



2012 STATE OF THE LAKE REPORT SUMMARY

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The *State of the Lake* report is a 'living' document that is intended to create a record of historic and existing conditions and influences in the Farlain Lake watershed. As a living document, the report will continue to evolve over time as individual circumstances and issues occur and new or better information becomes available.

Information in the *State of the Lake* report has been gathered over the past four years. Some of this information originated from historical records maintained by the Association. Other information was obtained from the Federal Government, Ontario Government, and municipal government sources. The report also contains recent information emanating from studies undertaken by community partners and by FLCA volunteers.

This State of the Lake report is intended to 1) evaluate the health of Farlain Lake and its watershed based on current available information and data, 2) identify information gaps where more research and data collection is needed, and 3) facilitate a better understanding amongst lake community residents, interested community partners, and visitors of the health of the lake and its watershed, and provide them with insights of both problems and potential solutions, as well as the serious challenges that lie ahead.

Information in the 82 page report is comprehensive and detailed. This summary highlights key findings in a number of key areas of interest.

An Overview

Farlain Lake has:

- 6.95 kilometre shoreline
- 2.6 kilometre fetch
- 1.10 square kilometres (109.59 ha) surface area
- Average depth 1.7 metres (5.6 feet) with two separate pockets of deep water approximately 5.0 metres (16.5 feet) in depth.
- An estimated water volume of 2,682,381 cubic metres. The retention time (how long water stays in the lake) has not been quantified.

An Overview (continued)

- One permanent inflowing stream located on the southwest shoreline. The flow rate of the stream is 11.2 litres per second. There is no visible outflow from the lake.

Lake Classification:

- Considered to be a kettle lake formation and classified as a seepage lake

The Farlain Lake Watershed:

- Includes all the land that drains into Farlain Lake.
- It is one of the watersheds in the 24 square kilometres Simcoe North Waterfront Drainage Basin (2ED-16).
- The preliminary watershed of Farlain Lake has not been determined.
- The ratio of land to lake surface area in the preliminary watershed has not been determined.
- Additional hydrological studies are needed to confirm Farlain Lake's watershed.
- There is no significant wetland within the lake's preliminary watershed. Two aquatic bed wetlands are situated at the north end of the lake and the southwest end of the lake.

Topography and Geology:

- The topography of the lake and its watershed reflects its Wisconsinan glacial origins.
- The watershed is dominated by a narrow, steep sided valley with a north-south orientation.
- The shoreline is flat to gently sloping.
- 12,000 years ago the lake was part of a glacial spillway that flowed into Lake Algonquin (Georgian Bay).
- Approximately 11,200 years ago the glacial spillway was segmented into three smaller bodies of water (Farlain Lake, Kettle's Lake, Gignac Lake) through the formation of sand dune complexes caused by wind and wave action.
- The surface elevation of Farlain Lake is 208 metres (682.42 feet) above sea level and the lake is approximately 9 metres (29.5 feet) higher than Kettle's Lake. Farlain Lake is more than 32 metres (105 feet) higher than Georgian Bay; the exact difference is not quantified due to constant reduction in the water level of Lake Huron.
- Approximately 31-61 metres (100 – 200 feet) of glacial till covers the limestone bedrock.
- Thin topsoil (0.1 to 0.25 metres) covers a well drained sandy loam till.
- Majority of shoreline is well-drained outwash sand with small deposits of clay.
- The lake bottom at the north and southwest ends of the lake consists of muck (sediments).
- A firm sand bottom may be present in shallow water if exposed to wave action.

An Overview (continued)

Hydrology

- There are two aquifers beneath the Farlain Lake watershed. One is confined; it is separated from the unconfined aquifer by a layer of silt and clay
- Aquifers travel in a west to east direction.

Groundwater Quality and Quantity

- The hydrologic budget is not quantified but groundwater is believed to be significant based on records of the Township pumping station that serves a 90 lot subdivision on the west side of the lake.
- Most of the groundwater in the lake's watershed comes from precipitation (rainfall and snowmelt) absorbed into the upper aquifer's permeable formation.
- The quality of groundwater throughout the watershed has not been assessed. However the water pumped from the Township well suggests that groundwater meets health standards.
- Due to the thin layer of topsoil and sandy loam soil lying beneath, groundwater is susceptible to surface contamination from land use activities.

Wellhead and Water Supply Protection

- A current comprehensive inventory of wells in the lake community does not exist.
- Sandpoint wells and shallow older wells located on smaller lots are susceptible to contamination from adjacent septic leaching beds and parking areas.

Wastewater and Sewage Disposal

- The Township initiated a septic system re-inspection program in 2002.
- 99.7% of the residential lots within the watershed were deemed to be acceptable (met specific standards) in December 2011. As of August 2012 all septic system issues within the watershed have been dealt with.
- Re-inspection of Farlain Lake area septic systems will be undertaken again in 2013.
- Treated water from swimming pools and hot tubs is likely emptied on land or into the lake as the treated water containing chemicals/salt is harmful to septic systems.

Landfill and Septage Disposal

- There is not a landfill site in the watershed; solid waste is collected by the County of Simcoe and disposed of at a transfer station within Tiny Township.
- There may be abandoned landfills within the Farlain Lake watershed.
- A septage disposal field owned by a private sector hauler and operated under a Ministry of Environment Certificate of Approval is located within the lake's watershed.
- The Township of Tiny does not have a central septage treatment facility; more than 90% of Township properties utilize individual septic systems.

An Overview (continued)

Surface Water Quality

- Farlain Lake is reasonably healthy.
- Levels of phosphorous and chlorophyll *a* as well as water clarity indicate that the lake is mesotrophic (moderately productive) to mildly eutrophic.
- Eutrophication is the natural aging process of a lake; human activity (cultural eutrophication) accelerates the lake's aging process.
- Sodium and chloride concentrations are low in the lake.
- Phytoplankton (algae) and zooplankton are at moderate levels; both are a biological component of a 'healthy' lake.
- Algal communities well balanced; typical of those found in shallow temperate water.
- Nutrient concentrations and algal biovolume have decreased since 1996.
- No significant bacteria (*E.coli*) counts; *E.coli* does not pose a health concern for residents and visitors for recreational use.
- Despite current good conditions, care needs to be taken to reduce human impacts (nutrient loading) to slow the aging process.

Water Levels

- Lake water levels fluctuate naturally due to precipitation and evaporation which varies from season to season and year to year. Some water loss can be attributed to draw off by shoreline residents for household use and property irrigation. There is an ongoing debate regarding the possible sub-surface migration of water from Farlain Lake into Kettle's lake.
- A water level gauge was installed this year and measurements, including water temperature and air temperature, were recorded May 19 - October 7, 2012. The net loss for the five month period was 22.9cms.

Fisheries

- The lake is a warm water fishery with a diverse fish community. i.e. yellow perch, smallmouth bass, rock bass, pumpkinseed, brown bullhead, white sucker.
- Largemouth bass and walleye (pickerel) are the principal game fish and predators.
- A study conducted by MNR in 2008 determined that both the walleye and mouth largemouth bass species are stressed.
- The cause in decline of the walleye and largemouth bass populations has not been determined. Possible causes include habitat loss, change in aquatic plant species, and over-harvesting by anglers.

An Overview (continued)

Wildlife

- There is limited scientific data collected about current wildlife conditions and trends in the lake's immediate watershed.
- Visual observations have concluded that the Farlain Lake watershed and nearby 2,915 hectare Awenda Provincial Park is home to a wide variety of wildlife, waterfowl, and bird species.
- Habitat loss through land development, the removal of natural shoreline vegetation, the presence of people and their activities, and climate change all have a cumulative affect on the long-term survival of wildlife species.
- The Ministry of Natural Resources has identified a number of species that are considered threatened, endangered, or of special concern. Some of these species include the Blanding's turtle, Monarch butterfly, Eastern Milk snake, Red-Headed Woodpecker, and the Eastern Fox snake.

Forest Resources

- Forest cover around Farlain Lake is comprised primarily of deciduous trees interspersed with some red pine plantations.
- MNR considers the Farlain Lake watershed to be highly forested. The current forest community exists as private and public (Township of Tiny, Awenda Provincial Park) holdings.
- The current amount and health of forest cover in Farlain Lake's immediate watershed has not been determined.
- Forest cover along the shoreline is generally fragmented or in various stages of succession.
- The County of Simcoe Forest Conservation Bylaw (tree cutting bylaw) regulates forested area at least one hectare (2.5 acres) in size or larger.
- A tree cutting bylaw does not exist to regulate forest cover removal on properties 1 hectare (2.5 acres) in size or smaller.

Open Space and Green Space

- Along the shoreline the Township of Tiny has ten unopened right of way properties, one public park, four access trails connecting inland property owners on Andrew Drive to the lake, and three large undeveloped green spaces.
- The Township's future plans for these properties are unknown.
- Without a long-term strategy, the undeveloped shoreline right of way properties may be developed as access points thereby subjecting the lake to increased ecological and social impacts.
- The Township park/undeveloped boat launch is problematic when various activities (i.e. swimming, picnicking, boat launching, etc.) occur at the same time.

An Overview (continued)

Aquatic Vegetation

- There has been little aquatic plant monitoring undertaken to indicate how aquatic plant has change over time on the lake.
- MOE undertook a basic study in 1973. Three plant species were identified
- The FLCA undertook a detailed submerged aquatic plant study during the summer of 2012. Ten plant species were identified.
- Vegetation varied throughout the lake from abundant to sparse and in some areas vegetation was non-existent.
- Dense vegetation is prominent at the mouth of the stream flowing into the lake. One of the plant species in this area is Eurasian water-milfoil which is a prolific invasive species.
- The other invasive species observed in the lake is the Curly Leaved Pondweed. As the growing cycle concludes in early July the overall presence of this invasive species will have to be monitored at the south end of the lake in 2013.

Boating Impacts

- 2011 watercraft carrying capacity study undertaken by FLCA in 2011
- There are a lot (387) of watercraft (powered and non-powered) for a small lake.
- The potential for conflict, accidents, and environmental damage to the lake's ecosystem exists...particularly on holiday weekends.
- Due to its overall shallowness, the lake will be prone to environmental impacts from motor boat activity particularly in shallow areas 1.5 metres deep or less.

Population Distribution

- A November 2011 review of properties within the lake community determined that there were 361 residential properties and 60 approved vacant properties.
- Of the number of residential and vacant properties, there were 203 (196 residential, 7 vacant) shoreline and 218 (165 residential, 53 vacant) properties
- Based on a Statistics Canada residential figure (2.7 persons per household) there are approximately 975 permanent and seasonal residents in the community.
- The physical carrying capacity of the lake community has not been determined.
- As development and population increases within the lake's watershed, the water quality and overall health of the lake may be affected.
- The Official Plan of Tiny Township will likely be reviewed in late 2013 or in 2014 once the County of Simcoe's Official Plan is approved by the Province.

Infrastructure

- The Township of Tiny maintains 15.2 kilometres of roads within the lake's immediate watershed.
- The Township applies 9.3 metric tonnes of road salt to roads in the lake community during the winter months.

An Overview (continued)

Values/Issues

- 2009 and 2011 community and membership surveys indicate lake community residents are highly concerned about natural resources (i.e. water quality, natural shoreline, invasive species, wildlife, etc.) in the watershed.
- Environmental concerns (i.e. septage disposal), land development, and the inappropriate behaviour of people on both land and water were also identified as key concerns.