and recruitment into the harvestable fishery. Redear longevity appears to peak at 6 years of age.
This survey was in response to Fisheries Division's Status and Trends Monitoring Program. The Status and Trends Monitoring Program seeks to randomly sample various sized lakes, using similar protocol, to determine trends among lakes at the regional and statewide levels (Wehrly et al. in Press).

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A total of 1,333 Bluegill were collected in this assessment (Table 1). Bluegill ranged from 1-9 inches and averaged 4.8 inches. Forty-two percent of the Bluegill found were of acceptable size to anglers (> or = to 6 inches), but the catch was dominated by the catch of young Bluegill by the smallmesh gear. Age and growth analysis indicated Bluegill were growing slightly below average having a mean growth index of -0.5 (Table 2). Multiple year classes (ages 1-11) were found suggesting excellent natural reproduction and recruitment into the harvestable fishery. Bluegill longevity appears to peak at 6 years of age.

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A total of 480 Pumpkinseed Sunfish averaging 6.4 inches were collected in this assessment (Table 1). Pumpkinseed growth was right at State average. The mean growth index was 0 (Table 2). Seven year-classes were represented. Eighty-two percent of the Pumpkinseed Sunfish met or exceeded the acceptable harvest size of 6 inches.

Sixty-nine Black Crappie averaging 8.3 inches (ranging 3-11 inches) were collected in this assessment (Table1). Eighty-three percent of Black Crappie met or exceeded the acceptable harvest size of 7 inches. Black Crappie were growing below State average and had a mean growth index of -0.9 (Table 2). Ten year-classes (ages 1-10) were represented.

The Martiny Flooding has fair abundance of Largemouth Bass. A total of 209 Largemouth Bass averaging 7.4 inches were collected in this assessment (Table 1). Six percent of the Largemouth Bass catch met or exceeded the legal harvest size of 14 inches. Age and growth analysis indicated Largemouth Bass were growing below State average having a mean growth index of -1.6 (Table 2). Multiple year classes (ages 1-12) were present. The catch was dominated by the younger age classes.

Thirty-eight Northern Pike averaging 21.8 inches were collected in this assessment (Table 1). Age and growth analysis indicated pike were growing below State average, having a mean growth index of -0.8 (Table 2). Eight year classes were represented. Thirty-four percent of the Northern Pike were legal (24 inches or larger).

There are currently Aquatic Nuisance Permits being issued for several lakes with treatments in the flooding. Tubbs Lake has had multiple treatments (1996-2000 and more recently 2015-2017). Lost Lake had one small treatment in 2001 and then permits for 2014-2016. The only other lake to have a permit application for treatments was Upper Evans Lake in 2016.

The land manager for the Department of Natural Resources Wildlife Division, Pete Kailing, reported the presence of exotic purple loosestrife in the Martiny Flooding but no State treatments have been conducted to date although one may be planned in the near future. The local North Country CISMA group is looking at Martiny Flooding for this. There are also Black Terns at the Martiny Flooding (rare birds), and Martiny Lake has a nice stand of Wild Rice (P. Kailling, Michigan DNR, personal communication).

Analysis and Discussion

In mid-Michigan warmwater lakes, Bluegill are typically one of the most abundant fish species present and play a key role in community structure and overall sportfishing quality (Schneider 1981). Schneider (1990) suggests indices of Bluegill characteristics can be used to classify populations. The "Schneider Index" uses size scores of length frequency and growth data and relates them to an objective ranking system ranging from "very poor" to "superior". Using this index, with the trap and largemesh fyke nets, the Martiny Flooding index was 4.8 which put the flooding between "good" and "satisfactory" (Table 3). There is ample fishing opportunity for Bluegill. It should be noted that with a much larger sample size, the Schneider index remained the same as 2005. Conditions are almost identical.

One very interesting surprise in the 2017 survey was discovering that Redear Sunfish had become established and are thriving in the flooding. Redear Sunfish are at the very northern end of their range. Ages 0 -8 were present indicating ample reproduction and survival. Redear Sunfish are exhibiting good growth. Anglers target them along with Bluegill and Pumpkinseed Sunfish. They are much larger, but may be harder to catch.

The Pumpkinseed Sunfish sizes should be highlighted in this lake. Eighty-two percent of the fish caught were desirable for anglers and they appear in appreciable numbers as well.

Black Crappie numbers were moderate but the timing of the survey, mid-June, may have caused numbers to under-represented. Black Crappie tend to suspend in late spring or summer as water temperatures increase. The ones captured were acceptable for anglers.

Predator numbers appear adequate and enough predators reach desirable size for anglers. Northern Pike growth and Largemouth Bass growth is slower but numbers and sizes appear acceptable, and they are most likely shaping the panfish population which appears to be in good balance. Larger bass and Northern Pike are difficult to net and are probably under-represented in the catch.

At the present time rough fish sizes and numbers do not appear to be a problem. Suckers, bullhead and Bowfin provide additional angler entertainment and some predation value from the latter two.

The overall species diversity of 23 species is one of the higher captured for any water body in the Southern Lake Huron Management Unit. The diversity is probably due to the variety of habitats in the flooding. Since the flooding is shallow it also has a diverse community of turtles. Seventy-eight snapping turtles (8-16 inches), 153 Painted Turtles (3-6 inches), 5 Map Turtles (7-9 inches), 1 Musk Turtle (5 inches), and 1 Softshell Turtle (7 inches) were netted incidentally.

Changes from 2005 to 2017 were very minor. The most notable was the establishment of Redear Sunfish. The fish community is surprisingly stable. There were a few slight changes and comparisons of some species are given in table 4.

Currently, a good fishery exists for most game species. This lake complex is very popular for panfish and bass fishermen in particular but anglers can also capitalize on the variety of other nice sized fish described earlier. There are many campgrounds and access points and areas to fish.

Recent tournament information indicated the popularity for bass fishing on Martiny Flooding is growing. There were 5 registered tournaments in 2016. Items reported include the average number of boats, anglers participation, data on bass released and caught, and biggest bass for event and season. In 2017 there were 11 registered. More detailed information is available but it is interesting to track the number of bass handled per event and there appeared to be a significant increase in 2017. Martiny Flooding ranked the 71st most popular Michigan Lake for bass tournaments of 275 total waters in 2017.

Management Direction

Presently, the Martiny Flooding is in good condition in terms of its overall fishery. The flooding offers very good angling opportunities for several species including Bluegill, Redear Sunfish, Pumpkinseed Sunfish, Black Crappie, Rock Bass, Largemouth Bass, and Northern Pike. Additional opportunities are available for non-game species. The flooding is ideal for small boats, canoes, or kayaks.

Fisheries management of the Martiny Chain should continue to focus on warmwater species. Sustainable populations of Largemouth Bass and Northern Pike as top predators will help maintain an improved panfish size structure. Presently, these species occur in sufficient numbers and appear healthy and no management actions need to be directed toward them. Efforts should continue to protect the habitat and riparian area.

References

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Fuller, L.M., and Taricska, C.K., 2012. Water-quality characteristics of Michigan's inland lakes, 2001-10: U.S. Geological Survey Scientific Investigations Report 2011-5233, 53 p., plus CD-ROM.

Schneider, J.C. 1981. Fish communities in warmwater lakes. Michigan Department of Natural Resources, Fisheries Division, Fisheries Research Report 1890, Ann Arbor, Michigan.

Schneider, J.C. 1990. Classifying bluegill populations from lake survey data. Michigan Department of Natural Resources, Fisheries Division, Fisheries Technical Report No. 90-10, Ann Arbor, Michigan.

Wehrly, K.E., G.S. Carter, and J.E. Breck. (in press) Standardized sampling methods for the inland lakes status and trends program. Michigan Department of Natural Resources, Fisheries Report, Ann Arbor.

Figure 1. Map of the east part of Martiny Flooding, showing sampling locations for 2017

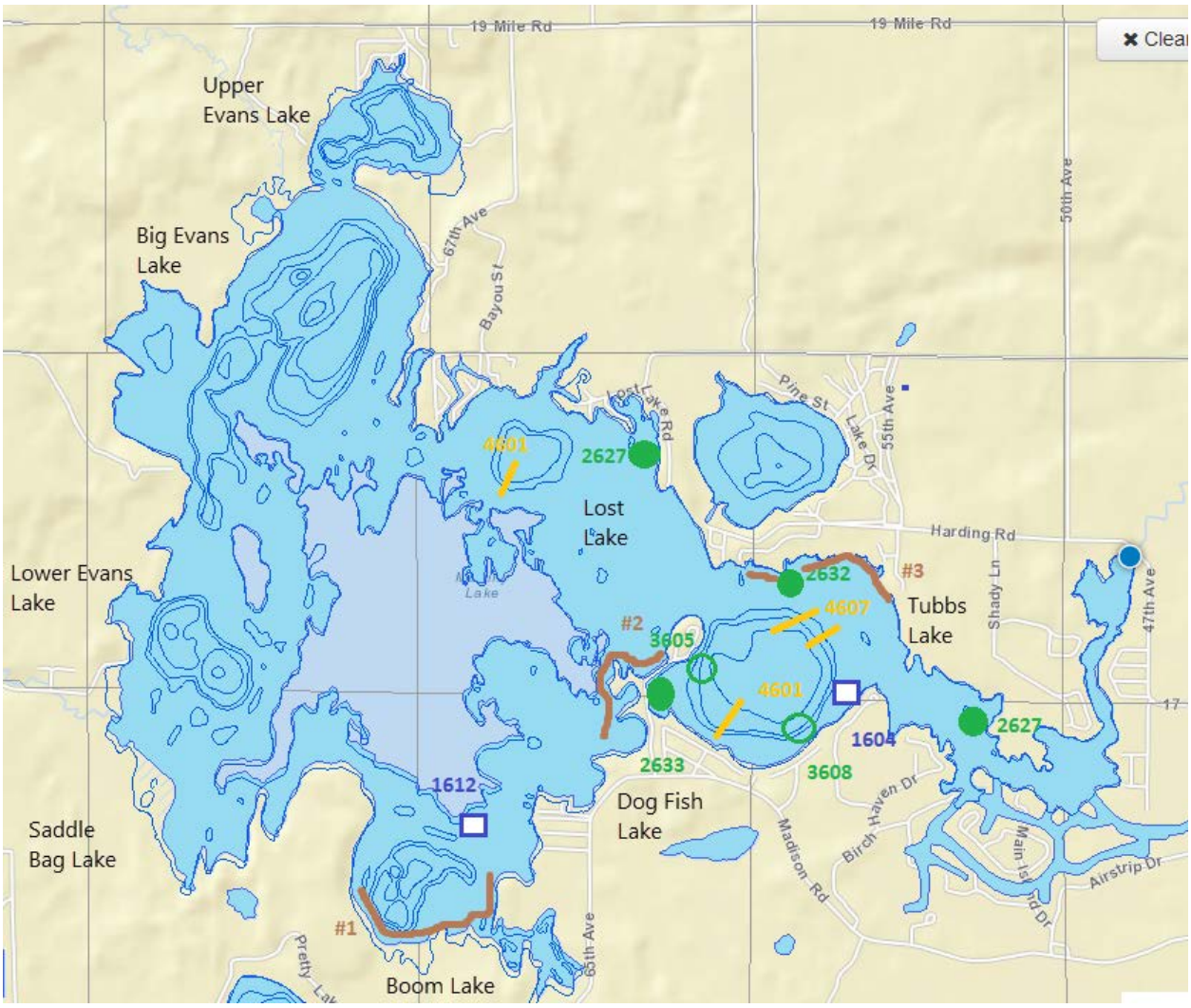

Figure 2. Map of the west part of Martiny Flooding, showing sampling locations for 2017

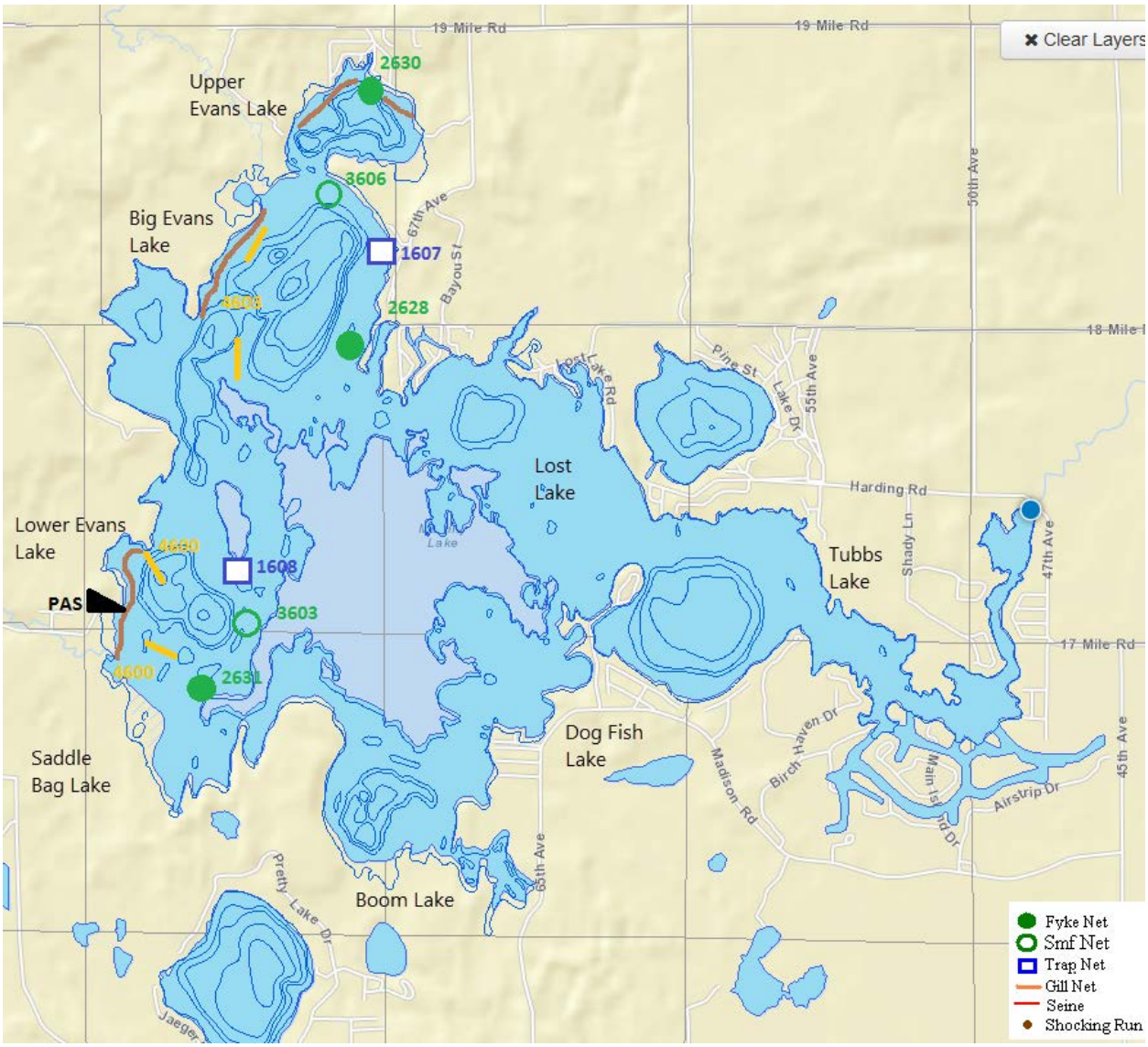

Table 1. Total catch (all gear) from Martiny Flooding, June 2017

Species	Number	Percent by number	Weight (lb.)	Percent by weight	Length range (in.)*	Average length (in.)	Percent legal size**
Black crappie	69	1.3	24.7	1.7	3-11	8.3	83
Black bullhead	12	0.2	9.9	0.7	5-16	9.0	50
Bluegill	1,333	25.9	158.4	10.7	1-9	4.8	42
Bluntnose minnow	331	6.4	1.8	0.1	1-3	2.5	100
Bowfin	75	1.5	262.9	17.7	11-28	20.7	100
Brown bullhead	243	4.7	117.5	7.9	5-13	9.9	97
Brook silverside	19	0.4	0	0	2-4	3.7	100
White sucker	7	0.1	11.1	0.7	12-18	15.6	100
Golden shiner	74	1.4	1.5	0.1	2-8	3.6	100
Grass pickerel	5	0.1	0.2	0	3-7	5.3	100
Green sunfish	5	0.1	0.4	0	4-5	4.7	0
Lake chubsucker	41	0.8	4.6	0.3	2-7	5.5	100
Largemouth bass	209	4.1	88.6	6	0-18	7.4	6
Longnose gar	3	0.1	17.1	1.2	35-40	38.2	100
Central mudminnow	13	0.3	0.1	0	1-3	2.4	100
Northern pike	38	0.7	101.5	6.8	13-30	21.8	34
Pumpkinseed	480	9.3	108.6	7.3	2-9	6.4	82
Rock bass	21	0.4	4.2	0.3	4-8	6.3	57
Redear sunfish	919	17.9	477.9	32.2	1-11	8.6	93
Tadpole madtom	7	0.1	0.1	0	2-3	3.1	100
Warmouth	96	1.9	15.1	1	2-7	5.7	40
Yellow Perch	960	18.7	4.9	0.3	1-7	1.7	1
Yellow bullhead	178	3.5	71.5	4.8	5-13	9.2	96
All species totals:	5,138	100	1,482.50	100			

Table 2. Age and growth data, Martiny Flooding, Mecosta County, 2017.

Species / Age	No. aged	Length range (in.)	State avg. length (in.)	Weighted mean len. (in.)	Weighted age freq.	Mean growth index*
Black crappie						-0.9
Age I:	5	3.20-4.20	4.8	3.56	5.80%	
Age II:	7	5.70-7.70	6.5	6.55	11.04%	
Age III:	17	6.70-8.80	7.9	7.49	28.82%	
Age IV:	4	8.20-8.90	8.9	8.65	4.83%	
Age V:	13	8.60-9.90	9.7	9.27	18.92%	
Age VI:	4	9.10-10.10	10.4	9.55	6.04%	
Age VII:	6	8.40-10.20	11.1	9.46	8.78%	
Age VIII:	4	9.40-10.70	11.6	10.27	5.88%	
Age IX:	1	8.90-8.90		8.9	1.21%	
Age X:	5	10.30-11.00		10.59	8.70%	
Bluegill						-0.5
Age I:	36	1.20-2.90	2.4	1.83	30.08%	
Age II:	24	3.00-4.30	4.2	3.45	7.87%	
Age III:	11	4.00-5.30	5.3	4.64	3.62%	
Age IV:	24	4.40-7.50	6.2	6.65	19.08%	
Age V:	38	4.60-8.10	6.9	6.34	32.66%	
Age VI:	15	5.50-8.20	7.4	7	4.66%	
Age VII:	5	5.80-9.30	8	6.8	1.03%	
Age VIII:	2	7.90-8.30	8.4	7.95	0.63%	
Age IX:	2	8.10-8.60	8.7	8.35	0.15%	
Age X:	2	8.70-8.90		8.8	0.15%	
Age XI:	1	8.80-8.80		8.8	0.08%	
Largemouth bass						-1.6
Age I:	26	2.90-5.60	5.4	4.25	17.26%	
Age II:	45	5.60-10.20	8.7	7.21	32.67%	
Age III:	30	7.80-11.30	10.6	9.23	17.40%	
Age IV:	17	10.00-12.70	12	11.18	10.65%	
Age V:	13	10.70-13.50	13.7	12.04	8.13%	
Age VI:	9	11.80-14.40	15	12.94	5.32%	
Age VII:	9	11.90-16.80	16.7	14.3	5.17%	
Age IX:	2	14.30-14.80	18.6	14.55	1.02%	
Age X:	2	18.10-18.10	19.3	18.1	1.19%	
Age XII:	2	18.60-18.80		18.7	1.19%	
Northern pike						-0.8
Age I:	2	13.10-13.10	14.5	13.1	5.26%	
Age II:	13	16.50-22.60	19	18.36	30.92%	
Age III:	14	17.10-27.30	21.8	20.83	34.87%	
Age V:	3	25.40-27.40	26.1	26.4	7.89%	
Age VI:	2	24.80-30.70	27.8	27.75	5.26%	
Age VIII:	3	27.60-30.10		29.1	7.89%	
Age X:	2	28.90-30.40		29.65	5.26%	
Age XI:	1	30.80-30.80		30.8	2.63%	
Pumpkinseed						0
Age I:	1	2.00-2.00	2.4	2	0.21%	
Age II:	9	3.00-4.10	4.2	3.53	2.02%	
Age III:	12	3.80-7.30	5.2	5.01	4.67%	
Age IV:	31	4.80-7.60	5.8	6.33	43.37%	
Age V:	23	5.70-7.50	6.3	6.44	41.92%	
Age VI:	12	7.00-8.40	6.8	7.2	7.02%	
Age VII:	2	5.90-8.10	7.2	6.48	0.79%	

Redear sunfish						0.1
Age 0:	16	1.20-2.50		1.88	1.74%	
Age I:	2	2.40-2.50	2.8	2.45	0.22%	
Age II:	42	3.40-7.00	5	5.75	7.80%	
Age III:	14	4.50-7.90	6.9	6.98	3.87%	
Age IV:	36	5.80-9.30	8	8.49	39.87%	
Age V:	33	5.40-10.60	9	9.2	38.09%	
Age VI:	10	6.50-10.50	9.8	9.82	6.80%	
Age VII:	5	7.10-11.10	10.5	9.17	1.14%	
Age VIII:	2	10.10-11.30		10.37	0.48%	
Yellow Perch						--
Age 0:	10	1.10-1.30		1.19	100.00%	0

Table 3. Schneider Index for classifying bluegill lakes using trap and largemesh fyke net gear, Martiny Flooding, Mecosta County

Sample date	5/2/2005	6/2017
Sample size	85	579
Water temp.	46-51F	
Ave. length (in.)	6.5 (5)	6.5 (5)
% >= 6 inches	61 (4)	79.2 (5)
% >= 7 inches	34 (5)	26.2 (4)
%>=8 inches	8(5)	5 (5)
Index score	4.8	4.8
Rank	Satisfactory - Good	Satisfactory - Good

Table 4. Comparisons of 2005 and 2017 surveys of Martiny Flooding, Mecosta County.

Species	Numbers	Numbers	Ave. Length	Ave. Length
Black crappie	69	303	8.3	8.1
Black bullhead	12	0	9.0	
Bluegill	1,333	439	4.8	5.1
Bluntnose minnow	331	33	2.5	2.4
Bowfin	75	151	20.7	21.0
Brown bullhead	243	517	9.9	11.5
Brook silverside	19	0	3.7	
White sucker	7	22	15.6	15.4
Golden shiner	74	8	3.6	5.5
Grass pickerel	5	7	5.3	8.5
Green sunfish	5	0	4.7	
Chubsucker	41	10	5.5	9.0
Largemouth bass	209	155	7.4	12.0
Longnose gar	3	0	38.2	
Central mudminnow	13	18	2.4	2.8
Northern pike	38	60	21.8	21.5
Pumpkinseed	480	112	6.4	6.0
Rock bass	21	2	6.3	7.5
Redear sunfish	919	0	8.6	
Tadpole madtom	7	0	3.1	
Warmouth	96	40	5.7	
Yellow Perch	960	132	1.7	
Yellow bullhead	178	232	9.2	