Fourteen Island and Mink Lakes

Lake Stewardship Plan Report and Recommendations

August 2010

To Protect and Enhance for Today and the Future

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A Message to Residents and Cottagers

It gives me great pleasure to see the completion of this Lake Stewardship Plan. It has taken a group of dedicated FIMLA people more than three years to research and write the plan. The members of the Lake Plan Committee are to be thanked and congratulated for a fine product. I want to thank Peter Peart, Mike Jennings, Elaine St. John, Grace D'Alo. I especially want to recognize Brett Dark, who took on the Chairmanship of the committee, and kept us all going throughout, and Robert Powell, whose publishing skills are evident in the high quality of this document.

An important part of the process was to engage the FIMLA community, and I believe we were successful with the various efforts to do so: two surveys; the 2007 workshop; the 2009 draft summary report; and the many updates in the newsletters, on the website, and at annual general meetings. We also reached out to the communities on the smaller lakes, Buffy, Little John, and Little John's Sister, as these lakes make up the subwatershed, or drainage area, of Fourteen Island and Mink Lakes. I hope that, as a result of these efforts, we will have a community who will continue to be involved in the stewardship of our lakes. Some of this is already happening. We have a water quality program that now includes all five of our lakes, we have people directly involved in fisheries management on Fourteen Island, and we have a list of specific actions that will need the support of members of the community.

The process has helped us to identify those values we all think are important to our lives on these lakes, and the challenges we think need to be addressed to protect those values. This is why we took on this project. The plan sets out a specific list of actions that we feel will meet those challenges. The actions are now ready to be tackled, and the only thing we need are volunteers to step forward to help. I hope all of you in the FIMLA community will look carefully at the list of actions in Section 8.0, and consider offering your services to get some of those things done. These are your lakes, and if you all pitch in a little, the lakes will continue to give you the pleasure they now provide.

I am proud to present to you the Fourteen Island and Mink Lakes Association's Lake Stewardship Plan.

Thank you,

Gord

Gord Rodgers, President
Fourteen Island and Mink Lakes Association

Preface

Those who live or cottage in the Fourteen Island Lake area realize it is a natural treasure. Its undeveloped, irregular shorelines, abundant fish and wildlife, and varied forests, nourish our hearts, bodies and minds. But there are simple and obvious questions to ask—who will protect this treasure, what needs to be done and when is the time to act? This plan is the Fourteen Island and Mink Lakes Association's answer to those questions.

This Lake Stewardship Plan is the work of the Fourteen Island Mink Lakes Association (FIMLA). It focuses on five lakes in the upper reaches of the Napanee River watershed: Buffy, Little John, Little John's Sister, Mink, and Fourteen Island. Volunteers from FIMLA contributed significant time and effort between 2006 and 2010 in developing this document.

The FIMLA area is environmentally healthy and stable from many perspectives. Land development is controlled and building lots are of sufficient size to discourage overdevelopment. Water quality is generally good and the water level in the lakes is adequately controlled. The variety, size and quantity of fish species are in a healthy balance with the amount of sport fishing in the lakes, although the walleye population is not doing well. Other parts of the FIMLA environment, such as the forest, wildlife and wetlands, are similarly well situated. But the FIMLA members know that the balance between a healthy ecological environment and human use is fragile. Keeping the current balance requires the attention and effort outlined in this plan.

The aim of this Lake Stewardship Plan is to:

- Identify what makes the FIMLA area a unique and desirable place to live and visit;
- Identify the challenges to maintaining its character;
- Establish a baseline for ongoing monitoring, collection of data, and advocacy for the healthy and sustainable development of the FIMLA area;
- Recommend actions for sustaining the environmental, social and cultural health and viability of the FIMLA region; and,
- Provide a structure for on-going planning, education and action; a 'living' document that can and should be regularly reviewed and revised to reflect the changing needs of the FIMLA community.

There is a saying that the best time to plant a tree was probably 20 years ago; the second best time is today. The same is true for this type of planning and community organizing process. The residents of Fourteen Island, Mink, Little John, Little John's Sister and Buffy Lakes believe it is critical to act now and to act together to protect and preserve the FIMLA environment for current enjoyment and future sustainability.

Acknowledgements

Many people spent many hours to make this plan a reality. They deserve a great big thank you from everyone.

The Lake Planning Committee

- Brett Dark – Committee Chair; 2008-09 survey
- Mike Jennings – Emergency Services Chapter
- Peter Peart – Fish and Fishing Chapter; fishing survey assistant
- Robert Powell – Layout, photography, and publication; History Chapter
- Gord Rodgers – Facilitator
- Elaine St. John – Land Use and Development Chapter

Other Contributors to the Plan Contents

- Grace D'Alo – Editor
- Reg Genge, Ontario Lake Assessments – Water quality analysis
- Susan Grigg – Natural Environment Chapter
- Dann O'Kane, Tim's Lake – Lists of plants and animals
- David Babcock - Advice on boating regulations map

Agency Partners

- Frontenac Stewardship Council – Financial support; mapping
- Ministry of Natural Resources – Fishing information and fishery surveys
- Ministry of the Environment – Water quality information
- Quinte Conservation Authority - Mapping; advice on dam
- Township of South Frontenac – Land Use and Municipal Planning information
- Thanks also to French Planning Services who provided facilitation throughout the process.

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Background Information

Stewardship Plan Summary

The FIMLA community developed a Lake Stewardship Plan because it wanted to better understand and protect the fragile treasure that its members have the privilege of owning and enjoying. This Lake Stewardship Plan is based on the surveys and investigations conducted by FIMLA association members over the period 2006-2010. Developing the plan has been a collaborative effort, reflecting the values of the FIMLA community, as laid out in the plan's Vision:

▲ Rainbow's end - at Fourteen Island Lake.

Figure 1. Stewardship Plan Vision

The Fourteen Island and Mink Lakes Association area is a treasure of natural beauty and balance. If every person in the FIMLA community acts as a steward, this beauty and balance can be preserved.

As stewards we will act conscientiously to promote:

- Healthy water quality;
- Rich biological diversity;
- A healthy fishery and good fishing;
- Responsible recreational activity;
- A friendly and open attitude towards neighbours and community;
- Environmentally sustainable development; and
- Peaceful enjoyment of the lakes and personal privacy of each resident.

Objectives

This Lake Stewardship Plan identifies seven objectives that correlate to the vision stated above. These objectives are listed below, and Chapters 1.0 through 7.0 of the plan contain a set of recommendations and actions associated with each of the objectives.

Natural Environment Objective:

To monitor, protect and enhance the ecosystems in our lakes and maintain a healthy environment for fish, wildlife, and vegetation for now and for future generations.

Water Quality and Water Levels Objective:

To maintain and improve the FIMLA lakes' water quality and water level management.

Fisheries and Fishing Objective:

To monitor our fish and fish habitats and take actions to ensure a healthy population and sustainable fishery for anglers.

Social and Recreational Activities Objective:

To promote cottage use and recreational activities that are safe,

Plan Summary (cont'd)

▲ Winter sunrise over Fourteen Island Lake.

respectful of others' right to peace and tranquility, and environmentally responsible.

Emergency and Municipal Services Objective:

To work with provincial and municipal authorities to improve police, emergency and other municipal services.

Land Use and Development Objective:

To ensure that future land development is in keeping with the environmental, social and physical character of the FIMLA area, and:

- to support administration and enforcement of environmental regulations; and,
- to promote comprehensive environmental planning for the FIMLA and contiguous regions.

Sense of Community Objective:

To bring people of the FIMLA area together to implement this Lake Stewardship Plan and to realize the community's shared vision and values.

Conclusion: The Role of the FIMLA Community

There is a role for everyone in this Lake Stewardship Plan. Whether it is to educate, advocate, investigate, network, or simply to responsibly enjoy the area, everyone can contribute to reaching the objectives stated above and protecting Fourteen Island, Mink, Little John, Little John's Sister, and Buffy Lakes.

Background of the Plan and Process

This Lake Stewardship Plan is a community plan, developed by and for the community of people who live on the five lakes comprising the FIMLA area: Fourteen Island Lake, Mink Lake (a.k.a. Sigsworth Lake), and the three lakes that flow into Mink Lake, namely Little John Lake, Little John's Sister Lake, and Buffy Lake. It also covers all the areas that drain into these lakes (the subwatershed area as outlined in Map 4.) It presents a history of the FIMLA region and how it has developed, and a snapshot of the characteristics and condition of the lakes and surrounding area. It also sets out some of the challenges to protecting the FIMLA area, and includes a plan of action for meeting these challenges.

▲ Launching a survey of residents at the 2008 FIMLA AGM.

The Planning Process

Step One - Getting Started

The idea of developing a FIMLA Stewardship Plan came from the Executive Committee of the Fourteen Island Mink Lakes Association (FIMLA). With the endorsement of the Association at the August, 2006 Annual General Meeting, the process was underway.

Lake Plan Committee

The FIMLA executive committee began by establishing the Lake Plan Committee, consisting of six community volunteers:

- Brett Dark, Chairperson
- Mike Jennings
- Peter Peart
- Robert Powell
- Gord Rodgers
- Elaine St. John

From the beginning of the process, the Lake Plan Committee's goal was to include the entire FIMLA community in every phase of the planning process. It provided information to the community through newsletters, workshops, the Annual General Meeting, and the FIMLA website. The Committee met regularly over a period of three years to monitor the progress of the planning process and do whatever was necessary to complete it.

The first action by the Lake Plan Committee was to conduct a survey of residents. This was completed by the end of 2006. The survey asked the question: "What matters would you like the lake association to tackle in the next three years?" The answers were the starting point for determining the topics that needed to be addressed in the Lake Stewardship Plan.

After deciding to go forward with a Lake Stewardship Plan for the watershed area of Fourteen Island and Mink Lakes, residents and property owners from the three lakes upstream of the main lakes (Buffy,

Plan Process (cont'd)

▲ Consulting stakeholders at a residents' workshop.

Little John's Sister, and Little John) were invited to join the FIMLA and to participate in the planning process.

Step Two – Residents' Workshop

The official 'kick-off' for the planning process took place on May 19th, 2007 at a Residents' Workshop, held at the Desert Lake Resort. All members of the FIMLA and property owners from all five lakes were invited. At the workshop, participants learned about lake planning what a lake planning process would look like in the FIMLA area.

Everyone attending was also asked to identify the following:

- Values, special places, and memories;
- A vision and objectives for the plan;
- Current and future issues on the lakes; and
- Actions to address the identified issues.

Step Three - Finding Funds

The Lake Plan Committee set a budget to cover costs for research and planning activities. Funding was sought and received from these sources:

The Frontenac Stewardship Council provided funding grants in 2007 and in 2008;

The Fourteen Island and Mink Lakes Association (FIMLA) provided funding in 2007, 2008, 2009 and 2010.

The Ministry of Natural Resources, through the Community Fish and Wildlife Involvement Program provided grants in 2008 and 2009 to help with fisheries assessment work.

Step Four - Finding Other Resources

During the last three years, members of the Lake Plan Committee contacted, met with, and/or presented information to, key government agencies to inform them of FIMLA's planning process and to seek their input.

These agencies include:

- The Planning Office and Council of the Township of South Frontenac,
- Ministry of Natural Resources, Kingston Area Office;
- Frontenac Stewardship Council;
- Quinte Conservation Authority; and
- Ministry of the Environment.

Step Five - Collecting Background Information: 'State of the Lake'

The most time consuming part of the planning process was collecting and analyzing background information. Members of the Lake Plan

Committee collected information from diverse sources and created a 'State of the Lake' report that summarized all the information that had been collected to that point. The State of the Lake report was presented to the FIMLA Annual General Meeting on August 3, 2008.

Over the period of developing the plan, the Lake Plan Committee worked to understand the concerns and desires of the community. The issues that were identified in our 2006 survey were refined at the May, 2007 workshop, and helped to focus the Lake Plan Committee's efforts. A final report on the survey and workshop results was circulated to the community and posted on our website in late summer of 2007. In addition, a telephone survey was conducted in 2008-09. Of a possible 96 residents, 72 were contacted and asked a series of questions about boating and social and recreational behaviour. The results of this survey were posted on the website, and presented at the 2008 and 2009 Annual General Meeting.

▲ Participants reflecting on values at a residents' workshop.

Step Six - Preparing the Plan

Based on all the information collected in the steps above, the Lake Plan Committee established a vision for the FIMLA lakes and objectives and recommendations for achieving that vision. By August of 2009, a draft summary of a comprehensive lake plan was completed entitled, 'Draft Lake Stewardship Plan: Summary of Recommendations'. This draft summary was printed and mailed to all FIMLA area property owners and members, and posted on the FIMLA website. It was also sent to the relevant government agencies. The FIMLA membership endorsed the draft summary plan at the Annual General Meeting in August of 2009.

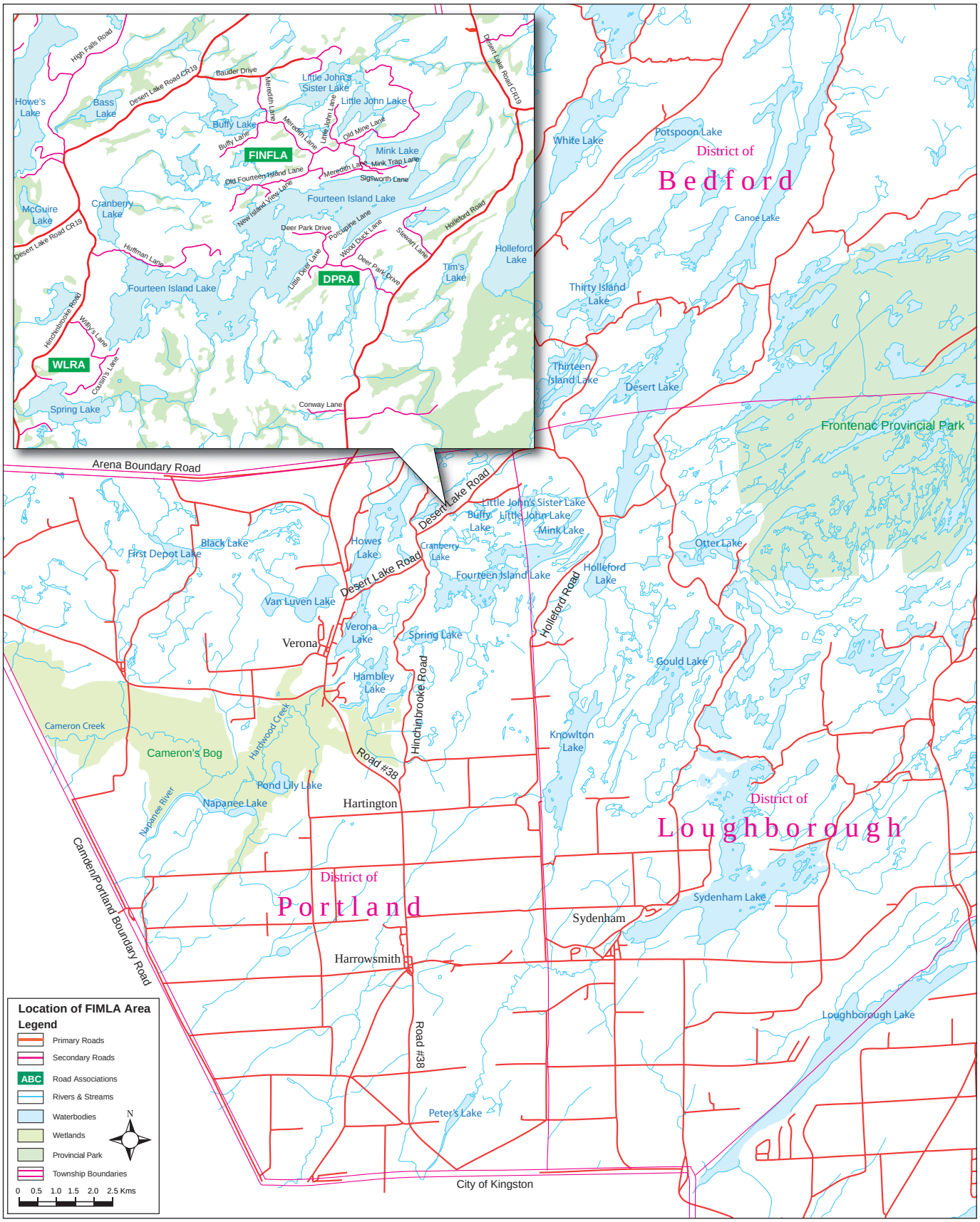
The Lake Plan Committee next finalized the lake stewardship plan and printed it in August, 2010.

Lake Stewardship Plan Report

A copy of the final stewardship plan is available to anyone at a (subsidized) cost of $10.00. It is also posted on the FIMLA website.

FIMLA Location

Map 1. FIMLA Area Location and Road Association Areas



Background Information (continued)

Description of the FIMLA Area

Location

The FIMLA lakes are located in the former townships of Portland and Loughborough, currently South Frontenac Township, in Frontenac County, Ontario. These lakes are about thirty kilometres north of Kingston and about five kilometres east of County Road 38 (formerly Highway 38). The lakes are east of the village of Verona, and north of Sydenham.

▲ Leafy lane in summer off Old Fourteen Island Lane.

As can be seen on Map 1. there are three primary access areas to the FIMLA lakes, each of which is maintained by a community-based 'road association':

- **Deer Park Drive Community:** The southern shores of the central and eastern basins of Fourteen Island Lake are accessible from Holleford Road via the private lane of Deer Park Drive, where Wood Duck Lane, Little Deer Lane and Porcupine Lane have access to a total of twenty-nine waterfront lots on Fourteen Island Lake.
- **Bauder Drive – Meredith Lane Community:** The north side of the watershed is reached from Desert Lake Road via Bauder Drive, from which a number of private lanes provide access to Buffy Lake (ten properties), Little John Lake (twelve properties), Little John Sister's Lake (sixteen properties), Mink Lake (fourteen properties), and the north shore of Fourteen Island Lake (twenty-four properties).
- **Willy's Lane Community:** The west end of Fourteen Island Lake is reached by Hinchinbrooke Road onto Willy's Lane, where there are nineteen properties.

There are several other smaller private lanes servicing small numbers of properties around the lakes: Conway Lane and Stewart's Lane on the south side of Fourteen Island Lake; Floyd Lane, Storm's Lane, and Huffman Lane on the north; and Bauder Road on Little John's Sister Lake.

Figure 2. Characteristics of the Lakes

Name	Size (hectares)	Depth (metres)	# Waterfront Lots
Buffy Lake	3.1 ha	4	13
Little John's Sister Lake	13.1 ha	4.5	16
Little John Lake	27.4 ha	23	12
Mink (Sigsworth) Lake	23.4 ha	25.6	15
Fourteen Island Lake	244.8 ha	36.6	81

Characteristics of the Lakes

The FIMLA area is a testament to the power of the glaciers that last went through this area about 12,000 years ago. As the early settlers quickly

FIMLA Lakes and Islands

▲ Buffy Lake in fall colours.

found out, the glaciers scraped away any rich, fertile soil. Glaciers also left a distinct pattern of ridges and hollows – aligned in roughly a northeast to southwest pattern. We see this pattern in the lakes (the shoals and deeper areas), as well as on the land, where there is a pattern of rock ridges with elongated wetlands in between.

The sub-watershed covered by the Lake Stewardship Plan includes 5 lakes, some large ponds, and lots of wetlands. The lakes include, in their order in the watershed:

- **Buffy Lake** at the top of the watershed, was formed when a dam was constructed at the outlet of Little John Lake, and it is the smallest of the FIMLA lakes. With only a small number of developed lots, Buffy Lake maintains a generally natural shoreline.
- **Little John's Sister Lake** is directly downstream of Buffy, and owes its size and depth to the same dam in Little John Lake. A stream from Buffy feeds into a large wetland bay at the northwest end of Little John's Sister. It is larger than Buffy, but since there is only a small number of developed lots with minimal waterfront clearing, the shoreline is also predominantly natural. The lake contains a number of islands, and its bays on both east and west ends are swampy. The outflow of Little John's Sister goes through a wetland area into Little John Lake. Although the area is heavily overgrown during the summer, canoes and small boats can make their way between the two lakes.
- **Little John Lake** is about the same size as Little John's Sister but is a deeper lake – twenty-three metres at its deepest point. The properties along the shoreline of Little John Lake establish a human presence on the lake, but like the two upper lakes, there is little clearing in front of most cottages/houses so it retains its natural character. In contrast to the flatter topography of the two upper lakes, Little John includes a number of steep rock faces, notably on the east shore. At the outflow of Little John Lake a stone and concrete dam maintains the water levels for the three lakes (Buffy, Little John's Sister, and Little John) before the water flows into the western basin of Mink Lake.
- **Mink Lake** (a.k.a. Sigsworth Lake) is a long (1.8 km.) and narrow (200m) lake, approximately 1.8 kilometres long and 200 metres wide. Its shape and topography indicate glacial gouging in its geological history. The bays at both east and west ends, where drainage enters Mink Lake, are shallow and weed-filled. The west basin includes the deepest part of the lake at 25 metres. The deepest point in the

▼ Fourteen Island Lake looking east.

east basin is 18 metres. Almost the entire north shore of the lake is high and steep, with a rock face section at its midpoint. Along the shoreline of the west basin of Mink Lake there are two subdivision plans approved in 1984 and 1986, along with a few individual lots that were developed in 1982. All lots have reasonably wide shoreline frontages, and a substantial amount of that shoreline remains in a forested state. The east basin remains undeveloped at the time of preparing this plan. A narrow channel leads from Mink Lake into Fourteen Island Lake.

- **Fourteen Island Lake** is the largest by far of the FIMLA lakes, at 245 hectares (605 acres). The lake consists of three basins, the western basin the deepest at 36 metres, the central basin at 22 metres (in the big bay east of Storm's Island), and the eastern basin at 20 metres. Steep shorelines characterize the lake especially in the eastern and central basins, with some impressive cliffs in the narrow, eastern bay. Only five of the fourteen Islands - Split Rock, Harkness, Storms, McLeod and Beaver - are formally named and are registered in the South Frontenac Township records.

The islands, the numerous bays, and the broken shorelines give the lake a sense of being bigger than it is, and give most of the property owners a degree of privacy despite the overall development on the lake. There is an enclave of older, traditional cottages in the far western bay, with scattered cottages and houses through the rest of the west basin and central basin. Subdivision developments dominate the rest of the lake until you reach the far eastern bay which at the time of this plan was undeveloped except for three cottages on the south side. The subdivisions of the 1980's were developed with more restrictive requirements than the original cottage lots. Minimum lot sizes increased, as did minimum setbacks from the water's edge. The proposal to develop the Deer Park subdivision on the south side of the lake was the impetus to form the Lake Association in 1987. The new Association wanted to ensure that this new development was in keeping with the character of the lake. The Association worked with the Township to reduce the total number of lots proposed, and increase the minimum lot size and frontage, as well as the required shoreline setbacks. Since much of the shoreline is steep and wooded, most houses had to be built above the steep slopes, and the overall appearance of the shoreline (both north and south sides in the eastern basin) is one of a forested natural landscape.

FIMLA Lakes and Islands (cont'd)

▲ The rocky, natural shoreline of Little John Lake.

▼ Fourteen Island Lake looking west.

Public Access and Public Land

▲ The overall appearance of shorelines is a forested, natural landscape.

Shoals are a dominant feature across Fourteen Island Lake, thanks to the passage of the glaciers. As can be seen on Map 6. they can be found in each of the three basins, all oriented in generally the same, southwest to northeast direction.

Public Access and Public Land

The beds of all the FIMLA lakes are Crown land, but there is no formal public access to the lakes. The unopened road allowances that abut waterfront are municipal land, and therefore 'public'. There are four small portions of municipal land on the north side of Mink and Fourteen Island Lakes that theoretically serve as public access points. One is at the junction of Old Fourteen Island Lane and New Island View Lane, two others are at the very end of Meredith Lane and the fourth is just past the junction of Meredith Lane and Old Mine Lane. All of these accesses are steep and cannot be used to launch any boat larger than a canoe. Limited access for boat launching is available via a boat launch off Willy's Lane. This launch site is on private property, and limited boat launching is available at the discretion of the owner of the land. Several of the residents around the lakes have their own launching sites at their cottages or homes. In winter, there is public access across the wetland on a municipal road allowance (road right of way) at the east end of Fourteen Island Lake.

A narrow strip of municipal land between two lots at the end of Bauder Drive provides a public access point to Little John's Sister Lake, although the area is not cleared and the shoreline is a shallow, weed-filled bay.

There is no Crown land or conservation authority-owned land in the sub-watershed.

▶ Beaver Island located in the central basin of Fourteen Island Lake.

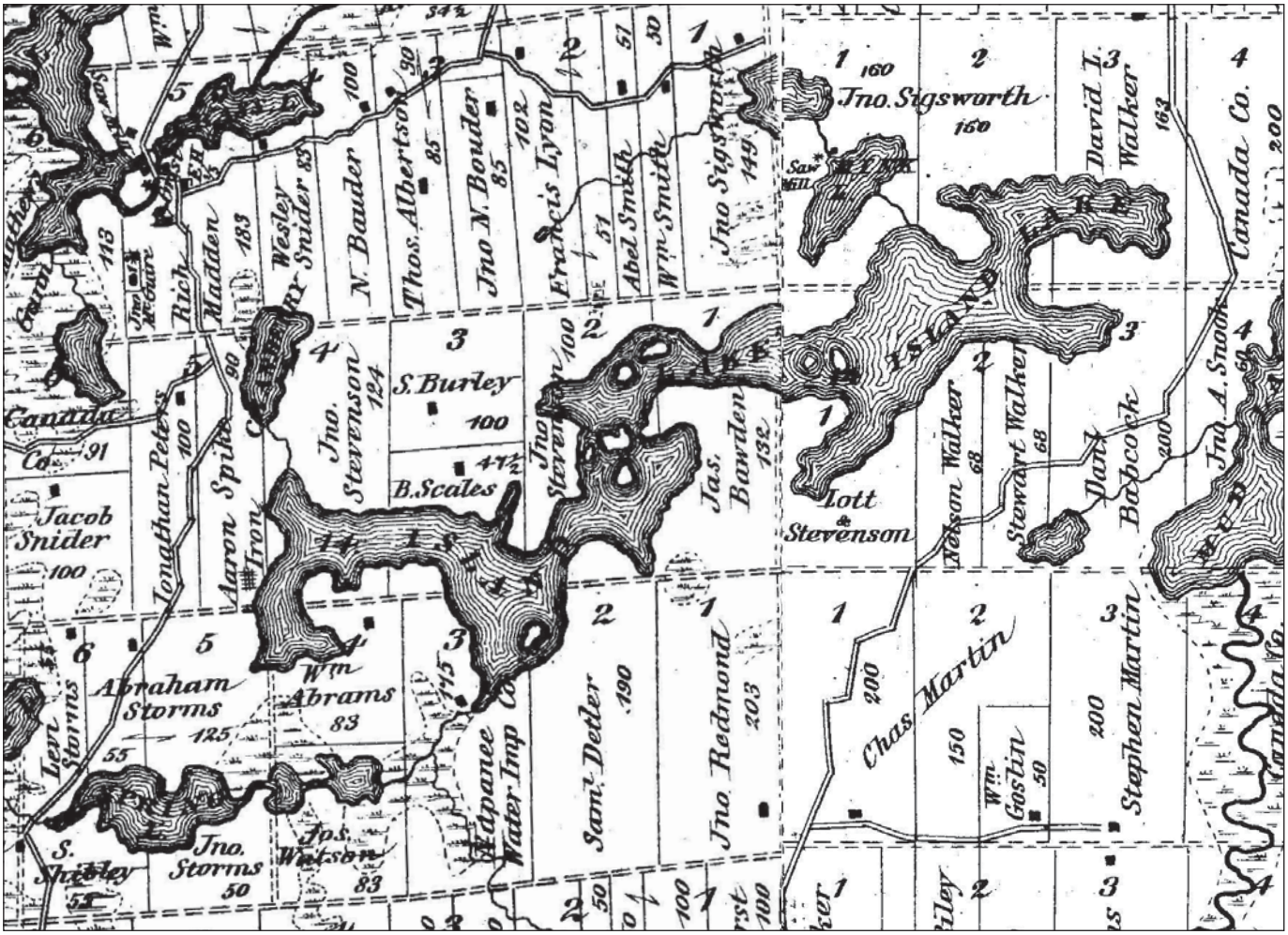
A Short History of the FIMLA Area

Township Origins

In 1784, following the end of the of the American War of Independence, 'water' townships were created on the north shore of Lake Ontario for the resettlement of exiled British Empire Loyalists. The Fourteen Island Lake area was first mapped when land further north was surveyed to create, the 'back country' townships of Portland and Loughborough. Samuel Wilmot, who completed surveying Portland in 1809, was not impressed with this area, commenting that, ". . . all the Land Lying North of the 8th Concession is absolutely not worth Surveying, being a body of Hills, Rocks and Drowned Land . . ." Most of the land around Fourteen Island Lake was granted to the children of Loyalists, when they came of age, but none of the original grantees settled on their lots. As late as 1861 all the lots around the lake were still vacant. Map 2. (below) records the names of landholders around the lakes in 1878.

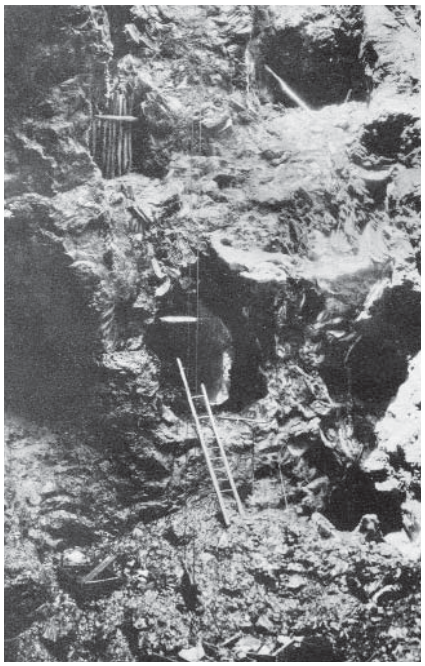
▲ Depiction of Empire Loyalists landing at St. John, New Brunswick, 1783.

Map 2. Historical Map of the Fourteen Island Lake Area



▲ Detail extracted from maps of Portland and Loughborough Townships in Meacham, J. H. 1878. The Historic Atlas of the Counties of Frontenac, Lennox and Addington.

History of FIMLA Area (cont'd)



▲ Open pit feldspar mine workings off Old Mine Lane c.1930.

Farming

The population of the townships remained sparse until after the 1830s when rising numbers of immigrants started arriving from the British Isles. Subsistence farming dominated when the first settlers in this area struggled to clear land and build homesteads. Labour intensive, mixed farming developed by the 1860's as fields were cleared and the land was drained. From the 1890's through to the mid-twentieth century, dairy farming developed in response to the demand for milk, butter and cheese by a growing urban population.

Logging and Lumber

Logging and lumber production were the other major economic activities in the nineteenth century. Around 1870 John Sigsworth (1827-1906) a local farmer and entrepreneur, operated a saw-mill in the northwest corner of Mink Lake (or Sigsworth Lake, the registered name of the lake). The mill, located on 'the shoots', a fast flowing section of the creek running from Little John's Lake into Mink Lake, was in operation until around 1890.

The Fourteen Island sub-watershed system was one source of water power used to drive saw mills and grist mills downstream. The flow of water from this watershed also provided a means of moving logs down the Napanee River to saw mills near navigable water. For sixty years the annual log drive was a time of excitement (and hard drinking) as the logs moved through Bellrock and Petworth.

In 1870 the Napanee River Improvement Company (NRIC) put in a dam at the outlet of Fourteen Island Lake to hold back the water for log drives and extend the operating season of the mills downstream. Dams worsened spring flooding and led to acrimonious disputes with local farmers. Irate farmers occasionally resorted to dynamite when the courts and legislation failed them. To avoid trouble, in 1872 NRIC purchased land to control the dam from Fourteen Island Lake. The dam was in use until the Company's demise in the 1950s. The task of controlling the water flow in the Napanee River watershed was taken over by the Province of Ontario in 1947 with the creation of the Napanee River Conservation Authority.

Mining

Mining for mica and feldspar supported scattered, struggling farm communities from around 1890 to the 1950s. One large open pit, now flooded, is located off Old Mine Lane. A local man, Cecil Rose, recalls working in the mine as a young man in 1949, forking feldspar into one-ton buckets for 50 cents an hour. Early on local farmers supplemented their income in winter by transporting 'spar' from the mine on horse drawn sledges. The route followed the north shore of Fourteen Island Lake west across country over the Hinchinbrooke Road and on to Verona. Tailings of feldspar from the mine, used for the road bed, can still be found along this route. Later on the rock was transported by truck out to the Desert lake Road.

20th Century Changes

By the end of the nineteenth century life around the FIMLA area began to change. The rural population declined as mechanical power replaced manpower on farms. Lumber resources dwindled and commercial logging, along with its associated industries, came to an end by the early 1900s. The decline of mining operations, that had helped sustain the population as rural industries were declining, added to the surplus work force caught in the depression years of the 1930's. Many moved to urban centres or joined the migration west. Post war more of the population moved toward urban centres as better roads and better, cheaper cars made travel easier, enabling people to take advantage of the new shopping centres on the western edge of Kingston. In 1951 there were fewer people living in the FIMLA area than one hundred years before.

Fishing and Hunting

Today's 'cottage country' industry in the FIMLA area began when anglers and hunters became attracted to the area. Bruce Huffman, in the 1920s, was an early pioneer of renting summer cottages, or cabins on Fourteen Island Lake, for recreational fishing, boating and swimming. Summer 'camps' were established such as Bikey's Camp. Located on a point on the north east shore of the west basin, Bikey's was renowned (or notorious) for the production of moonshine.

Cottage Country Development

In the 1950's cottage development continued on 100 foot wide strips of waterfront sold by Everett Orser on Willy's Lane. Nearby cottages were built on land leased by the Trousdales. Isolated cottages were developed on severed lots on the western edge of the lake. There were others on the south side at the extreme east of the lake, accessed by a track running from Holleford Road. In the 1960's four cottages were built on an isthmus between Fourteen Island Lake and Mink Lake, on the south shore of Mink Lake, by C.J. MacCharles, from Toronto, who had acquired 1,000 acres once farmed by David and Grace Bauder.

Residential Development

By 1974, according to a W. G Smith who produced a fish survey of the lake in that year, there were thirty-eight cottages and one resort with five cottages around Fourteen Island Lake. Smith's opinion was that "This is probably all that can be built due to the steepness of the shoreline, 5% is flat, 20% rolling, 60% hilly and 15% mountainous". Despite this assessment, in 1973 the Meredith Brothers, real estate brokers from Toronto, bought the 1,000 acres of farmland on the north east end of the lake once owned by the Bauders. In 1980 they created five lots by severance along Mink Trap Lane on the south side of Mink Lake. Next they severed three 30 acre lots (one fronting Desert Lake Road and two fronting Desert Lake Road and Bauder Drive). A 'Country Estate' sub-division was granted on one lot enabling all year residences to be built on both sides of Bauder Drive.

▲ The attractions of recreational fishing, boating and swimming led to 'cottage country' development in the FIMLA area.

History of FIMLA Area (cont'd)

▲ Plans of sub-division have increased residential development around the lakes in recent decades.

Development of the remainder of the land on the north shore proceeded by five plans of sub-division, comprising about 70 lots that were approved between 1984 and 1988. Mike Meredith and sons, trading as Stonehouse Investments, then proceeded with the development of the south east shore of Fourteen Island Lake on 150 acres of land once owned and farmed by Ewart Campsall, from Hartington. Two plans of sub-division, comprising around 24 lots, were approved in 1989. The newly-formed Fourteen Island Lake Association worked with the township councils to make sure that the lots were of a reasonable size (around two acres or more) with good access, wide waterfront footage, and privacy for each property owner.

Conclusion

Today the land around the FIMLA lakes is divided into over 154 lots. Over two thirds of the dwellings on the lakes were built in the last thirty years, and based on the 2008 survey, about 30% of the developed lots have full-time residents. Lake development has not taken place without controversy with many local people concerned about the potential detrimental effects of increased development on the local environment, wildlife and the character of the area. However, 'Cottage Country' may not have had a significant negative effect on the environment of the FIMLA area. Wild animal populations and their natural habitat have been re-established on land once cleared for farming. Beaver have returned to abandoned water meadows and deer, fishers, and other animals have returned to areas that have reverted to bush. The area remains a haven for species at risk.

As the price of waterfront property continues to rise, Eastern Ontario and particularly the Land O'Lakes area is getting more attention as a viable alternative for seasonal and permanent residences, being only two and one-half hours east of Toronto, two hours from Ottawa and two and one-half hours west of Montreal. It has also become possible to live permanently on the lakes and work in a nearby city, such as, Kingston, Brockville and Belleville. Based on this it is no surprise that 30% of the homes on Fourteen Island and Mink Lakes are permanent, year round residences.

Reconciling protection of the environment with development is at the heart of the FIMLA Lake Stewardship Plan. Hopefully, future historians will chronicle our success.

1.0 The Natural Environment

Objective: *To protect and enhance the ecosystems in our lakes and maintain a healthy environment for fish, wildlife, vegetation and people for now and for future generations.*

▲ Trillium lilies abound in the ground cover in early spring.

Overview

The FIMLA lakes sit on granite bedrock. Moving to the south and west of this area the bedrock is limestone. The FIMLA area is on the edge of the Frontenac Axis, a tongue of Canadian Shield that dips through Frontenac County, across the St. Lawrence River and south to join the Adirondack Mountains in New York State.

The location on the Frontenac Axis supports forests and vegetation communities typically found in more northerly environments in Ontario. FIMLA area forests are mostly mixed (coniferous/deciduous) with some areas predominately deciduous. Soils are shallow and scattered across the landscape can be found rock barrens and swamps and marshes. The granite bedrock that underlies the lakes and surrounding area contains significant amounts of feldspar and mica, two minerals that were mined in the early part of the 20th century.

This landscape has been recognized internationally as part of a significant natural and cultural area. The Fourteen Island Lake sub-watershed is situated in the Frontenac Arch Biosphere Reserve, a designation given to the area in 2002 by the United Nations Education, Science, and Cultural Organization (UNESCO).

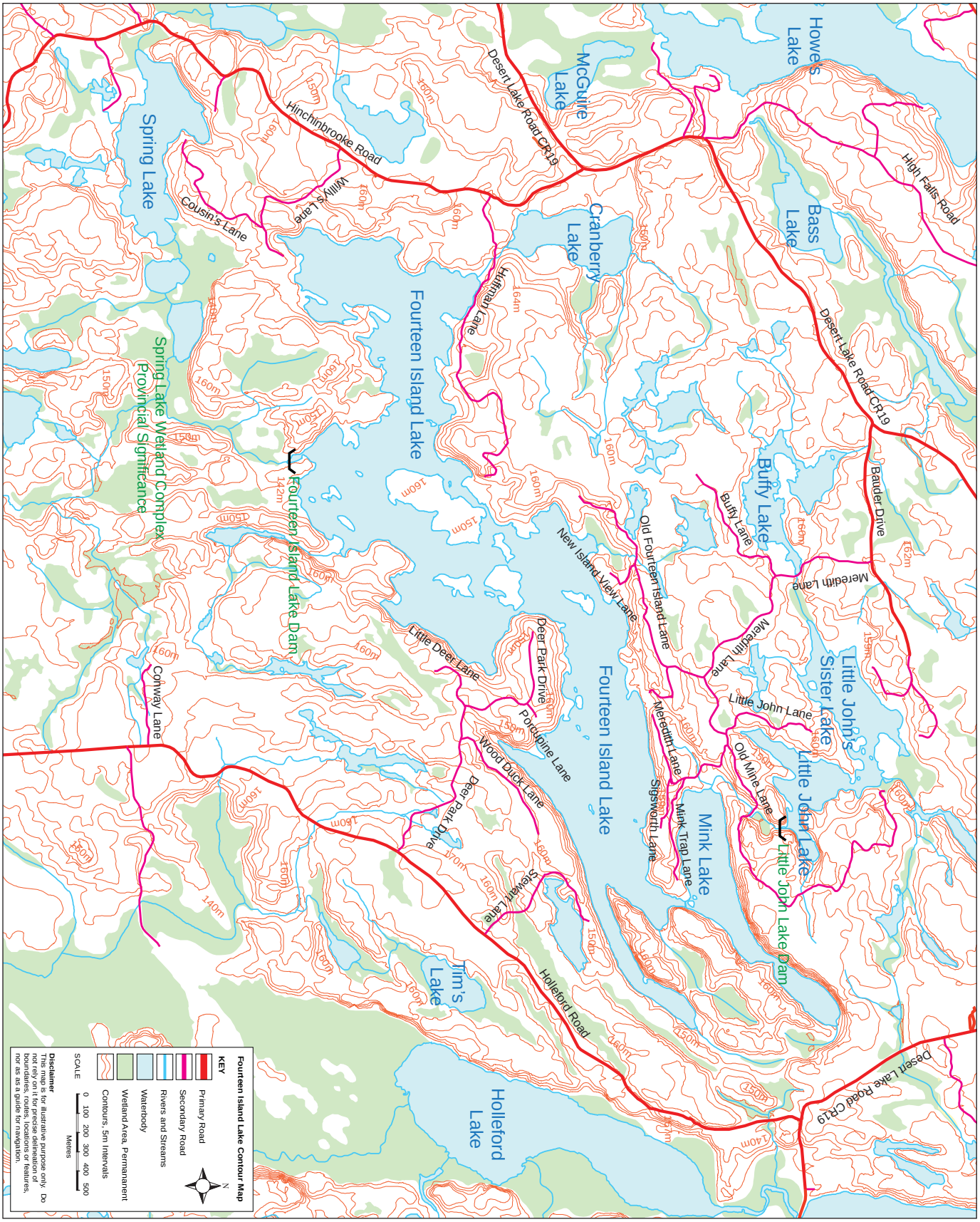
Forests

The forests in the area reflect both the underlying rock and soils as well as the economic activities over the past two hundred years. The FIMLA area was heavily logged and mined in the nineteenth and early twentieth centuries. Land was cleared for farming, but because of the terrain, the clearing was not as extensive as it was to the south where terrain and soils were more amenable to agriculture. Cattle grazed on many parts of the watershed over the years. As grazing faded over the past 40 years, these areas re-naturalized, and are now 'middle aged' forest, characterized by sugar maple, white birch, ironwood and basswood. In some areas, scattered mature white pine and white oak have seeded their young offspring. The dominant ground cover is sedge species such as Pennsylvania sedge (Carex pensylvanica). There are pockets of hemlock along steep slopes, and some hickory on upland areas. There are also a few large stands of cedar here and there where conditions permit.

An extensive list of some of the tree species found in our sub-watershed can be found in Appendix A.

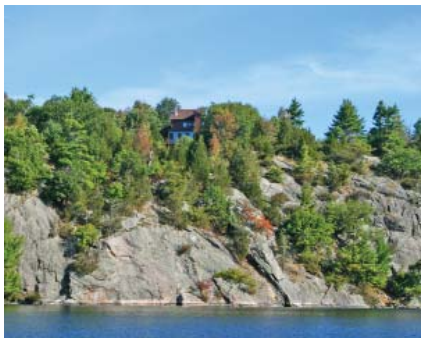
FIMLA Area Topography

Map 3. FIMLA Area Topography



Shorelines and Channels

Apart from the developed residential lots, the FIMLA shorelines are for the most part naturally vegetated, with white pine, white cedar and hemlock being the dominant coniferous trees. Dominant deciduous species are sugar maple, oak, white ash, and American beech. Groundcover and understory plants include ferns such as bracken fern and royal fern, blue flag iris, cardinal flower, mosses and common spring ephemerals (trillium, spring beauty, Dutchman's breeches, violet).



▲ The rocky cliff face along the north east shore of Mink Lake.

Although most of our shorelines have natural vegetation right to the water's edge, there are a few locations where natural vegetation has been cleared, and in some cases replaced by manicured lawn with few trees and little to no shading along the shoreline. Some of this shoreline area has been hardened with rock shore wall or boulders, or replaced with sand, eliminating shoreline habitat for wildlife and fish.

There are a few areas of steep, bare rock ridges along the shoreline (see Map 3.) particularly along the northeast shoreline of Fourteen Island Lake, the northern shore of Mink Lake, and the northeast shore of Little John Lake. Based on inventories of nearby Frontenac Provincial Park, there is potential for rare plant species on cliff faces along the shoreline (MNR 2004), but no inventories have been carried out on the FIMLA lakes.

Some of the larger islands on the lake have had little human disturbance, and support mature forest.

The lakes also contain a few narrow channels, subject to speed restrictions, as indicated on Map 6.

Wetlands

The FIMLA sub-watershed is rife with small ponds, swamps and marshes. Map 4. shows many of these wetlands across the subwatershed. Anyone who has gone for a long walk in the area has seen them. In the past, swamps and marshes were considered wasteland, with no real value.

We now know that wetlands are critically important for several reasons:

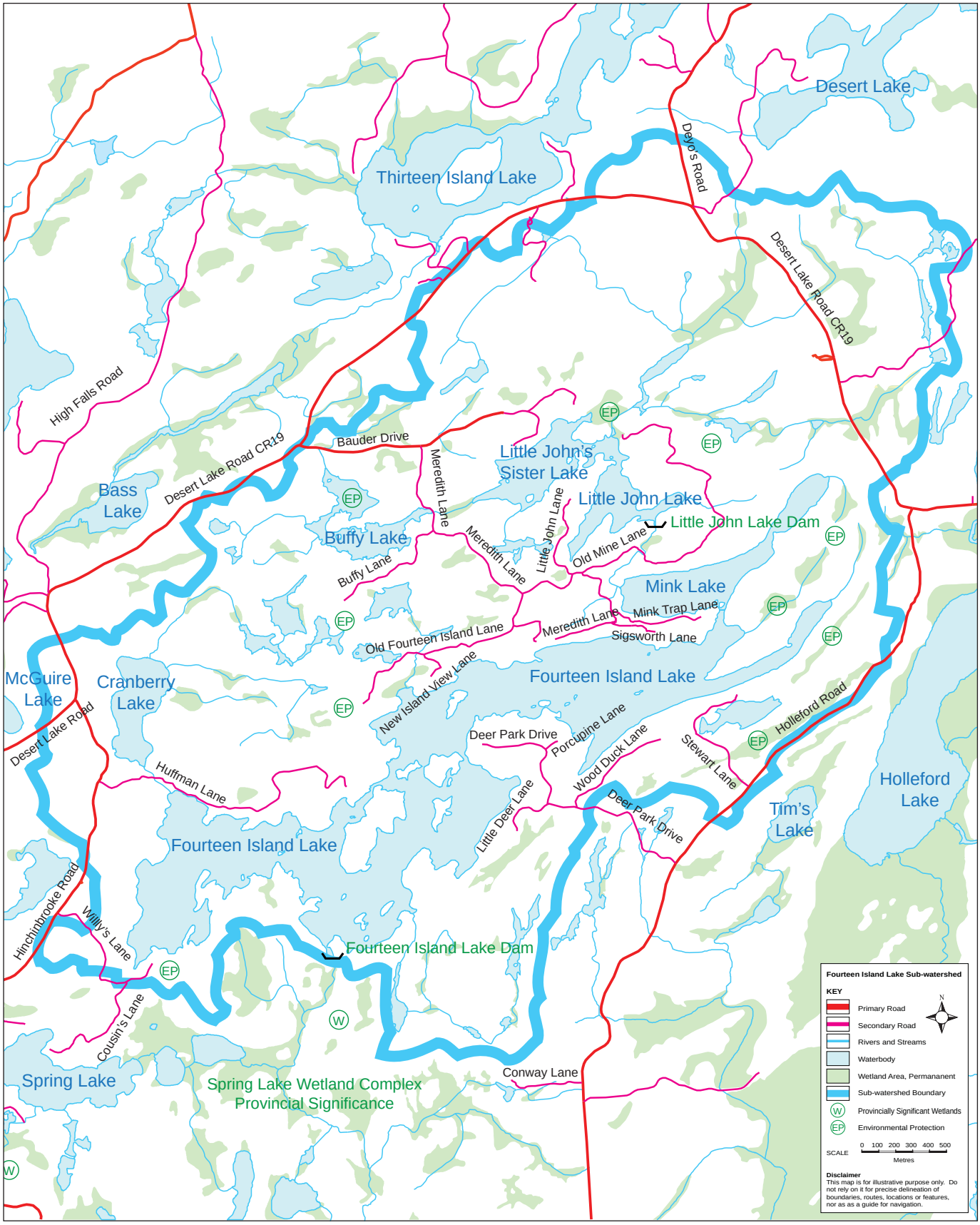
- They provide habitat for fish and wildlife species (insects, reptiles, amphibians, mammals);
- They help balance water levels by storing and holding water; and
- They help to improve water quality by filtering and storing pollutants.

Shallower swamp areas are characterized by shrubs, such as buttonbush and winterberry, and ferns (sensitive fern, royal fern). Deeper marsh areas support floating aquatic species such as yellow pond lily, water lily and arrowhead, reeds, cattails, and pickerelweed.

The FIMLA lakes drain into a provincially significant wetland. Downstream of the dam at the outlet from Fourteen Island Lake is the Spring Lake Wetland Complex. This eighty hectare wetland complex consists of ten individual wetlands comprising a total of twenty percent

FIMLA Sub-Watershed

Map 4. Fourteen Island Lake Sub-Watershed



swamp and eighty percent marsh. It includes the creek flowing from the dam on Fourteen Island Lake, several smaller creeks flowing from adjacent smaller lakes and adjacent floodplain, and Spring Lake into which all these streams flow. Wildlife features include a heronry and several beaver dams. The surrounding habitat is diverse, with areas of pasture, abandoned agricultural land, deciduous and coniferous forest with a hilly, undulating terrain (Boxall 1992).

▲ Osprey in flight over Fourteen Island Lake.

Animals and Their Habitat

Our shorelines, wetlands, and forests are habitats for healthy and diverse populations of animals.

The wetland areas and adjacent shoreline are home for species such as beavers, muskrats, frogs, turtles, herons, damselflies, and dragonflies.

The upland areas are habitat for many species of birds and common mammals, such as squirrels, chipmunks, deer and porcupine. There are many wildlife habitat features in the forested areas, such as: snags or cavity trees (standing dead or partly dead trees), surface water (seasonal and permanent ponds), fallen and dead trees, mast trees (trees with hard or soft fruit or seed, such as oak, beech, hickory, black cherry, cedar, pine) or shrubs (wild grape, sumac, dogwood, raspberry), very tall (supercanopy) trees, dens or dug holes, and conifer thickets (hemlock thickets). These areas provide wildlife with shelter and food sources (berries, cones, saplings).

The largely natural FIMLA shorelines provide habitat for a variety of species. The area directly along the shore is often referred to as the lake's 'ribbon of life' because it is the key to existence for many animals, including many of our fish species.

There is no formal inventory of the plants and animals in the FIMLA area, but residents of Tim's Lake started to list plant and animal species in that area. Lists for the FIMLA sub-watershed, based on these, can be found in Appendix A.

Some Species of Note

The FIMLA sub-watershed supports a number of species of note.

Osprey. There has been an osprey nest within a supercanopy tree on a small island in Fourteen Island Lake for about fourteen years, and these birds are regularly sighted throughout the sub-watershed. Every spring the pair of osprey return as soon as the ice is out, and then raise their one or two young – something they have done successfully for the past many years. In a vicious windstorm in late December, 2008, their pine tree home was snapped off right below the nest, and the nest came crashing to the ground. Not to be deterred, the osprey returned, and rebuilt their nest on what remained of the pine, and successfully produced two young in 2009.

Herons. Our lakes are blessed with a good population of herons, regularly seen in flight or stalking their prey in the wetlands and lake

Animals and Habitat (cont'd)

▲ Blue Heron wading on an island shore in the south west basin of Fourteen Island Lake.

shallows. In 1992 a heronry was reported within Spring Lake Wetland Complex, and the herons we see may nest in that area, or might be from a colony on nearby Desert Lake.

Turkey vultures. A bare rock cliff at the north east end of Fourteen Island Lake is a nesting site for a turkey vulture colony.

Reptiles and amphibians. There are many reptiles and amphibians, thanks in large part to the mix of wetland and upland habitats. Reptiles and amphibians deserve special consideration, as all species are at some level of risk from human persecution, road mortality, and other factors. Amphibians are a visible indicator of the overall health of our lakes and surrounding environment; these are the first species to decline when environmental stress comes to an area. Our sub-watershed supports seven species of snakes, including the eastern rat snake (black rat snake), one of the provincial 'species at risk'. We have five turtle species and nine amphibians (six frogs, one toad, and two salamanders) in and around the lakes. There are no formal counts available, so we don't know how robust the populations are at present, but informal observations suggest they are in good shape.

Loons. Everyone around the lakes has heard the unmistakable cry of the loon. There appears to be a healthy population on the FIMLA lakes and young loons are regularly observed in the late spring. However, the loon populations have never been formally counted so the number of loons and the fluctuations in population are uncertain.

Whistling swan. In December, 2009, before freeze-up, a Whistling swan was observed at a few locations around Fourteen Island Lake. It is likely that this is a migrant, and one of a large number of swans being observed in the bays of Lake Ontario in Kingston. It met its demise when the ice froze, and coyotes took it down.

White Tailed Deer. As gardeners are all too well aware the surrounding forests abound in this native species.

Lions and tigers and bears. Maybe there aren't any lions or tigers, but a few black bears are spotted regularly around the lakes. They may be merely passing through, or they may reside in the sub-watershed.

Exotic Species and Diseases

Non-native or exotic species are species that have been introduced to an area, and are not native to Ontario. They are sometimes referred to as 'invasive species' as they will often take over, or invade an area once they are introduced, usually because they have no known enemies in their new environments. Although there is no scientific survey to determine all the invasive species that might be in the FIMLA subwatershed, two prominent and well-known invaders recently arrived, the zebra mussel and purple loosestrife. They join Dutch elm disease, which has been with us for quite a bit longer.

Zebra mussels are freshwater molluscs thought to have been brought

Exotic Species and Diseases

into the Great Lakes from Asia in ship ballast water in the 1980s. They have few natural predators. Zebra mussels were first noticed on Fourteen Island Lake in 2002. They were probably attached to a boat hull, trailer, bilge or bait bucket on an infected lake and transported here. By 2005, they had spread across Fourteen Island Lake and through Mink Lake. Their numbers exploded, reaching a peak in 2006. There are no actual counts, but their presence is impossible to miss. Many residents have cut a hand or a foot, or had a dog's paw sliced by the mussels' sharp shells. In addition, zebra mussels have clogged lake water intakes, and even fouled outboard motors.

▲ Pair of Loons on Fourteen Island Lake.

Zebra mussels have two other notable effects on the FIMLA ecosystem:

- They usurp the niche of native clams and mussels. As a result, animals that depend on these native species for food have lost an important food source. In most cases, the zebra mussel is not of interest to the mammals and birds who normally feed on fresh-water clams;
- Zebra mussels are filter feeders. They filter the lake water and take out the small bits of algae and plankton leaving the water clearer than before. *As a result:*
  - Light penetrates deeper into the water and stimulates the growth of aquatic plants (weeds);
  - Increased weed growth, leads to reduced oxygen levels when the weeds sink to the lake bottom at the end of summer and decomposition takes place;
  - Fish species such as walleye are affected. Walleye do not thrive in clear water. They prefer a murky environment in which to hunt their prey;
  - Zebra mussels will attach themselves to the stones that many fish use to spawn. Once this happens, these areas are no longer viable spawning sites.

Since about 2006, the population of zebra mussels in Fourteen Island and Mink Lakes appears to be stable. As far as we know, they will never go away. The ecosystem is moving into a new balance and what that means is uncertain – time will tell. To date, they are not found in the three upper lakes, and residents and visitors need to be vigilant to make sure they stay out.

Purple loosestrife (*Lythrum salicaris*) is an ornamental plant that escaped from the gardens of Ontario into the wild. It occurs within the lakes and wetlands of the sub-watershed, and in the 90's was considered a major threat to native plant communities. FIMLA members have spent many hours pulling out the loosestrife plants. Thanks to these efforts, and to a beetle that was introduced to control the plant, the growth of purple loosestrife appears to be limited and under control in the FIMLA area. At this point it is not a serious threat to the local native plant communities.

Exotic Species (cont'd)

▲ A young white tailed deer foraging around Pine Point.

Dutch elm disease has been present in Ontario since before the Second World War. The current, virulent strain of the fungus was first discovered in Ontario in 1967. White elms that used to grow into large and stately trees will now get to about 12-18 inches in diameter and then succumb to the Dutch elm fungus, carried by the elm bark beetle.

Exotic Species To Watch For In Future

We have a number of potential threats that are known to be in the area or could be brought in:

Emerald Ash Borer (EAB) is an insect pest originating from eastern Asia that will infect and kill all species of ash tree. In Ontario, the infestations have been primarily in south western Ontario, but in the summer of 2008, the EAB was discovered in trees in the Ottawa area. In late 2009, Ottawa began a program of ash eradication, to try to stem the spread of the Borer. There are no reports of the Borer in the FIMLA area yet, but Ottawa is not far away for this pest, and it may be just a matter of time before we see it in the ash trees around the lakes. The insect is able to fly up to several kilometres, but it is mainly transported in infected wood that is moved from one area to another such as in the transportation of firewood, nursery stock, logs, or bark/wood chips. There is no known treatment, and once the insect takes hold in an area, it can devastate all ash trees in a woodlot over time.

Dog strangling vine is a species that came to Canada as an ornamental plant in the late 1800s. It is becoming a concern in FIMLA area, but has not been formally documented within the sub-watershed. In addition to being an agricultural pest, the vine grows in dense patches in forest areas, and will totally envelop and suppress the growth of tree seedlings and young saplings. Because of its deep root system and abundant seed production, it is tough to get rid of this invader.

Spiny Water flea is a small zooplankton species and a member of the group of organisms known as crustaceans. Shrimp, crayfish, and lobster also belong to this group. As with the zebra mussel, the spiny water flea was introduced to North America from the ballast waters of Eurasian ships in 1982; it has spread throughout all the Great Lakes and more than 120 inland lakes and waterways in Ontario since then. The biggest issue with these invaders is that they can become entangled in fishing lines and downrigger cables. When the cable is pulled from the water, the spiny water fleas attached to the cable look like straight pins. If the proper precautions are not taken, spiny water fleas can be brought into our lakes unknowingly by boaters and anglers.

Round Goby is a fish that also arrived in the ballast of ships from Eastern Europe. Gobies can reach lengths of 25cm (10 in) and live for up to five years. They are typically mottled brown in colour, and resemble native sculpins. It is illegal to possess or to use these fish as bait. In some areas they have become an annoyance to anglers due to their habit of stealing bait. The round goby is an aggressive fish that can spawn several times each season. These characteristics,

combined with its abundance and relatively large size, mean that the round goby will have an impact on native fish species by taking over habitats and preying on the native fish. Round gobies also are a vector in transferring botulism up the food chain. Gobies feed predominantly on zebra mussels, and mussels, which because they are filter feeders often have high contaminant levels in their tissues. When fish predators like ducks or loons eat gobies, the contaminants are also consumed, with disastrous results for the ducks and loons. Out-breaks of botulism have been observed in loons on the Great Lakes. Although anglers and boaters can help to prevent the spread of gobies to inland waterways, there are no known ways of eliminating them once they have arrived. Gobies, like many other exotic species, are here to stay. And while they might eat zebra mussels, they will never eat enough to get rid of that invader.

▲ An Eastern Ratsnake (Threatened).

Species at Risk and Rare Species

'Species at risk' are plants and animals native to Ontario that have been designated by experts to be at risk of extinction.

There are several known species at risk within the sub-watershed including two species of snake, three species of reptile, and at least 3 species of bird.

▲ A Milk Snake (Special Concern).

Figure 3. Species at Risk

Species at Risk Observed Within the Subwatershed

Common Name	Species	Status
Eastern ratsnake	*Elaphe obsoleta*	Threatened
Milksnake	*Lampropeltis triangulum*	Special Concern
Blanding's turtle	*Emydoidea blandingii*	Threatened
Common musk turtle	*Sernotherus odoratus*	Threatened
Northern map turtle	*Graptemys geographica*	Special Concern
Five-lined skink	*Eumeces fasciatus*	Special Concern
Bald eagle	*Haliaeetus leucocephalus*	Endangered
Cerulean warbler	*Dendroica cerulea*	Special Concern
Whip-poor-will	*Caprimlugus vociferous*	Threatened

▲ A Common Musk Turtle (Threatened).

Eastern ratsnake (Threatened Species), also known as the black ratsnake, is undoubtedly one of FIMLA's most interesting inhabitants. Although extremely rare in the province, it is relatively common in our sub-watershed. It is frequently seen, often basking on roads or at the roadside, or perhaps in a woodshed or attic. It is Canada's largest

Species at Risk (cont'd)

▲ A Baby Blanding's Turtle that hatched from eggs protected by residents on the lake (Threatened).

▲ A pair of Northern Map Turtles (Special Concern).

▲ A Five-lined Skink (Special Concern).

snake, normally reaching 1.5-1.8m in length. The record length is 2.57m, or 8 ½ feet! Adults have a shiny black back and sides, often with faint patches of brown blotching, with a white chin and belly. Young snakes are pale grey with blotches of dark brown or black along their backs and sides, and can look similar to a young water snake, milk snake or eastern fox snake. They live 25 to 30 years, mature late and reproduce infrequently. This snake likes FIMLA's mixed forest with shore areas that provide prey and basking sites. Although it spends a lot of time in trees, it is often seen on the ground and can also swim. These snakes like dead and semi-hollowed trees for loafing, nesting, and shedding. They need underground cavities (hibernacula) below the frost line to hibernate from October to April. Most eastern ratsnakes return to the same hibernacula each year. They may travel up to five kilometres to get to these sites, the same sites that have been in use for hundreds of years. They eat mainly small mammals (mice, squirrels, chipmunks, bats), small birds and birds' eggs. Adult eastern ratsnakes are eaten by raccoons, coyotes, foxes, minks and hawks. They are relatively docile and non-venomous and although they will bite in self-defence they are harmless to humans. When threatened they often vibrate their tail to mimic a rattlesnake, and sometimes rear and strike. The eastern ratsnake is at risk from human activities such as altering habitat by development; killing or and collecting, road mortality, and destroying hibernacula (MNR 2001).

Milk snake (Special Concern) is mainly nocturnal, so is rarely seen. It prefers open agricultural areas.

The turtle species listed below have several things in common. Turtles are long-lived, mature late and have low reproductive output. This creates a basic level of threat to the rarer species. Other threats to turtles include loss of habitat, nest (egg) predation and road mortality.

Blanding's turtle (Threatened) is a species of turtle that is largely terrestrial and can travel up to six kilometres, using interconnected lake, river, stream, marsh and pond habitats, to nest on land. Some local residents helped protect the hatchlings of one Blanding's turtle in 2008. The turtle had buried her eggs in the driveway in front of their house. The eggs were protected by surrounding them with concrete blocks and putting a grate on top. In September they transported the hatchlings to the swamp. The precise location has not been disclosed, as in some areas smugglers have been known to move in and decimate populations by taking young for the pet trade.

Common musk turtle, or stinkpot, (Threatened Species) is a small, shy turtle that searches for food at night, so is rarely seen. It was observed in 2007 during fisheries assessment work on the lake.

Northern map turtle (Special Concern) is largely aquatic and needs large water bodies, such as Fourteen Island Lake. It spends a lot of time basking on rocks. It nests along shorelines. Shoreline clearing, controlled water levels and degradation of aquatic habitat are the main risks to this species.

Species at Risk (cont'd)

Five-lined skink (Special Concern) is the only lizard species in Ontario, and its habitat is on rocky outcrops and rock ledges.

Cerulean warbler (Special Concern) is a small brilliantly blue bird. Although its presence has not been confirmed, it is likely found within the sub-watershed. This species is listed as occurring to the west of Fourteen Island Lake and is found in nearby Frontenac Provincial Park to the east of the sub-watershed (MNR 2004). Its habitat is mature deciduous forest canopy (upland or swamp), and the main concentration of this species in Canada is in the Frontenac Axis.

Bald Eagle (Endangered Species). Bald eagles are spotted occasionally in the FIMLA area, but they are not known to nest. It is likely that they are spotted during their migration to and from Northern Ontario.

Whip-poor-will (Threatened Species). The distinctive call of the whip-poor-will can be heard around the FIMLA area, but only at night. Its habitat is a mix of open and forested areas. Once widespread throughout the central Great Lakes region of Ontario, distribution of the whip-poor-will is now more fragmented, mainly as a result of habitat loss.

▲ A Bald Eagle (Endangered).

▲ A Whip-poor-will (Threatened).

▲ Cerulean Warbler (Special Concern).

Section 1.0 Recommendations and Actions

1.1 Maintain a complete species list (plants and animals) for the subwatershed, wetlands, and forests.

Actions:

1.1.1 Expand and maintain species list, based on Tim's Lake list;

1.1.2 Place the list on the FIMLA website, and invite residents to add or correct the listed species.

1.2 Monitor the population of some of our more important species: loons, frogs, snakes, turtles, osprey, and all our species at risk.

Actions:

1.2.1 Call for volunteers to take on the monitoring work, which will be linked to provincial and federal programs of species monitoring;

1.2.2 Monitoring results will be published in newsletters, on the website, and highlighted at AGMs.

1.3 Monitor existing invasive species, and be vigilant for any new invasive species.

Actions:

1.3.1 Call for volunteers to take on the monitoring work, which will be linked to monitoring work being done by Ministry of Natural Resources and Ontario Federation of Anglers and Hunters;

1.3.2 Publish monitoring results in newsletters, on the website, and highlight at AGMs.

1.4 Educate our residents and visitors about the importance of: maintaining habitat, especially shorelines; protecting species at risk; and keeping new invasive species out of the area.

Actions:

1.4.1 Continue to include information on these items in FIMLA newsletters;

1.4.2 Provide presentations and guest speakers at AGMs.

2.0 Water Quality and Water Levels:

Objective: *To maintain and improve the FIMLA lakes' water quality and water level management.*

Overview

When FIMLA members were asked about what concerned them the most, the item that topped the list was: "keeping our water quality healthy". Whether boating, swimming, fishing or gazing at a sunset, water quality affects the experience.

▲ The dam at the outflow of Fourteen Island Lake.

The FIMLA Watershed

The FIMLA lakes are part of a small subwatershed (or drainage area) located at the upper end of the Napanee River watershed (see Map 5.). Directly to the north and west is another part of the upper Napanee watershed, including Thirty Island, Thirteen Island, and Howe Lakes. The water from the FIMLA watershed lakes drains over the dam (in the bay south of McLeod's Island on Fourteen Island Lake) and out through the Spring Lake Wetland to Spring Lake, then into Hambly Lake. It meets up with drainage from Howe Lake at Verona Lake and flows into Hardwood Creek, Napanee Lake, the Napanee River and out to Lake Ontario. Directly to our east, however, the drainage is in a different watershed – Tim's Lake, Holleford Lake, Desert Lake and Canoe Lake all flow north and east through to the Cataraqui River.

Our sub-watershed consists of a drainage area of 14.7 square kilometres. The waters of the FIMLA lakes are fed from a multitude of small ponds, wetlands, and streams across this drainage area. Although no formal study has been done to measure spring sources, residents of Fourteen Island Lake report a number of locations where underwater springs contribute to the flow into the lake. The area of the sub-watershed is well forested, with a lot of wetlands. This, combined with the lack of industrial sites and no intensive agriculture, contributes to a healthier aquatic environment in all of the lakes.

The reason to look at the entire sub-watershed area and not just Fourteen Island and Mink Lakes is because of the interconnectedness of the area's ecosystem. Whatever happens to the water 'above us' will affect FIMLA lakes, and whatever drains out over the dam in Fourteen Island Lake affects the rest of the Napanee River watershed.

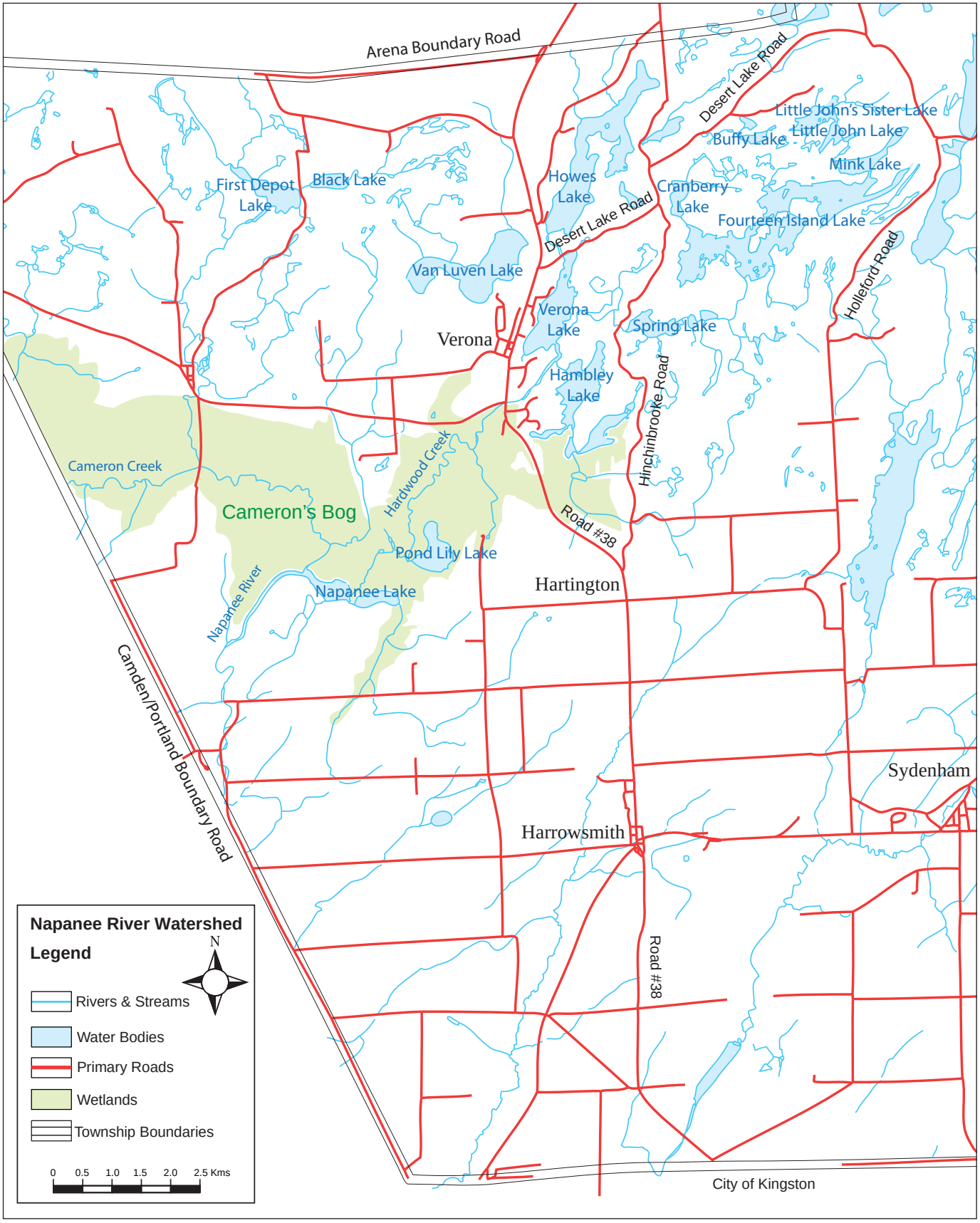
Dams and Water Levels

Our lakes are served by two dams – one at the main outflow of Fourteen Island Lake into Spring Lake wetland and Spring Lake, and the dam from Little John Lake into Mink Lake (see Map 4.). Both dams are 'private', owned by the adjacent landowners. Much of the character of all the FIMLA lakes is linked to these two dams.

Fourteen Island Lake Dam: A group of Napanee business men operating as the Napanee River Improvement Company (NRIC) built

Napanee River Watershed

Map 5. Napanee River Watershed



Dams and Water Levels

the dam at the outlet of Fourteen Island lake around 1870. When the Company folded, all control over the dam reverted to the registered owners on the west and east sides of the stream flowing from the dam, who at that time were William Trousdale on the east side of Conway Creek and Fred Babcock on the west. Before the dam was functioning, the lake level was probably four to six feet lower than it is now. This original dam was replaced in the early 1950's and went through a major renovation in 1994. The cost of the renovation was shared by: MNR, FIMLA, Portland Township, Loughborough Township, and Napanee Conservation Authority. The 6.5 foot wide concrete dam (with 7 removable boards) holds back about 7 feet of water. This is a significant depth of water so the dam clearly is an important asset to Fourteen Island and Mink Lakes.

▲ The spillway dam on the south side of Little John Lake.

Work done by the Conservation Authority in 1981 established the following for Fourteen Island:

- Lake level – 138.66m above sea level (asl);
- The 100 year rain event (i.e., the theoretical level of the lake with the highest rainfall estimated in a 100 year period) was estimated at 138.97m asl; and
- The 100 year snowmelt (i.e., the theoretical level of the lake at the highest spring thaw estimated in 100 years) is estimated at 139.29m asl.

Although there is no formal management agreement, Frank and Dave Babcock, with help from the late Grant Shepherd, have monitored and maintained the dam over the past number of years. In 1981, MNR set a level at which the dam should be kept, based on what would be best for the community around the lake. Prior to 1981, the level was slightly higher. Since 1981, the dam has been kept at the same level (138.7m. asl), and fluctuations in the water levels of the lakes year-to-year, or in-year, are due to rain falls and snow melts. At FIMLA's request, the Quinte Conservation Authority carried out a dam inspection in 2009, and noted that the dam is in fair condition overall, but is in need of some repairs. Quinte Conservation also observed that the current water level may be too high, leading to shoreline erosion.

Little John Lake Dam: Little John and Little John's Sister Lakes owe their current levels to a dam in a natural spillway at the south side of Little John Lake. It is believed that the original dam was constructed in the 1950s by David Bauder to create a reservoir and bass spawning area. That dam effectively transformed Little John's Sister Lake from marshland into a small shallow lake. Over the years since then the dam has fluctuated in height, due in part to the local beaver populations. Water levels have been the subject of some disagreement among the landowners of Little John and Little John's Sister Lakes, until 2003 when the dam was repaired and set at a level that was a compromise among the landowners at the time. The current structure is a solid weir (with no removable boards), consisting of a base of loose rock capped with about 18" of concrete, holding back about three feet of water. Water

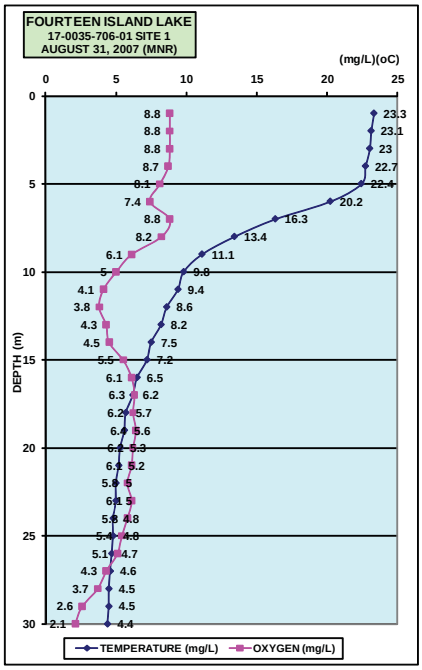
Control of the Dam

No government body has a specific obligation to control the water levels of lakes in the province, but whoever controls water levels has to work in cooperation with the MNR and local conservation authority.

The two dams in the FIMLA area are owned by the adjacent landowners. Neither dam has a formal management agreement in place to control water levels.

The Quinte Conservation Authority is not prepared to take over responsibility but has been helpful with advice and assistance in the past. Ultimately, control of the dams may benefit from an agreement between the property owners and the conservation authority, with participation of the township, MNR, and FIMLA.

Lake Turnover



▲ Dissolved Oxygen and Temperature Profile August 31, 2007 Fourteen Island Lake.

flowing over the dam flows into a creek that empties into the northwest corner of Mink Lake.

Overview of Water Quality

As a part of preparing the FIMLA Lake Stewardship Plan, Reg Genge of Ontario Lake Assessments compiled and reviewed all the available data on water quality for our lakes. The Ministry of the Environment (and in some cases, Ministry of Natural Resources) have done intensive water testing on Fourteen Island Lake in 1975, 1983, and 1985, and water samples were taken over the years since 1985 by FIMLA volunteers and sent in for analysis by the Ministry of the Environment under the Lake Partner Program. In 2009, for the first time, samples were taken on all 5 lakes (for Secchi disk and phosphorous). Historic water quality data are very limited for Mink, Little John and Little John's Sister Lakes; data for the latter two lakes is only available for 1985.

Trends over time are the most telling indicators in assessing water quality. It is difficult to come to firm conclusions without a reasonable amount of comparable information over many years of testing. Mr. Genge has examined all the available data and has concluded that, for Fourteen Island Lake, " . . . there has not been much change in water quality over the 33-year period of record (1975-2008)". Although there is not enough data to draw general conclusions for the other lakes, the available information is summarized later in this chapter.

Regular water sampling would provide the FIMLA with enough data to see trends. This information could then be used to alert residents to any threats or emergent problems.

Lake Turnover

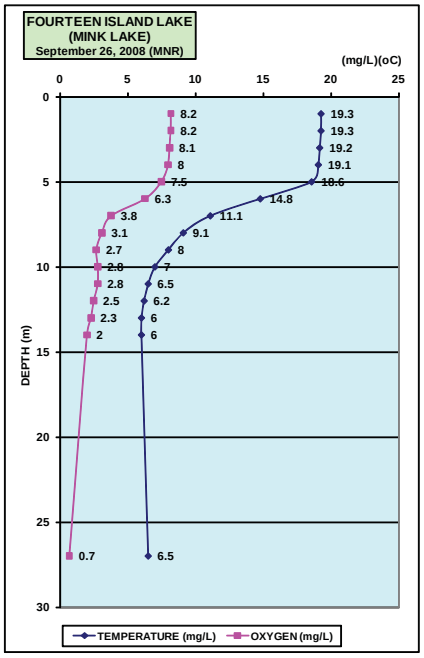
The phenomenon of 'lake turnover' is useful to understand when interpreting water quality data. Turnover refers to the natural mixing of the surface waters with the deep waters of a lake in spring and fall. During summer, the surface layer of water (up to 6 or 7 metres) heats up, changing the density of the water, and keeping this upper layer from mixing with the colder and denser lower level. Dead algae and other plant and animal material settle to the bottom of the lake and form part of the lake sediments. Oxygen, entering the water from the surface and from plant photosynthesis near the top, is kept to the upper layer, and the deeper waters often will experience a period of very low oxygen, putting stress on anything that wants to live in those waters. In fall, the surface waters cool, and the temperature and density becomes the same as the deeper waters. With a little wind, the waters mix, or 'turnover', allowing oxygen to reach the lower levels. Over the winter period, this boost of oxygen supports the fish, insects, and frogs that live in those deeper waters or in the lake sediments. The oxygen also feeds the decomposition of plant material that has dropped into the sediments over the summer, further reducing the amount of oxygen available to support life in the lower depths. In some instances with small shallow lakes, too much decomposition will suck all the oxygen out of a lake and

result in a 'winter kill' of fish. When spring returns, and the ice cover is removed, the winds will again mix the deeper water with the surface water. In doing so, the nutrients that were in the lake sediments (e.g. phosphorous) will be brought to the surface and provide a growth fix for the algae – a spring 'algae bloom' that happens on many lakes.

In the case of Fourteen Island and Mink Lakes, there is between six to nine times as much phosphorous in the lake bottom as there is measured at the surface. This accumulation of phosphorous leads to algae blooms at the time of spring and fall turnover when these nutrients are made available at the surface again.

Little John Lake experiences this phenomenon of turnover, and experiences poor oxygen conditions in the deeper levels during summer. There is a significant difference in phosphorous values between surface and bottom sample results, as much as fifty times more phosphorous at depth than at the surface

Little John's Sister and Buffy Lakes are too shallow to experience stratification of water levels, and therefore surface and bottom nutrient values are the same. Given their shallow depth, these lakes could also be subject to winter fish die-off.



▲ Dissolved Oxygen and Temperature Profile September 26, 2008 Mink Lake.

Water Quality in FIMLA Lakes

People generally want answers to the questions, "Is my lake healthy? Is it susceptible to a change in water quality? Is there anything that can be done to protect my lake?" What follows is a brief summary of what we know about selected water quality parameters that have been measured in our lakes over the years since 1975. A substantially more extensive summary and review can be found in the report prepared by Reg Genge of Ontario Lake Assessments in March, 2009.

Sensitivity to Acidification

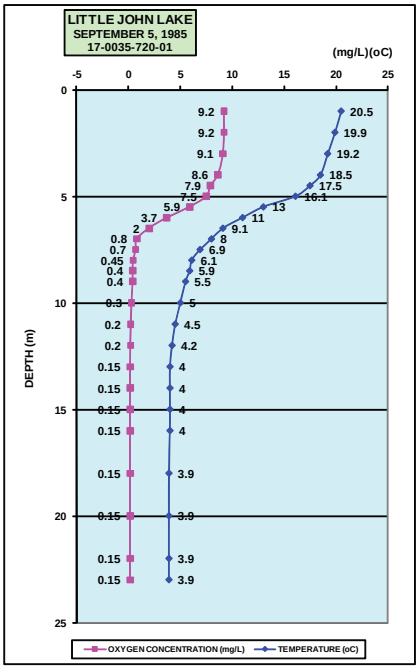
The FIMLA lakes are all located on the granite of the Canadian Shield. Shield lakes can be sensitive to the effects of acid rain and snow. High levels of acidification result in lakes that cannot support healthy fish populations. One of the parameters used to measure this phenomenon is water alkalinity, which is a measure of the lake's ability to neutralize acid levels.

The average alkalinity value in Fourteen Island Lake is 71.5 mg/L (milligrams per litre) for the period 1975 - 1987. The average alkalinity values for Little John and Little John's Sister are 97.7 mg/L and 78.64 mg/L respectively (for 1985). Lakes with alkalinity values above 25 mg/L are not sensitive to the effects of acid precipitation, so none of the FIMLA lakes is sensitive to acid precipitation effects. Unfortunately, high alkalinity lakes are prone to colonization by zebra mussels, who need a minimum of 50 mg/L alkalinity. The three FIMLA lakes all have levels higher than this. Fourteen Island (and Mink) already have zebra mussels, and Little John and Little John's Sister are susceptible.

For the full 'Summary and Review of the Water Quality of FIMLA Lakes', prepared by Ontario Lake Assessments, see the FIMLA website at:

www.FIMLA.org.

Health of Lakes



▲ Dissolved Oxygen and Temperature Profile September 5, 1985 Little John Lake.

Figure 4. Water Quality Table

	Alkalinity	Water Clarity (Secchi disk depth)		Chlorophyll	Phosphorous	
Sample period	1975-1987	1975-2008	2009	1975-1993	1975-2008	2009
Fourteen Island Lake	71.5 mg/l	5.8 m	5.9 m	2.14ug/l	15.5 mg/l	12.6 mg/l
Mink Lake	-		5.0 m	-		9.45 mg/l
Little John Lake	97.9 mg/l		4.4 m	*1.9ug/l	*18.4 mg/l	13.7 mg/l
Little John's Sister Lake	78.6 mg/l		*2.3 m	*3.98ug/l	*32 mg/l	13.7 mg/l
Buffy Lake	-		*2.8 m	-		21.8 mg/l
Comments	>25mg/l means NO sensitivity to acid precipitation; >50mg/l means susceptibility to zebra mussels		*These lakes have naturally darker, "tea-stained" water.	*One year only, 1983	*one year only, 1985 15 mg/l considered threshold level for phosphorous	

Water Clarity – Secchi Disc Depth

'Secchi disk' measurements are a simple and useful way to get a reading of water clarity, which in turn provides a coarse measure of the level of algae and other microscopic life in the lake. The Secchi disk is a black and white disk that is lowered into the water, and a measurement is taken at the point when the disk can no longer be seen. One of the advantages of using the Secchi disk is that samples can be taken by lake association volunteers without extensive training.

Indications are that water clarity has improved in Fourteen Island Lake over the period 1975 to 2008. While this should be considered a positive trend, one of the reasons the water is clearer is the presence of zebra mussels. This invasive species will filter algae and other matter out of the water column, resulting in increased clarity of the water.

Both Little John's Sister and Buffy show a relatively low water clarity based on the results of 2009. Little John's Sister recorded 2.3 metres and Buffy recorded 2.8 metres on the Secchi disk measurements.

These lakes are naturally a darker 'tea' colour and contain more suspended materials because of the preponderance of wetlands and the lakes' shallow profiles.

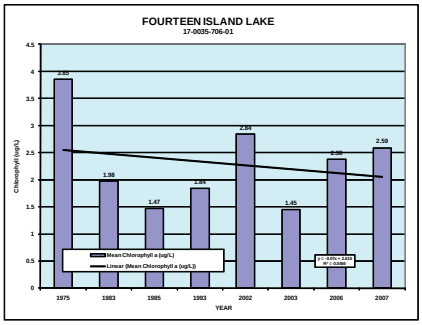
Chlorophyll Concentrations

'Chlorophyll a' is a measure of the green pigment in algae. It is a more precise way to measure algae levels than using the Secchi disk readings. There are only limited results available for chlorophyll a and no readings have been taken since 1993.

The mean chlorophyll a concentration for Fourteen Island Lake for the period 1975 to 1993 is a relatively low 2.14 ug/L (micro-grams per litre).

Little John Lake has a mean chlorophyll a value of 1.90 ug/L, but this is based on only one year of sampling, 1985. Little John's Sister has a reported mean chlorophyll a value of 3.98 ug/L for the same single year of sampling.

Algae growth occurs naturally and the levels found in Fourteen Island, Little John and Little John's Sister Lakes are consistent with what might be expected to occur naturally in those lakes.



▲ Trend in Chlorophyll a 1975 - 2007 Fourteen Island Lake.

Nutrients (Total Phosphorous [TP])

One of the most important measurements of a lake's water quality is its phosphorous levels. Why? Because phosphorous is one of the nutrients upon which plants and algae depend for their survival. Without phosphorous, a lake would be as barren as a desert. However, with too much phosphorous, there is excess algae and weed growth, poorer water clarity, and lower oxygen levels. Phosphorous is what comes along with poorly maintained septic systems and fertilizer runoff (natural and chemical).

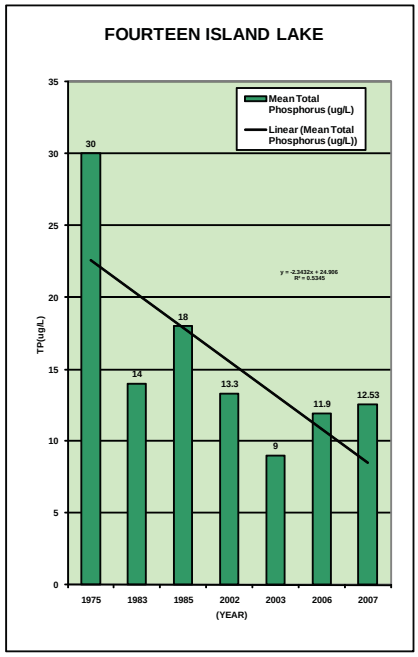
Phosphorous levels in Fourteen Island Lake show a modest decline from 1975 to 2009, based on a limited number of years of sampling.

The mean value is 15.5 ug/L over this time period. Results in recent years have been a bit better than this (12.5 in 2007; 12.6 in 2009) but the samples taken in the central basin of the lake in 2009 were noticeably higher than those in the western basin, averaging 14.8 ug/L. 15 ug/L is considered a threshold point beyond which a lake could tip over into an 'enriched' lake, with more frequent and more severe algae blooms and weed growth.

The 2009 average level for Mink Lake was 9.45 ug/L, well below the threshold. There are no previous results to compare trends for phosphorous on Mink Lake.

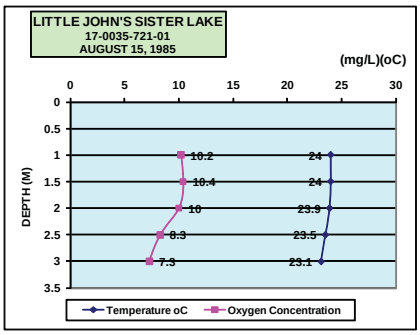
The mean surface phosphorous value for Little John Lake in 1985 was 18.4 ug/L. Results from 2009 show an average level of 13.7 ug/L. More sampling would help to provide a clearer picture of trends.

For Little John's Sister Lake, data from 1985 show a mean phosphorous value of 32 ug/L. The 2009 data had an average of 13.7 ug/L. The



▲ Trend in Mean Total Phosphorous 1975 - 2007 Fourteen Island Lake.

Health of Lakes (cont'd)



▲ Dissolved Oxygen and Temperature Profile August 15, 1985 Little John's Sister Lake.

Phosphorous

Major sources of phosphorous include:

- **Manure** - manure is rich in phosphorous, and this is why it is spread on farm fields to enrich the soil. However, if cattle are allowed into streams, or if manure piles are allowed to run off into streams and lakes, phosphorous levels in the lake will increase;
- **Fertilizers -** farm fertilizers and lawn fertilizers are rich in phosphorous, and if they are applied near streams or lakeshores, they will contribute directly to increased phosphorous levels in the lake;
- **Human waste** - our out-houses, septic systems, and other waste disposal systems all contain loads of phosphorous (along with other nutrients and bacteria). Poorly designed or maintained systems are going to be a major contributor to the phosphorous loads going into the lakes.

elevated phosphorous in Little John's Sister is not a man-made situation; it can be attributed to the large extent of wetlands headwater to the lake and also to the fact that phosphorous does not have the opportunity to settle out and into the sediments.

For the first time, water samples were taken on Buffy Lake in 2009. The average phosphorous level over the year was 21.8 ug/L, a value that is not unexpected for a small lake surrounded by wetlands.

Lakes such as Fourteen Island Lake, Mink Lake and Little John Lake may undergo only partial mixing (turnover) in the spring, which results in very low or zero oxygen conditions at the bottom. In addition, these conditions can lead to an accumulation of nutrients (e.g., phosphorous) in the bottom waters. This accumulation comes from the decomposition of organic material such as algae and aquatic plants that settles from above and from the re-suspension or release of nutrients from the lake bottom sediments. Ultimately, the higher concentrations of phosphorous near the lake bottom will come to the surface during the fall turnover, and may result in major algae blooms if the conditions are right.

Oxygen and Temperature Profiles

These are important measurements that help determine what kinds of fish can be supported in a lake. For example, trout will only survive in lakes with a consistently high oxygen level, whereas fish such as walleye, pike, bass and perch will be more tolerant of lower levels of oxygen. Measurements are taken from the surface to the bottom in specific locations of the lake, and a series of readings of temperature and oxygen levels give an 'oxygen profile' for that spot. Oxygen and temperature recordings have been undertaken on 24 different occasions on Fourteen Island Lake over the period of 1975 to 2009.

Oxygen concentrations for all the early season measurements indicate that Fourteen Island Lake has difficulty undergoing complete mixing during the spring turnover period, and is not able to move oxygen down to the lower water depths. This situation occurs because the basins are deep, but relatively small in surface area, and are protected by large hills (see Map 8.). There is not a large fetch (distance from shore to shore) to allow for strong winds to act; it takes a lot of wind energy to cause the lake to mix to the bottom allowing for spring turnover and infusion of oxygen into the bottom waters. It only takes a few days in early May of stable hot weather to set up stratification and prevent the lake from complete mixing. As a result the lake becomes oxygen poor below about eight metres in depth and remains in an oxygen deficit state most years until the fall mixing period reinstates good oxygen values in the deepwater portion again.

In 2008 and 2009, oxygen profiles were completed on Mink (Sigsworth) Lake. The profiles were located over a water depth of 27 metres and showed severe oxygen loss from about 15 metres to the lake bottom. This lake basin has all the characteristics discussed above for Fourteen Island Lake. The basin is small, deep, protected by high hills and has a

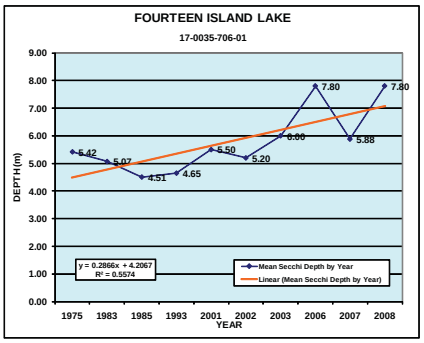
short fetch shore to shore; all are characteristics that cause incomplete spring mixing and poor late season oxygen conditions as a result.

Oxygen and temperature recordings have been completed on 7 different occasions on Little John Lake in 1985; poor oxygen concentrations are evident below 11 metres depth. The October 1985 profile shows that the lake remains stratified and oxygen values below 7.0 metres of depth are close to zero.

Little John's Sister Lake is only 4.0 to 4.5 metres deep and therefore is not deep enough to become stratified. It therefore would be expected to have the same temperature surface to bottom and to be completely mixed surface to bottom for the entire season. Oxygen values would also be expected to be good from top to bottom.

Little John's Sister actually may experience fish kills under the ice in the late winter. The ice sheet prevents the lake from mixing and under conditions of deep snow depth photosynthesis is prevented under the ice. Shallow, productive lakes such as this can experience oxygen depletion under the ice resulting in late winter or early spring fish kills.

None of the oxygen results for these lakes is unusual, given the lakes' sizes and shapes. But lower oxygen levels will have an effect on fish, who will not be able to survive in the lower and cooler waters of the lakes. This may not have a significant effect on many of the fish in the lakes, but it could affect walleye, a species that is having a difficult time on Fourteen Island and Mink Lakes. The relationship between phosphorous levels and oxygen is important to keep in mind. Increased levels of phosphorous and other nutrients lead to increased algae and plant growth, and when the algae and plants die, they fall to the bottom and decompose, sucking up any oxygen that is around them as they decay.



▲ Trend in Water Clarity (Secchi Disc Depth) 1975 - 2008 Fourteen Island Lake.

The Health of FIMLA Lakes

There is nothing that indicates any of the FIMLA lakes is 'unhealthy'. None experience eutrophic conditions as a result of human interference at this time. Each lake falls into its trophic state classification largely as result of geologic and natural circumstances.

Fourteen Island and Mink lakes both experience a less than complete turnover, and so can be susceptible to fall algae blooms in certain years. Based on the overall water quality data available, these would be considered 'mesotrophic' lakes, subject to mild algae blooms. The goal for these lakes should be to ensure the phosphorous levels stay below15 ug/L, a threshold recommended by the Ministry of the Environment. The central basin of Fourteen Island, in recent years, has been at this threshold and should be monitored carefully in future. If phosphorous levels rise much above the 15 ug/L level, significant algae blooms may result.

Little John Lake would also be considered a mesotrophic lake, subject to the same considerations as Fourteen Island and Mink.

Trophic State

'A lake's ability to support plants, fish, and wildlife'.

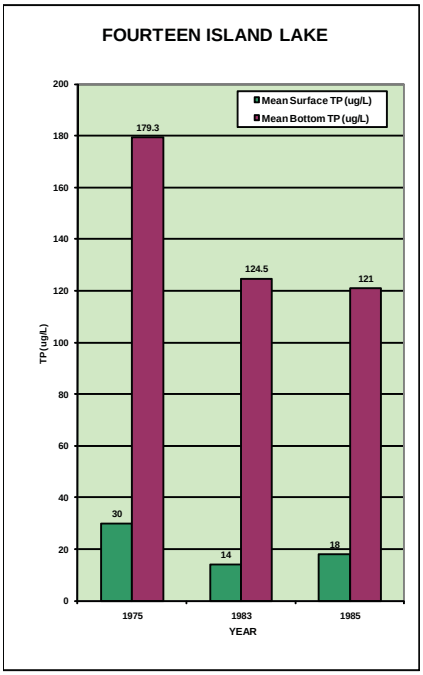
Using the concept of 'trophic state' allows for a simple generalization of the state of lake in terms of its productivity level. The items measured to determine status are: phosphorous levels; algae abundance; and water clarity.

Oligotrophic lakes have clear water, few aquatic plants, and few fish.

Mesotrophic lakes have moderately clear water, a moderate amount of aquatic plants, and potential for lots of fish.

Eutrophic lakes have poor water clarity, lots of aquatic plants, potential for lots of fish, and potential for regular and persistent algae.

Health of Lakes (cont`d)



▲ Mean Surface & Bottom Total Phosphorous 1975, 1983 & 1985 Fourteen Island Lake.

Little John's Sister, and Buffy are lakes that naturally would be less clear and contain higher levels of phosphorous. The water chemistry of these lakes is somewhat different from the other three FIMLA lakes, and higher phosphorous levels are a natural condition that may not mean significant algae blooms. By their nature, they will produce more fish.

All the FIMLA lakes will suffer if more nutrients are pumped into our lakes through faulty septic systems, clearing of shorelines and runoff from lawns and agricultural operations. Lake waters will lose their oxygen levels quicker and bottom nutrient levels will increase that much more. This can cause these lake types to experience eutrophic conditions, including algae blooms, for extended spring and fall periods. It is difficult if not impossible to reverse this process once in place, so vigilance and care is critically important. Warm and dry summers will also contribute to increased algae and weed growth. Since we have no control over the weather, we must be especially careful to control what we can. We can control the nutrients flowing into the lakes by making sure our septic and animal wastes are properly managed, refraining from using fertilizers, and keeping our shorelines in a natural state as much as possible.

Section 2.0 Recommendations and Actions

2.1 Establish a comprehensive water sampling program for all lakes.

Actions:

2.1.1 Conduct additional sampling for Oxygen levels;
2.1.2 Conduct monthly sampling for Secchi and phosphorous in 2009;
2.1.3 Establish long term annual water sampling for Secchi disk and phosphorous.

2.2 Establish a monitoring program for water levels across all lakes.

Actions:

2.2.1 Contact Quinte Conservation to determine best location(s) and sampling protocols;
2.2.2 Call for volunteers to collect and record regular measurements.

2.3 Assess the condition of the two dams in the FIMLA system and engage South Frontenac Township, MNR, and Quinte Conservation in developing a comprehensive program to monitor and maintain these dams.

Actions:

2.3.1 Request dam assessments from Quinte Conservation;
2.3.2 Undertake repair work on both dams as needed, and seek financial assistance from Township of South Frontenac and Quinte Conservation.

2.4 Educate and inform our residents and visitors about what they can do to maintain good water quality in our lakes.

Actions:

2.4.1 Prepare and distribute to all residents a brochure on how to maintain water quality;
2.4.2 Create a ‘renters’ package’ that would include information do’s and don’ts related to water quality, septic systems;
2.4.3 Continue to include information on water quality and how to protect it in FIMLA newsletters;
2.4.4 Provide presentations and guest speakers at AGMs.

(Cont’d overleaf)

Section 2.0 Actions (cont'd)

2.5 Develop an awareness and education program on septic system care and maintenance.

Actions:

2.5.1 Prepare and distribute to all residents a brochure on septic system care and maintenance;
2.5.2 Continue to include information on septic system care in FIMLA newsletters;
2.5.3 Provide presentations and guest speakers at AGMs.

2.6 Request South Frontenac Township to include FIMLA properties on the township's septic pollution reduction program.

Actions:

2.6.1 Send a letter requesting this to the township.

3.0 Fisheries and Fishing

Objective: *To monitor our fish and fish habitats and take actions to ensure a healthy population and sustainable fishery for anglers.*

▲ Going fishing on Fourteen Island Lake.

Overview

The most vivid and emotive symbol of Fourteen Island Lake's beauty and magic is the loon. The first loons return well before the lake has lost all of its ice. The nest building, the sight of a baby loon swimming on the other side of its mother or resting on her back, the madcap displays of the adults in August all enchant the observer. And always the haunting tremolo of the loons' calls remind us that we are in nature and blessed to be so.

But like every other life form natural to our lake, the loon is dependent on other species for survival. And the loon is reliant on the lake's fishery. A loon nest composed of two adults and two babies will, during one season, consume 700 pounds of fish. If the fishery were sick or were to suffer a catastrophic shock the loons would disappear. The fishery's health is the life-blood of our lake's most vital symbol.

The fishery is essential in many other areas as well. Birds such as the kingfisher and osprey rely on fish for much of their diet. So do mammals like the otter and fisher. A healthy fishery is the source of pleasure for those who fish and for those who take joy in the rising of a bass at dawn or the slow passage of a prowling northern pike near shore at sunset. The fishery may be the lake's greatest asset and its continued health our greatest concern.

Fourteen Island Lake's Historic Fishery

A 1975 Report by W.G. Smith offers an idea of the fishery in the 1970s and earlier. The report references lake surveys that were conducted in 1959 and 1964, and the 'current' work of 1974 and 1975.

Highlights of this report include:

- In 1962, 5.5 million walleye were planted in Fourteen Island Lake;
- Walleye were fewer in 1974 compared to 1964, with a conclusion that the effects of stocking were no longer evident in 1974;
- Sunfish numbers significantly decreased (by 73%) between 1964 and 1974;
- Yellow perch and black crappie were found in 1974, but were not abundant;
- Burbot and black crappie were found in 1974; neither had been caught in previous surveys;
- Largemouth and smallmouth bass were well represented in the 1974 catches;
- Northern pike had undergone some poor years, but a strong 2-year

Fourteen Island Lake Fishery

▲ Fish studies were conducted on Fourteen Island Lake in 2007 and 2008.

class of pike suggested that they would be doing well in the future;

- Lake herring had been caught in the 1959 survey, but none were found in 1964 or 1974;
- The 1974 survey noted that were “some very nice sized Bluegills and Pumpkinseeds”.

Fishery of Buffy, Little John, and Little John’s Sister Lakes

There are no formal survey results for the smaller lakes. It is known that the lakes have a very strong population of bass, and particularly largemouth. They are there both in large numbers and in good sizes. The lakes also are known to contain perch, rock bass, pumpkinseed, and mudcat. The Ministry of Natural Resources is beginning a new fisheries assessment program, ‘Broad-scale Fisheries Monitoring’, and Little John Lake will be included. The summer of 2010 will be the first year of monitoring the fishery of Little John Lake.

Fourteen Island Lake Fishery

As a part of the lake plan initiative, FIMLA requested that the Ministry of Natural Resources update the fisheries information on our lakes. During the summer of 2007 and 2008, water quality and fishery assessments were carried out by the Ministry of Natural Resources with volunteer support from the Lake Association membership.

A summary of the findings of the 2007 and 2008 surveys is provided in Figures 5. and 6. below.

In a nutshell, the results show:

- **Walleye** are not plentiful, but are found to be well distributed around the lake. Specimens that were caught ranged in size from 29 to 65 cm (11-26 in). Most of the walleye that were caught were fish that had been stocked in previous years, so natural reproduction is irregular at best. Overall, the results are not encouraging for the walleye fishery of the lake.
- **Largemouth bass** abundance is relatively high with an average catch in the 2007 survey of 5.3 fish per net. Fish ranged in size from 14 to 46 cm (5½ -18 in). Ages ranged from 1 year to 11 years with a mean age of 4.3 years.
- **Smallmouth bass** were found to be fairly abundant in the 2008 gill net surveys, and ranged in size from 20 to 46 cm (7.8 – 18 in).
- **Black crappie** abundance appears to be relatively low for the species (3.2 fish per net) but these numbers still represent a fishery. Black crappie ranged in size from 15 to 32 cm (6-12 ½ in) and ages ranged from 3 years to 8 years with a mean age of 4.8 years.
- **Northern pike** ranged in size from 42 to 60 cm (17-24 in). Ages ranged from 1 year to 6 years with a mean age of 3.9 years.
- **Sunfish (notably bluegill and pumpkinseed)** were abundant in the 2007 survey; these species represented the largest number of any of the species captured.

Implications of Results

Overall, all our lakes have a healthy and vibrant fishery. The upper lakes have a very good bass fishery, and have had one for many years. Fourteen Island and Mink have a strong fishery for bass (small and large mouth), perhaps thanks to some of the efforts at marking bass nesting areas in the spring. Pike, crappie, and sunfish also are found in good numbers and sizes.

▲ Data was collected on the variety, quantity, size, age and health of fish in Fourteen Island Lake.

Figure 5. Trap-netting Results for Fourteen Island Lake 1964, 1974 and 2007

	1964		1974		2007	
	# Fish	% of Catch	# Fish	% of Catch	# Fish	% of Catch
Walleye (yellow pickerel)	137	3.7%	77	5.7%	15	13.3%
Northern Pike	45	1.2%	23	1.7%	7	1.6%
Largemouth Bass	130	3.5%	52	3.8%	58	12.9%
Smallmouth Bass	128	3.5%	43	3.2%	2	0.4%
Black Crappie	0		48	3.5%	35	7.8%
Yellow Perch	151	4.1%	25	1.8%	1	0.2%
Bluegill	*2386	*64.8%	230	16.8%	120	26.8%
Pumpkinseed			639	46.9%	165	36.8%
Rock Bass	511	13.9%	278	20.4%	24	5.5%
Brown Bullhead	164	4.5%	156	11.4%	13	2.9%
Yellow Bullhead	**		**		7	1.6%
American Eel	21	0.6%	10	0.7%	0	
Burbot	0		9	0.7%	0	
White Sucker	6	0.2%	2	0.2%	1	0.2%
Notes	*In 1964 survey, bluegill and pumpkinseed were combined. **In 1964 and 1974 surveys, yellow bullhead were likely included in the Brown bullhead count.					

However, the analysis of the lake's walleye population is not encouraging, and this will come as no surprise to those who regularly fish the lake. Despite a stocking program that goes back many years there appears to be, in the Ministry's words, "walleye recruitment failure on Fourteen Island Lake". In other words, the walleye are not reproducing.

Walleye Fishery

A History of Walleye Stocking

Walleye, or yellow pickerel, are not a native species to many of the lakes in eastern Ontario, including Fourteen Island Lake.

Stock was brought here for the first time in 1927 from the Bay of Quinte, and walleye populations started to breed and to take hold in many of the lakes.

Stocking has continued over the years, with a considerable effort on Fourteen Island Lake since the 1980's by concerned individuals and conservation groups.

Figure 7. summarizes the amount of stocking done over recent years.

For the full 'MNR Fish Survey Reports' for 2007 and 2008 see the FIMLA website at:

www.FIMLA.org.

Figure 6. Gillnetting Results for Fourteen Island Lake 1974 and 2008

	1974		2008	
	# Fish	% of Total Catch	# Fish	% of Total Catch
Walleye (Yellow pickerel)	7	15.9%	14	6.0%
Northern pike	7	15.9%	9	3.9%
Largemouth bass	2	4.5%	3	1.3%
Smallmouth bass	16	7.0%	16	7.0%
Bluegill	0		62	27.2%
Pumpkinseed	9	20.4%	10	4.4%
Yellow perch	4	9.0%	64	28.1%
Rock bass	3	6.8%	15	6.6%
White sucker	3	6.8%	1	0.04%
Burbot	5	11.3%	0	
Golden shiner	*0		34	14.9%
Notes	*In 1974, it is likely that Golden shiner were present, but mesh size of nets did not capture this species.			

There are three possible causes for what has happened to the walleye fishery:

- First, the traditional spawning areas are no longer available. The stream leading from Little John to Mink Lake no longer provides spawning beds due to the dam that has slowed the flow into the stream. Another traditional spawning area in a bay of the western basin of the lake has been cut off to the walleye as a result of sand and silt build up at the mouth of the stream. There may also be some impact on spawning sites (on lake shoals) as a result of slightly increased water levels after the dam was repaired in 1994;
- Secondly, the presence of zebra mussels has created an environment that is not as appealing to walleye. The zebra mussels have increased the clarity of the water in the lake, while walleye prefer a murky environment to hunt their prey;
- A third possible impact on the walleye might be from heavy fishing pressure. In May, June and September it is not unusual to see eight to ten boats, or more, fishing from light to dark.

One of the follow ups that has been pursued in 2009 has been to take a good look at potential spawning areas for walleye. One potential spawning area has been identified on a stream that leads into the bay near Huffman Lane. This is a location where it is believed that walleye spawned in the past, and MNR biologists agree that there is good

Figure 7. Walleye Stocking Record for Fourteen Island Lake

Year	Life Stage	Number Stocked
1927, 1929, 1936, 1938, 1940, 1946-1954	Unknown	Unknown
1962	Probably eggs	5,494,250
1983	Fry	283,000
1984	Fry	285,000
1985	Fry	350,000
1988	Fingerlings	24,600
1989	Fingerlings	13,150
1990	Fingerlings	300
1991	Fingerlings	247
1992	Fingerlings	4048
1993	Fingerlings	1730
1994	Fingerlings	17,800
1995	Fingerlings	2238
1996	Fingerlings	349
1997	Fingerlings	236
1998	Fingerlings	3343
1999	Fingerlings	351
2000	Fingerlings	1296
2001	Fingerlings	1050
Notes	Fry are very young fish, only a few days old; fingerlings are older fish, about 2-3 months of age when they are stocked.	

potential for spawning to take place in future. The stream needs some rehabilitation to encourage the walleye to return to the area to spawn.

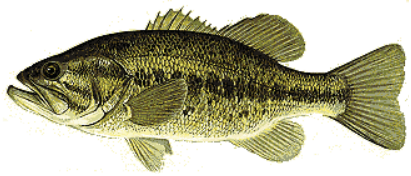
Walleye Options

After reviewing the results of the studies by MNR in 2007 and 2008, the Lake Plan Committee considered three options for dealing with walleye and presented these to the Annual General Meeting in 2009:

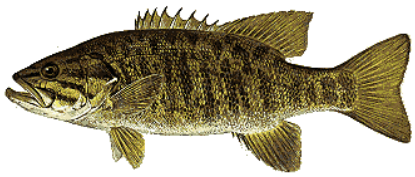
- Continue an annual stocking program;
- Encourage the natural reproduction of walleye; or
- Do nothing.

The decision taken at the AGM was Option 2, to improve conditions for natural reproduction. This may include stocking in the short term, but over the long term the goal is to have a self-reproducing population and eliminate the need for stocking.

▲ Yellow Pickerel (Walleye).



▲ Large Mouth Bass.



▲ Small Mouth Bass.

▲ Pumpkinseed.

▲ Northern Pike.

Section 3.0 Actions

3.0 Recommendations and Actions

3.1 Continue to examine the potential for walleye spawning in Fourteen Island and Mink Lakes, and apply for MNR funding to rehabilitate if potential exists.

Actions:

3.1.1 Examine potential spawning areas, and ask for MNR assistance and confirmation.

3.2 Continue to monitor fish populations.

Actions:

3.2.1 Request that MNR return to re-survey the lake in 2013 (5 year interval);

3.2.2 Request fisheries surveys for all FIMLA lakes.

3.3 Conduct a creel survey to determine what fishermen are catching in the lakes.

Actions:

3.3.1 Encourage MNR to conduct training sessions for lake associations in how to carry out a creel survey;

3.3.2 Carry out a set of creel surveys on all FIMLA lakes in 2011 and 2012;

3.3.3 Engage the commercial operator to help gather information on fishing and boat use on Fourteen Island Lake.

3.4 Develop an awareness and education campaign about the lakes' fisheries, and current regulations.

Actions:

3.4.1 Prepare and distribute to all residents a brochure on the FIMLA fisheries and fishing regulations;

3.4.2 Include fish and fishing information in the 'renters' package' such as current Fishing Regulations;

3.4.3 Include information on fisheries, fishing, and regulations in FIMLA newsletters, including the results of future creel surveys;

3.4.4 Provide presentations and guest speakers at AGMs.

4.0 Social and Recreational Activities

Objective: *To promote cottage use and recreational activities that are safe, respectful of others' right to peace and tranquility, and environmentally responsible.*

▲ Reconciling different activities and interests on the lake is a key issue in the plan.

Overview

In the two surveys conducted by FIMLA for this plan, residents emphatically stated that they valued the quiet and the beauty of the environment. All FIMLA lakes have a considerable amount of natural shoreline, with cottages and homes well separated, and only a moderate amount of boat traffic.

In the case of Buffy, Little John's Sister, and Little John, boat traffic is almost exclusively non-motorized. In fact, Little John formally prohibits motors. The occasional fishing boat on Little John's Sister does little to detract from the summer quiet on the water.

Summary of Survey Findings

Fourteen Island and Mink are larger lakes with many more motor boats with larger engines and cruising pontoon boats, but motor boats still only represent one third of the total boats around the lakes. The rest of the water craft are canoes, kayaks, paddle boats, and a few sailboats and sailboards.

According to the 2008 survey, people use their motor boats on average, 1.5 hours per week. It's not surprising to hear from visitors used to the Rideau, Muskoka or Kawartha Lakes that our lakes seem almost deserted most of the summer. Although boat use is low, and towing skiers, wake boarders or tubes is only ten percent of the total motor boat use, respondents to the survey expressed concern about motor boat use.

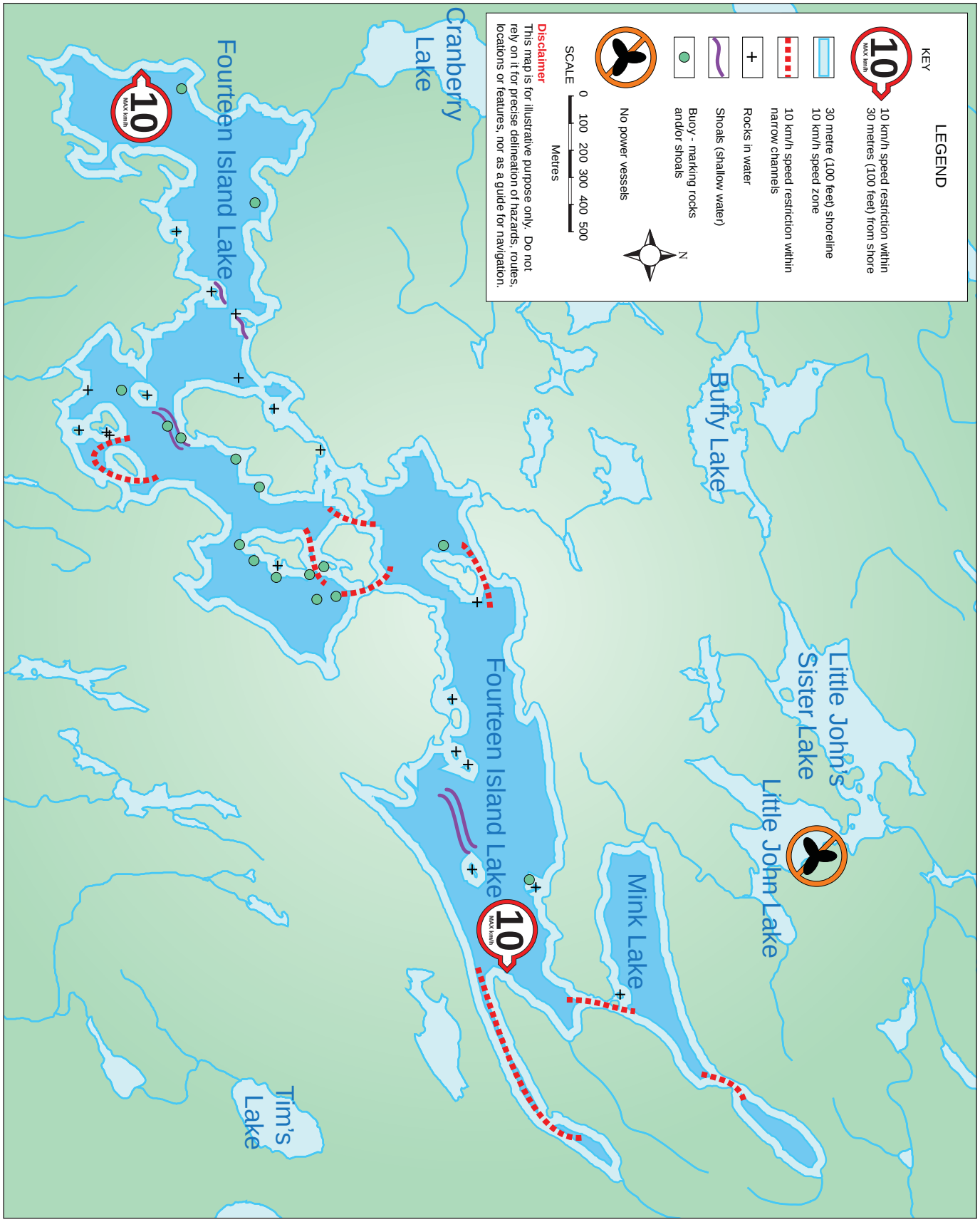
The relatively narrow width of our lakes may be a cause of an increased sensitivity, since every boat that goes by one's dock is noticeable, no matter how far out it is. People were also concerned about loss of tranquility, effects on shorelines and docks from boat wakes, and speeding through narrow channels.

Residents also described harrowing experiences with boats and personal watercraft (PWCs or Seadoos) that left them fearful and anxious. Although there was support for an increased awareness campaign on boating issues, residents did not favour the use of signs (e.g. for speed limits).

Many residents expressed specific concerns about the noise and speed of PWCs on Fourteen Island and Mink Lake. Except for those who enjoy using them, people do not like PWCs. Many find their engine noise irritating, and there is also concern about the safety of humans and wildlife if they are not operated in a respectful manner.

Boating Guidelines Map

Map 6. Boating Regulations and Speed Limits



In addition to their interest in safe and responsible boating on the lakes, residents and cottagers are also anxious to maintain a generally quiet and tranquil environment. While it's not a common concern around the lake, there have been incidents of very noisy parties going well into the night, or people playing loud music during the day or night. As everyone knows, sound travels very efficiently across water, so lots of people get to share the party sounds from a long way off.

Another part of the environment that many enjoy is our star-filled skies, but few people notice how over time the sky is brightening up at night from the lights to the south, and from the many lights that are used by people around the lake. Other lakes across the province have experienced a significant loss of their starry night skies, and are now trying to do whatever they can to restore this privilege of cottage life. If we want to be able to continue to enjoy our night sky, we need to become more aware of how we ourselves are starting to drown out the stars.

▲ A spotter must be on board whenever a boat is towing.

Figure 8. FIMLA Survey Findings Summary

The 2008 survey clearly highlighted the fact that people value the quiet nature of these lakes, and expressed a number of social and recreational concerns that echo those expressed in the original survey of 2006 and the workshop in 2007:

- Boats travelling too fast or creating wakes on shorelines and docks;
- PWC (Seadoo) speed and noise;
- Excessive partying and noise;
- Fishing in the middle of channels;
- Fires being set during fire bans;
- Boat engines, especially older 2-strokes, that pollute the lake and air;
- Unnecessary lights leading to light pollution and reduction of our dark skies.

Guidelines on Recreational Behaviour

The Actions that follow in this chapter propose a number of tasks that would raise awareness about responsible boating and other issues related to recreational enjoyment of the lake. Information is presented in Appendix B. on boating rules and regulations that apply on all waters in Ontario, and in Appendix C. on 'Good Neighbour Guidelines', to provide a starting point for these initiatives.

Section 4.0 Actions

4.0 Recommendations and Actions

4.1 Expand upon the current FIMLA initiatives to promote safe and considerate boating.

Actions

4.1.1 Prepare and distribute a map/brochure showing narrow channels and recommended speed limits and a short 'Code of Conduct' for responsible boating;

4.1.2 Continue to use the newsletter to inform residents of boater safety issues;

4.1.3 Invite the OPP Marine Unit to an AGM to provide a presentation and a booth on boating.

4.2 Establish an awareness program on the environmental impact of poorly maintained boat engines.

Actions

4.2.1 Continue to place articles in the newsletter;

4.2.2 Bring a speaker to a future AGM.

4.3 Develop a 'good neighbour' awareness campaign to deal with noise.

Actions

4.3.1 Prepare a brochure and distribute to all residents; include as a part of the 'renter's' package;

4.3.2 Bring the subject up at meetings of road associations.

4.4 Promote the concept of 'dark skies', and make residents aware of its importance and value.

Actions

4.4.1 Continue articles in the newsletter dealing with: why dark skies are important; what kind of lighting will help ensure minimal light pollution;

4.4.2 Bring an expert speaker to an AGM who can show the impacts of light pollution through a slide presentation and talk.

5.0 Emergency and Municipal Services

Objective: *To work with provincial and municipal authorities to improve police, emergency and other municipal services.*

▲ Portland District Tanker 43 serving the local community.

Overview

As the FIMLA community grows, the need for effective fire, police, and ambulance services increases. With greater numbers of year-round residents, and a good number of older residents and cottagers, comes an increase in demand for services. All emergency services are mandated by the province and provincial regulations specify minimum standards for all levels of government services.

The current response times to emergencies are reasonable in light of the tax resources available, the distances to travel, and the condition of some of the roads.

One shortcoming in the overall emergency response system is a lack of an integrated 911 response system using GPS technology. Although the province currently funds an initiative to implement an integrated call response in the next two years, an up to date residence GPS system is not currently available for the FIMLA area.

Fire and Rescue Service

The fire service is provided by and for the Township of South Frontenac. The service relies on a volunteer force of 140 fully trained volunteer fire fighters with one paid position for the Chief, with a plan to hire and train more volunteers. Nine stations cover over 800 km of roads across the township, with fire halls that service the FIMLA area in Hartington, Verona and Sydenham. This area enjoys the highest rural protection rating by the insurance industry, based on the Township's complete fleet of vehicles: sixteen fully equipped fire trucks, several tankers, rescue boats, and specialized emergency equipment.

Despite the best efforts of the fire service, residents need to be more aware of their vulnerability and take what steps they can to improve their level of protection. Some ideas that enhance fire safety are outlined below.

- One road association, Fourteen Island North Feeder Lakes Association (FINFLA) located off Meredith Road, purchased fire pumps and hoses and set up a system of first response within the community in order to fight a fire before the fire trucks arrive;
- In some places in the FIMLA area, the water needed to refill the tanker trucks is not always readily available in winter. There have been discussions with the Fire Chief to consider installing 'dry hydrants' in strategically-located ponds to allow for easier access to water;
- Most summers, the Township issues a total fire ban. Given the amount of forest in the FIMLA area, this is a ban that must be strictly adhered to.

Police Services

▲ An OPP cruiser.

Ontario Provincial Police Services

Police services for this area are provided by the Ontario Provincial Police, on a contracted basis to the Township of South Frontenac.

The OPP office in Hartington covers a zone of about 800 kilometres of roads, bounded by Highway 15 in the east, Sharbot Lake to the north, Highway 41 to the west, and Loughborough Lake to the south.

The staff and equipment available at the Hartington detachment include:

- 1 unit commander;
- 4 sergeants;
- 4 uniformed police officers;
- 4 civilian personnel;
- 10 marked police cars;
- 2 unmarked cars;
- 1 marine boat.

Additional resources such as personnel, helicopters, forensic officers, dogs, bomb disposal etc., are brought in as required. The Hartington detachment has a number of well trained criminal investigators for drug, breaking and entering, sexual assault, motor vehicle accidents, hostage negotiation and youth crime. The detachment provides ongoing driver spot checks, boating safety checks (augmented by a specialized marine unit in Odessa) and community event participation when requested.

Lake communities meet regularly with the OPP and provide them with a contact list that includes phone numbers of permanent residents. This assists the OPP in investigations and improves critical information flow.

The FIMLA community enjoys a very low crime rate, although there have been incidents of break and enter, assault, and a case of commercial marijuana growing within the community.

Ambulance Services

The ambulance service is provided by Frontenac County. All ambulance staff are fully trained and qualified paramedics. There are only two 24-hour ambulances serving the extensive FIMLA community, one stationed in Tamworth and the other just north of Kingston on County Road 38. Response times can be an issue, especially in winter driving conditions. Code 4 or most urgent serious calls have increased almost 10% since 2006 in South Frontenac.

At the time of writing this report Frontenac Township has made the decision to provide a new 24 hour ambulance service in the Village of Sydenham. The future of the Tamworth station is still being decided.

▲ Serving the FIMLA area: a Frontenac Paramedic Services ambulance.

Section 5.0 Actions

5.0 Recommendations and Actions

5.1 That the County and Township include a four-wheel drive ambulance for rural areas for the new Sydenham station.

Actions

5.1.1 Prepare and send a letter to South Frontenac Township and Frontenac County requesting that the Sydenham ambulance facility be equipped with a four-wheel drive ambulance.

5.2 Request County and Township to purchase an up to date GPS system to improve response time of emergency responders.

Actions

5.2.1 Prepare and send a letter to South Frontenac Township and Frontenac County requesting that they purchase an up to date GPS system to improve response time of emergency responders.

5.3 Maintain and expand the relationships with the Fire Chief, the OPP detachment, and the Township of South Frontenac.

Actions

5.3.1 Continue to attend meetings of lake associations and Fire and Police services;

5.3.2 Prepare and present the results of the Lake Stewardship Plan at municipal council;

5.3.3 Invite councillors and key staff to visit the FIMLA lakes, by providing a boat tour and through open invitations to FIMLA's AGMs.

5.4 Promote the self-help fire protection as done by the FINFLA Road Association.

Actions

5.4.1 Request a feature article for the newsletter on the FINFLA self-help fire protection approach.

6.0 Land Use and Development

Objective: *To ensure that future land development is in keeping with the environmental, social and physical character of the FIMLA area, and:*

- *to support administration and enforcement of environmental regulations; and*
- *to promote comprehensive environmental planning for the FIMLA and contiguous regions.*

Overview

Current Land Use and Development

As the price of waterfront property continues to increase, Eastern Ontario and particularly the Land O'Lakes area is getting more attention as a viable alternative for seasonal and permanent residences. The FIMLA area is only two hours or slightly more from Toronto, Montreal, and about an hour to upper New York State. It is relatively easy to commute from the area to work in nearby cities, such as Kingston, Napanee, Brockville and Belleville. Based on this it is no surprise that 30% of the homes on Fourteen Island and Mink Lakes are permanent, year round residencies, housing working people or retirees.

▲ Footings being laid for a new waterfront development.

Figure 9. FIMLA Area Land Use and Development

Out of a total of 154 lots listed, 11 are back lots and 137 are waterfront lots. Six of the larger islands on the lakes are also included in the analysis. The adjusted number of landholders is approximately 138. Around 16 landholders have multiple holdings (corresponding to a total of 22 lots).

FIMLA Area	# Lots	Permanent	Seasonal	Vacant	Status Unknown
Buffy Lake	13	7	0	6	0
Little John's Sister Lake	16	6	2	8	0
Little John Lake	12	4	5	3	0
Mink (Sigsworth) Lake	15	4	8	3	0
Fourteen Island Lake	81	21	45	13	2
Islands	6	0	3	3	0
Back Lots	11	3	1	7	0
Totals	**154**	**45**	**64**	**43**	**2**

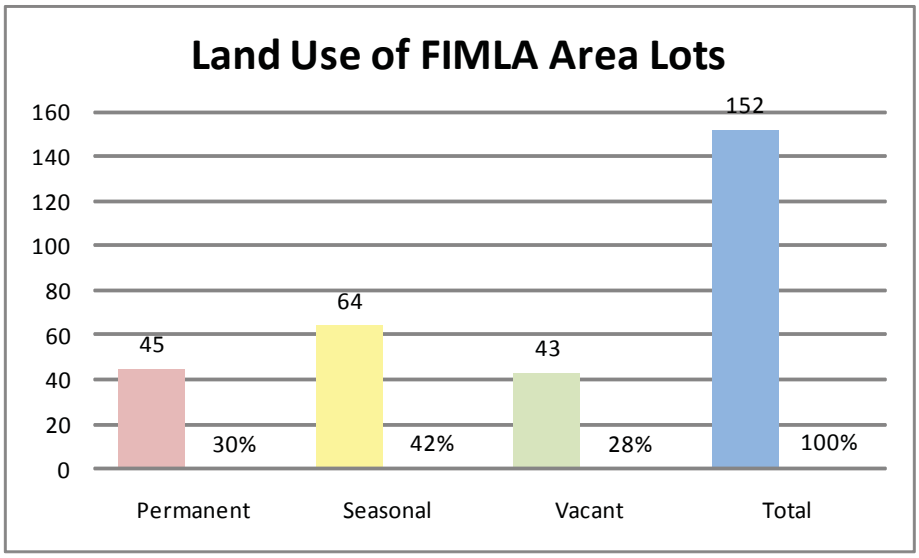
"There are 38 cottages around the lake and one resort with 5 cottages. This is probably all that can be built due to the steepness of the shoreline, 5% flat, 20% rolling, 60% hilly, and 15% mountainous."

W.G. Smith, 1975.
Fourteen Island Lake 1974 Trapnet and Gillnet Report.

FIMLA Area Land Use

▲ Standards for minimum setbacks and waterfront widths protect shorelines.

Figure 10. FIMLA Area Lots Classified According to Land Use.



It's also interesting to see where the cottagers or owners of undeveloped land travel from, as seen in Figure 11.

Figure 11. Locations of Non-Residential Landholders

	Germany	USA					Canada					
		Pennsylvania	New York	Massachusetts	Florida	California	Quebec	GTA	Ottawa Area	Kingston-Belleville	'Local' Towns	SW Ontario
Seasonal/ cottagers	1	2	5	1	1	1	1	5	4	25	6	
Owners of Vacant Land			1		1			6		9	4	2

FIMLA lakes are populated by cottagers and full-time residents, with about a 70-30 mix. The buildings around the lakes range from small one-room summer cottages to 5,000 sq. ft. permanent homes. There are a few lots with trailers, which will need to be removed by the end of 2010, based on the township's trailer bylaw. There is only one commercial operation on the lakes, a set of 5 cottages that are rented out on a regular basis from Spring through Fall each year. The renters are mostly repeat users, many of whom have been coming here for 20-40 years, and some for even longer.

A small number of owners (six percent) rent out their cottages during the summer. A few are on a long term lease and some have multi-

family use.

There are no active commercial farming operations in our sub-watershed, with the exception of small operations with cattle that graze over the summer on one or two properties to the north of Little John and Little John's Sister Lakes. There are dairy operations to the south, close to Fourteen Island Lake, but beyond our sub-watershed, and off the Frontenac Axis.

Map 7. shows the developed and undeveloped properties in the immediate vicinity of the FIMLA lakes. There are a number of small, undeveloped lots and a few larger holdings scattered around the lakes. Any owner wanting to sever or subdivide their property would be subject to the township's zoning bylaw which limit parcel size and lake frontage as described later in this chapter.

The Official Plan

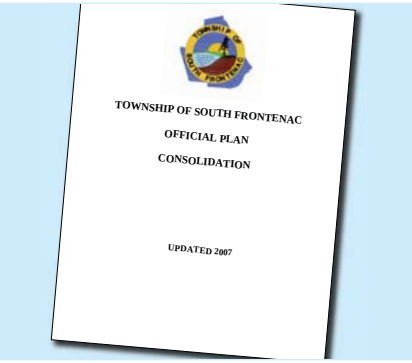
The FIMLA sub-watershed is in Portland and Loughborough districts of South Frontenac Township. The current Official Plan (OP) for South Frontenac was approved in 2007, and is currently under a scheduled review. The OP provides a vision statement and framework for directing South Frontenac's growth in a manner which preserves the Township's environmental integrity while enhancing both its rural character and its long-term economic viability.

The 'Natural Heritage' and 'Transportation' goals are particularly relevant to the FIMLA area. The natural beauty of South Frontenac lakes, forests and rural landscape are recognized as the Township's predominant assets. The Natural Heritage Goal of the Official Plan seeks to preserve and enhance South Frontenac Township's environmental quality for the enjoyment of future generations, while realizing its economic potential.

The Transportation Goal seeks to establish an efficient and cost-effective transportation network that optimizes the movement of people and goods throughout the Township. One of the objectives under the Transportation Goal is that the Township avoids upgrading or assuming any existing private road responsibilities.

In the 2009-2010 review of the Official Plan, this is a contentious issue, as the Ministry of Municipal Affairs and Housing are not supportive of the continuation of development on private roads and lanes, which may result in a change to the Township's practice of using private roads or privately-maintained roads to service waterfront developments.

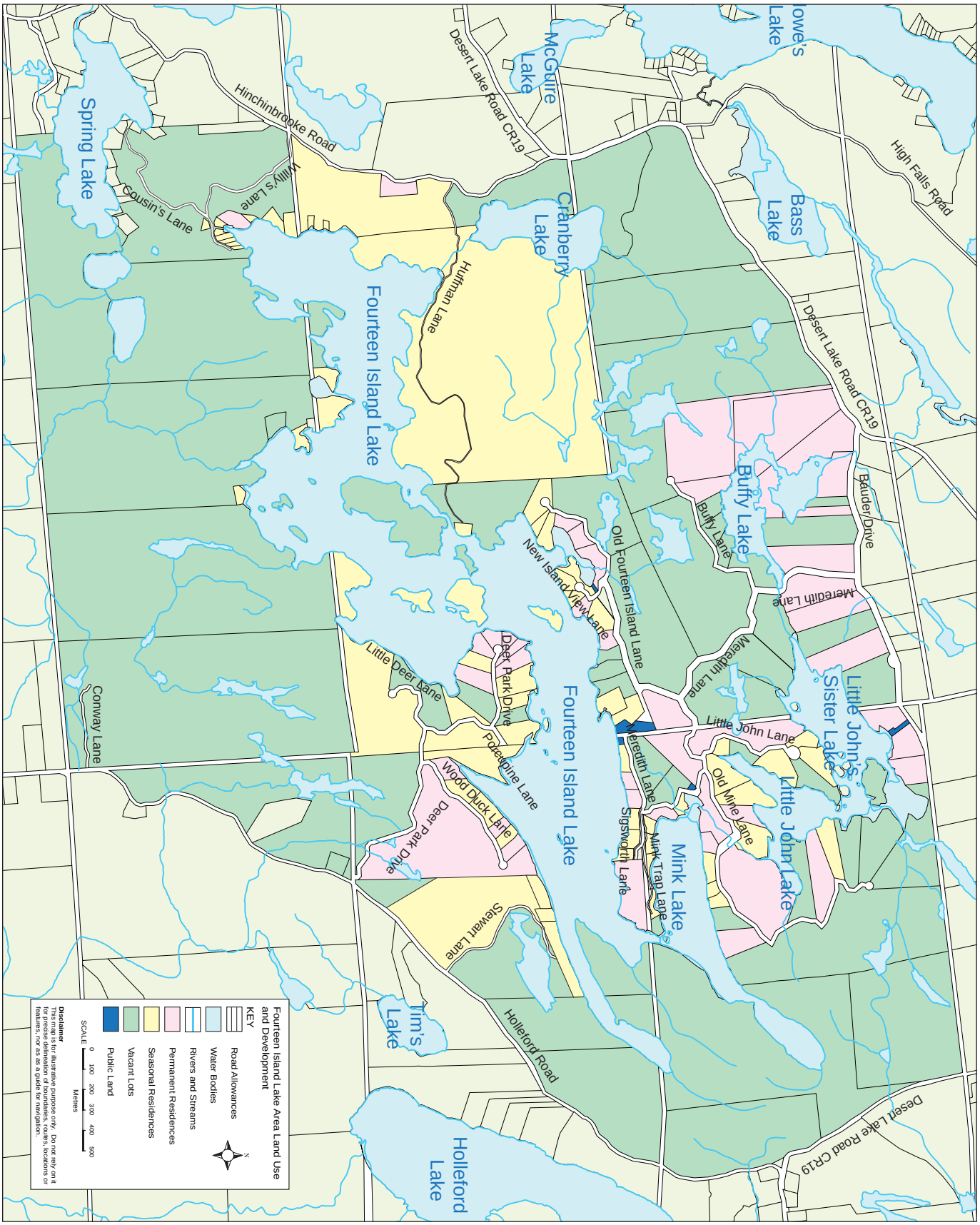
At the time of writing this lake stewardship plan, the issue has not been resolved.



▲ The current Official Plan for South Frontenac is presently under a scheduled review.

Land Use and Development Map

Map 7. FIMLA Area Land Use and Development



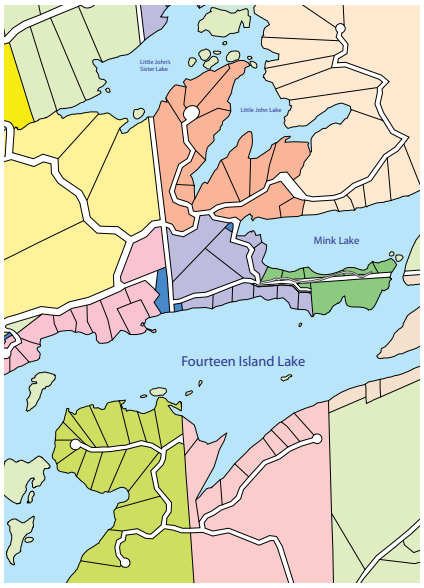
Zoning Bylaws

Zoning across our waterfront lots is primarily 'Limited Service Residential – Waterfront'. This zoning applies to the rural areas of the township where the primary access to a body of water is from a private road or a navigable waterway. Uses permitted include single, detached residential dwellings and seasonal residential dwellings. These will be serviced by private water and sanitary sewage disposal systems (wells and septic systems).

In 2007, South Frontenac Township amended its zoning bylaws, and in doing so, formally changed the rules for developing waterfront lots in a significant way. These changes reflected a policy statement from the Official Plan:

" . . . residential development shall be designed to preserve as much as possible of a site's physical attributes, such as tree coverage, varying topography and scenic views for the benefit of future residents."

The regulations for development on Limited Service Residential – Waterfront became far more restrictive, as are summarized in Table 12.



▲ Further development is subject to stringent zoning bylaws.

Figure 12. Zoning Regulations

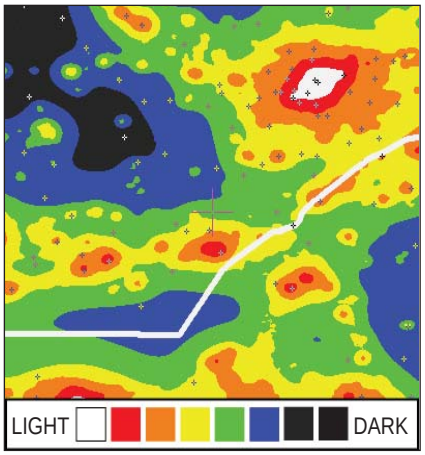
Specific regulations for Limited Service Residential - Waterfront
Zone regulations for a principal building are:

RESIDENTIAL	WATERFRONT	ISLAND
LOT SIZE		
Lot Area (minimum)	1 ha (2.5 acres)	2 ha (5 acres)
Lot Frontage (Minimum Shoreline)	91 m (300 ft)	91 m (300 ft)
Lot Coverage - Buildings	5% maximum	5% maximum
SETBACKS		
Shoreline setback	30 m (100 ft)	30 m (100 ft)
Side Yard Main Building	3 m (10 ft)	3 m (10 ft)
Side Yard Accessory Building	3 m (10 ft)	3 m (10 ft)
MAXIMUM HEIGHT		
Main Building	11m (36 ft)	11m (36 ft)
Accessory Building	6 m (20 ft)	6 m (20 ft)

There are additional restrictions for lot severance in areas that are defined as "Shallow (less than three metres or ten feet deep) and Narrow (less than 150 metres or 492 feet wide) bodies of water". An example of such a body of water is the long bay at the east end of Fourteen Island Lake. In these locations, each new lot must have a minimum lake frontage of 150 metres or 492 feet.

A bylaw that was passed in 2005 requires that any existing trailers must

Back Lot Development



▲ Light pollution map centred over Otter Lake, about 5 kms due east of the FIMLA area. (Source: ClearDarkSky. A. Danko)

be removed by December 31st, 2010, unless the property owners have committed to the construction of a permanent dwelling on their property by applying for a building permit.

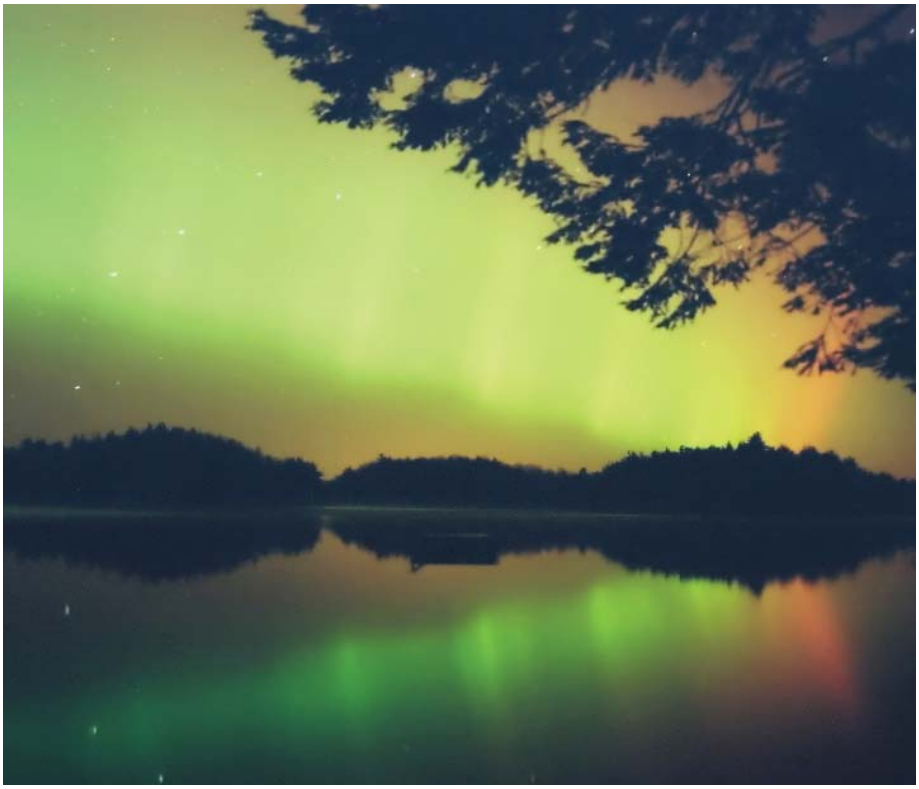
'Back lot' development is not permitted on those lanes that service waterfront land, and this is continued as a policy of the revised Official Plan. This means that any future development of the private lanes will be permitted only on the side of the lanes fronting the lakes.

Concerns about Future Development

In the two surveys and the workshop, FIMLA residents expressed concerns about the impact of increased residential development.

These concerns included:

- Unnecessary lights drowning out the night sky;
- Increased development that has increased the amount of unnatural noise in the area;
- Future 'back lot' development;
- 'Condominium' or timeshare type development on the lake;
- Appropriate development of the remaining large tracts of vacant land on the lake;
- The need to ensure that future development follows the bylaws and that it remains 'sustainable'.



▲ A dramatic night sky over Fourteen Island Lake in the fall of 2003.

Future Development

Overall, the current bylaws ensure well controlled new development. All new lots will be reasonably spaced along the remaining undeveloped shoreline (with 300 feet minimum frontage), and new cottages or houses will be set back from the water's edge a minimum of 100 feet.

▲ Fall reflections over Buffy Lake.

The issue of condominium-style development or joint/fractional ownership has not surfaced on any of the FIMLA lakes. On our lakes there are no properties currently zoned that would allow for such development. For any property to be developed in this way, a zoning bylaw change would be required. While it appears unlikely that this would happen, any change in the zoning of a property has to go through a public process, including notification of neighbouring property owners.

▲ The ospreys on Eate's Island rebuilt their nest after it was blown down one stormy night in the winter of 2008.

Section 6.0 Actions

6.0 Recommendations and Actions

6.1 Present the results of the FIMLA Lake Plan to the South Frontenac Township council, stressing components related to protecting lake values and controlling new development.

Actions

6.1.1 Make a presentation to council;

6.1.2 Invite the Township planner to a meeting of the FIMLA executive, and discuss in detail the contents of the FIMLA Lake Stewardship Plan;

6.1.3 Request that the FIMLA Lake Stewardship Plan be used as a reference in future planning decisions in the FIMLA area;

6.1.4 Request that FIMLA executive be notified in future of Plans of Subdivision or severances in the FIMLA area.

6.2 Examine Official Plan and Zoning Bylaws to determine development potential on the lakes, and monitor future severances and subdivisions.

Actions

6.2.1 Prepare a lake map showing the maximum lot creation available on all FIMLA lakes' shorelines;

6.2.2 Present this information in the newsletter and at an upcoming AGM.

6.3 Monitor and review current and future policies and proposals related to backlot and condominium development on FIMLA waterfronts.

Actions

6.3.1 Examine the Official Plan review ongoing at the time of developing this lake plan to confirm the Township positions on back lot development and condominium/joint ownership and if necessary, present a position to the Township on behalf of FIMLA;

6.3.2 Request that FIMLA executive be notified of any applications for backlot development or condominium/joint ownership buildings.

7.0 Sense of Community

Objective: *To bring people of the FIMLA area together to implement this Lake Stewardship Plan and to realize the community's shared vision and values.*

Overview

"This lake could put those folks in the mental health industry right out of business", observed a long time cottager as she sat one summer afternoon on her deck overlooking Fourteen Island Lake. She was right. The lake allows us to slow down, to re-prioritize, to re-create ourselves. Why is this so?

In its first survey and the kickoff workshop, the Lake Plan Committee asked residents to identify what they valued about the FIMLA area. A high degree of consensus resulted. Foremost was the enjoyment of nature in tranquility: the wildlife in its variety and richness; the shorelines in their natural beauty; and the water, so clean, so inviting, so refreshing. And always, the loons. Their beauty in flight, their fluffy babies after the eggs have hatched, their mad antics in August and, surpassingly, their haunting cries.

▲ Community involvement will be essential to implementing the lake plan.

Figure 13. What is Valued?

Residents were asked to identify what they valued about the FIMLA area:

- Tranquility; how quiet the lake is even on a long weekend;
- Enjoying nature and wildlife, especially the loons;
- Fishing;
- Clean water, excellent swimming;
- Natural shorelines;
- Lack of traffic, boats, jet skis;
- Friendships and the sense of community;
- Buildings around the lake are unobtrusive;
- Remote, but close to Kingston.

But the essence of the lake community's values centre on the two words 'Nature' and 'Tranquility'. FIMLA residents place the highest priority on their being able to immerse themselves into a world of nature so different from their workaday lives. Of course, glorious sunrises and vibrant sunsets are vital to this, but so too are the violent thunderstorms, the chasing of a rat snake out of the tool shed, the successful launch of the newest ospreys from their island nest, and the woods that stand right behind our cottages.

High value was placed, too, on the enrichment our lake provides for family life. The opportunity to gather, to be with others, to experience the yearly development of children and grandchildren, is made even more enjoyable at the lake.

Special Places

▲ Special places: 'jumping rock' in the narrows south east of Mink Lake.

The survey highlighted the general importance placed on tranquility, on peace and quiet. Our community is friendly, warm and welcoming. But privacy and serenity are held at a premium. A wide-spread antipathy was expressed for noise and intrusiveness such as result from personal water craft and excessive outdoor lighting at night.

Figure 14. What Places Are Special?

Residents were asked to identify what places were special to them:

- The various islands and swamps around the lakes;
- Osprey island in Fourteen Island Lake;
- Picnic Island;
- Narrows between Mink and Fourteen Island Lake;
- Turkey vulture nest area;
- Mink Lake feldspar mine;
- Diving cliffs in the east bay of Fourteen Island Lake, and elsewhere;
- The woods on our properties;
- Spring Lake wetland;
- Any place where you are invited in for a drink and a chat;
- The dam flowing out of Fourteen Island Lake;
- Anne's place – the beach where we have our meetings;
- Sigsworth Mill – the inlet to Mink Lake;
- Bikey's Camp area (used to make moonshine);
- Snake rock;
- Willy's Lane boat launch;
- The "whole lake".

▶ Another tranquil day dawning over Fourteen Island Lake.

Figure 15. What Memories Do We hold?

Residents were asked to identify the memories they held dear:

- Some spectacular thunderstorms;
- When there were few cottages on the lake and a boat passing by was an event;
- Lining up at the realtor to buy this 'piece of heaven';
- The day I saw the house we had bought/my first view of the lake;
- The first loon of the summer;
- Black rat snakes – in the shed, in the garage, the basement, the upstairs bathroom;
- Telephone system woes;
- Otters on the attack;
- When the walleye (and the grouse) were abundant;
- When the dam was fixed, and before – when water levels used to be up and down;
- When the lake was 6-8 feet lower, back in the 40's;
- Finding the marijuana plantation in our 'back 40';
- Birth of grandchildren;
- Black bear in the compost;
- Watching a blue heron on a windswept night;
- Kids growing up on the lake;
- Cleo the wonder dog swimming with the loons;
- Thelma and Louise's Ice Cream Delivery;
- Talking to the old timers;
- Quiet peaceful moments on the dock;
- Cross country skiing across the lake;
- Paddling the lake on Christmas Day, 2006.

These values, held in common, create a community that is much like a neighbourhood. To maintain it requires consideration, helpfulness and responsibility - a small price to pay for such a treasure.

▲ Memories we hold: quiet, peaceful moments on the dock.

Section 7.0 Actions

7.0 Recommendations and Actions

7.1 Canvass the FIMLA community to determine level of interest in future community events.

Actions

7.1.1 Use newsletters and the AGM to ask members if they wish to have more community events, and what kind of events would be of interest.

7.2 Prepare and publish a history of the FIMLA area.

Actions

7.2.1 Establish a history working group of interested residents.

7.3 Set out a clear action plan for implementing the Lake Stewardship Plan and for monitoring results and reporting back to the community.

Actions

7.3.1 Continuously review, update and implement the draft action plan outlined in Section 8.0 of the Lake Stewardship Plan.

8.0 What's Next? The FIMLA Action Plan

1.0 Natural Environment

To monitor, protect and enhance the ecosystems in our lakes and maintain a healthy environment for fish, wildlife, and vegetation for now and for future generations.

Recommendations	Actions/Deliverables	Lead	Target Date	Status
1.1 Maintain a complete species list (plants and animals) for the subwatershed, wetlands, and forests.	1.1.1 Expand and maintain species list, based on Tim's Lake list; 1.1.2 Place the list on the FIMLA website, and invite residents to add or correct the listed species.			A first draft of the list has been prepared and is included as Appendix A in this plan.
1.2 Monitor the population of some of our more important species: loons, frogs, snakes, turtles, osprey, and all our species at risk.	1.2.1 Call for volunteers to take on the monitoring work, which will be linked to provincial and federal programs of species monitoring; 1.2.2 Monitoring results will be published in newsletters, on the website, and highlighted at AGMs.			
1.3 Monitor existing invasive species, and be vigilant for any new invasive species.	1.3.1 Call for volunteers to take on the monitoring work, which will be linked to monitoring work being done by Ministry of Natural Resources and Ontario Federation of Anglers and Hunters; 1.3.2 Publish monitoring results in newsletters, on the website, and highlight at AGMs.			
1.4 Educate our residents and visitors about the importance of: maintaining habitat, especially shorelines; protecting species at risk; and keeping new invasive species out of the area.	1.4.1 Continue to include information on these items in FIMLA newsletters; 1.4.2 Provide presentations and guest speakers at AGMs.			

8.0 What's Next? The FIMLA Action Plan

2.0 Water Quality and Water Levels

To maintain and improve the FIMLA lakes' water quality and water level management.

Recommendations	Actions/Deliverables	Lead	Target Date	Status
2.1 Establish a comprehensive water sampling program for all lakes.	2.1.1 Conduct additional sampling for Oxygen levels; 2.1.2 Conduct monthly sampling for Secchi and phosphorous in 2009; 2.1.3 Establish long term annual water sampling for Secchi disk and phosphorous.			Reg Genge conducted additional Oxygen sampling in Sept. 2009; Volunteers are in place to conduct water sampling on all lakes; Monthly sampling took place on all lakes in 2009.
2.2 Establish a monitoring program for water levels across all lakes.	2.2.1 Contact Quinte Conservation to determine best location(s) and sampling protocols; 2.2.2 Call for volunteers to collect and record regular measurements.			
2.3 Assess the condition of the two dams in the FIMLA system and engage South Frontenac Township, MNR, and Quinte Conservation in developing a comprehensive program to monitor and maintain these dams.	2.3.1 Request dam assessments from Quinte Conservation; 2.3.2 Undertake repair work on both dams as needed, and seek financial assistance from Township of South Frontenac and Quinte Conservation.			Fourteen Island dam assessed by Quinte Conservation engineer in 2009.
2.4 Educate and inform our residents and visitors about what they can do to maintain good water quality in our lakes.	2.4.1 Prepare and distribute to all residents a brochure on how to maintain water quality; 2.4.2 Create a 'renters' package' that would include information do's and don'ts related to water quality, septic systems; 2.4.3 Continue to include information on water quality and how to protect it in FIMLA newsletters; 2.4.4 Provide presentations and guest speakers at AGMs.			
2.5 Develop an awareness and education program on septic system care and maintenance.	2.5.1 Prepare and distribute to all residents a brochure on septic system care and maintenance; 2.5.2 Continue to include information on septic system care in FIMLA newsletters; 2.5.3 Provide presentations & guest speakers at AGMs.			
2.6 Request South Frontenac Township to include FIMLA properties on the township's septic pollution reduction program.	2.6.1 Send a letter requesting this to the township.			Letter was sent; re-inspection for Fourteen Island, Mink and Little John's Sister set for 2010.

3.0 Fisheries and Fishing				
To monitor our fish and fish habitats and take actions to ensure a healthy population and sustainable fishery for anglers.				
Recommendations	**Actions/Deliverables**	**Lead**	**Target Date**	**Status**
3.1 Continue to examine the potential for walleye spawning in Fourteen Island and Mink Lakes, and apply for MNR funding to rehabilitate if potential exists.	3.1.1 Examine potential spawning areas, and ask for MNR assistance and confirmation.			A good site was found near Huffman Road, and confirmed by MNR. MNR funding is secured for 2010.
3.2 Continue to monitor fish populations.	3.2.1 Request that MNR return to re-survey the lake in 2013 (5 year interval); 3.2.2 Request fisheries surveys for all FIMLA lakes.			
3.3 Conduct a creel survey to determine what fishermen are catching in the lakes.	3.3.1 Encourage MNR to conduct training sessions for lake associations in how to carry out a creel survey; 3.3.2 Carry out a set of creel surveys on all FIMLA lakes in 2011 and 2012; 3.3.3 Engage the commercial operator to help gather information on fishing and boat use on Fourteen Island Lake.			Training session planned for 2010.
3.4 Develop an awareness and education campaign about the lakes' fisheries, and current regulations.	3.4.1 Prepare and distribute to all residents a brochure on the FIMLA fisheries and fishing regulations; 3.4.2 Include fish and fishing information in the 'renters' package' such as current Fishing Regulations; 3.4.3 Include information on fisheries, fishing, and regulations in FIMLA newsletters, including the results of future creel surveys; 3.4.4 Provide presentations and guest speakers at AGMs.			

8.0 What's Next? The FIMLA Action Plan

4.0 Social and Recreational Activities

To promote cottage use and recreational activities that are safe, respectful of each other's right to peace and tranquility, and environmentally responsible.

Recommendations	Actions/Deliverables	Lead	Target Date	Status
4.1 Expand upon the current FIMLA initiatives to promote safe and considerate boating.	4.1.1 Prepare and distribute a map/brochure showing narrow channels and recommended speed limits and a short 'Code of Conduct' for responsible boating; 4.1.2 Continue to use the newsletter to inform residents of boater safety issues; 4.1.3 Invite the OPP Marine Unit to an AGM to provide a presentation and a booth on boating.			Appendix B. contains a preliminary 'Code of Conduct'.
4.2 Establish an awareness program on the environmental impact of poorly maintained boat engines.	4.2.1 Continue to place articles in the newsletter; 4.2.2 Bring a speaker to a future AGM.			
4.3 Develop a 'good neighbour' awareness campaign to deal with noise.	4.3.1 Prepare a brochure and distribute to all residents; include as a part of the 'renters' package'; 4.3.2 Bring the subject up at meetings of roads associations.			Appendix C. contains a set of 'Good Neighbour Guidelines'.
4.4 Promote the concept of 'dark skies', and make residents aware of its importance and value.	4.4.1 Continue articles in the newsletter dealing with: why dark skies are important; what kind of lighting will help ensure minimal light pollution; 4.4.2 Bring an expert speaker to an AGM who can show the impacts of light pollution through a slide presentation and talk.			

5.0 Emergency and Municipal Services				
To work with provincial and municipal authorities to improve police, emergency and other municipal services.				
Recommendations	**Actions/Deliverables**	**Lead**	**Target Date**	**Status**
5.1 That the County and Township include a four-wheel drive ambulance for rural areas for the new Sydenham station;	5.1.1 Prepare and send a letter to South Frontenac Township and Frontenac County requesting that the Sydenham ambulance facility be equipped with a four-wheel drive ambulance.			
5.2 Request County and Township to purchase an up to date GPS system to improve response time of emergency responders;	5.2.1 Prepare and send a letter to South Frontenac Township and Frontenac County requesting that they purchase an up to date GPS system to improve response time of emergency responders.			
5.3 Maintain and expand the relationships with the Fire Chief, the OPP detachment, and the Township of South Frontenac.	5.3.1 Continue to attend meetings of lake associations and Fire and Police services; 5.3.2 Prepare and present the results of the Lake Stewardship Plan at municipal council; 5.3.3 Invite councillors and key staff to visit the FIMLA lakes, by providing a boat tour and through open invitations to FIMLA's AGMs.			
5.4 Promote the self-help fire protection as done by the FINFLA Road Association.	5.4.1 Request a feature article for the newsletter on the FINFLA self-help fire protection approach.			

8.0 What's Next? The FIMLA Action Plan

6.0 Land Use and Development

To ensure that future land development is in keeping with the environmental, social and physical character of the FIMLA area, and:

- to support administration and enforcement of environmental regulations; and,
- to promote comprehensive environmental planning for the FIMLA area and contiguous regions.

Recommendations	Actions/Deliverables	Lead	Target Date	Status
6.1 Present the results of the FIMLA Lake Plan to the South Frontenac Township council, stressing components related to protecting lake values and controlling new development.	6.1.1 Make a presentation to council; Invite the Township planner to a meeting of the FIMLA executive, and discuss in detail the contents of the FIMLA Lake Stewardship Plan; 6.1.2 Request that the FIMLA Lake Stewardship Plan be used as a reference in future planning decisions in the FIMLA area; 6.1.3 Request that FIMLA executive be notified in future of Plans of Subdivision or severances in the FIMLA area.			
6.2 Examine Official Plan and Zoning Bylaws to determine development potential on the lakes, and monitor future severances and subdivisions.	6.2.1 Prepare a lake map showing the maximum lot creation available on all FIMLA lakes' shorelines; 6.2.2 Present this information in the newsletter and at an upcoming AGM.			
6.3 Monitor and review any future policies and proposals related to back lot and condominium/joint ownership development on FIMLA waterfronts.	6.3.1 Examine the Official Plan review ongoing at the time of developing this lake plan to confirm the Township positions on back lot development and condominium/joint ownership and if necessary, present a position to the Township on behalf of FIMLA; 6.3.2 Request that FIMLA executive be notified of any applications for backlot development or condominium/joint ownership buildings.			

7.0 Sense of Community				
To bring people of the FIMLA area together to implement this Lake Stewardship Plan and to realize the community's shared vision and values.				
Recommendations	**Actions/Deliverables**	**Lead**	**Target Date**	**Status**
7.1 Canvass the FIMLA community to determine level of interest in future community events.	7.1.1 Use newsletters and the AGM to ask members if they wish to have more community events, and what kind of events would be of interest.			
7.2 Prepare and publish a history of the FIMLA area.	7.2.1 Establish a history working group of interested residents.			
7.3 Set out a clear action plan for implementing the Lake Stewardship Plan and for monitoring results and reporting back to the community.	7.3.1 Continuously review, update and implement the draft action plan outlined in Section 8.0 of the Lake Stewardship Plan.			The draft Action Plan is complete.

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Appendix A.

Plant and Animal List for FIMLA Area

This appendix comprises tables listing plants and animals sorted by species identified within the Fourteen Island and Mink Lakes watershed by FIMLA members. As proposed in the Report (Section 1.0 The Natural Environment, Recommendations and Actions 1.1.1.) it is the starting point for an initiative to maintain a complete species list (plants and animals) for the sub-watershed, wetlands, and forests. This more detailed and comprehensive list will be placed on the FIMLA website for residents to update with their own observations.

Key To Tables

The tables contain the following information:

Family Common and or scientific name(s).

Name Common name(s).

Key Type of sighting.

The following codes are used to record type of sighting:

HO Heard Only. Some animal calls are unmistakable. E.g. whip-poor-wills, brush wolves and mourning doves could be included, based solely on the sounds they make.

NV Not Verified, but very strong evidence of animal sighting.

P Photo of sighting.

S Sighting, with positive identification.

Comments Any additional descriptive information - colour phases, varieties, races, other names, etc.

Spotter Space to record initials of observer; multiple observers are not recorded.

Credits

This document is based on work conducted by the Tim's Lake Community Association. We are very grateful to Helen and Dann O'Kane and the other residents of Tim's Lake who kindly allowed us to adapt their format and listings to reflect the ecosystem of the Fourteen Island and Mink Lakes watershed.

Table of Contents

Spotters

SBG	Sue and Brian Grigg
MNR	Fish surveys 2007/08
PP	Peter Peart
RP	Robert Powell
GR	Gord Rodgers
StJ	Elaine and Stu St. John
CS	Charlotte Smith
KS	Keith Spriggs

Amphibians

Family	Name	Key	Comments	Spotter
Salamanders	Blue Spotted Salamander	S		RP
	Yellow Spotted Salamander	S		RP
Frogs & Toads	Bull frog	S	Various shades of green	SBG
	American Toad	S, P	Colour varies greatly	RP
	Gray Treefrog	S, P		StJ
	Green Frog	S		SBG
	Leopard Frog	S	Green colour phase	SBG
	Pickerel Frog	HO		SBG
	Spring Peeper	S	Regular, annually	SBG
	Wood Frog	S		SBG
	Western Chorus Frog	HO		SBG

Birds

Family	Name	Key	Comments	Spotter
Blackbirds	Brown Headed Cowbird	S		SBG
	Common Grackle	S	Large flocks move through during early Fall migration	StJ
	Red Winged Blackbird	S	Common during Spring nesting	GR
Chickadees	Black Capped Chickadee	S	Common year around	GR
Ducks	American Black Duck	S		CS
	Bufflehead	S	Spring/Fall migrant	CS
	Common Merganser	S	Aka 'Fish Duck'	CS
	Hooded Merganser	S	Spring/Fall migrant	CS
	Mallard			
Gallinaceous Birds	Ruffed Grouse	S	Incorrectly called 'Partridge'	GR
	Wild Turkey	S, P	Quite common in the general area	StJ
Geese	Canada Goose	S		CS
Goatsuckers	Common Nighthawk			
	Whip-poor-will	HO	Unmistakable call	CS
Grosbeaks, Sparrows, Buntings	Evening Grosbeak	S	Fall migrant	CS
	Purple Finch	S	Infrequent Fall migrant	SBG
	Rose Breasted Grosbeak	S, P	Seen infrequently year round	StJ
	Snow Bunting	S	Common Fall migrant	CS
Gulls	Herring Gull	S	Common	
	Ring-billed Gull	S		SBG
	Common Tern	S		SBG
Herons	Great Blue Heron	S, P	Several common to the lake and area	RP
	Green Heron	S		SBG
Humming-birds	Ruby-Throated	S, P	Common	RP

Birds

Family	Name	Key	Comments	Spotter
Jays, Magpies, Crows	American Crow		Common	
	Blue Jay	S, P	Common year around	RP
	Common Raven	S		SBG
Loons	Common Loon	S, P	Official bird of Ontario	RP
Mocking-birds, Thrashers	Brown Thrasher	S		CS
Nuthatches	Brown Creeper	S	Elusive, seen more frequently when leaves are off in the Fall	CS
	White Breasted Nuthatch	S, P	Common year around	RP
	Red Breasted Nuthatch	S	Not as common as White Breasted	CS
	American Redstart	S	Seen infrequently	CS
Orioles	Northern Oriole	S	Baltimore Race Quite active during Spring nesting period	CS
Owls	Barred Owl	S	Several birds in area	GR
	Eastern Screech Owl			
	Snowy Owl		Spring migrant	
Pigeons, Doves	Mourning Dove	S	Common during feeder season	GR
Redpolls	Common Redpoll	S	Common during feeder season	CS
Sandpipers & Phalaropes	American Woodcock	S		SBG
	Common Snipe	HO		SBG
Shrikes	Northern Shrike			
Siskins, Goldfinches	American Goldfinch	S		CS
	Indigo Bunting	S		SBG
	Pine Siskin	S		SBG
Sparrows	Chipping Sparrow	S	Common	CS
	Dark Eyed Junco	S	Slate coloured race, seen more frequently during feeder season	CS
	Field Sparrow	S		SBG
	Fox Sparrow			
	Song Sparrow	S	Common	CS
	Swamp Sparrow			
	White Throated Sparrow	S	Common	CS
Starlings	European Starling	S	Common	CS
Swallows	Barn Swallow	S		SBG
	Cliff Swallow			
	Tree Swallow	S		CS

Birds

Family	Name	Key	Comments	Spotter
Swans	Tundra Swan			
Tanagers	Scarlet Tanager	S		CS
Thrushes, Solitaires, Bluebirds	American Robin	S	Common	CS
	Eastern Bluebird			
Trogons	Belted Kingfisher	S		CS
Tyrant Flycatchers	Eastern Kingbird	S		CS
	Eastern Phoebe	S	Common	CS
	Great Crested Flycatcher	S		CS
Vireos	Philadelphia Vireo			
	Solitary Vireo			
	Yellow Throated Vireo			
Vultures, Hawks, Falcons	American Kestrel			
	Bald Eagle	S		GR
	Broad Winged Hawk			
	Merlin			
	Northern Goshawk			
	Osprey	S, P	Resident pairs in area	RP
	Red Tailed Hawk	S		CS
	Turkey Vulture	S	Common	RP
	Sharp-shinned Hawk	S		SBG
Waxwings	Cedar Waxwing	S		CS
Wood Warblers	Bay Breasted			
	Black & White	S		CS
	Pine	S	Common	CS
	Yellow	S		CS
	Yellow Rumped	S		CS
Wood-peckers	Common Flicker	S	Common	CS
	Yellow-bellied Sapsucker	S		SBG
	Downey Woodpecker	S, P	Common	StJ
	Hairy Woodpecker	S, P	Common	StJ
	Pileated Woodpecker	S, P	Common	StJ

Fish

Family	Name	Key	Comments	Spotter
Cool Water Species	Black Crappie	S		MNR
	Northern Pike	S		MNR
	Rock Bass			
	Sauger			
	Walleye	S	Aka `Yellow Pickerel'	MNR
	White Crappie			

Fish

Family	Name	Key	Comments	Spotter
	White Sucker	S		MNR
	Yellow Perch	S		MNR
Warm Water Species	Bluegill	S		MNR
	Bowfin			
	Brown Bullhead			
	Carp			
	Channel Catfish			
	Goldeye			
	Largemouth Bass	S		MNR
	Pumpkinseed	S		MNR
	Smallmouth Bass	S		MNR
	White Bass			
	White Perch			

Insects

Family	Name	Key	Comments	Spotter
Odonata	Dragonflies			
	Damselflies			
Ephemer-optera	Mayflies			
Orthoptera	Grasshoppers			
	Cicadas			
	Crickets			
Culicidae	Mosquitoes			
Hemiptera, Homoptera	Aphids		aka ‘bugs’	
	Plant Hoppers			
Lepidoptera	Monarch Butterfly			
	West Virginia White			
	Moths			
Coleoptera	June Beetle			
	Ladybird Beetle			
	Fireflies			
Diptera	Flies			
	Black Flies			
	Deer Flies			
Hymen-optera	Ants			
	Wasps			
	Bees			

Mammals

Family	Name	Key	Comments	Spotter
Fur-Bearing	Beaver	S, P	Healthy population	RP
	Black Bear	S	Numerous recent sightings	PP
	Cottontail Rabbit	S		SBG
	Jackrabbit	S		SBG

Mammals

Family	Name	Key	Comments	Spotter
	Snowshoe Hare	S	aka Varying Hare	GR
	Coyote	S	Heard frequently, seen periodically	RP
	Fisher	S		GR
	Mink	S		SBG
	Muskrat	S		RP
	Least Weasel	S		SBG
	Raccoon	S		RP
	Red Fox	S	Red colour phase Cross colour phase	RP
	River Otter	S, P		RP
	Whitetail Deer	S, P	Common	StJ, KS
Rodent	Deer Mouse	S		GR
	Eastern Chipmunk	S, P	Common	RP
	Field Mouse	S	Common	CS
	Eastern Gray Squirrel	S	Common Black colour phase Gray colour phase	CS
	Little Brown Myotis		aka 'Little Brown Bat'	
	Northern Flying Squirrel	S, P	Seen infrequently	StJ
	Porcupine	S	Common	GR
	Red Squirrel	S	Common	GR
	Striped Skunk	S		CS
	Vole		Common, unknown variety	
	Woodchuck	S, P	Aka 'Groundhog'	RP

Plants

Family	Name	Key	Comments	Spotter
Berries	Purple Flowering Raspberry	S		SBG
	Redberry Elder	S		SBG
	Swamp Dewberry			
	Wild Highbush Blueberry			
	Wild Raspberry	S		SBG
	Wild Strawberry	S		SBG
	Winterberry	S	aka 'Black Alder'	SBG
Bushes	Wild Rose	S		SBG
	Steeplebush			
	Bellflower			SBG
	Bishop's Cap			SBG
Ferns	Bracken Fern			SBG
	Common Polypody Fern			SBG
	Crested Shield Fern		Wood Fern	SBG
	Royal Fern			SBG
	Sensitive Fern			SBG
Wildflowers (native)	Bittersweet nightshade		Climbing and deadly	

Plants

Family	Name	Key	Comments	Spotter
	Black-eyed Susan	S		CS
	Bladder Campion	S		CS
	Bloodroot			SBG
	Blue-eyed Grass			
	Bur Reed			
	Bushy Aster			
	Canada Anemone			SBG
	Canada Mayflower			SBG
	Canadian Thistle	S		CS
	Cardinal Flower			SBG
	Climbing Bittersweet	S		CS
	Common Blue Violet			
	Common Buttercup	S		CS
	Common Milkweed	S		CS
	Common Mullein	S		CS
	Common Plantain	S		CS
	Common St. John's Wort	S		CS
	Coreopsis		Lance-leaved	
	Creeping Bellflower			SBG
	Day Lily			
	Dutchman's Breeches			SBG
	False Solomon's Seal			SBG
	Foamflower			SBG
	Fragrant Water Lily	S		CS
	Fringed Polygala			
	Hairy Vetch	S		CS
	Heliopsis			
	Indian Cucumber Root			SBG
	Indian Pipe			SBG
	Iris Blue Flag	S	aka 'Iris versicolour' or 'Slender Blue Flag'	CS
	Lambs Ear			
	Large-Flowered Trillium	S	Yellow White	CS
	Mitre Wort			SBG
	Northern Bedstraw			
	Orange Hawkweed	S	aka 'Devil's Paintbrush'	CS
	Oxeye Daisy	S		CS
	Philadelphia Fleabane			
	Phlox	S		CS
	Pickerelweed	S		CS
	Queen Anne Lace	S		CS
	Red Baneberry	S		SBG
	Rough-fruited Cinquefoil			
	Round-lobed Hepatica	S		CS

Plants

Family	Name	Key	Comments	Spotter
	Spring Beauty	S		SBG
	Tall Corydalis			
	True Solomon's Seal			SBG
	Trout Lily	S	aka 'Dogtooth Violet'	CS
	Two-leaved Bishop's Cap			
	Violet			
	Water Hemlock			
	White Campion			
	White Clover	S		CS
	Wild Columbine	S		CS
	Wild Raisin		aka 'Witherod'	
	Wild Sarsaparilla	S		SBG
	Wintergreen			
	Wood Lily			
	Yarrow			
	Yellow Goatsbeard	S		CS
	Yellow Hawkweed	S	aka 'Kings Devil'	

Reptiles

Family	Name	Key	Comments	Spotter
Turtles	Blanding's	S, P		StJ, RP
	Painted	S, P		RP
	Northern Map Turtle	S		MNR
	Snapping Turtle	S, P	Very active during spring egg laying period	RP
	Stinkpot Turtle	S		MNR
Snakes	Common Garter Snake	S, P		RP
	Eastern Fox Snake			
	Eastern Milksnake	S		GR
	Eastern Rat Snake	S, P	aka 'Black Rat Snake'. Healthy pop. in area	RP
	Eastern Ribbon Snake		Similar in appearance to Garter, but smaller and more slender	
	Northern Water Snake	S, P		RP
	Red-bellied Snake	S		GR
	Smooth Greensnake	S		GR

Trees and Shrubs

Family	Name	Key	Comments	Spotter
Beech	American Beech			GR
	Bur Oak			
	Red Oak			GR
	White Oak			GR
Birch	Green Alder			
	Grey Birch			GR
	Hop-Hornbeam		aka 'Ironwood'	GR
	Paper Birch		aka 'White Birch'	GR

Trees and Shrubs

Family	Name	Key	Comments	Spotter
	Speckled Alder		aka 'Tag Alder'	
	Yellow Birch			
Buckthorn	European Buckthorn			
Cypress	Eastern Red Cedar			GR
	Eastern White Cedar			GR
Elm	American Elm		aka 'White Elm'	GR
	Common Hackberry			
	Rock Elm			
	Slippery Elm		aka 'Red Elm'	
Honeysuckle	Highbush Cranberry			GR
	Nannyberry			GR
Linden	American Basswood			GR
Maple	Mountain Maple		aka 'Moose Maple'	
	Red Maple			
	Silver Maple			GR
	Striped Maple			GR
	Sugar Maple			GR
Olive	Black Ash			
	Common Lilac			GR
	Red Ash			
	White Ash			GR
Pine	Balsam Fir			GR
	Black Spruce			
	Eastern Hemlock			GR
	Eastern White Pine			GR
	Jack Pine			GR
	Red Pine			GR
	Tamarack			
	White Spruce			GR
Rose	American Mountain Ash			
	Chokecherry			
	Common Apple			GR
	Hawthorn			
	Pin Cherry			
	Serviceberry			
Walnut	Bitternut Hickory			
	Black Walnut			
	Butternut			
	Shagbark Hickory			GR
Willow	Balsam Poplar			GR
	Black Willow		aka 'Swamp WIllow'	
	Large-Toothed Aspen			
	Peachleaf Willow		aka 'Swamp WIllow'	
	Shining Willow		aka 'Yellow Willow'	
	Trembling Aspen		aka 'Quacking Aspen'	GR

Appendix B.

Code of Conduct for Responsible Boating

This appendix comprises a brief outline of boating rules and regulations that apply within the Fourteen Island and Mink Lakes watershed. As proposed in the Report (Section 4.0 Boating and Recreational Activities, Recommendations and Actions 4.1.1.) it is the starting point for an initiative to prepare and distribute an information sheet with a map of the lake (showing narrow channels and recommended speed limits) and a short 'Code of Conduct' for responsible boating.

Know the Boating Laws

The following are extracted from the Small Vessel Regulations and the Canada Shipping Act. Please refer to the complete regulations to ensure you are operating your boats in compliance with the law.

Boating Rules and Regulations

As a boater, you have to follow a set of rules and regulations that are designed to protect you, other boaters, and the wildlife habitat of the region.

Boating Law Enforcement

Under the Contraventions Regulations in Ontario authorities can ticket offenders on the spot for offences such as disobeying speed limits or careless operation of a vessel. There is a zero tolerance policy regarding missing safety equipment on a boat.

Operate at a Safe Speed

You may have to stop or turn suddenly to avoid a collision, so operate at a safe speed.

When choosing a safe speed consider:

- The visibility conditions (fog, mist, rain and darkness) and your ability to see ahead;
- The wind, water conditions and currents;
- The manoeuvrability of your boat;
- The traffic density, types of vessels in the area and their proximity;
- The proximity of any navigational hazards (rocks, and tree stumps);
- Other users of the waterway such as swimmers, divers; and,
- People aboard small vessels that your wake could cause to capsize.

Shoreline Speed Restrictions

On all waters in Ontario there is a shoreline speed zone which restricts all power-driven vessels to a maximum speed of 10 km/h (6.2 mph) within 30 metres (100 ft.) from shore.

Watch Your Wake

In restricted channels and near shore areas please slow down to a point where you are generating a minimum wash. The waves generated by a boat can do a great deal of damage, especially in narrow channels. It can erode shorelines, swamp the nests of loons and other waterfowl, damage docks and moored vessels, and upset canoes and small boats.

Water Skiing and Towing

The rules governing waterskiing include other towing activities such as tubing and knee-boarding.

The Small Vessel Regulations require that:

- A spotter must be onboard;
- Tow boats must have room for driver, spotter AND the person(s) being towed;
- There must be a seat available for each person being towed in case recovery is necessary;
- Only personal watercraft designed to carry three or more people can be used for towing water skiers;
- Towing activities are not allowed in the period from one hour after sunset to sunrise;
- The towing vessel cannot be remotely controlled.

Proof of Competency

As of September 2009, all boat operators must carry with them a Pleasure Craft Operator Card (PCOC), or other proof of competency, to operate any boat with a motor. The only exceptions are American boaters who operate their boat in Canada for less than 45 consecutive days and whose boat is registered in the U.S.

Licence

All recreational boats powered by a motor 7.5 kW (10 HP) or greater, and under 15 gross tons (over 12 metres), must be licensed and the licence number must be clearly marked on both sides of the bow (with letters of contrasting colour to the boat, at least 7.5 cm high). In addition, any boat less than 5m (16 ft, 5 in) in length, powered by a motor 7.5 kW (10 HP) or greater, must carry a plate stating the maximum load and kilowatts recommended for it.

Age Restrictions

On all waters in Ontario:

- No one under the age of 16 can operate a PWC (personal watercraft);
- No one under the age of 12, who is not being directly supervised (by someone over the age of 16), may operate a vessel with a motor exceeding 10 hp;
- No one between the age of 12 and 16, who is not being directly supervised (by someone over the age of 16), may operate a vessel with more than 40 hp.

Don't Cruise with Booze

Drinking and driving (whether on land or water) is illegal and punishable under the Criminal Code. If you're impaired while in "care or control of a vessel', including non-motorized vessels such as sailboats, canoes and kayaks, your driver's licence will be suspended (just as if you had been impaired while driving a car).

The Province of Ontario's Liquor License Act forbids the operation of a boat with liquor on board unless it is unopened and sealed, or stored in a closed compartment.

Alcohol can only be consumed aboard a pleasure craft that has permanent sleeping accommodations and permanent cooking and sanitary facilities, and only while the boat is at anchor or is secured to the dock or land.

Emergency Gear

Your boat must carry mandatory safety equipment, which depends on the length of your boat. You can be charged up to $200 for each safety item you don't have on board!

At a bare minimum, you should always have with you:

- Canadian approved flotation device or lifejacket of appropriate size for each passenger on board;
- Buoyant heaving line at least 15 metres in length;
- A working, watertight flashlight (test it regularly) OR Canadian approved flares – Type A,B or C;
- Sound signalling device;
- Manual propelling device (i.e. paddle) OR an anchor with at least 15 metres of rope, chain or cable;
- Bailer OR manual water pump;
- Class 5 BC fire extinguisher for inboard and outdrive boats.

Equipment carried on board must be in good working order, maintained according to the manufacturer's instructions, and available immediately, in case of emergency. In addition, it is important that life jackets and personal flotation devices (PFDs) be worn while boating. If someone accidently falls off your boat, or your boat is struck by an underwater object or another boat, chances are that you may be unconscious when you enter the water.

Collision Avoidance

Here are the basic rules:

- If a boat under power approaches you on your port (left) side, then maintain your course and speed with caution;
- If a boat under power approaches you on your starboard (right) side, then move to keep clear of it;
- If two boats under power are approaching head on, each should change course to starboard, and pass port to port;
- A boat overtaking another boat must keep clear of that boat. Sound your horn,

one blast to pass on starboard, two blasts to pass on port. A good boater will slow down his vessel to let the other pass him;

- A vessel under power should keep clear of unpowered boats (a sailboat under sail, rowboat, or canoe);
- A vessel more than 20 metres long has the right of way over all other vessels (except one bigger than it).

For more information visit the Office of Boating Safety website at:

www.boatingsafety.gc.ca

Working Together to Raise Awareness

Prohibitions Against Careless Operation

Under the Canada Shipping Act, the 'Small Vessel Regulations' prohibit the careless operation of a vessel. This means no person shall operate a small vessel in a careless manner, without due care and attention or without reasonable consideration for other persons.

Where boater behaviour is a concern in the community, and they want to do something about it, the Office of Boating Safety has produced the following notice that can be reproduced and posted in key areas, such as boat launches, around waterways and marinas, to deter potential offenders.

WARNING
CARELESS OPERATION
An offence is subject to a fine or court appearance or both
Section 43 of the *Small Vessel Regulations of the Canada Shipping Act* reads: **Prohibition Against Careless Operation** 43. *No person shall operate a small vessel in a careless manner, without due care and attention or without reasonable consideration for other persons.*
Examples of behaviours which could be considered careless under section 43 may include (but are not limited to the following): • operating vessel at high engine regime in circular or criss-cross patterns for extended periods of time in the same location; • jumping waves or the wake of another vessel unreasonably close to that vessel or so as to cause engine RPM to peak and make unusual or excessive noise; • weaving through congested traffic at more than slow speed; • swerving at the last possible moment to avoid collision (playing chicken); • operating a vessel at a speed higher than is necessary to maintain steerage way when near swimmers, or non powered vessels.

Appendix C.

Good Neighbour Guidelines

This appendix comprises a brief outline of good neighbour guidelines to be promoted within the Fourteen Island and Mink Lakes watershed. As proposed in the Report (Section 4.0 Boating and Recreational Activities, Recommendations and Actions 4.3.1.) it is the starting point for an initiative to prepare and distribute an information sheet to raise awareness about issues related to recreational enjoyment of the lake.

Noise

- Noise travels over water. It can spoil your neighbour's enjoyment.
- Please avoid noisy activities in the early morning (before 8:00 am) or evening (after sunset), on land and on boats, such as:
  - playing loud music;
  - loud parties;
  - using power tools, hammers and construction equipment; and
  - barking dogs.
- Please avoid daytime noise that might be intrusive to neighbours even at moderate volume such as radios or recorded music.

The sound of children playing at the lake is not noise and should be encouraged.

Keep It Quiet

- All boats must have a muffler in good working order and in operation at all times to prevent excessive noise.
- PWC drivers should travel at a speed that avoids bouncing and exposing the water intake.

Water Skiers And Wake Boarders

… and any other towing activities like barefoot skiing, knee boarding, tubing, etc.

- Please don't start before 8:00 in the morning and finish before sunset. Your neighbours will appreciate a good night's rest.
- Plan your circuit to ensure you do not enter narrow channels and you have room to turn around safely (obey the law and keep your skier and everyone else safe – you and your skier must be more than 30m from shore).
- Plan your circuit to avoid over-using any one area of the lake. One circuit across more of the lake is better than multiple circuits of the same area.
- Stay in the middle of the channel. Stop if there is congestion. If everyone is courteous, everyone can have fun!
- For tubing avoid circling in one place and ensure that you leave space for other boats to pass when you zigzag down the lake.
- Tubing with more than one tube at a time is dangerous and creates a serious risk

of head injury.

- When the person being towed falls, best practice is to quickly come to a stop, turn around and idle back to the person who fell, staying in line with the person within the channel – other boaters will go around the tow-boat and thus stay away from the person in the water. Circling around leaves the person in the water unprotected and creates choppy wake that makes it harder to re-start.
- When the person being towed falls, they should always raise a hand to show they are un-injured. If they are unable to raise their hand, the tow-boat should move as fast as possible to pick them up.

Swimmers

Make sure you have a boat beside you if you swim away from the shore or across the lake. Make safe swimming a priority!

Keep It Safe

Please avoid high speeds – our lakes are very narrow in places and there is little margin for error in passing other boats.

Power boats must give right of way to non-powered boats.

Stay as far from shore as possible when you are travelling quickly – give swimmers at the shore lots of room to have fun.

Carry lights and reduce your speed after dusk. This is for your own safety as well as the safety of those in approaching boats!

The Speed Limit is 10 Kph Within 30m (100ft) of Shore

- At this speed almost every boat will produce only insignificant wake – if your boat is making a wake you are going too fast.
- Any person or thing you are towing should be more than 30m from shore if they are going faster than 10 kph.
- There are channels on the lake that are narrower than 60m. It is illegal to travel more than 10kph through these channels.

Watch Your Wake!!!

- Shoreline erosion is a serious problem.
- Boats tied to docks can be damaged.
- Loon nests are close to shore and chicks can be drowned by big waves.
- Please keep your boat either on plane (riding quickly on the surface of the water) or slow to 10 km/h or less (moving slowly in the water).
- If you are passing smaller boats and non-powered boats, minimize your wake by keeping your boat on plane or slowing to 10 km/h or less.
- PWC drivers should avoid circling in one place.

Keep It Clean

- To protect our lake, ensure your boat is washed thoroughly well away from the lake before launching. Better still, leave it in dry storage for 48 hours before you

launch it.

- Boat motors can last forever – but should they? If your motor is more than 10 years old it creates a lot of pollution. Consider upgrading to a new, low emissions motor.
- Do not throw garbage over-board – it can harm wildlife and it will only wash up on a neighbour's shore.

Lights

Minimizing your night lighting helps reduce light pollution, lets your neighbours see the stars and makes it safer for boaters navigating at night.

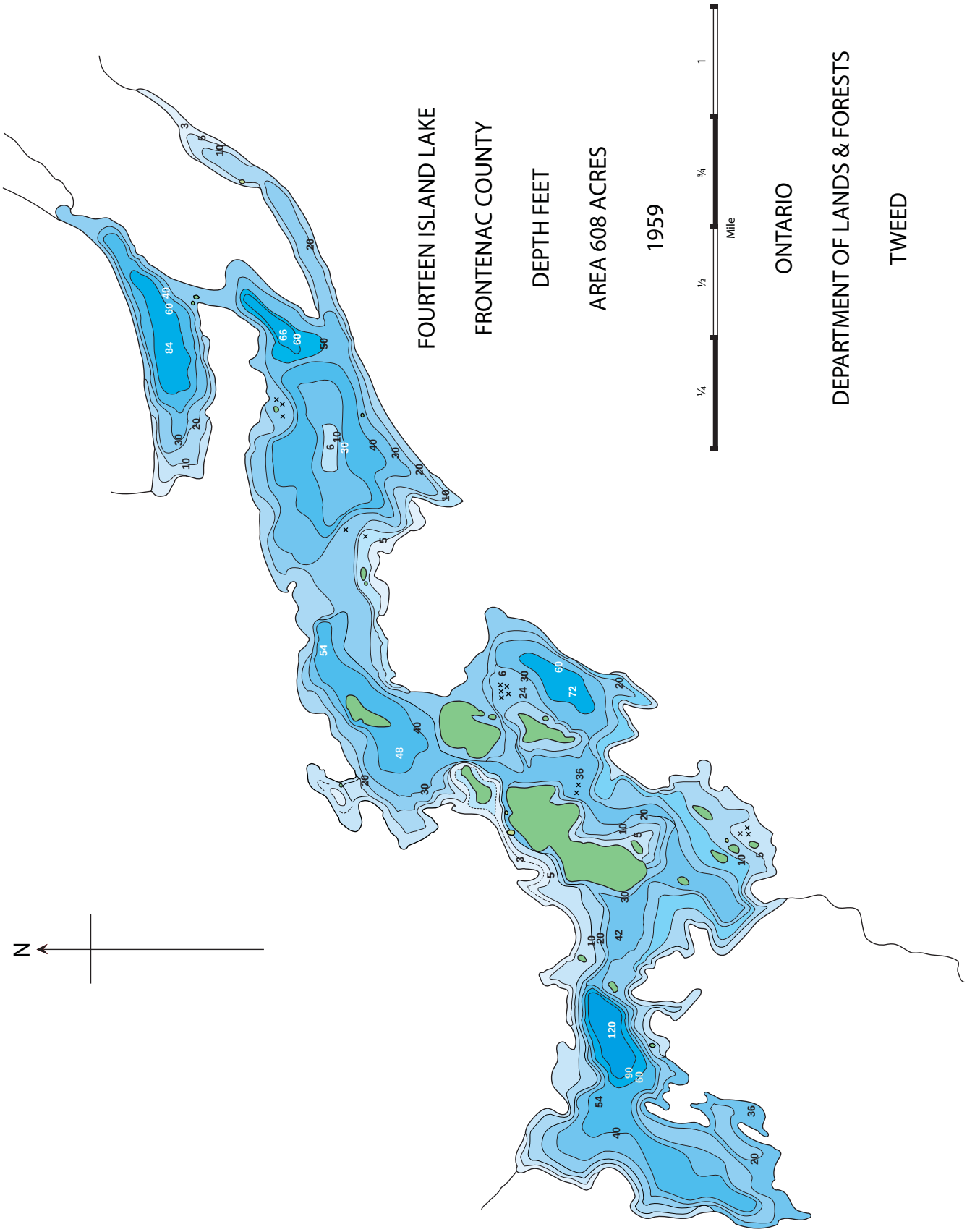
- Switch to a low wattage bulb and use yellow lights (which are less blinding than white lights).
- Avoid high-mounted area lights.
- Use a light fixture that shields the bulb, ensure lights are directed down and do not cause glare across the lake.

Hikers/Walking Around Others' Properties

- Always seek permission before going onto anybody's property.
- Do not drop litter.
- Keep animals under control.
- Respect plants and wildlife.
- Do not hunt without permission.

Notes

Map 8. Bathymetry Depth Chart of Fourteen Island Lake



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