WHITE LAKE

2016 Lake Sampling Report

Watershed Watch

Mississippi Valley Conservation Authority

INTRODUCTION

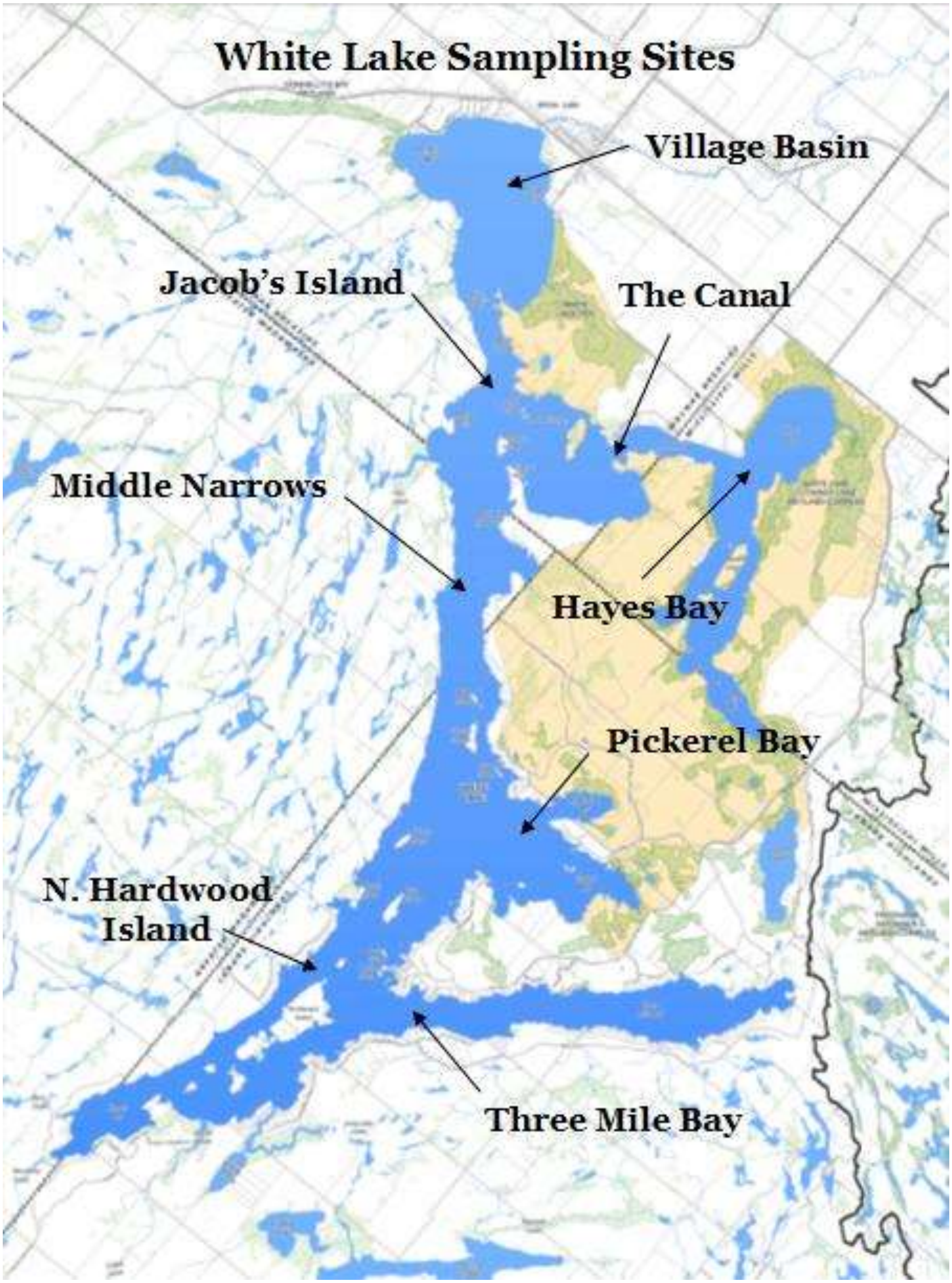
Mississippi Valley Conservation Authority (MVCA) has long recognized the recreational and aesthetic value of lakes. As lake front development continues to increase, this value is threatened by the increased runoff and changes to water chemistry that so often accompany development. Regular monitoring is important in order to identify trends and shifts in the lake's trophic status which can then be used to identify problems and influence future lake planning decisions.

The trophic state of a lake can be impacted by a variety of factors including lake shape and depth, the amount of shoreline development and the surficial geology of the surrounding area. Since lake shape, depth, and geology do not quickly change over time we would expect a relatively stable trophic status under natural conditions. However, the presence of development can introduce any number of nutrients into the lake, thereby influencing it's trophic state.

On one end of the scale, oligotrophic lakes have the lowest concentration of nutrients and are often characterized by low plant and algal growth. On the other end of the scale eutrophic lakes have the highest concentrations of nutrients and typically have dense populations of aquatic plants and algae. Mesotrophic lakes fall in between these two extremes with a moderate level of nutrient enrichment. While all three of these types occur naturally, a quick shift from one to another can indicate human influence. By monitoring regularly we can identify these shifts and work alongside stakeholders to protect the functions of the lake.

The White Lake Preservation Project (WLPP) has been collecting data on White Lake since 2014. In 2015 and 2016 MVCA partnered with the WLPP to help facilitate additional lake monitoring. Our monitoring program focussed on four key parameters: secchi depth, total phosphorous, chlorophyll a, and dissolved oxygen concentrations.

In 2016, sampling was conducted on eight sites over three sampling dates: mid-June, mid-July, and mid-August. The sites were chosen to represent as much of the lake as possible (see figure below) and were sampled for the four key parameters discussed above.


White Lake Sampling Sites
Village Basin
Jacob's Island
The Canal
Middle Narrows
Hayes Bay
Pickerel Bay
N. Hardwood
Island
Three Mile Bay

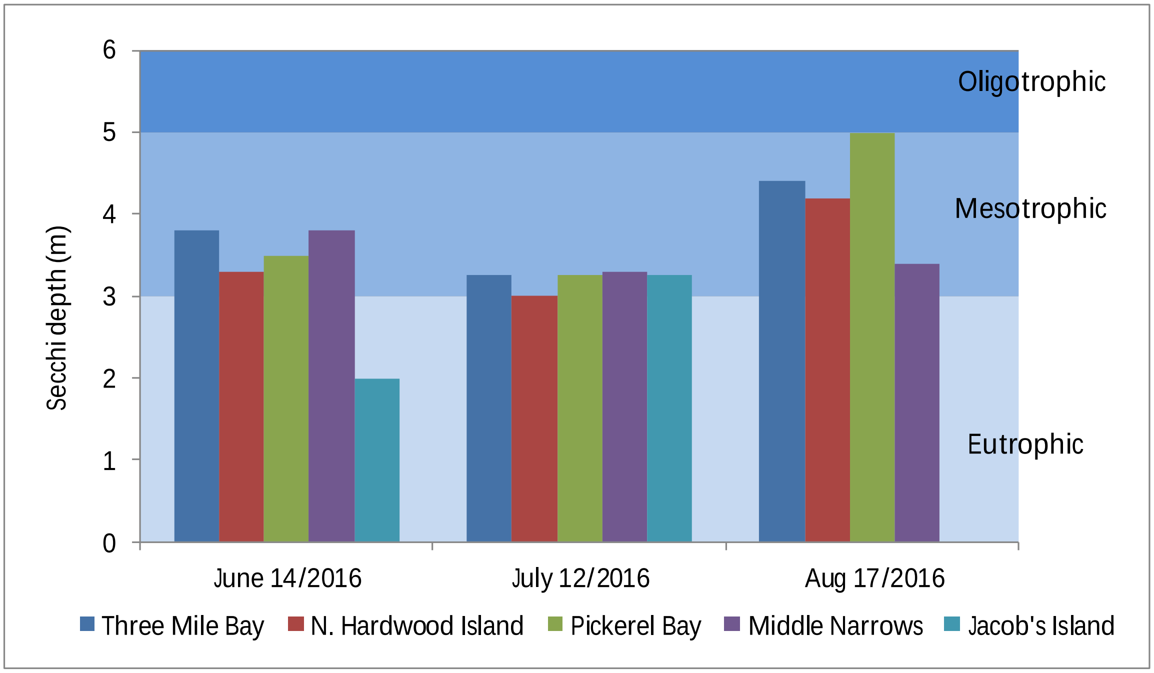
RESULTS

WATER CLARITY

A Secchi Disc is a black and white coloured disc used to determine water clarity. The disc is lowered into the water on the shady side of the boat. As the disc is lowered the point when it is no longer visible is noted as well as the point at which it reappears when you bring it back up. The average of these two depths is the Secchi depth. The greater the Secchi Disc measurement, the clearer your lake. Secchi depth is influenced by the concentration of algae in the water column; greater concentrations of algae in the water results in a smaller Secchi depth.

Interpreting SECCHI DISC Results	
Secchi Depth	**Lake Nutrient Status**
Over 5 metres	Oligotrophic – unenriched, few nutrients
3.0 to 4.9 metres	Mesotrophic – moderately enriched, some nutrients
Less than 2.9 metres	Eutrophic – enriched, higher levels of nutrients

White Lake
2016 Secchi Depths



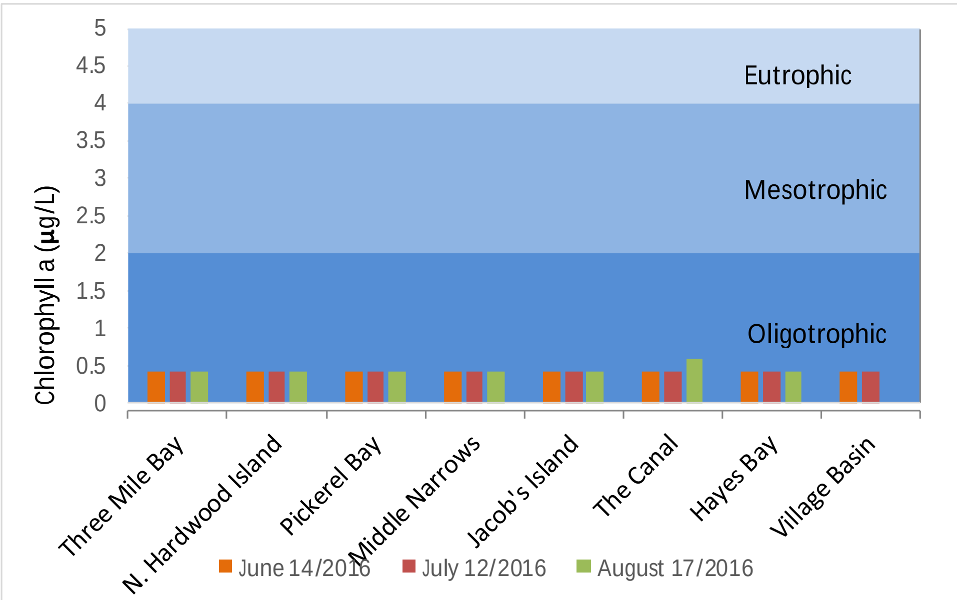
CHLOROPHYLL a

Water clarity is influenced by the amount of phytoplankton or microscopic algae present in the water. Chlorophyll a is the green pigment in phytoplankton. The lower the chlorophyll a density in your lake, the lower the phytoplankton concentration and the clearer your lake is. Chlorophyll a and phytoplankton concentration is directly affected by the amount of phosphorous in your lake. The more phosphorous there is in the water, the greater the potential for phytoplankton growth to occur.

A Composite Sampler (pictured to the right) is used by dropping the tin container into the water. When it reaches the required depth it is slowly pulled back to the surface. The tin is filled as water enters one tube and air escapes the other. Some air remains in the tin to ensure collection throughout the haul to the surface.

Interpreting CHLOROPHYLL a Results	
Chlorophyll a Reading	**Lake Nutrient Status**
Up to 2 ug/L – low algal density	Oligotrophic – unenriched, few nutrients
2 – 4 ug/L – moderate algal density	Mesotrophic – moderately enriched, some nutrients
More than 4 ug/L – high algal density	Eutrophic – enriched, higher levels of nutrients

WHITE LAKE
CHLOROPHYLL a CONCENTRATIONS (μg/L)



* All chlorophyll a samples (except August at The Canal) were below the Reporting Detection Limit of 0.5 μg/L.

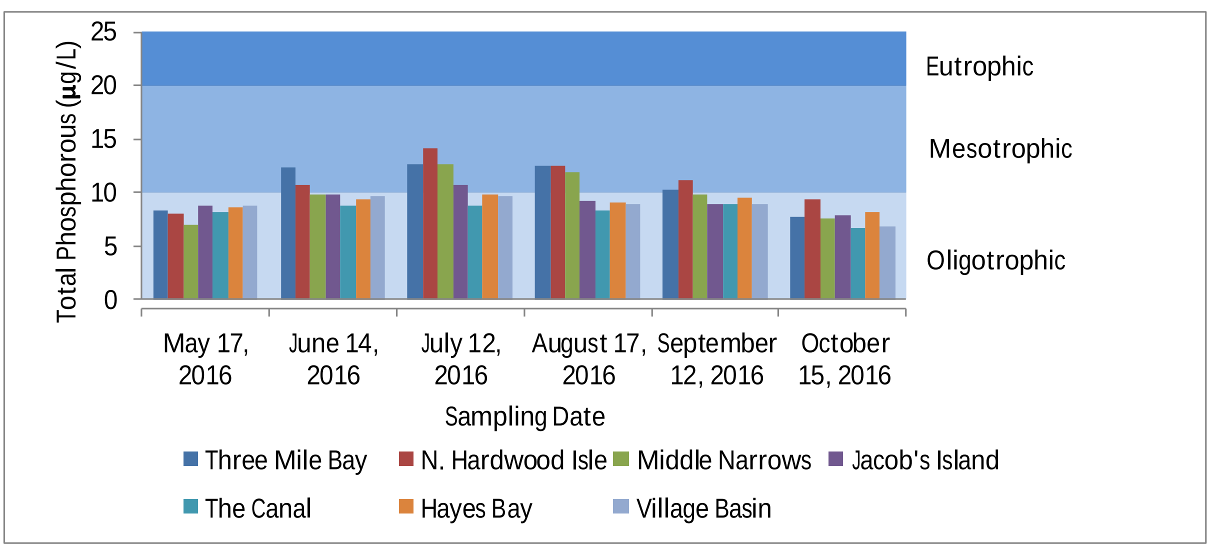
TOTAL PHOSPHOROUS CONCENTRATION

Phosphorous is the nutrient that controls the growth of algae in most Ontario lakes. For this reason increases in phosphorous levels in the lake can result in an increase in the quantity of aquatic plants and algae. High levels of phosphorous can lead to algal blooms which, along with being unsightly, can in some cases affect the habitat of cold water fish such as lake trout. A general guideline exists to characterize a lake's trophic status based on the total phosphorous that is measured. The PWQO (Provincial Water Quality Objective) is 20µg/L of total phosphorous for lakes. This goal is to help ensure aquatic health and maintain the recreational value of our lakes.

A Kremmerer Bottle (pictured to the right) is used to sample water at specific depths. The bottle is lowered to the required depth with both ends open. A weight on the rope is dropped. When the weight hits the bottle it causes both ends to close, sealing the sample water in the bottle.

Interpreting TOTAL PHOSPHORUS Results	
Total Phosphorus	**Lake Nutrient Status**
10 ug/L or less	Oligotrophic – unenriched, few nutrients
11 to 20 ug/L	Mesotrophic – moderately enriched, some nutrients
21 ug/L or more	Eutrophic – enriched, higher levels of nutrients

White Lake
Total Phosphorous Concentrations (µg/L)



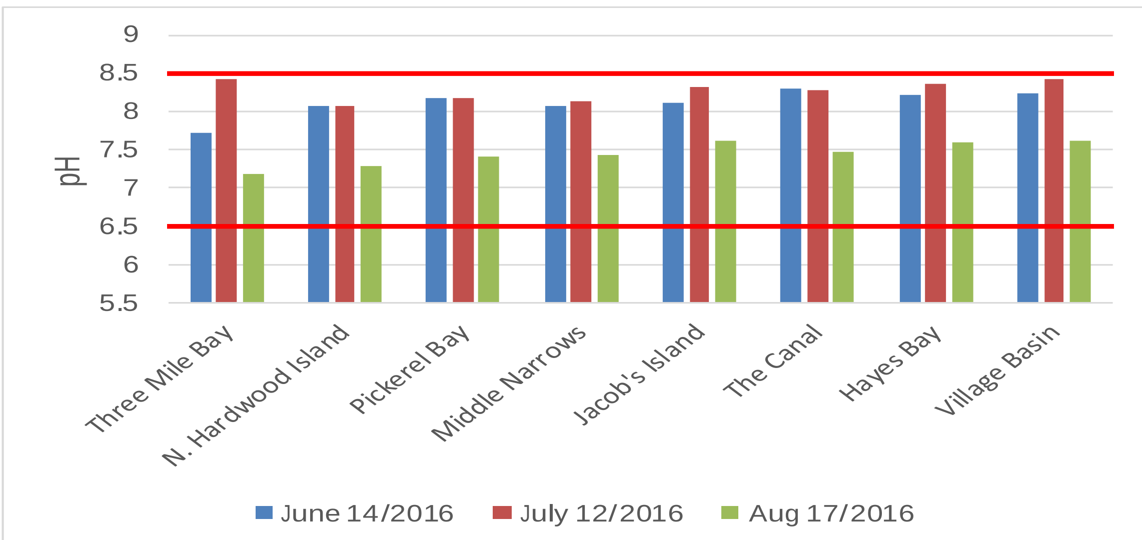
ACIDITY

The acidity of a solution is measured on the pH scale. The pH scale is a logarithmic measure of the concentration of hydrogen ions in solution. This means that a change from pH 7 to pH 8 is a ten-fold change in the concentration of hydrogen ions in solution.

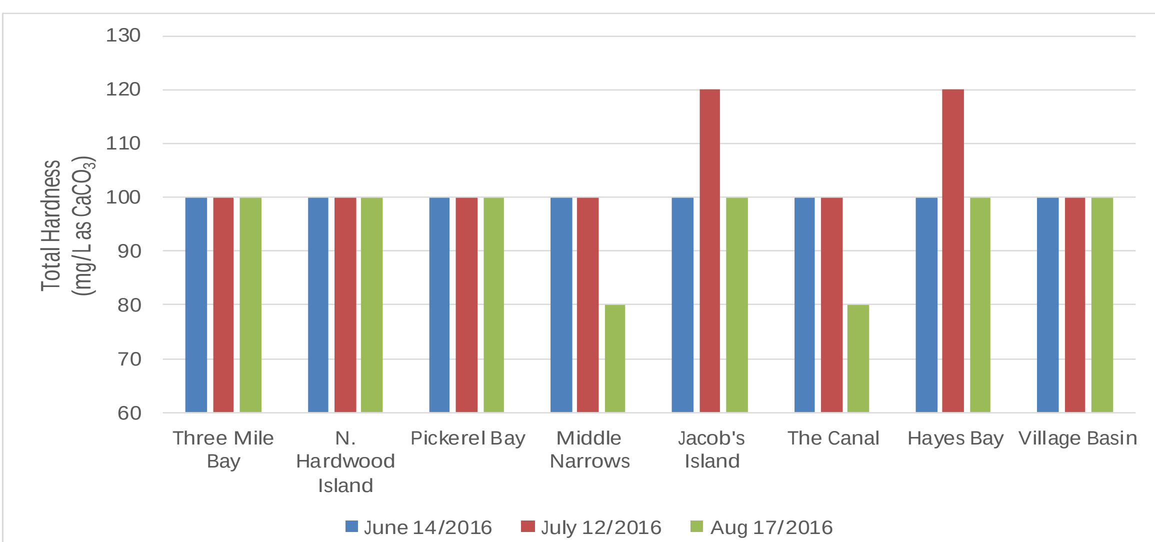
Monitoring the pH of our lakes allows us to identify when changes are occurring. The Provincial Water Quality Objective for pH is between 6.5-8.5 in order to protect aquatic life. Acidity of a water body can also change the availability of metals such as Calcium and Aluminum. This has been shown to change zooplankton (small planktonic invertebrates) communities which are an important food source for many baitfish species.

Below are the pH and calcium values for White Lake in 2016.

White Lake 2016
pH Values



White Lake 2016
Total Hardness



DISSOLVED OXYGEN (D.O.)

Adequate dissolved oxygen is important for good water quality and necessary to all forms of life. Poor (low) D.O. levels will cause stress on fish and may result in fish kills (mass death of a species in a season). Many factors can influence dissolved oxygen concentrations in the lake but two key factors are lake stratification and the amount of phytoplankton (microscopic algae) biomass produced in the lake.

Lake stratification is the separation of the lake into three layers: the epilimnion (top layer), metalimnion (middle layer) and the hypolimnion (bottom layer). Stratification is caused by changes in water temperature with depth, and occurs from late spring to early fall. Lakes that stratify during the summer are characterized by a warm epilimnion separated from a cold hypolimnion by a layer of water where temperature rapidly declines with depth, known as the metalimnion or thermocline. DO is at its lowest during the late summer and early fall as water in the hypolimnion cannot recharge its oxygen since it is isolated from the atmosphere by the epilimnion and thermocline. This can result in low dissolved oxygen in the hypolimnion which may have detrimental effects on aquatic species that regularly inhabit this part of the lake.

The Dissolved Oxygen Meter is used to gather D.O. and temperature readings. The probe is lowered into the lake at its deepest point and readings are taken at every meter from the hand-held screen.

Phytoplankton production also plays a role in the concentration of dissolved oxygen. When phytoplankton dies and settles to the lake bottom, it is decomposed by bacteria. This bacteria consumes large amounts of oxygen, reducing the concentrations available for fish and other organisms.

Largely because of its shallow nature, stratification is uncommon in White Lake, and as expected was not seen at any of the sampling points in 2016. The constant mixing from wave action/boats allows for a relatively constant temperature and dissolved oxygen readings throughout the depth of the lake. This is optimal habitat for the warm water fish community present in White Lake.

Below are the temperature, DO, pH, and conductivity profiles for the eight sampling sites in 2016.

Three Mile Bay

June 14th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	17.17	9.61	99.8	7.72	236
1	17.15	9.61	99.7	7.81	236
2	17.11	9.6	99.5	7.88	236
3	17.06	9.59	99.4	7.98	236
4	17.04	9.62	99.4	8.02	236
5	17.01	9.61	99.3	8.08	236
6	Bottom	Bottom	Bottom	Bottom	Bottom

July 12th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	23.95	9.07	107.9	8.43	231
1	24	9.12	108.3	8.34	231
2	23.68	9.19	108.6	8.18	229
3	23.03	9.04	104.6	8.19	229
4	22.77	8.45	96.7	8.15	228
5	22.51	6.44	73	7.94	234
6	Bottom	Bottom	Bottom	Bottom	Bottom

August 17th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	23.5	9	104.2	7.19	215
1	23.56	8.01	94.3	6.89	214
2	23.53	7.95	93.6	6.92	214
3	23.48	7.9	93	6.98	214
4	23.45	7.82	91.9	7.04	213
5	23.41	7.8	91.4	7.1	214
6	23.37	7.79	91.5	7.15	215
7	Bottom	Bottom	Bottom	Bottom	Bottom

Vital Habitat for Cold Water Fisheries (Trout) = DO > 4 mg/L at < 15.5°C

Optimal Habitat for Cold Water Fisheries (Trout) = DO > 6 mg/L at < 10°C

North Hardwood Island

June 14th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	17.56	9.72	101.6	8.08	237
1	17.5	9.63	100.8	8.12	236
2	17.33	9.65	100.6	8.13	236
3	17.26	9.66	100.4	8.12	236
4	17.18	9.04	93.9	8.08	236
5	17.07	9	92.5	8.06	237
6	17.03	8.8	90.8	N/A	237
7	Bottom	Bottom	Bottom	Bottom	Bottom

July 12th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	23.63	8.73	103	8.08	232
1	23.47	8.87	104.5	8.15	232
2	23.06	8.85	103.6	8.13	233
3	22.78	8.56	100.1	8.03	234
4	22.61	8.16	95.3	7.99	234
5	22.37	6.65	76.7	7.96	235
6	Bottom	Bottom	Bottom	Bottom	Bottom

August 17th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	23.75	7.95	93.9	7.29	218
1	23.67	7.7	90.4	7.2	217
2	23.62	7.54	89	7.05	217
3	23.58	7.48	88.4	7.07	217
4	23.56	7.48	87.9	7.12	216
5	25.5	7.49	88.1	7.14	216
6	Bottom	Bottom	Bottom	Bottom	Bottom

Pickerel Bay

June 14th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	17.47	9.11	95.2	8.18	235
1	17.46	9.11	95.2	8.18	235
2	17.36	9.11	94.7	8.18	235
3	17.31	9.06	94.3	8.17	235
4	17.28	9.03	93.9	8.14	235
5	17.25	8.99	93.5	8.08	235
6	17.17	8.94	92.7	8.12	235
7	17.12	8.88	92.1	8.1	235
8	Bottom	Bottom	Bottom	Bottom	Bottom

July 12th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	24.5	9.2	110.4	8.17	235
1	24.46	9.15	109.7	8.14	234
2	23.3	9.16	107.3	8.08	231
3	22.74	8.66	100.4	8.11	233
4	22.66	8.37	97	8.09	234
5	22.59	8.18	94.8	8.08	234
6	22.53	8.03	92.7	8.07	234
7	21.79	N/A	N/A	7.8	235
8	Bottom	Bottom	Bottom	Bottom	Bottom

August 17th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	24.44	7.96	93.5	7.41	222
1	23.97	7.6	90.3	7.23	221
2	23.84	7.56	89.5	7.11	221
3	23.78	7.53	89.1	7.45	221
4	23.73	7.55	89.1	7.18	221
5	23.68	7.56	89.3	7.18	220
6	23.64	7.59	89.6	7.18	220
7	23.58	7.6	89.6	7.2	220
8	Bottom	Bottom	Bottom	Bottom	Bottom

Middle Narrows

June 14th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	17.74	8.53	89.7	8.08	236
1	17.65	8.48	88.7	8.06	235
2	17.31	8.46	88.1	8.05	235
3	17.28	8.47	88.3	8.02	235
4	17.27	8.49	88.4	7.95	235
5	17.11	8.4	86.5	7.99	235
6	17.03	8.2	84.8	7.98	235
7	Bottom	Bottom	Bottom	Bottom	Bottom

July 12th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	23.65	8.81	104	8.14	233
1	23.62	8.77	103.5	8.09	233
2	23.49	8.76	103.2	7.99	233
3	23.14	8.74	102.1	8.09	233
4	22.99	8.64	100.8	8.08	232
5	22.26	6.95	80.1	7.95	230
6	22.12	6.05	70.0	N/A	231
7	Bottom	Bottom	Bottom	Bottom	Bottom

August 17th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	24.64	7.99	96.1	7.44	219
1	23.99	7.75	91.8	7.28	218
2	23.83	7.22	91.6	7.14	217
3	23.77	7.81	92.4	7.21	216
4	23.67	7.62	90	7.23	216
5	23.66	7.56	89.1	7.22	216
6	23.65	7.44	87.4	7.22	216
7	Bottom	Bottom	Bottom	Bottom	Bottom

The Canal

June 14th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	16.53	9.97	102.1	8.31	241
1	16.27	9.99	101.9	8.35	241
2	15.83	10.24	103.4	8.36	238
3	Bottom	Bottom	Bottom	Bottom	Bottom

July 12th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	22.65	10.13	114.6	8.28	223
1	22.63	10.21	120.6	8.26	223
2	22.63	10.32	121.8	8.23	223
3	Bottom	Bottom	Bottom	Bottom	Bottom

August 17th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	22.37	9.07	104	7.48	204
1	21.97	8.95	102.4	7.47	202
2	21.94	8.71	99.6	7.35	201
3	Bottom	Bottom	Bottom	Bottom	Bottom

Hayes Bay

June 14th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	16.56	9.78	100.3	8.23	265
1	16.53	9.77	100.1	8.22	266
2	Bottom	Bottom	Bottom	Bottom	Bottom

July 12th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	23.84	9.35	110.8	8.37	261
1	23.78	9.63	113.9	8.18	262
2	Bottom	Bottom	Bottom	Bottom	Bottom

August 17th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	23.32	9.1	104.7	7.6	243
1	22.15	8.87	101.7	7.49	240
2	Bottom	Bottom	Bottom	Bottom	Bottom

Jacob's Island

June 14th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	17.37	9.11	94.9	8.12	235
1	17.2	9.09	94.3	8.11	235
2	16.65	9.21	94.6	8.01	234
3	16.23	9.58	97.8	8.1	233
4	16.16	9.75	99.3	8.17	233
5	Bottom	Bottom	Bottom	Bottom	Bottom

July 12th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	24.21	8.74	104.2	8.33	232
1	24.08	8.54	101.6	8.1	231
2	23.97	8.56	101.6	8.03	231
3	23.77	8.94	105.8	8.08	230
4	22.52	N/A	N/A	7.91	224
5	Bottom	Bottom	Bottom	Bottom	Bottom

August 17th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	24.44	8.44	101.1	7.62	212
1	24.02	8.17	97.1	7.41	210
2	23.41	7.96	93.2	7.27	206
3	23.17	8.05	94.6	7.31	204
4	23.15	8.17	95.5	7.31	203
5	Bottom	Bottom	Bottom	Bottom	Bottom

Village Basin

June 14th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	16.14	10.04	102.1	8.24	236
1	16.1	10.05	102.1	8.23	236
2	16.11	9.93	101.1	8.18	236
3	Bottom	Bottom	Bottom	Bottom	Bottom

July 12th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	23.64	10.02	118.3	8.42	233
1	23.57	10.53	124.3	8.39	230
2	Bottom	Bottom	Bottom	Bottom	Bottom

August 17th 2016

Depth (m)	Temp °C	D.O. (mg/L)	D.O. % Saturation	pH	Conductivity (µS/cm)
0.1	23.39	9.14	103.9	7.6	202
1	21.74	8.92	101.5	7.52	200
2	Bottom	Bottom	Bottom	Bottom	Bottom

WHITE LAKE SUMMARY

Sampling on White Lake in 2016 took place in June, July, and August on eight different sites: Three Mile Bay, North Hardwood Island, Pickerel Bay, Middle Narrows, The Canal, Hayes Bay, Jacob's Island, and Village Basin.

Lake Clarity

The clarity of White Lake in 2016 was considered fair, with all results falling within the mesotrophic 3 – 5 meter range, except for the June sample at the Jacob's Island site which read 2 meters (see figure 2). The annual mean Secchi depth was 3.53 meters, an increase over the 2015 result of 3.4m. During the July sample – the only sample taken during the same month for both 2015 and 2016 – there was a much larger increase in mean Secchi depth, from 2.65m (2015) to 3.21m (2016). This significant increase in clarity is believed to be the result of the arrival of zebra mussels in the lake.

All sites sampled for chlorophyll a in 2016 yielded results under the laboratory detection limit of 0.5 µg/L, except for The Canal site in the August sample which yielded 0.7 µg/L. In 2015, all May samples were under the 0.5 ug/L detection limit while the mean for the July and September samples was 2.0 ug/L. We believe the reason for both the large decrease in chlorophyll a and the increase in Secchi Depth is related to the introduction of zebra mussels into the lake. Phytoplankton, the main source of food for zebra mussels contains chlorophyll a, which it uses during the process of photosynthesis. Heavy feeding by the zebra mussels would decrease the level of phytoplankton, thereby decreasing chlorophyll a levels, and increasing the clarity of the water (Secchi depth). This is what we are seeing in White lake.

Total Phosphorous

Total Phosphorous values were once again collected through the Lake Partner Program each month for six months (May – October). All sites except for Pickerel Bay were sampled. TP values in 2016 show a similar trend to those in 2015. Both years the levels increased from May to their highest value in July, and decreased from August through to October. Also similar to 2015, the highest values in 2016 were found at the Three Mile Bay (12.7 µg/L) and North Hardwood Island (14.1 µg/L) sites.

Importantly however, while the trends remained the same, the absolute values of total phosphorous decreased dramatically from 2015 to 2016. The all site means for June and July 2015 (13.5 and 16.8 µg/L) were significantly higher than those of 2016 (10.1 and 11.2 µg/L). While in 2015 the TP values spanned all three trophic classes, this past year the large majority were found in the oligotrophic class (0 - 10 µg/L) with a handful of values signifying mesotrophic (10 - 20 µg/L). This change can also be attributed largely to the introduction of zebra mussels.

Through their prolific filter feeding, the mussels essentially move the phosphorous from phytoplankton to the lake sediments. So while the TP is still present in the lake, it is in an entirely different form that is not tested through our sampling procedures.

The intense predation of zebra mussels on phytoplankton also has an effect on the lake ecosystem by decimating an important component of the food chain. Phytoplankton is a crucial energy source for zooplankton, which in turn are an important food source for planktivorous fish, and so on. Any decrease in phytoplankton levels will affect the populations of all organisms who rely on them, either directly or indirectly. This may eventually have an effect on the recreational sport fish present in White lake.

Dissolved Oxygen

None of the sites sampled in 2016 showed any thermal stratification over any of the sampling days although past studies have shown stratification in the deepest basin of the lake near Pickerel Bay which was not sampled in 2016. Since only a small area of the lake stratifies, most of the lake mixes with the atmosphere which maintains excellent dissolved oxygen concentrations for the warm water fish community present in White lake. Consideration should be given to monitoring the deepest points to monitor for oxygen depletion in the deepest water. If conditions were favourable (low wind, high temperature) it is also possible that some of the deeper sites surveyed in 2016 (Pickerel Bay, Middle Narrows, Three Mile Bay) may stratify and oxygen depletion could occur.

pH and Calcium

While the pH values were relatively consistent in 2015, in 2016 there was a significant drop in pH across all sampling sites during the August sample (all site mean June = 8.1, July = 8.3, Aug = 7.5). Nonetheless, pH values fell within the range of the Provincial Water Quality Objectives of 6.5 – 8.5, meaning the pH of White Lake is ideal for aquatic life. Similar to the pH, we saw a decrease in calcium hardness over the summer (all site mean June = 33.3 ppm, July = 32.3 ppm, Aug = 30.8 ppm). The high pH and total hardness in White lake is also what makes it a very appealing environment for the propagation of zebra mussels. However, at some point an equilibrium must be reached in which there is not enough calcium (among other things) to support further growth of the zebra mussel population. At what point this occurs on White lake remains to be seen.

Overview

As described previously in this report, in 2016 White lake was classified as mesotrophic according to Secchi depth and oligotrophic according to total phosphorous and chlorophyll a. While these classifications of trophic status are a useful tool to get an idea of the condition of the lake, we should be cautious of putting too much stock in them. It should be noted that while TP levels were low enough this year to warrant an oligotrophic status, this was largely a pseudo effect caused by zebra mussels filtering out large amounts of phytoplankton. It does not mean that White lake will suddenly start bearing the qualities of a more classically oligotrophic lake. White lake is in a period of transition as it reaches a new equilibrium with the presence of zebra mussels. It is important to continue to collect data to observe this transition but to make sure to keep an eye on the bigger picture rather than overreact to every small change.

Help MVCA and the Ontario Federation of Anglers and Hunters

Stop the Invasion!

In 2015 zebra mussels were confirmed in White Lake. While already present, it is important to slow the spread of this invasive species to other lakes as well as prevent the invasion of other species such as spiny water flea. Residents and property owners need to ensure that all access points to the lake have posted signs indicating the precautions that boaters and anglers can take to prevent the spread of invasive species.

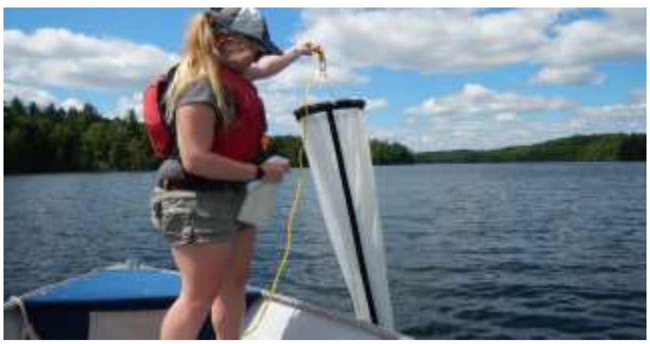
Residents are invited to participate in the Invading Species Awareness Program (www.invadingspecies.com) through MVCA and OFAH.

Pictured Top left—Rusty Crayfish Photo; Doug Watkinson, DFO
Middle left—Zebra Mussels Photo; Amy J. Benson
Bottom left– Spiny Waterflea Photo: Cathy Darnell

Check and clean watercraft <u>every</u> time it is moved to a different water body!

For more information on these and other invasive species, please visit: www.invadingspecies.com/invaders or call the Invading Species Hotline at: 1-800-563-7711.

If you would like to help monitor and prevent the spread of invasive species in the Mississippi Valley watershed, email monitoring@mvc.on.ca or call us at 613-253-0006.



MVCA and OFAH promote a proactive approach to invasive species management. This includes education and outreach about invasive species and how they are transported. Stop signs such as the one pictured above remind boaters to Inspect, Clean and Drain their boats so that they don't give invasive species a free ride.

WHAT CAN YOU DO?

The major impact of lake front development on water quality is caused by the change in land use from forest to low density residential development. This increases the amount of water that is directed to the lake during rainfall events, carrying sediments, nutrients and contaminants into the water.

These impacts can be limited by temporarily storing water (eg. rain barrels), directing runoff away from the lake (eg. installing properly working eaves troughs), and infiltrating more water (eg. using rain gardens). These methods are ways to help limit the effects of development but the best way to avoid impacts is to reduce the land use change. This can be accomplished by re-planting or maintaining current vegetated buffers and reducing the vegetation cleared for buildings.

ALGAE WATCH

Over the last few decades algae and plant growth appears to be increasing in our lakes. MVCA in partnership with Friends of the Tay Watershed Association, Carleton University and Rideau Valley Conservation, are trying to better understand aquatic plant and algae growth in Eastern Ontario lakes. Phosphorus, climate change and zebra mussels are all being examined for their possible effects.

You can help us get a handle on this issue by reporting algae blooms and excessive plant growth on your lake at www.citizenwaterwatch.ca.

SITE EVALUATION GUIDELINES

Water front development can introduce nutrients and suspended solids into surface water through migration from septic systems and runoff from cleared areas. Through lake stewardship, proper planning, and education, the negative effects of shoreline development on lake health can be greatly reduced. Mississippi Valley Conservation Authority (MVCA) along with Rideau Valley Conservation Authority (RVCA) and Cataraqui Region Conservation Authority (CRCA) have released Site Evaluation Guidelines for water front property which will help to address potential impacts on the aquatic environment for the review of development proposals.

For more information on these guidelines please contact Mississippi Valley Conservation Authority at 613-253-0006.

For more information about MVCA
monitoring programs
please call Mel Dodd-Moher at
613.253.0006 ext. 272 or
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