A Lake and Watershed

Management Plan

For

Koshlong Lake

(Commemorating the KLA 50th Anniversary)

Lake Plan Index

Chapter 1 Introduction

Most lake plans have two main purposes. The first is that it tries to describe the character of the lake itself and the surrounding watershed. The second is that it outlines what steps should be taken to preserve and enhance those traits. Although this lake plan provides that same information, it is somewhat different, in that it also looks at various aspects of the lake from three different perspectives: the past, present and future. This plan is meant to be a reference journal that captures history of the lake - to show how it has evolved into what we know today. It also tries to document the present, so that this snapshot can be used to see how it changes in the future. Finally, it provides a set of action items that will help to guide the lake community in its quest to improve our enjoyment of the lake.

Now, let's begin with a general overview of this lake plan.

In the past century, Koshlong Lake saw many changes. In the early 1900's it was primarily a commercial waterway that was used to move timber to a thriving industry, the Standard Chemical Plant in the bustling village of Donald. Now, in the early 21st century, it is a recreational haven sought out by a lucky few hundred families who want to unwind from the pressures of urban life.

Unfortunately, most of the details of that transition, from past to present, have been lost. What was it like for the families that originally came to this lake in the wilds of Haliburton? Who were they and why did they choose to buy property, clear some land and begin building their cottages or in a few cases start businesses? Perhaps we may never know, but this Lake Plan will try to uncover some of those stories and preserve the heritage of Koshlong.

Similarly, what was the lake itself like in those early years? How has it changed, not just in the past 100 years, but also over the eons that have shaped its environment? Even more important, how should the lake and its surrounding watershed look in the next 50 or 100 years? We cannot reshape the past; but we can and will have a pronounced impact on the future of Koshlong. What are the things that should be done in order to give the coming generations a place to cherish and preserve? This lake plan will also try to answer those questions, through a set of recommendations.

When one thinks about Koshlong, our thoughts are not just about the people and the lake. They include the whole surrounding environment - the animals and vegetation that are indigenous to this area, the birds that live here all year or keep returning year after year and all of the other species on the shores and in the water. This Lake Plan will try to look at all of those components of the lake area and it will try to provide a picture of them from a perspective of the past, the present and the future.

A final question that this Lake Plan will try to address is – 'Why do people now want to visit or live beside Koshlong Lake?' This question prompted an examination of the values of present lake community. It also led to an identification of the natural habitat, physical elements, and social values that support the current

quality of life on the lake and the culmination of a set of action plans and recommendations on ways to rehabilitate, enhance and protect them.

1.1 The Purpose and Scope of the Koshlong Lake Management Plan (KLMP)

The purpose of this plan is multifaceted. It encompasses the following points:

- to identify and document the unique character of the lake,
- to develop a picture of how the character of the lake should appear in the years to come,
- to develop specific objectives for long-term protection, maintenance and restoration of the lake,
- to identify land use and stewardship actions to protect these values for the future,
- to identify the natural elements and man-made rules that effect the lake community,
- to identify some of the wildlife that live in and around that lake.
- to document the history of Koshlong,
- to provide a snapshot of life on Koshlong in 2012, so that in the future people can compare it with their current reality and determine whether the changes that have occurred have been positive or not.

The broad scope of the KLMP applies not only to the lake and shoreline, but also to the upstream waters that flow into Koshlong Lake, for they too are an important component of the lake. While background information has been collected on the entire watershed, the specific scope of this plan focuses on Koshlong Lake and the area immediately adjacent to it.

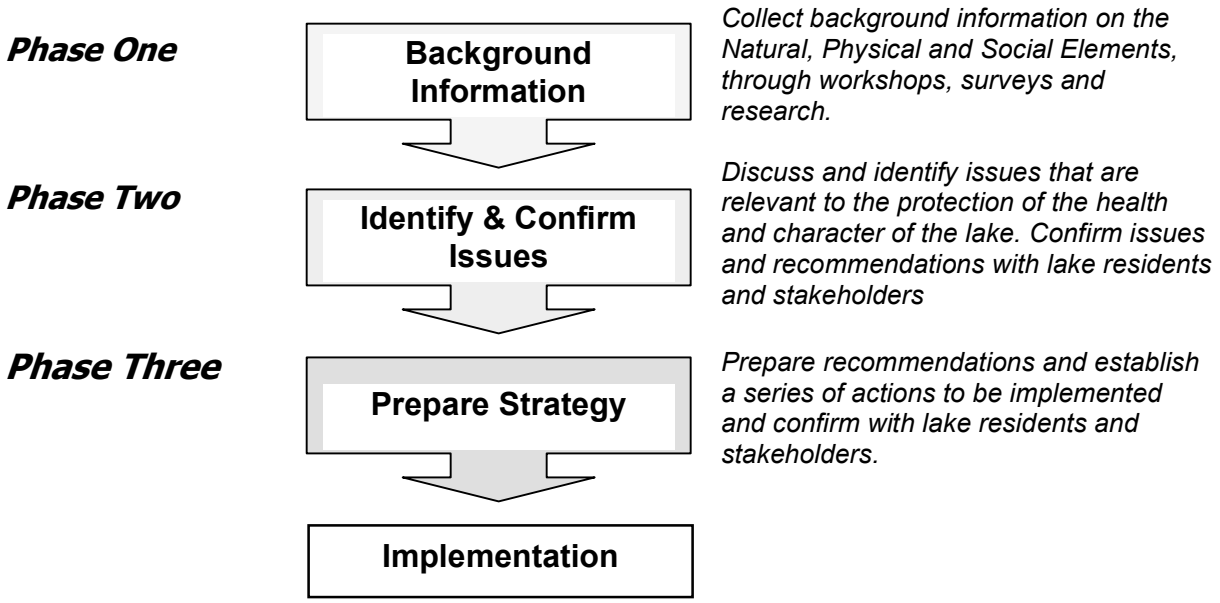
Map 1 – Study Area (from 6 Km - courtesy of Google Maps)

1.2 Planning Approach

In mid-2008, the Koshlong Lake Association accepted an initiative to develop a lake plan that would be similar to those developed by other lake associations in Ontario.

The preparation of the Lake Management Plan took place in three phases, as described below:

Figure 1.1 – Lake Planning Process



The first steps, in phase one, were to conduct a survey to obtain the views of property owners (both private and commercial), and then to gather information on other lake plans. That survey was completed in the autumn of 2008 and some of the findings were published in the 2008-9 edition of Wavelength. Additional information on the survey was made available from the Survey Monkey web site and a link to that site was provided on the KLA web site.

One of the aims of the survey was to identify the values that supported the enjoyment of the lake and quality of life of the lake community. It also helped to form a picture of the physical characteristics of the cottages, homes and watercraft. These were needed in order identify the character of the lake community and to address the issues and concerns that could impact the values of the lake community. These values would be used to develop a set of strategic action items that would protect the elements that support and enhance this quality of life.

In October of 2008, the Federation of Ontario Cottagers' Associations (FOCA) began working on a guidebook that would help lake associations to prepare their lake plans. A conscious decision was then made to delay the work on the KLMP, so that the lake plan volunteers could learn more about the process of developing a lake plan and the preferred content of the plan. FOCA completed their project in the summer of 2009.

Another component that was needed was to establish the overall principles that would guide the focus of the Lake Plan and its Action Plan. Another survey was conducted, via email, on the overall principles. It provided several alternatives and recommended one of them. That recommendation was accepted by the majority of those who responded.

The following is the accepted set of guiding principles:

The Koshlong Lake Community envisions the lake to be a place where:

- ***The beauty of the landscape and the quality of the water are preserved;***
- ***Wildlife, aquatic life and the natural habitat are safeguarded;***
- ***Preservation of the environment is valued more than economic development;***
- ***Tranquility of the surroundings and the quality of life are maintained;***
- ***The community is actively involved and educated in stewardship; and***
- ***These objectives are acted upon and preserved for future generations.***

It should be noted that these principles provide guidance for what the lake should become in the near and distant future. They help to describe both the character of the lake and the common goals that are important to the majority of the Koshlong community.

The guiding principles try to take into consideration the values that are significant to residents, commercial operators and stakeholders, and lake users. They also provide a high-level direction in the development of the lake Plan.

Armed with these objectives and the FOCA '*Lake Planning Handbook for Community Groups*', work resumed on preparation of the KLMP in the autumn of 2009. This was a busy period that involved doing research on as many sections of the KLMP as possible, collecting background information, consulting with and engaging experts in external organizations (like the Ministry of Natural Resources), getting feedback from the municipal offices in Highlands East and Dysart et al, composing the primary chapters of the KLMP and developing a set of action items that were designed to protect and enhance the qualities of the lake environment.

The first draft of the KLMP was completed in the summer of 2010 and that draft was distributed to the lake community, prior to the first workshop.

Due to the small number of volunteers, it was not possible to complete and validate all of the chapters of the KLMP. Those missing or incomplete sections were scheduled for completion by spring 2012.

A key component on the development of the KLMP was a set of workshops that were scheduled over the summer of 2010 and spring 2011. The purpose of these workshops was:

- to engage the Koshlong community,
- to determine whether the values (identified in the survey of 2008) were still valid and represented the feeling of the majority the lake community,
- to receive feedback on the overall Lake Plan and, in particular, its action items.

1.3 Information Sources and Support

There were many agencies that were supportive of the process and were involved in the collection of background information: The Municipality of Highlands East, Municipality of Dysart et al, County of Haliburton, Ministry of Natural Resources (MNR) Minden Office, the Ministry of the Environment (MOE), the Ministry of Northern Development and Mines (MNDM), Parks Canada and the Department of Fisheries and Oceans (DFO).

An essential resource that provided much material for the KLMP was the Paudash Lake Management Plan. Since the natural and physical environment of that lake is very similar to Koshlong, a lot of the information gathered in their lake plan was relevant to the KLMP. Many thanks and much appreciation is extended to the Paudash Lake Association and the people who developed their excellent lake plan.

A Work List of required information was prepared and members of the Lake Plan team contacted agencies, collected information and prepared summaries of their findings. That information includes:

Natural Elements: Water quality and quantity, wetlands, wildlife habitat, fish habitat, nesting sites, streams, vegetation, and rare, threatened and endangered species.

Physical Elements: Narrow water bodies, steep slopes, flood prone areas, access, watershed considerations, mineral and aggregate resources, and forestry.

Social Elements: Aesthetics, ambience, historical development, cultural sites, recreation and boating.

Land Use Information: Official Plans, Zoning By-laws, Site Plan Control By-laws, Crown Land Policy and Legislation

There were many documents that provided detailed information on Koshlong Lake. These sources and websites are listed in the References section, at the end of this Lake Plan.

Steps will be taken in 2010 and 2011, to not only obtain the opinions and comments from Koshlong property owners and commercial operators, but also from federal, provincial and municipal officials

1.4 Lake Plan Structure

The KLMP is divided into 8 sections, in keeping with the FOCA template and the standards developed by other lake associations. These sections are:

- Chapter 1 - identifies the purpose and scope of the KLMP, the process that was used, and the type of information that was collected.
- Chapter 2 - identifies the community vision, goals and targets.
- Chapters 3 to 7 - provides a description of the natural and physical elements, social aspects, land use, and contains summaries of observations and recommendations.
- Chapter 8 - contains the full list of Action Items (Recommendations)

Major observations and recommendations are provided throughout the document. These observations are based on the information that has been collected and the recommendations presented are for consideration and acceptance by the Koshlong Lake community.

A glossary of scientific and unusual terms has been provided in APPENDIX G.

1.5 Special Thanks

The following is a list of the people who helped put this Lake Plan together:

- Betty Kaye, who provided the History of Camp Lagakelo and information on Ripple Rock Drive
- Bob Harrison, who research the streams flowing into Koshlong and provided additional information on historical information
- Margaret (Emmerson) Robinson, who provided her personal memoires of Koshlong entitled 'My Memories of Red Haven on Koshlong Lake'.
- Alison Pentland, who opened up her cottage and co-ordinated the work of two students from Fleming College as they conducted a field study around Barristers Bay (see APPENDIX E)
- Ann Schmidt, who worked with staff at Highlands East Municipal Offices and prepared the list of by-laws that were most influential to Koshlong property owners
- Dennis Choptiany, author and editor of the Lake Plan
- Andy Hayes and John Guiler, who wrote the article on the Kaye Family and Their Legacy
- David Flowers (Fish Biologist at MNR), who provided valuable data on fish in Koshlong
- Bill and Paul Seaton who provided historical information on Turtle Rock Lane
- Andy Gruppe and Paul Raposo who provided information on the history of Camp Wanakita
- The CHA, for the Septic Tips and various environmental information

Chapter 2 Vision, Principles and Targets

One of the most beautiful statements of principle to live by is found in the Jain religion. It reads, "*Do not injure abuse, oppress, enslave, insult, torment, torture, or kill any creature or living being*."

One can only hope that one day mankind will fully embrace that principle.

But it seems obvious that the Jains had little experience with blackflies, mosquitoes, deerflies, horseflies and any other pest that live around Koshlong Lake. Therefore our vision, principles and objectives will not be as lofty.

2.1 Vision and Mandate

A vision statement provides guidance for what the lake should become. It describes overall objectives that are important to most KLA members and it concentrates on the future. The KLA Survey of 2008 and the vision statements from other lake associations helped to develop this one.

The following Vision Statement reflects the values and visions that private and commercial property owners and government stakeholders share (Figure 2.1).

Figure 2.1 – Vision for Koshlong Lake

The vision for the future of Koshlong Lake is…

A place where water quality, wildlife and their habitat, natural beauty, peace & quiet, and social, business & recreational opportunities, are all balanced, sustained and improved upon for the benefit of present and future generations.

This vision statement touches on the important elements that bring people to Koshlong. But what does it all mean? What are the factors that have an impact on the natural and social aspects of life on Koshlong? Can we really sustain the social and recreational aspects without infringing on the wildlife and their habitat?

In order to answer these questions we will have to look more closely at the elements that make up and have an impact upon the natural, social and physical aspects of Koshlong. The following chart helps to

clarify these elements or factors. It also hints that these factors cannot be taken in isolation in that there is an intertwining relationship between all of them.

Figure 2.2 - Key Factors that Influence Quality of Life on Koshlong

Natural	Social	Physical
Water Quality Wetlands Fish Habitat Wildlife Habitat Vegetation Threatened/ Endangered Species Environmentally Sensitive Areas Invasive Species Ecological Issues	Recreational Activities Aesthetics Boating Activities Cultural/Heritage Sites Community Character Septic Systems Landscape Noise Roads Economics Development	Water Levels Soils Geology Ground Water Topography Outdoor Lighting Hazardous Wastes Navigation Hazards Shallow Waters Steep Slopes

These are by no means all of the factors that have an impact on Koshlong but they represent the major elements.

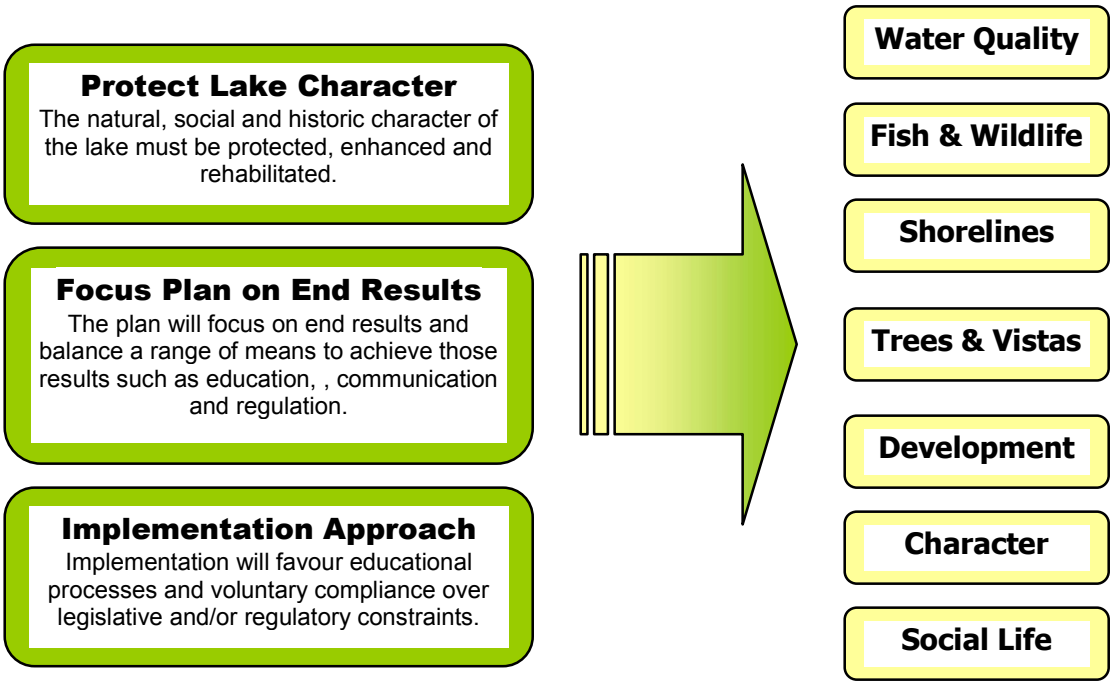
Having identified these major factors, one can more readily see some of the relationships. Many are obvious. For example septic systems and soils have an impact on water quality. Similarly, fish habitat and navigational hazards should have an impact on boating activity. But merely identifying them is not enough.

If one starts out on a boat trip without any destination in mind, then going in any direction and stopping anywhere is fine (*until a thunderstorm erupts*). But this lake plan is not a just pleasure trip. It has a destination and purpose. In order to develop a plan to balance, sustain and enhance these values and elements we must establish objectives and targets. We must also be aware of any obstacles.

2.2 Objectives and Targets

The Koshlong Lake Plan Team confirmed a series of high-level objectives to be used for the preparation of the Lake Management Plan and identified seven potential targets to be addressed (see Figure 2.3).

Figure 2.3 - Objectives and Targets



These objectives and targets helped to identify important aspects of the lake and provided the KLA with a method for measuring their efforts in the preparation of the plan and the protection of these features. These targets are further described as follows:

1. Water Quality - The water of Koshlong Lake should not contain contaminants in excess of the natural historic levels (i.e., the level of contaminants that would occur in nature prior to human habitation), or standards specified by qualified official bodies. Significant contaminants to be monitored should include phosphorus, nitrates and other contaminants that may be identified in the planning process. Water clarity, calcium, dissolved oxygen levels and other factors will also be used to determine water quality

2. Fish and Wildlife – The Koshlong Lake watershed area should be able to support a sustainable fish population and maintain stability in the bio-diversity of wildlife species and their habitat. Within the lake there should be an optimum habitat for its naturally reproducing species and stocked lake trout. The introduction of 'invasive species' such as zebra mussels and purple loosestrife, must be prevented.

3. Natural Shorelines and Riparian Areas - The shoreline can be described as the 'ribbon of life' that supports a diverse range of fish and wildlife species. The protection and rehabilitation of the shoreline (littoral, riparian and upland areas) should be promoted to increase and improve upon the 'ribbon of life'.

4. Natural Appearance and Vistas – One of the most enjoyable aspects of Koshlong Lake, particularly when compared to urban life, are the natural vistas. Therefore, the natural vista should be maintained. Buildings and structures should have a minimal impact on the natural appearance of the shoreline and the landscape. The natural vista should also include night skies.
5. Economic and Property Development - A co-operative working relationship must be fostered and maintained between recreational, residential and commercial members of the Koshlong Lake community in order to ensure that any proposed development and activities respect the environment and character of the lake, as well as maintain property values.
6. Historical, Cultural and Natural Character - The natural, historical and cultural character of the lake ought to be recognized, protected and maintained, where appropriate. Future public, commercial and residential development should complement and be compatible with the cultural and natural character of the lake.
7. Social Life - A range of social and recreational activities should be promoted that foster a sense of community around the lake, are consistent with the natural character of the lake, and preserve the health and ambience of the lake.

2.3 Observations – Objectives & Targets

Looking at these objectives and targets, it is quite evident that the environment is very important as it encompasses the first four of them. More details about our lake and the watershed will follow in other sections; but there are some observations that we can make about our environment at this stage:

- ***The natural ecosystem is a complex living entity, which should have protection from the destructive actions of individuals and commercial enterprises.***
- ***Learning to live and work without degrading the environment is both a key challenge and opportunity for members of the Koshlong community.***
- ***Integrating biological conservation with development may require partnerships between private and public interests as well as heightened awareness of issues in order to produce results, which are in harmony with nature.***

Now, what is it that we can do in order to sustain and enhance our environment?

2.4 Recommendations – Objectives & Targets

Cleaning up the environment is not an easy task. But it is also not impossible if everyone is aware of the problems and works toward the solutions.

1. ***Establish education programs to acquaint members with environmental issues***
2. ***Inspire individuals to take responsibility for their actions.***
3. ***Encourage KLA members to think globally, but act locally***

Chapter 3 Lake Description

Historical Development

A lake is more than just a body of water. There is a natural history of how it developed. There is also a human-based history of the lake, including discovering who were the first settlers on the lake. This chapter explores some of the many facets of our lake.

3.1 The Name Koshlong Lake

There isn't any clear and definitive information on the origin of the name Koshlong. Indications are that the name has evolved from its native origin. According to the Ontario Department of Lands & Forests, previous iterations include the following – Kokwayong (1858), Cockweong (1862), Coowayong and even Cochlong (1900). It should be noted that Kokwayong means "waves washing onto the shore" in Ojibway. Finally, in 1909, the name Koshlong Lake was established.

The name has even taken a few trips off the lake. An Internet search shows that Koshlong was the name of a 45' sailing yacht that was last seen in the Caribbean, near Antigua In the summer of 2006. The owner, at one time had a cottage on Koshlong. He sold that cottage and with his family literally set sail for sea adventures.

It also was the name of an Australian beer – Koshlong Blonde. This came about because Kevin Rowland (son of Janet Rowland [nee Cavell]) spent his summers at the Cavell cottage on Turtle Rock Lane. He grew up and after marrying Andrea (from the UK) decided to move to Australia, started the prize winning Northern River Brewing Company and coined the name Koshlong Blonde for their smooth golden beer. The company has since been sold and the name of the beer has been retired, but for a short time Koshlong had an international flavour.

3.2 Native History of Koshlong Lake

It is hard to know what people first laid eyes on Koshlong Lake. Going way back, it was 10,000 to 12,000 years ago that Paleo-Indian first walked across the Bering Strait via a land bridge (Beringia). The ice age was just ending and the receding glaciers (at one time more than a mile thick) were still storing a vast quantity of water. The ocean levels had dropped and a narrow corridor of land was exposed between what is now Russia and Alaska. Some have estimated that this exposed land was about a kilometre wide and it provided a relatively easy passage to Alaska. These early hunters followed mammoth and bison and

eventually spread across North America. Another theory about the first inhabitants was that they came by canoe, even before the end of the ice age. These marine hunters were after seals and fish. Whatever theory is correct is not as important as the timing of the original people who first inhabited North America. They were here at least 10,000 years ago.

Many Wars and Many Tribes

Even the more recent history of this area is quite sketchy. Some archaeological discoveries in Algonquin Park have been dated back to about 3,000 BC, but little is known about these natives. Since then Haliburton has been dominated by various tribes, including the Huron, Ojibwa, Algonkin (*that is not a mistake, but rather an ancient spelling of the name*), Ottawa, Iroquois, Mohawk and the Chippewa. Tribal wars determined which natives controlled the area. One good source of information is the opening chapter of the book 'In Quest of Yesterday', by Nila Reynolds. The library and the museum in Haliburton could also be consulted if one wants to learn more about that era and the early native inhabitants.

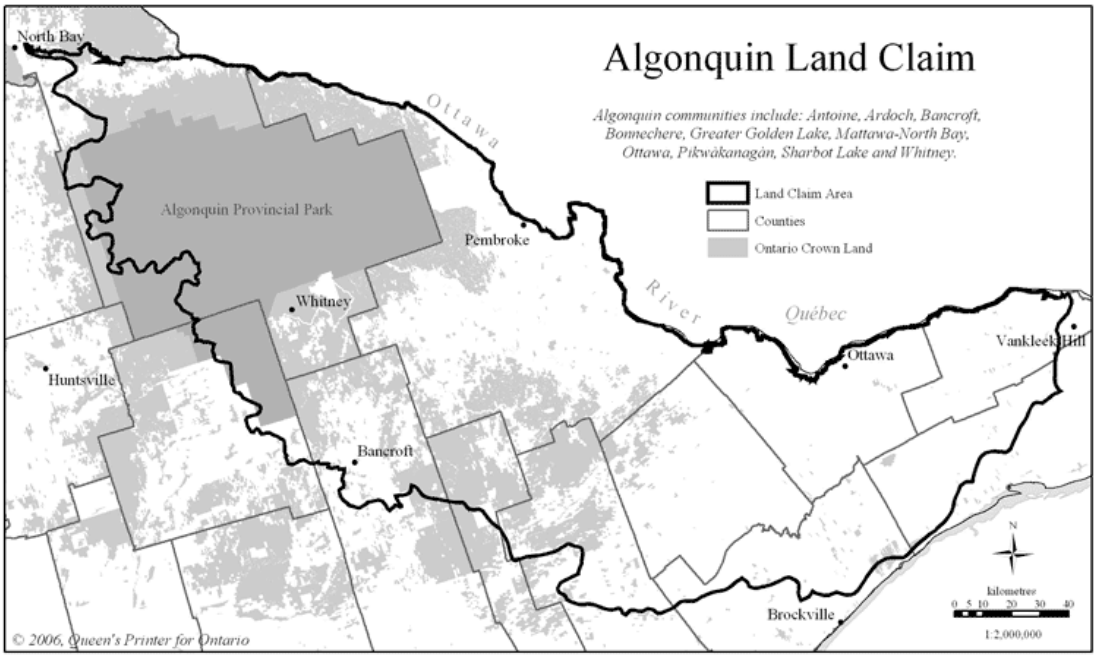
Most Recent Native Territory

Since Koshlong is a 'head lake', with no major rivers flowing into or out of it, the natives had a hard time getting to it and did not use it as a settlement. They may have hunted in the area, but there is no evidence of a village or even seasonal camp on the lake.

The most dominant native tribe to the east of Koshlong was the Algonquin nation. The following map (Figure 3.1), represents the approximate general area of a current Algonquin land claim. That territory covers 36,000 square kilometres (14,000 square miles), which represents the Ottawa River watershed and the southeast portion of the Mattawa River watershed within Ontario. Whereas the Algonquin did not sign any formal treaties, their land claims have still not been fully resolved. A small portion of Haliburton County (west of Bancroft) is in this contested area, but luckily Koshlong Lake and the surrounding watershed is not.

To the west and south, the main tribes were the Oneida and Mohawk, but it has been difficult to find accurate data on the extent of their territories.

Figure 3.1 – Algonquin Land Claim



(map is courtesy of the Ontario Ministry of Aboriginal Affairs)

As we know, the dominant tribe or people were eventually the Europeans. Fortunately for us, all native land claims to a sizable territory in Ontario, including most of Haliburton County, were resolved by the Williams Treaty in 1923. As such, we should not be enmeshed in any treaty claims that are still points of contention between the Canadian Natives and the provincial and federal governments.

The first official British imprint on the lands in this part of Ontario took place in the mid-1800's. In January 1859, Philip M. Vankoughnet, the Commissioner of Crown Lands, decided to sell blocks of land for fifty cents per acre. These blocks were actually quite sizeable, as ten of them formed the townships of the County of Haliburton. A newly formed company called the Canadian Land and Emigration Company (CLEC) purchased these blocks in 1861, for the sum of $192,000. The Chairman of the Board was a fellow whose name was Thomas Chandler Haliburton. The following year CLEC began selling acreages, mainly to tradesmen and professionals.

As interesting as this period was, the remainder of this chapter will focus on the last 100 years, when Europeans began settling in the area near Koshlong.

3.3 The Early Stages of Koshlong Community

This section provides a flavour of the community on Koshlong Lake between 1900 and 1970, and the many people who have helped to shape its character. The earliest settlers in area were farmers, who were lured by the promise of relatively inexpensive land. Life was harsh and seasonal with farming in the Spring and Summer, and logging in the winter.

The Hamlet of Donald

With the dawn of the 20th century, the first people to use the lake were loggers and the closest community was in the hamlet of Donald.

It can be rightly argued that at one time Donald was the industrial capital and economic centre of Haliburton County. The main employer was the wood-alcohol company called Donald Wood Products, established in 1908, by Mr. R. A. Donald of Markham. The plant produced wood alcohol, acetate and charcoal and some of the remains of this plant can still be seen in Donald.

At its peak, the company employed almost 300 men (mostly loggers) and paid its workers an average of $1.90 a day, which at that time was considered to be a good wage. In 1915 it was sold and became the Standard Chemical plant (usually referred to as 'the Chemical').

There were many advantages and disadvantages to being a company town. The major disadvantage occurred when the wind shifted and began blowing from the plant toward the town. The black smoke from the boiler fires and the acrid smell of acetate made life in Donald unbearable. Fortunately, that did not happen on a regular basis. On the positive side was the availability of electricity and hot running water, at a time electricity was not readily available in the county. That did not happen in the rest of the county until the 1950's. The plant had to generate its own electricity to operate and it was also supplied to the town.

In 1937, the hamlet of Donald was a thriving place with about 100 Residents. The train stopped there three times each day. At that time Donald had a post office, nineteen houses, a huge two-story boarding house the 14 bedrooms, a general store run by John Emmerson and two large houses that were used by plant management. There was even an 'Opera House' that was used for community events and church services. One memorable building was the schoolhouse. It has long since been renovated into a residence and can still be found at the intersection of Gelert Road and the Old Donald Road. In spite of a devastating fire that consumed much of the town in 1951, several other buildings are still standing, including the old general store that is now a residence and a bakery.

One interesting legacy of the Chemical was an influx of new blood into Haliburton. General labour was plentiful. But farmers, who supplemented their income by logging, were only willing to work at cutting timber in the winter months, after their crops were harvested. Skilled labour that wanted to work through the whole year was scarce. For that reason, the Chemical recruited loggers from Italy to fill the labour shortage. This was not the only time that recruitment for specific skills had gone offshore to find the people that he wanted. Germany had an educational system that developed a highly skill workforce and one of the first distillery technicians was brought in from that country. Descendants of those original immigrants are still contributing to the cultural mosaic in Haliburton County.

For more information on the Standard Chemical plant, see Appendix D.

Little is known about the extent of logging on the shores of Koshlong. It is highly likely that all of the shorelines were completely logged in the early 1900's, but the lake was definitely used to transport logs from surrounding areas to the plant. There was even a steamer moving logs across the lake. It is rumoured that this steamer still lies somewhere at the bottom of Koshlong Lake (possibly in Dysart Bay). Many submerged logs litter the waters of the lake.

In order to move logs more easily through the narrows, a wooden dam was constructed - where the current cement dam is located. This raised the water level by blocking some of the water flowing out of Koshlong Creek. We owe our current man-made water level to these industrious loggers.

3.4 Roads and Early Cottagers

The first road to reach Koshlong ran from the Standard Chemical plant to the northern tip of Dysart Bay. Loggers were able to use this road to transport logs to the plant. But as the viability of the plant started to wane, things began to change. The Crown Land Corporation began selling land on the shores of Koshlong. Since the road to Dysart Bay provided the easiest access to the lake, land in that area was the first to be sold.

The most desirable lakefront properties had a sandy beach and the northern shores of Koshlong had this characteristic in spades. In the early 1900's, Hamilton Harrison purchased an acreage in the area around Harcob Trail. (*It is no accident that the first three letters in the name Harrison are the same as the first three letters in Harcob.*) Soon after, a cottage was built and a road was pushed through to access that property. That road became the basis for what is now Koshlong Lake Road. Their descendants still own much of the property and one Harrison family has recently made it their permanent home.

Red Haven [*The following paragraphs are based a short history written by Margaret (Emmerson) Robinson, entitled 'My Memories of Red Haven on Koshlong Lake.*]

In 1935 John E. Emmerson purchased 500 acres of land where East Wanakita now stands. The purchase price was $500, with the stipulation that a dwelling had to be built within a year of the purchase. In June of the next year, his first cottage was started. It was a quite sizeable building with 5 bedrooms, a kitchen, sitting room and a large dining room. The cost of the lumber alone was $1,500. The name of the cottage was Red Haven and the family moved into it on July 4th 1936. Since John owned the general store in Donald, it was a relatively short commute and the family was able to live in Red Haven for the warmer months, until Thanksgiving. The following year, West Haven was built, near Camp Lagakelo. Red Haven is still standing and is now part of Camp Wanakita and known as Hamlin Lodge.

A tradition that he started was that every year on August 24th, a huge bonfire was started and everyone who had a cottage on Koshlong was welcome to enjoy hot dogs, pop and singing.

Ever the entrepreneur, John built five rental cottages for summer visitors, as well as an icehouse in 1937. In the winter, the ice on the lake would freeze to a depth of 2 – 3 feet. He'd cut the ice into manageable sizes and stored them in the icehouse, then sell blocks to cottagers in the summer months. The walls of the icehouse were insulated with sawdust and as crude as it might seem it worked very well. Electricity and roads were not commonplace, so a good icebox was needed - for more than just keeping one's beer cold.

At that time, the family attachment to Koshlong was quite strong and at one time, his son Bill operated Koshlong Marina at the north end of Dysart Bay. (*It was Bill who later started Emmerson Lumber*)

The idea of buying land and building a cottage on lakes, like Koshlong, became more popular. By the 1950's the purchase price for shoreline property had climbed to the princely sum of 30 cents per foot of shoreline. However, one still had to build a cabin or structure with a value of at least $100 within the first 18 months after purchase. In spite of those financial obstacles people were still attracted to the lakes of Haliburton.

Who's That?

As mentioned earlier, train service was available in Donald. It was not uncommon for the father to leave work in Toronto on Friday, board a train and in a few relaxing hours be in Donald. Whether arriving by train or car, the husband would get to either the government dock or the north part of Dysart Bay. Then, using a car horn, he would honk the appropriate code to announce his arrival. Of course everyone within earshot would know

who was being beckoned. A member of the family would then take a boat to greet him and bring him to the cottage. If it was late in the evening, some could signal using car lights instead of the horn. Doesn't that just sound so civilized?

Turtle Rock Lane

In the 1950's, there were 11 cottages (*now 16*) on the east side of Dysart Bay. People were quite content to take a boat to their cottages, even when it was raining. After all - this was the wilderness. There were very few roads around the lake and everyone (well almost everyone) was used to boat access. But in 1960, this tradition was about to change, at least for this section of Koshlong.

Bill Seaton bought some land on Koshlong, due to the fond childhood memories of visiting a cottage on Drag Lake. But a surprise was about to happen. His wife Betty announced that their first child was on the way and she did not want to rely on a leaky boat to access their cottage. A road was needed, and soon.

All he had to do was plan the location of the road, hire someone to build it, get approval from the Department of Lands and Forest to use some crown land, negotiate a right-of-way over some private property and obtain about $6,000 for all of the legal and construction work. And it had to be done before the arrival of their first son.

No problem.

Still in his early 20's, Bill may have lacked experience and strong financial resources, but he made up for that with drive and unflappable willpower. With the strong support from Frank Cavell, he started working on the road project.

The first problem meant getting others to agree that a road was needed. Not everyone was expecting a baby and they were quite comfortable using a boat to get to their cottages. There was also the question of money. An estimated cost of five to six hundred dollars may not seem like much now, but in 1960, it amounted to about five to ten percent of an annual wage. A lot of pleading and arm-twisting was needed, but Bill and Frank were successful in getting the commitments. They also knew that they would probably have to make up any shortfall, and that proved to be correct.

The second major problem was that of gaining access rights over the crown land and private land that separated the cottages from Koshlong Lake Road. A few visits to the Department of Lands and Forests (the precursor to the Ministry of Natural Resources) solved the first problem. After reviewing a map of the area, penciling in the proposed road and filling in a few forms, a permit was granted. There was no cost for this

and the only restriction was that any trees that were removed had to be cut into prescribed lengths and properly stacked. One more problem solved.

Gaining a right of way over private land took a bit more time and involved hiring a lawyer. The cost of this agreement was $500 and each cottager also had to pay a $10 annual usage fee for the first five years and $5 for the next five years. Don't laugh. Remember that this was 1960.

Lymburner Construction was hired to build the road. After fine-tuning the 1.2 km route, construction began in mid-August and was competed in September of that year.

The result was more of a trail rather than a road, since the work mainly involved removing trees, hauling in sand and putting in inexpensive wooden culverts (which unfortunately didn't last very long).

The advantages of the road were self-evident, but so were the problems. Rain proved to be the biggest issue and it was not uncommon for cars to get bogged down in mud. It didn't take long for cottagers to realize that hauling in gravel (rather than sand), replacing wooden culvert with metal ones and committing to annual road maintenance were better than being towed out of low-lying areas. Much like today, isn't it.

There is some disagreement on how the name Turtle Rock Lane came about. Some say that it was chosen because it was thought that the road would eventually end up at the large rock formation near the dam. Others say that it was because a few cottages have a view of a rock formation, across from the bay, which looks like a turtle. Whatever the reason, the road has endured and is a testament to the strong determination of Bill and Frank.

Ripple Rock Drive

The most recent road to be built, and no doubt the longest private road is Ripple Rock Drive.

Ron Alberty was the motivating and driving force for this road. He started by checking with all of the cottagers that it would service, to get an idea of their interest and support. Most agreed, so he contacted the Ministry of Natural Resources for approval to use the Crown land and began walking a trail many times to establish the best route.

When tendered, three bids were received and the winning one was of course the lowest (at $60,000 for approximately 5km) from a company in Gooderham. Each of the cottagers contributed $3,000 – which gave the project some reserve money to cover any unforeseen issues.

Construction began in the late Fall of l987 but hauling gravel was found to be too expensive and so the work was stopped until a less expensive alternative could be found. Ron had identified three places as sources of gravel and permission to use these pits was approved by the MNR. Winter meant that heavy equipment could be used, so trucks were brought to move gravel and construction continued through the snows and the road was completed by early summer of l988.

Once the decision was made to build a road, an agreement was drawn up (by a lawyer/cottager) forming an organization called the Koshlong Lake South Shore Road Association. This was done to protect the liability of the individual owners and to have an administrative body to maintain the road.

The original road name 'South Shore Road' stood until the 911 Committee determined that there were other similar road names in the county. So, another had to be chosen. Isobel Dillane thought one of the rocks on the road looked rippling and suggested Rippling Rock Drive. But, many thought that it sounded like an ice cream flavour and suggested the shorter version of Ripple Rock Drive.

A point of interest is that Ripple Rock Drive terminates at the water entrance to Bark Bay. That point of land had been known as 'Coowayong' because that name was used as the name of our lake on the original property deed, dated in the late 1800's. That name was considered, but it was rejected as being too difficult to remember, spell or pronounce.

Another result of the change in road name was that a different name was need for the branch that traveled south along Bark Bay, from Ripple Rock Drive. The name chosen was Arrowhead Drive. This came about because Jordana Weiss had found an unusual rock, near the western shore of the bay. Someone at the Haliburton Museum was asked to examine this rock and it was determined to be flint and had been shaped into a 'projectile point' perhaps 4,500 to 5,000 years ago. It was also likely used on a spear rather than an arrow. The curator noted that there was a small piece missing from the tip, indicating that it had probably snapped on impact and the hunter could not locate it, otherwise it would have been reshaped and reused.

I'm sure you will agree that arrowhead sounds much better than spearhead. It's also interesting to note that the natives believed in reuse, long before it became popular at the end of the 20th century.

Other Roads

There are obviously many other roads surrounding Koshlong, but it has been difficult getting the history of them. If some budding historians are able to draft a short story abut their road, those vignettes can be added to subsequent versions of this lake plan.

3.5 Quaint Names

Telephone Bay

One of the interesting names on Koshlong Lake is Telephone Bay. No, it is not the location for the first under water phone line and it definitely does not look like a telephone. The history of this bay is that in the late 40's, several families built cottages on the shores of a bay adjoining Seymour's Point, on the east side of Koshlong. As we know, sound travels quite well over water, so neighbours communicated merely by talking or at times shouting across the bay. There were no phones and no roads in that area, so if someone was going into town, he would ask if anyone else needed something or wanted to have a ride.

In the early 1950's, Bell Canada was buying up small rural phone companies. They began selling or just discarding the old phone equipment – the kind where you turn a crank to ring for the operator, who would then connect you to the party that you wanted to reach.

Two of the cottagers (Dwight Wilson and Clair Forester) were career telephone company employees and they were delighted to get their hands on the old equipment.

Soon phone lines were being strung along the shores and across bottom of the bay. Before long, five cottagers were connected via their own private phone service. These phones were battery operated (except for the ring which required the crank and magneto) and formed a party line, where everyone could talk to everyone else on the line – just like our conference calling systems, but much less complicated.

The service also served as a quick fire warning system, but thankfully it was never used for that purpose.

They were the first and perhaps the only ones to set up their own telephone service, so the name Telephone Bay was a natural.

Barristers Bay

Another story is about the name Barristers Bay (just east of Camp Wanakita). Among the first property owners in this area of the lake were two lawyers - both graduates from Osgoode Hall. Yes, they were friends and no, they did not take delight in foreclosing on retired widows. [*You can think of your favourite lawyers joke here, to spice up the story.*] They bought several lots in the 1950's and soon had their cottages built. Lawyers Lane would have been a great name for the road to their cottages; but there was no road, so that wouldn't work. Lawyers Inlet didn't have much panache, so that too was discarded. Then one day (*perhaps after a few stiff drinks*) the name Barristers Bay came to mind. No one is sure who coined the name, but it seemed like a good one and it has resisted all official and unofficial challenges. After all, it does have a certain poetic charm. Case successfully closed.

3.6 Observations – Historical Development

- *This chapter is viewed as the beginning of an attempt to capture and document the history of Koshlong Lake. But, more local information is needed.*
- *Over the past century, Koshlong Lake has had a significant increase in development – primarily seasonal cottages.*
- *The economic base of the area has changed. The original logging industry has been superseded by a recreational, residential and camping (ie. Camp Wanakita) boom. In fact tourism is now the economic engine of the whole county.*
- *More and more people have decided to become fulltime residents of Koshlong Lake. Although many of them are retirees, there is a growing number who are still working and prefer the peace and quiet of this natural environment to the hectic urban lifestyle. In 2008, there were at least nine full-time residences on Koshlong.*

3.7 Recommendations – Historical Development

4. ***Further investigate the history of the area and prepare articles for the KLA newsletter and web site, and subsequent updates to this lake plan.***
5. ***Obtain information on fires and natural disasters that occurred around Koshlong.***
6. ***Residents and cottagers are encouraged to contribute their memories, anecdotes and photographs, for an up-dated history of Koshlong.***
7. ***Residents and cottagers are asked to report anything that might be archeologically significant, so that the history of our lake can become more complete.***

3.8 General Location and Physical Characteristics

Koshlong Lake is a mid-size body of water, located about 7 km south of Haliburton. It lies mainly in the geographic township of Glamorgan, which is now part of the Municipality of Highlands East, and the County of Haliburton. Only a small part of Dysart Bay lies in the municipality of Dysart et al. Interestingly, it is almost equidistant from both the Equator and the geographic North Pole.

The lake has a total surface area of 400 hectares (ha), a maximum depth of 43 metres (m). The volume is estimated at about 43 million cubic metres. Its width, measuring north-south in the main lake is about 1.75 kilometres and its length measuring east/west is just shy of 6 kilometres

Figure 3.1 provides details on the physical characteristics of Koshlong Lake

Figure 3.1 – Koshlong Lake Physical Characteristics

Latitude	44^0 58’	Mean Depth	10 m
Longitude	78^0 29’	Maximum Depth	43 m
Surface Area	400 ha	Perimeter	11 km
Length	5.9 km	Height Above Sea Level	346 m

Source: Google Maps 2009

Water depths in the lake will be shown on the map in APPENDIX A. Almost all of the water in Koshlong Lake comes from rain or snow melt. Although some have theorized that Koshlong is also fed by a number of underwater springs, this theory has not been substantiated. What is known is that a number of streams flow year-round into Koshlong Lake. There are actually 18 streams that are considered to be significant by the Ministry of Natural Resources. These have year-round or intermittent water flow and are shown in the map in APPENDIX A. There are also several creeks or channels that are only active in the Spring or after a heavy rain. A number of natural marshes and depressions or swales also pass storm water into the lake. The only outlet is Koshlong Creek, which flows west into the Burnt River and eventually to the Trent River system.

3.9 Watershed

At his time, little is known about the watershed surrounding Koshlong Lake. Anything that has a positive or negative impact on the lake should be researched, either out of curiosity or because of the potential impact of severe storms or future mining endeavours. Investigating the watershed is one of the issues that the Lake Plan has identified and should be addressed, even though it is a low priority item.

3.10 Observations

- *Although Koshlong Lake constitutes a small fraction of the Burnt River watershed, its health and well-being has an immediate impact on those bodies of water downstream of it, as it is a headwater lake for that watershed.*
- *The main source of water for Koshlong is the rain and snow that drains from the surrounding terrain. The natural aspects of that watershed area have a direct impact on the health of the lake.*
- *There are numerous streams that flow into Koshlong Lake, some of which are fed by ponds and marshes, and their health will impact the future health of Koshlong Lake.*
- *Some speculate that Koshlong is also supported by a number of underwater springs, but their veracity and locations have not been confirmed.*

3.11 Recommendations - Watershed

8. ***KLA members should become familiar with navigation hazards in the lake and avoid these areas when boating. Although the KLA map roughly indicates these hazardous areas, it should be used only as a guide and not a final authority on shoals.***

9. ***The KLA should work with both Highlands East and Dysart et al, to ensure that bylaws are developed to improve the ecological health of the lake and surrounding waterbodies.***

10. ***The watershed should be explored and any areas that could have an impact on the health of the lake should be identified and protected – particularly those areas that provide constant water flow.***

3.12 Water Levels

As noted previously, loggers had originally built a wooden dam in the mid 1800's. This was a fairly common practice throughout Haliburton and neighbouring counties. But because it wasn't regulated or properly controlled, it created sporadic water flows in the downstream rivers.

In September 1873, at the urging of the lumber companies, the provincial government took possession of the dams in the reservoir lakes for one dollar and agreed to maintain them on the condition that various lumber companies paid tolls on the timber to help finance dam maintenance.

Over the next 30 years, the province maintained these dams through their Department of Public Works. But in 1906 the province transferred ownership and responsibility for these dams to the federal government.

In 1918-19, a new wooden dam was built by the federal government, replacing the original dam at the western end of Koshlong Lake. Then in 1936-37, it in turn was replaced by a concrete dam, which was subsequently rebuilt, during the winter of 2002-03.

The dam is now owned by Environment Canada and controlled by Parks Canada. During the control period, the water level in Koshlong varies between its highest in April/May (after the main logs are replaced in the dam) to its lowest in October (when most of the main logs are removed). Figure 3.2 shows the variation in metres above the Sill Plate. For those who are not familiar with them, the logs are wooden timbers that measure one foot in thickness. They are placed one on top of another to block the flow of water through the dam. Crude – yes, but effective.

Figure 3.2 – Water Levels

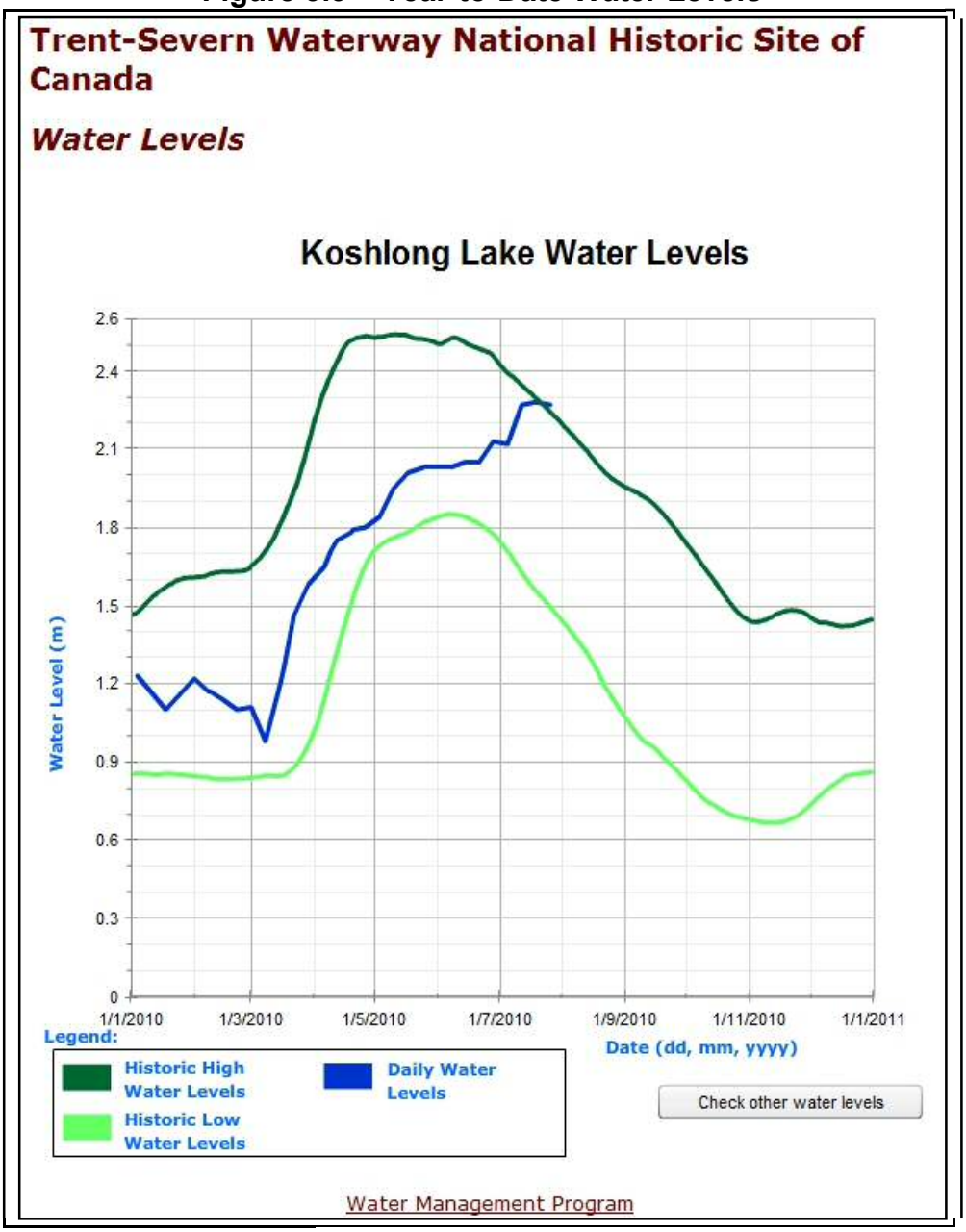
	Water Level	Average High & Low Water Levels
Record High-Water Level	2.53 m	2.29 m (90“) – 7 1/2 logs 0.92 m (36“) – 3 logs
Record Low-Water Level	0.66 m	
Sill (Lowest Possible) Level	0.0 m	

Source: Parks Canada, 2010

NOTE - The Sill Plate is the part of the dam on which the logs are placed. The lowest possible water level would be reached if all logs were removed. However, Parks Canada has made a practice of leaving several logs (usually three) in place during the winter months, thereby providing a normal low-water level reading of 0.92 metres.

Figure 3.3 shows the actual water levels in Koshlong Lake during the first half of 2010. On-site readings are taken by Parks Canada personnel every Monday using a gauge located at the Koshlong dam and the updated graphs are available the next day on the Parks Canada web site. A link to that site is accessible from the KLA web site.

Figure 3.3 – Year-to-Date Water Levels



Graph is Courtesy of Parks Canada – 28 July 2010

Note that 2010 was an unusual year with very little snow in the winter. Yet nature has a way of healing itself and the amount of rain in spring and early summer was enough to not only compensate for the winter shortfall, but also to achieve a record-breaking level in late July.

It should be noted that water levels are rarely equal to the level of the topmost log in the dam. It is usual for a 'head' of water to be several centimetres above the top of the logs. It is also possible for the water level to drop below the level of the topmost log due to evaporation or the recent addition of a stop-log.

Parks Canada considers the following factors when controlling the water levels of Koshlong Lake:

a. To maintain levels in the Trent-Severn Waterway in the summer for boating, and other recreational activities;
b. To avoid spring flooding (everywhere on the system) as much as possible;
c. To maintain adequate water flow for the production of hydro-electric power;
d. To meet the water needs (both residential and commercial) of downstream communities, and
e. To protect fish and wildlife habitat.

According to Parks Canada, 'Water is now drawn from each of the reservoir lakes in an equal percentage basis according to the storage range established for each lake. For example, when a lake with a relatively large storage range of 3.0m is drawn down 50%, its level will be at 1.5m, while a lake with 1.0m of usable storage will be lowered to 0.5m. When a lot of rain is forecast, staff may read water levels several times a week at dams and make the necessary log changes to ensure that drawdowns are proportional.'

To explain more about water management in the Trent/Severn Waterway, the following statement are taken directly from the Parks Canada web site:

Fall and Winter

During the Fall and Winter, the Haliburton and Kawartha Lakes are lowered by increasing their outflows. This drawdown prepares the lakes for the spring snowmelt and reduces the threat of high water and ice damage. Snow course sites throughout the Trent and Severn drainage areas are surveyed regularly beginning in January. Information about the depth and water content obtained from these surveys aids in forecasting the total volume and peak runoff for the upcoming spring freshet.

Spring

March, April and May are critical months for Waterway hydrologists as melting snow and rain fill waterway lakes. Attention focuses on the weather. Both heavy rainfall and prolonged warm temperatures will cause rivers and lakes to rise suddenly. The historical record shows this often results in more than one peak during spring freshet. Efforts to control this flooding are hampered by narrow channels, insufficient storage capacities in some lakes and the differing abilities of soils throughout the drainage basins to absorb water. While flood mitigation is a primary spring-time concern of waterway staff, care is also taken to ensure that

water flows and levels are adequate to protect fish spawning sites and for use in the following summer.

Summer

During the summer, attention shifts to preserving water levels and flows. Navigable depths on the Waterway must be maintained while minimizing the requirement for water from the reservoir lakes. Although minimum flows are maintained to sustain water quality, the main cause of water loss is evaporation from the surface of lakes. The weather, particularly temperature, humidity and rainfall, determines the rate at which water from the reservoir lakes is needed.

While summer water management generally means conserving water supplies, unusually heavy rainfall at any time during the season can increase the risk of flooding. At these times, levels rise and flows are increased to move water out of the system. This may sometimes result in closures to navigation until flows and levels return within safe navigation limits.

TSW Study

In 2005, the federal government initiated a review on the future of the Trent/Severn Waterway. The result of this work was an excellent report entitled “It’s All About Water”. The primary recommendation of this report was the establishment of an Independent Water Management Agency (IWMA), which as to have regulatory responsibilities for water usage in the entire waterway, including the reservoir lakes. However, that same government then chose to ignore this recommendation, much the displeasure of those on the reservoir lakes.

Water Level Forecasts

One of the problems in the reservoir lakes is trying to adjust one’s boating habits to the changing water levels. Rocks, that were not visible in the spring, start protruding above the water in mid-summer. Shoals become significant hazards in late summer. On some shores, docking becomes a real challenge in September.

To help combat this problem, in 2009, Parks Canada decided to start provide weekly forecasts of the expected water levels in all reservoir lakes. The forecasts are updated on the first regular working day of the

week and are readily available from the CEWF web site. These forecasts are not avialable during all weeks of the year. They are typically provided in July, August and September when levels are in their greatest state of flux. A handy link to that site is provided on the KLA web site.

The following definitions should help to interpret the following forecast table (Figure 3.4):

- **Sill Level** - the base level of a dam, when all logs have been removed
- **Start Date** - shows the water level above the dam sill level on the noted date (in metres), and how many inches that level is down from the full level reference.
- **End Date** - shows the forecast height of the water above the dam sill level on that date (in metres), and how many inches that level is down from the full level reference.
- **Target Differential** - is the number of metres or inches by which the lake is forecast to change over the two weeks (a negative number is a lower water level; a positive number is an increase).
- **Full Level** - a reference point, indicating the height of the water above the dam sill level (in metres and inches), when all of the logs are in place and the water level is at its maximum.

Figure 3.4 – Weekly Water Levels Forecasts

Trent-Severn Waterway National Historic Site of Canada
Water Management Program
Forecasted Water Levels - Haliburton Area

Start Date: 26/07/2010
End Date: 09/08/2010

	Start Date		End Date (Target)		Target Differential		Full Level	
Lake Name	Water Level (m)	Inches down (")	Water Level (m)	Inches down (")	metres (m)	Inches (")	metres (m)	Inches (")
Gull River Watershed								
Kennisis Lake	2.495	13.6	2.280	22.1	-0.215	-8.5	2.84	111.8
Redpine Lake	0.971	9.8	1.057	6.4	0.086	3.4	1.22	48.0
Nunikani Lake	2.198	33.5	2.356	27.3	0.158	6.2	3.05	120.1
Hawk Lake	4.110	12.2	3.695	28.5	-0.415	-16.3	4.42	174.0
Halls Lake	2.230	11.0	2.126	15.1	-0.104	-4.1	2.51	98.8
Sherborne Lake	1.210	12.2	1.110	16.1	-0.100	-3.9	1.52	59.8
Kushog Lake	2.981	4.7	2.809	11.5	-0.172	-6.8	3.10	122.0
Percy Lake	1.870	4.3	1.859	4.8	-0.011	-0.4	1.98	78.0
Haliburton Lake	2.800	9.8	2.620	16.9	-0.180	-7.1	3.05	120.1
Redstone Lake	3.376	11.2	3.197	18.2	-0.179	-7.0	3.66	144.1
Eagle Lake	2.080	8.3	1.672	24.3	-0.408	-16.1	2.29	90.2
Twelve Mile Lake	1.708	10.7	1.696	11.2	-0.012	-0.5	1.98	78.0
Horseshoe Lake	2.303	5.4	2.224	8.5	-0.079	-3.1	2.44	96.1
Big Bob Lake	2.730	6.7	2.652	9.8	-0.078	-3.1	2.90	114.2
Little Bob Lake	1.380	5.5	1.305	8.5	-0.075	-2.9	1.52	59.8
Gull Lake	2.132	-0.1	1.869	10.3	-0.263	-10.4	2.13	83.9
Moore Lake	1.447	2.9	1.400	4.7	-0.047	-1.9	1.52	59.8
Burnt River Watershed								
Drag Lake	2.224	-0.9	2.044	6.1	-0.180	-7.1	2.20	86.6
Canning Lake	1.286	7.2	1.177	11.5	-0.109	-4.3	1.47	57.9
Miskwabi Lake	2.070	8.7	1.963	12.9	-0.107	-4.2	2.29	90.2
Loon Lake	1.634	12.0	1.391	21.6	-0.243	-9.6	1.94	76.4
Koshlong Lake	2.270	0.8	2.078	8.4	-0.192	-7.6	2.29	90.2
Farquhar Lake	2.760	7.9	2.619	13.4	-0.141	-5.6	2.96	116.5
Grace Lake	1.980	1.6	1.846	6.9	-0.134	-5.3	2.02	79.5
Esson Lake	2.810	9.4	2.644	16.0	-0.166	-6.5	3.05	120.1
Little Glamour Lake	1.690	5.5	1.669	6.3	-0.021	-0.8	1.83	72.0
Big Glamour Lake	2.130	12.2	1.838	23.7	-0.292	-11.5	2.44	96.1
Gooderham Lake	1.770	2.4	1.621	8.2	-0.149	-5.9	1.83	72.0
Contau Lake	1.650	1.2	1.595	3.3	-0.055	-2.2	1.68	66.1
White Lake	1.820	0.4	1.735	3.7	-0.085	-3.3	1.83	72.0
Crystal Lake	2.580	6.3	2.423	12.5	-0.157	-6.2	2.74	107.9
Anstruther Lake	2.150	5.5	1.959	13.0	-0.191	-7.5	2.29	90.2
Mississagua Lake	2.319	4.8	2.012	16.8	-0.307	-12.1	2.44	96.1
Eels Lake	3.100	22.0	3.100	22.0	0.000	0.0	3.66	144.1
Jack Lake	1.590	13.4	1.514	16.4	-0.076	-3.0	1.93	76.0

Table is Courtesy of Parks Canada and CEWF – 28 July 2010

(***Koshlong data can be found in the fifth row of the Burnt River grouping.***)

3.13 Observations – Water Levels

- *Water levels in* Koshlong *Lake are controlled by Parks Canada by means of a dam at the far-west end of the lake.*
- *The main consideration for lowering the water level is to provide downstream water for the Trent-Severn Waterway and to meet the needs of the downstream communities,*
- *The major factor concerning the timeframe to reach the final (low) water level is to accommodate ideal trout breeding, but more research is needed to determine the best shoals and best depth for spawning at those shoals,*

- *Current water level management may have a detrimental effect on the natural ecosystem, but no studies have been prepared to support or oppose this claim.*

3.14 Recommendations – Water Levels

11. ***The KLA should encourage MNR to prepare an assessment of the impact of the fall drawdown and winter water level on Lake Trout spawning success and the natural environment.***

12. ***The KLA should continue to support and work with the Coalition for Equitable Water Flow (CEWF) as it advocates for better water management practices.***

13. ***The KLA should encourage Parks Canada to install remote sensors to provide real-time data on water levels, rather than relying on weekly on-site visual readings. This has already been done on other lakes.***

14. ***The KLA should encourage Parks Canada to re-consider replacing the existing operating dam structure with a remotely-operated system, to more accurately control the water level fluctuations, particularly when abnormal rainfall or drought conditions are encountered.***

15. ***The KLA should also encourage Parks Canada to enhance the existing dam with a hydro-electric facility that can feed power into the electricity grid. Money earned could be used to offset operating and maintenance costs of the facility. A small percentage of the money earned from that power could be awarded to the municipality of Highlands East.***

3.15 Access

Public boat launch access to Koshlong Lake is provided at two locations. The westerly access point is at the end of Koshlong Lake Road and serviced by a permanent municipal dock. The other is at the end of Dead Beat Bay, along Telephone Bay Road.

There are two public roads (Koshlong Lake Road and Wolverine Trail) and many private roads that provide access to the lakeshore properties. Public and private road networks around the lake are shown on the map in APPENDIX A – KLA Map 2008. All cottages and residences on the shores have road access. However, water access is still required for island properties.

3.16 Observations - Access

- *There are two (2) public boat launch points.*
- *All mainland properties are accessible by road.*
- *There are four private island properties that are accessible only by water.*

3.17 Recommendations – Access

16. ***Local municipalities should maintain the public roads on a regular basis, including periodic resurfacing with environmentally friendly products.***

17. ***Local municipalities should retain and maintain existing public access sites.***

18. ***Additional public access sites should not be developed.***

3.18 Ownership

Land along the shoreline of Koshlong Lake is approximately 60% privately owned with the remaining 40% being Crown land. The reverse is true concerning backlot areas (those with no shoreline) around the lake, which are predominantly crown land. There is only one major private landowner that owns a large tract of backlot land, to the west of Camp Wanakita. This lot stretches primarily along the north side of Koshlong Lake Road from Wanakita to the bridge that crosses the Burnt River and it encompasses a large pond called Colonel Kenny's Lake. The developer is DelZotto (using the name Dysart Land Corporation). Although there has been sporadic tree clearing and logging trails, there has not been any development of this land.

3.19 Observations - Ownership

- *Crown land on the shorelines enhances the natural beauty of the lake.*
- *Crown Land in backlot areas reduces the possibility of commercial development.*
- *MNR considers Koshlong Lake to be 'at capacity' and will not sell any Crown Land with shoreline.*

('At Capacity' means that the dissolved oxygen level in the lake waters is just above the minimum level sufficient to support the existing fish population. The sale and development of new shoreline properties would tend to reduce the dissolved oxygen level in the lake and adversely affect the fish population.)

3.20 Recommendations – Ownership

19. ***A stewardship program to encourage and educate property owners on the maintenance and restoration of shorelines should be introduced.***

20. ***The MNR should be encouraged to retain the remaining Crown shorelines on Koshlong Lake***

3.21 Global Warming (Climate Change)

Although some are still in denial, Global Warming is an established scientific fact.

Studies show that although the world's overall climate was rather unsteady before the last ice age, the climate has been remarkably stable in the ten thousand years since the last glaciation. However, measurements of climate trends since the industrial revolution in the mid-1800s, have showed a clear and gradual rise in global mean temperatures. Weather patterns aside, the global warming means that the populations of some of the native species are going to change.

Predictive models show that southern species of plants and animals will move northward, and northerly-tending species will either retreat further north, or compete (probably not very well) with the advancing southerner species or not simply survive. As example, over the next several decades shagbark hickory (near its northern limits here now) will likely extend into the present-day boreal, well north of Algonquin Park. In another case, the Pine Beetle has migrated further north in BC, with catastrophic results.

A concern at Koshlong Lake is the overall warming of the lake. Lake trout have an ideal summer temperature range of 9 – 13º C. Bass prefer temperatures in the 18 – 24º C range, particularly for spawning. While warming of the lake favours warm water species, it makes conditions less tolerable for cold-water species, such as lake trout. Compounding the situation is that warmer water encourages growth of aquatic plants and algae, which consume oxygen when they die - again, causing additional stress to the lake trout and other fish.

The most devastating aspect of global warming will be the ferocity of storms. As more energy is pumped into the atmosphere, in the form of heat, that energy must go somewhere. This excess energy will mean that storms will become more violent. Confirmation of this is evident in Hurricane Sandy of 2012 and the floods of 2013 in Calgary, Toronto and Minden. It is going to be a wild ride and we are causing it.

As individuals, our carbon footprint might be small, but collectively the activities of human beings are the major contributor to global warming. Even the many trips to and from the lake have an impact on global warming trend. With tongue in cheek, it can be argued that we should fight against global warming by spending the whole summer at the lake, rather than driving back and forth most weekends.

The intent of this section is not to encourage everyone to stay at the lake, but rather to make people aware that global warming is happening and to become more aware of the changes to the lake (eg. water temperatures in July and August) and the probable differences in the animal, fish, insect and plant populations (particularly migrating birds).

Chapter 4 Social Elements

Social elements enhance the quality of life on Koshlong Lake. According to many shoreline residents, “a lake environment is a place where you can relax, rejuvenate and get away from it all”. For a growing number of Ontarians, it is a natural environment in which to enjoy retirement, and for others it is a place to open new businesses and create recreational opportunities such as marinas, restaurants and bed and breakfasts. This diversity makes social elements difficult to identify and protect, but they are some of the most important elements that contribute to one’s experience on any lake. On Koshlong Lake these social elements include recreational activities, cultural sites, landscape and aesthetics, and noise and lighting.

4.1 Recreational Boating

Boating is the second most popular recreational activity on Koshlong Lake, next to swimming, with over 86% of resident survey respondents citing it as a preferred recreational activity. All types of vessels are on the lake from non-motorized boats, such as kayaks and canoes, to large inboard motorboats and pontoon boats.

There are no records on the type and number of boats on Koshlong, prior to the KLA 2008 survey. However, it is quite likely that all cottagers had at least one small boat before roads were built. These were probably 13’ to 15’ aluminum boats (often referred to as ‘tin boats’) with a 9.9 engine.

As recent as 1980, there were only two inboard/outboard boats on the lake and the most common boat was a 15’ runabout with a 70HP outboard engine. By the turn of the century, this had changed.

Figure 4.1 indicates the percentage of boats (motorized and non-motorized) by household. The number of boats per household was not considered. Surprisingly, this result implies that 9% of households did not have any boats. Bear in mind that the results are only accurate for those that replied to this survey. But it gives a good indication of type of boats on the whole lake.

Figure 4.1 – Type of Boats – by Household

Type of Boats	%
Motorized Boats	82
Non-Motorized Boats	91

Source: Koshlong Lake Survey, 2008

Figure 4.2 shows the type of motors used by powerboats (not including pontoon boats). At that time, the vast majority of motors were the outboard type. But that ratio seems to have changed dramatically in the past few years, as more and more inboards are seen.

Figure 4.2 – Type of Boats – by Household

Type of Engines	%
Outboard Motors	82
Inboard and I/O Motors	18

Source: Koshlong Lake Survey, 2008

Boating is a very popular activity but there are several issues, such as safety, speed and reckless operation. As boats become larger, more powerful and faster, these issues can become more significant. There are also potential environmental concerns associated with larger boats - for example wake damage to loon nesting areas in the southern shoals of Bark Bay. Another concern is the possibility of wake damage to docks and docked boats, and increased noise from the boat engines and occupants of the boats. All boaters are therefore requested to not only be aware of these issues, but also to become good boaters by minimizing those problems by exhibiting safe and sensible boating habits.

4.2 Personal Water Craft (PWC)

There are very few PWC's on Koshlong Lake. When these vessels were first introduced they were quite noisy and very dangerous in the hands of young novice boaters. Newer PWC's are generally more quiet and easier to control. They are fast, fun and can turn on a dime. They are also quite safe, but only if handled properly. Some can be steered when the engine is in idle and some have brakes.

In 2001, Senator Mira Spivak introduced Bill S-26 (now Bill S-8), The Personal Watercraft Act. This Bill requires the Minister of Transportation to restrict PWC's wherever local authorities find they cause excessive problems. Restrictions could take the form of limiting hours, setting speed limits, or outright bans. The Federation of Ontario Cottagers Associations Inc. (FOCA) supported the Bill.

Luckily, PWC's have not presented a problem on Koshlong and there has not been a need or outcry to restrict their operation.

4.3 Speed

Speed is always a concern - on highways and on water. The environmental impacts of inappropriate boat speeds and wakes can be large and have long term or permanent negative effects on wildlife and vegetation. When propeller driven boats venturing into shallow waters, they not only increase turbidity and but can also damages weed beds, resulting in the loss of fish habitat. Disturbance of nesting waterfowl is also a problem, as the nest might be swamped and all eggs lost for that season.

Unfortunately, these problems are not addressed when boaters take the Boaters Certificate course. However, they should be known by all boat operators. Responsible boaters should not only be aware of potential problems, but also be ready to apply a strong dose of common sense to mitigate them.

Technically, there is a 10 km/hr speed restriction for all vessels within 30 metres of the shoreline. But there is much debate on this point and the issue of boat wakes. Does a boat on 'full plane' cause more of a wake than one travelling at a slower speed? Does a tin boat with one person travelling at 20 km/hr cause fewer problems than a fully loaded 18ft. powerboat travelling at 10 km/hr? If a boat that is 80 metres from the shore travelling at 40 km/hr creates a one-foot wake, is this any less of a problem than a one-foot wake created by a boat travelling at 30 km/hr 40 metres from a shore?

There is also a major issue of driver attentiveness. When water skiing or tubing, there is always a tendency for the driver to look behind and watch the action rather than looking ahead. In the spring, there are always logs and occasionally docks floating anywhere in the lake. In the summer, there is always the possibility of swimmers venturing a distance from shore or loons surfacing unexpectedly. These pose potential problems to the boat, the swimmers and the loons.

As a rule of thumb, boat operators should always be aware of what is in their path and the wake that they are creating. Speeding generally decreases your reaction time and increases the severity of your wake. The answer - slow down and drive safely and sensibly.

People who witness unsafe boating also have a responsibility – namely to report the offence. The KLA Incident Reporting Form should help. In most cases, speeders are long gone by the time the police are on the scene, so it is necessary to take down the required information when assisting with community based policing. It is important that boat registration numbers and descriptions of the drivers of the offending vessels be recorded. Eyewitnesses would have to be willing to testify in court, and video recordings are extremely useful as evidence.

4.4 Navigation Aids (Buoys)

In 1970, the Ministry of Natural Resources produced a lake bottom contour map. This information has been incorporated into the official Koshlong Lake Map, which was distributed to all property owners in 2008. That map may not be accurate and **should not be used for navigation purposes**. But it is the best map available, and boaters are dependent on the general depth contours shown on the map and their own familiarity with the lake's features and navigation aids. A lack of awareness could result in unwanted 'direct experience' with hazards.

As the water level drops in August, the major hazards become quite apparent. But, what are not obvious are the new shoals that come into play. Every boater should therefore be familiar with the lake's underwater contours and avoid shallow areas when possible – particularly in August and later.

Although the KLA has distributed the lake contour maps, it has not taken responsibility for the placement of any buoys or markers to identify shoals or the lighthouse at 'the Narrows'. For everyone's benefit, it is expected that these navigation aids will continue to magically appear, as they have in the past. Officially approved marker buoys may be obtained from the KLA.

4.5 Enforcement and Regulations

Operator Competency Regulations are now in effect for powered recreational vessel operators anywhere in Canada. This program was phased in over a number of years. Since 1999, any operator under the age of 16 was required to have a Pleasure Craft Operators Card (PCOC). In 2002, all operators of powered recreational vessels under 4 metres (13.1 ft), regardless of age, must have been certified. The final phase of this legislation came into effect on September 15th, 2009, so now operators of all powered recreational vessel (including PWC's) must have a competency card.

Operators of paddleboats and canoes (unless used with a motor) are not required to have a PCOC.

The boater's exam is maintained by Transport Canada and is administered by a list of approved teachers that it has licensed. Unlike an automobile driver's license that must be regularly renewed, the card is valid for life.

There are courses available through the Canadian Power and Sail Squadron and the Canadian Coast Guard. Information is available on the web sites http://www.ccg-gcc.gc.ca and http://www.cps-ecp.ca or by calling the Boating Safety Information line at 1-800-267-6687.

It is an offence to not carry a PCOC, while boating. When patrolling the lake, the OPP will ask boat operators to show their PCOC. There is a zero tolerance policy regarding this card, so failure to produce it when asked will result in a $250 fine. A photocopy of the card will not be acceptable.

The OPP will also ask to see that all safety equipment (eg. lifejackets, whistle, bailing bucket, etc.) is on board. Everyone should be aware that seat cushions are no longer approved as a lifejackets. You must have a jacket that is Canadian Standards Association approved and meets the specifications for usage (eg. it has to conform to your body size and weight). Safety equipment standards change periodically, so everyone is expected to be aware of current regulations and comply with them.

Drinking and driving is not only frowned upon, it is illegal and subject to a fine. Again, the OPP has a zero tolerance policy on this issue. No more booze cruises.

4.6 Observations - Boating

From the 2008 Survey:

- *The most popular/numerous type of boat on the lake is a canoe, followed by kayaks and then powerboats.*
- *Ninety one percent (91%) of all respondents stated that they engage in power boating and seventy percent (70%) said it is an important recreational activity.*
- *The average household has about three (3) watercraft, and there are more non-powerboats than powerboats (when counting ALL boats, including canoes, kayaks and sailboats at Wanakita).*
- *Seventy-five percent (75%) of all households have at least one canoe.*
- *Eighty-four percent (84%) of all motorized boats have 2 stroke engines.*
- *Twenty-two percent (22%) of all boats have greater than 101 HP engines.*
- *There were usually only two personal watercraft (PWC's) on the lake.*

NOTE – from casual observations, it is obvious that the boating makeup on Koshlong has significantly changed, even from 2008. There are many more inboards and the outboards are more powerful. Pontoon boat are becoming the choice for more cottagers of all ages and PWC`s are gaining popularity.

4.7 Recommendations - Boating

21. The KLA should continue to educate members about safe boating practices for the benefit of all those who use the lake.

22. A Safe Boating Guide should be produced. It would focus on current boating safety rules and regulations, and include fines and penalties for infractions.

23. Boaters should be encouraged to reduce speed, noise levels and wakes.

24. Any swimmers that venture far from the shoreline should be encouraged to confine their activities to well-lit daytime periods and to wear a brightly coloured bathing hat, so that they are more noticeable. Staying closer to the shoreline would also be a good idea.

25. Boaters should be encouraged to wear an approved lifejacket, particularly when canoeing, kayaking and sailing.

4.8 Social, Cultural and Historic Sites

Cultural and historic sites are elements that add to the character of the lake and improve the social and living experiences. Where appropriate, these sites should be protected and enhanced. The map in APPENDIX A - identifies the location of many of these sites.

Points of Interest on Koshlong Lake

1. Camp Wanakita – on the northern shore of the main lake. This is the largest commercial and privately held area on Koshlong and in Highlands East. With over 7,000 visitors enjoying the year-rounds activities offered by the camp it is also the busiest part of the lake. For a variety of reasons, many would argue that it is also Koshlong's greatest man-made asset.

2. Divers Rock – is located on the south shore of the main lake. There are several places at varying heights that are great for diving or jumping. Looks like fun, but not for the timid (see Picture 4.1)

3. The Heronry – a shallow area at the most-westerly part of Bark Bay. At one time, herons may have nested there, but as more people began settling on Koshlong, the resulting noise and activity caused them to seek a quieter area.

4. Umbrella Island – this is the only uninhabited island on Koshlong Lake. It is quite small, rocky and has very few small trees. At one time it might have looked like the top of an umbrella protruding from the waters. It is available for daytime camping, and of most importance, is the launching point for the annual Canada Day fireworks display.

5. Koshlong Lake Dam – at the most westerly part of the lake. The dam is owned by Parks Canada and managed primarily for the benefit of the Trent-Severn Waterway.

6. Koshlong Lake Marina – located at the northern tip of Dysart Bay. Was once a busy marina and general store, but is now a private home.

7. Water Ski Courses – There are two officially approved water ski courses. One near the south-west shore of the main lake and the other in the south-east shallows of Bark Bay. These have been authorized by the Coast Guard, for the exclusive use of the owners, during prescribed hours. (NOTE – *The course in Bark Bay is not used during loon nesting season*.)

8. Elephant Rock – A large smooth and barren rock on the north shore, near the dam. A great resting and sunning place after a long canoe trip.

Picture 4.1 – Divers Rock

4.9 Observations – Social, Cultural and Historic Sites

- *There are many local sites that add to general interest and the quality of life on Koshlong Lake*

4.10 Recommendations – Social, Cultural and Historic Sites

26. Important historical and natural sites should be identified and protected from incompatible usage or development.

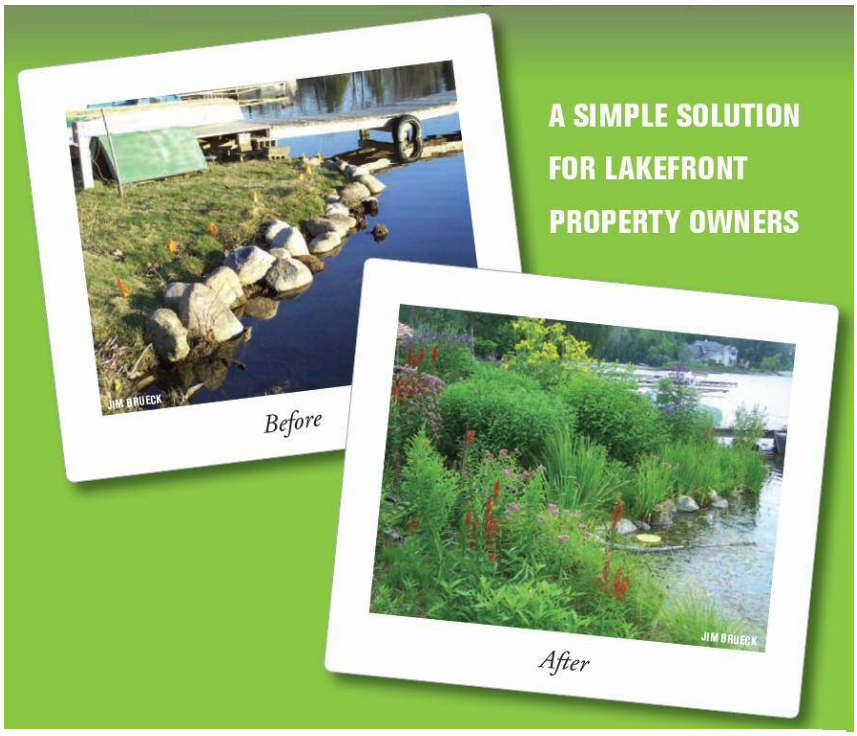
4.11 Landscapes and Aesthetics

Aesthetic values differ greatly from person to person. Some people prefer the "urban park like setting" that is characterized by manicured lawns and vegetation. Others prefer a "natural setting", with limited display of human structures. From an aesthetic perspective, any viewpoint is correct for a specific property owner and the owner should be free to do whatever she wishes with her property – within reason of course. However, from an ecological perspective natural landscapes are important, in that they contribute to the health and natural beauty of the lake.

Picture 4.11 – Natural Shorelines

Environmentalists agree that the most important area of a property is the Riparian area. This is the upland area next to the shore or beach. Some call this area the 'ribbon of life'.

MRI studies of brain patterns have shown that when subjects were exposed to natural surroundings (even when simulated) it produced a calming and positive effect.



Courtesy of the State of Michigan – Natural Shorelines for Inland Lakes Brochure

Natural surroundings are one of the main reasons why people have been drawn to Koshlong Lake.

The main advantages of a natural shoreline of native plants are:

- Erosion Control – a buffer of at least 3 metres will limit the runoff from the property into the lake. This runoff may contain some residual effluent from a septic system or fertilizer from flowerbeds and soil from a sloping landscape. By slowing and absorbing that runoff, the buffer is helping to keep the lake uncontaminated and clean.
- Cleaner Air and Water – In addition to runoff control, shrubs and trees will help to clean the air by absorbing carbon dioxide and producing oxygen.
- Wildlife Protection – small animals, such as rabbits, that are drawn to the water to quench their thirst or forage in the underbrush are given some protection from predators who will find it more difficult to see them.
- Mitigating Wildlife Problems – Canada Geese will be deterred from scrambling onto one's property by a thick natural shoreline of native shrubs and flowers.
- Shade – the shade from shrubs and even more so from trees provides a cooling effect on the air and water. Although lying in the sun can be enjoyable, people as well as animals, birds, fish, amphibians and snakes also need shade to cool off. A natural shoreline of shrubs and trees will attract more wildlife, including birds that prey upon insects and that's not a bad thing (except for the insects).
- Privacy – even a green buffer only 3-feet high can give increased privacy without limiting one's view and enjoyment of the lake.
- More Pleasing Shoreline – if people liked looking at manicured lawns, then would stay in the city. A natural shoreline is a more pleasing and one of the main reasons why boaters enjoy leisurely cruising around the lake.
- Noise Reduction – shrubs and trees will tend to mitigate (but unfortunately not eliminate) noise from rowdy neighbours.
- More Leisure Time – less time spent mowing a lawn means more time enjoying the lake.
- Increased Land Value – people are generally attracted to lakes where that water is clean and the vistas are natural. Therefore natural shorelines will increases the property value of homes and cottages on lakes with those qualities.

"A single mature tree can absorb carbon dioxide at a rate of 48 lbs./year and release enough oxygen back into the atmosphere to support 2 human beings."
- McAliney, Mike. Arguments for Land Conservation: Documentation and Information Sources for Land Resources Protection, Trust for Public Land, Sacramento, CA, December, 1993

"On average, one tree produces nearly 260 pounds of oxygen each year. Two mature trees can provide enough oxygen for a family of four."
- Environment Canada

Is it any wonder why Haliburton County developed a Shoreline Tree Preservation Bylaw in 2012? A copy of the bylaw is available from the county web site - http://www.haliburtoncounty.ca/documents/3505ShorelineTreePreservationBylaw.pdf

In order to maintain the natural appearance, the shoreline development of fixed structures should also be done with a discerning eye. High profile structures, such as large or brightly painted buildings, detract from the natural beauty of the shoreline.

4.12 Observations – Landscapes and Aesthetics

- *Survey respondents indicate that one of the most valued attributes of the lake is the natural beauty and natural shorelines.*
- *Crown Land (particularly shorelines) adds to the natural beauty of the lake and must be protected from development.*
- *High profile structures, such as large or brightly painted buildings, detract from the natural beauty of the shoreline.*

4.13 Recommendations – Landscapes and Aesthetics

27. ***Work with the local townships and the Ministry of Natural Resources to ensure that commercial development and resource management activities (forestry, mining, pits and quarries) do not occur in the backlots, on heights of land, scenic areas, or within the viewscape of Koshlong Lake.***

28. ***Take steps to ensure that the significant removal of vegetation does not occur along the treed horizon or natural shoreline. Shoreline preservation and restoration should be encouraged, for ecological and aesthetic reasons.***

29. ***Work with the county and municipalities so that their Official Plans contain policies to recognize the importance of landscapes and natural vistas on lakes. (See section 7.21 for more details on current bylaws).***

4.13 Noise and Lighting

The purpose of this section is to raise the reader's awareness of two issues that are often overlooked, but have a great impact on people trying to enjoy their time at the lake.

Peace and tranquility is highly rated as one of the most essential elements of life on Koshlong Lake. Ninety-seven percent (97%) of the residents indicated it as an important value.

Conversely, noise and indiscriminate lighting impact the enjoyment of a natural setting. About half of the survey respondents said that night-time noise and lighting were at least a significant problem. So if you are not bothered by either of these issues, then it means that at least one of your neighbours is. Figure 4.7 outlines the concerns of residents based on the Residential Survey.

Figure 4.7 – Resident Noise and Lighting Concerns

Negative Values	% Very Significant	% Somewhat Significant	% Significant	% Not Significant
Daytime Noise	11	11	12	63
Night Time Noise	15	12	25	46
Lighting	14	16	16	51

Source: Survey, Summer 2008

(*The full responses to the 2008 Survey will be found in APPENDIX S*)

The responses to the question of Negative Values in the 2008 Survey indicated that 34% were significantly impacted by daytime noise. But a glaring 52% were bothered by night-time noise. The survey also indicated that 51% were impacted by boat traffic and 59% specifically by PWC's. A smaller problem was that of rowdy campers where 41% said it was a significant problem. Not to be outdone, 44% said that rowdy neighbours were a bane of theirs. The result of these responses shows that even if you are not bothered by noise, the chances are that your neighbour is adversely affected by it.

Some of the cottages along the shoreline have cleared natural vegetation resulting in the need for lawn mowers, weed whips, and leaf blowers. Aside from the visual impact of urbanization, the lack of trees to absorb sound means that noise intrusion is increased where open landscaping is practiced. The sound of a stereo being played on a deck or other human noises can be heard from great distances, especially across water where there are no barriers to sound.

There is no right time for noise. The most objectionable time is just after sundown and at a night, when people are curled up with a good book or trying to sleep. This is underlined by the Highlands East by-law that forbids unnecessary noise between the hours of 11:00 pm and 6:00 am. The next most intrusive is early morning when people are trying to enjoy a quiet breakfast or just absorbing the tranquility of nature during that period.

Most human activity occurs in mid-afternoon, when the sounds from tubing, water skiing, jet skiing, boating and frolicking all meld like an out-of-tune rock-group practicing a new song. At that time, the additional sounds from lawnmowers, leaf-blowers, chainsaws, skill-saws and the like are least

bothersome. Also, keep in mind that the same principle for noise is one that is common to speeches; namely, 'the shorter, the better'.

Light pollution is another human-made impact that affects many shoreline residents. However, it is apparent that strategically located mood lighting can add to one's enjoyment and shoreline lighting can serve as landmarks to help evening navigation. Outdoor lighting is also a safety measure.

The 2008 Survey indicated that about 46.5% of the respondents are significantly or moderately impacted by light pollution (ie. Outdoor Lighting).

The brightening of the night sky is a universal problem that, until now, continues to grow. Municipalities are taking steps to ensure that street lighting is directed down. But more could be done by the general public. The popularity of landscape lighting, string lights, garden lighting and especially poorly aimed spotlights adds to the level of light pollution and annoyance around the lake.

Waterfront lighting poses a special problem, since water reflects light as it crosses a lake and wave action multiplies that effect. The spotlight that lights up one's shoreline may seem to vanish as it shines out over the water. However, when viewed from an opposing shore, its light is greatly magnified and that one light source becomes hundreds of bothersome lights dancing across the waves.

Light pollution also presents a problem for plant and animal physiology, as well as ecological dynamics. The adverse effects of light pollution on wildlife can sometimes be subtle. For example, female fireflies produce their light to attract males only when ambient lighting is below the intensity of a full moon. When lighting exceeds that threshold females are not attracting males and their nocturnal reproductive behaviour is curtailed.

Many small animals, such as salamanders and flying squirrels, will only forage at night when they are less visible to prey animals like owls. Unnatural lighting will not only have an impact on these animals, but may have undesired consequences on plant proliferation.

Research has shown that nocturnal insects that congregate around light sources are at greater risk of predation. Bats, which can consume 30-50% of their body weight in insects each night, gorge on these insect masses found near light sources. Some insects are important pollinators and food sources for many other species. Those that are unable to avoid bats are removed from the local food chain, reducing the local biodiversity and adversely impacting the ecosystem.

Another adverse effect may support the growth algae blooms. Many zooplankton only forage near water surfaces at night, during darkest hours. Lighting sources greater than that of a half-moon can keep zooplankton from grazing on algae near the surface thereby encourage algae blooms.

Last, but not least, is the impact on the environment and our purse strings. Every unnecessary light wastes electricity and money, and adds to the carbon footprint when that electricity is produced from fossil fuels.

Individually, these issues may seem miniscule. But collectively from a lake area, a county and all of cottage country, the problem becomes quite significant. Unless some initiatives are taken to inform the public about the effects and costs associated with lighting, the adverse impacts on people, animals, plants and biodiversity will increase.

For those that insist on night-time lighting, please note that the spectrum of light can have a profound effect. Full spectrum lighting that contains blue and ultraviolet should be avoided. Blue light send a signal to plants and animals that it is daytime and ultraviolet is attractive to insects. Longer wavelengths, such as yellow and red, tend to have less impact, particularly on insects.

4.14 Lighting Solutions

Light pollution is both simple and difficult to address. It is simple because once the light is switched off or redirected, the problem vanishes. It is difficult because its solution involves an awareness and cultural change by people. However, the following points should help to mitigate the problem:

1. Is the light needed for safety or merely a convenience?
2. Is the light directed to where it is needed, or is it shining unnecessarily upward or toward a neighbour's property (particularly across the water)?
3. Is the light intensity correct or is it too high for the stated objective?
4. Is the light shining only when needed, or should it be controlled by a timer or motion detector?
5. Is full spectrum light needed or could light with longer wavelengths be used?

4.15 Observations – Noise and Lighting

- *A high majority of those surveyed (93%) indicated that peace and tranquility were either very important or somewhat important to their quality of life at the lake.*
- *Excessive and unnecessary lighting detracts from the natural ambiance of the lake and results in reduced visibility of the stars.*
- *Unnatural lighting has an adverse effect on ecosystems.*

4.16 Recommendations – Noise and Lighting

30. The KLA should educate members on the detrimental aspects of noise and light pollution.

31. The KLA should provide members with examples of appropriate lighting techniques.

4.17 Safety – Personal and Property

Since 911, personal safety has become more of an issue. We suffer in silence as airport screening becomes more intense and restricting. The ease of crossing borders, particularly the US border, is no longer the quick and easy experience that it once was. The Canadian G8 and G20 Sessions in June 2010 showed that politicians will spend staggering sums and inconvenience thousands of law-biding citizens in order to protect fellow politicians from the 'great unwashed'. But, are we any safer now than we were in the 20th century? The answer is quite debatable.

Personal Safety

Another question is,' are we any safer in cottage country than in an urban area?' A close look at crime statistics (on a percentage basis over several years) will no doubt show that there is very little difference. People are still people and criminals are still criminals, no matter where they live. So from the perspective of human interaction, there is probably little, if any, difference between staying at Koshlong and living in a more 'civilized' area in Toronto.

However, there are two elements in cottage country that is not a normal problem in an urban area. The first element is the wilderness. We co-exist with wild animals and certain plants that are not encountered in a big city. However, the chances of being bitten or scratched by a domestic animal are much higher than being injured by a wild animal, since native wild species are quite wary of human beings and will go to great extents to avoid contact with people. Venomous snakes have never been seen or reported in Haliburton, so they are not a problem.

The other element is hunting. According to the International Hunter Education Association approximately 1,000 people in the US and Canada are accidentally shot by hunters every year, and just under a hundred of those accidents are fatalities. Most victims are hunters, but non-hunters are also sometimes killed or injured. Although some other forms of recreation cause more fatalities, hunting is one of the few activities that endangers the entire community, and not just the willing

participants. (From http://animalrights.about.com/od/wildlife/f/HuntingAccident.htm) Canada has its fair share of fatalities. In the first part of October 2012 there were four hunting deaths in Canada (one in Ontario, one in Alberta, one in Saskatchewan and one is BC) and one non-fatal incident in BC.

Although not limited to cottage country, people should be aware of harmful plants. Poison Ivy, hogweed and certain mushrooms pose a health problem.

Unfortunately, carnage on highways shows that we are more of a threat to wild animals than they are to us. So, from a personal safety point of view, just relax and be happy. But also take steps to avoid wild animals – more to protect them than to prevent them from injuring us.

4.18 Observations – Personal Safety

- *Wild animals are more at risk from injury or death from people that humans are from injury by them.*
- *People should take steps to avoid contact with wild animals.*
- *Extra care should be exercised during 'hunting seasons'*

4.19 Recommendations – Personal Safety

32. The KLA should educate members on the characteristic of wild animals and promote programs like 'Bear Smart'.
33. Members should become more aware of harmful plants, like poison ivy, hogweed and various mushrooms, and educate their children in order to avoid problems.

Protecting Private Property

As stated earlier, criminals are neither more nor less common in cottage country than in urban areas. Cottage break-ins have occurred around Koshlong and they will occur in the future, but steps can be taken to mitigate the problem.

There are two kinds of theft or break-ins that occur. One type is a random crime of convenience and usually involves young people who want to 'get some booze', or they see a quaint road sign or an attractive object and they seize on the opportunity to get what they want. Hiding attractive objects, closing curtains or blinds and locking windows and doors (particularly with good deadbolt locks) will generally prevent those crimes. More serious crimes are committed by professional criminals who see unoccupied cottages as easy targets. Watchful neighbours, alarm systems and multiple

deadbolt locks on doors may deter these criminals, but will not prevent them from exercising their craft. Bad weather and the snows of winter may defer their activities but will not stop them.

In both cases, property owners should report any vandalism, break-ins or theft to the OPP. Other illegal activity should be reported to the proper authority (eg. MNR, MOE, Canadian Coast Guard). Filling out the KLA Incident Report and sending a copy to the Koshlong Lake Association may help to arrest in criminal, or prevent similar activities.

4.20 Observations – Private Property

- *It may not be possible to prevent crimes of convenience or other criminal activity, but steps can be taken to mitigate the risk.*
- *Neighbours can help by watching the property of others.*
- *Marking valuable personal property may help to reclaim stolen objects.*
- *Never place yourself at risk when investigating a potential crime.*

4.21 Recommendations – Private Property

34. ***The KLA should investigate the Cottage Watch program supported by FOCA and the OPP, and adopt it if it seems viable.***
35. ***Members should always fill in a KLA Incident Report if illegal activity is observed.***
36. ***The KLA should acquire an engraving pen, for the use of members who wish to mark their valuable objects.***

Chapter 5 Natural Heritage

Koshlong Lake is an oligotrophic body of water - a lake that is lacking in nutrients. This is typical of northern lakes and they rarely experience significant algal blooms. Unfortunately, oligotrophic lakes are more susceptible to acidification because of the lack of calcium ions (nutrients) to buffer or neutralize the acid precipitation. Although natural systems are dynamic and fragile, they are also resilient systems.

This section examines the natural heritage features of the Koshlong Lake watershed, in order to identify potential issues and actions for the lake plan. Water quality, vegetation, streams, fish and wildlife and species at risk are topic of this section.

5.1 Water Quality

In general, there is no single measure that constitutes “good” or “poor” water quality because qualifying water quality depends on its use (ie. drinking water vs. navigational water vs. recreational use), and some water quality problems are treatable. Therefore, water quality is determined through the analysis of its chemical (nutrients, alkalinity, conductivity, total dissolved solids (TDS) and pH) and physical characteristics (turbidity, colour and odour).

All surface waters are subject to nutrient, sediment and toxic contamination, which come from the lake’s own substrate or runoff from the landscape. Sources of these contaminants are the soil, local vegetation and wildlife, precipitation and runoff, biological, physical and chemical processes as well as human activities.

Self-Help Program

In 1971 the Ministry of Environment (MOE) initiated a program to monitor and assess the water quality of lakes throughout the province. It was called the Self-Help Program and encouraged volunteers to collect water samples from their lakes for analysis in labs located in Toronto. These water samples were analysed for chlorophyll. This might seem surprising now, but at the time it was felt that Chlorophyll was an important indicator of the biological health of a lake.

Chlorophyll is a green pigment found in all algae. It helps to capture radiant energy from sunlight for photosynthesis. The amount of chlorophyll in a water sample can therefore be used as an indicator of the amount of algae in a lake. Algae provides a vital foundation for the biological food chain in this it is consumed by 'water fleas' (ie. Daphnia) which are eaten by small fish which in turn are eaten by larger fish and so on up the food chain.

Koshlong became a partner in this Self-Help Program; however, samples were taken on an irregular basis. Values obtained for 1988 are:

Koshlong Lake Results (1988)				
	Seymour Point		Wallace Island	
Sample Date	Chlorophyll (ug/L)	Secchi Disk	Chlorophyll (ug/L)	Secchi Disk
12-Jun	1.1	3.1	0.8	2.6
19-Jun	2.0	5.0	2.3	4.0
03-Jul	1.8	5.5	2.9	6.5
24-Jul	6.0	4.0	5.0	4.0
14-Aug	2.8	3.5	3.1	4.0
21-Aug	1.5	4.0	1.6	4.0
05-Sep	2.9	4.0	2.5	4.1
Average	**2.6**	**4.2**	**2.6**	**4.2**

Detailed readings were not readily available for other years, but average readings were as follows:

Koshlong Lake Results		
Sample Year	Chlorophyll (ug/L)	Secchi Disk
1973	2.0	5.7
1974	1.4	5.4
1975	1.9	6.5
1983	2.7	5.0
1985	3.4	4.7
1986	3.6	4.3
1987	3.9	4.3
1988	2.6	4.2
Average	**2.7**	**5.0**

Lake Partner Program

This program replaced the Self-Help Program. It retained the Secchi Disk analysis for water clarity, but replaced the analysis of chlorophyll with Total Phosphorous.

Since 1992, Koshlong has participated in the MOE's Lake Partner Program—an enhanced lake monitoring series—to improve information about the lake's water quality. Our Lake Stewards and volunteers have taken total phosphorus samples and water clarity depth measurements. This information allows the early detection of changes in the nutrient status and/or the water clarity of the lake, and enables natural resource managers to determine the type and level of recreational activity that could be sustained by the carrying capacity of the lake.

Water Clarity – Secchi Disk

Water clarity is a widely accepted indicator of lake trophic status. Secchi disks (*a 20 cm in diameter, black and white disc, which is lowered into the water by a rope marked in 1 m increments to determine the depth to which light penetrates the water column*) are the most inexpensive, common and effective tools used to measure the level of turbidity or water clarity. The common assumption is that the deeper the Secchi disk reading, the clearer and more oligotrophic the lake.
(Photograph by Leszek Bledzki)

Since 1992, The Koshlong Lake Steward has been taking Secchi Disk reading. These have been forwarded to the Ministry of the Environment, as part of their Lake Partner Program. The data in Figure 5.1 shows the readings that are on their database, as of 2009. No reasons have been given as to why readings are not showing for every year.

Figure 5.1 – Secchi Disk

Location	Year	(m)
Wallace Is.	**1992**	5.2
Wallace Is.	**1995**	5.3
Wallace Is.	**1997**	4.8
Wallace Is.	**1998**	5.8
Wallace Is.	**1999**	5.7
Wallace Is.	**2000**	5.5
Wallace Is.	**2001**	5.5
Wallace Is.	**2004**	4.0
Wallace Is.	**2006**	3.0
Seymour Pt.	**1992**	5.6
Seymour Pt.	**1995**	5.5
Barristers Bay	**2006**	2.7
Barristers Bay	**2007**	3.7
Bark Bay	**2004**	4.0
Bark Bay	**2006**	3.0
Bark Bay	**2007**	3.7
Dam-Outlet	**2004**	4.0
Telephone Bay	**2006**	3.7

Courtesy of MOE Nov 2012

Due to the variation in locations and missing data, it is difficult to see a real trend. Looking at the data for readings near Wallace Island, it would appear that water clarity has been slowly declining. An Analysis of the hundreds of lakes taking part in the program indicates a water clarity value in the range of 4.0 to 4.2 metres. However, there are mitigating factors that could have an impact on the Koshlong results.

Clarity is affected by suspended physical particles (sediment) and biological particles (algae and bacteria). Physical particles can enter the water through natural or human caused soil erosion, water discharge, or disturbance of an inflowing riverbed. Biological particles may enter the water through waste discharge (bacteria) or by proliferation of algae during warm summer months (algal blooms). High turbidity can increase water temperatures, reduce light levels for photosynthesis for plant growth, clog the breathing gills of fish and macro-invertebrates (benthic insects) and decrease habitat diversity.

Since the Secchi Disk readings are taken visually, the measurements are subject to various conditions. One's ability to see the disk can be directly affected by factors such as the glare from the sun, cloud cover, whether polarized sunglasses are worn. Two different people taking the same reading can also provide different results based on their eyesight. The Secchi Disk reading and Total Phosphorous

samples should be taken on the same day and before the 24th of May. Ideally, they should be done 2-3 weeks after the ice break-up, since stratification has not occurred and the characteristics of the lake are not dependent on the depth where samples are taken. More rigorous readings will have to be taken in order to determine whether a trend exists.

Total Phosphorous

Total Phosphorous (TP) is another indicator that is monitored in the Lake Partner program. These data are used to interpret the nutrient status because phosphorous is the element that controls the growth of algae in most Ontario lakes. Increases in phosphorous will decrease water clarity by stimulating algal growth.

Figure 5.2 shows the TP readings for Koshlong, as recorded in the MOE Lake Partner database. There are two columns shown for TP because two samples are taken at the same time. This minimizes the problem if one sample was contaminated. Therefore, the mean value between the two samples should be considered as the correct reading. As such, the average reading for Koshlong is 6.5 ug/L.

Figure 5.2 – Total Phosphorous

Location	Date	TP1 (µg/L)	TP2 (µg/L)	Calcium
Wallace Island	19-Jun-02	24.9	26.1	
Wallace Island	31-May-03	32.4		
Wallace Island	30-May-04	4.0	4.2	
Wallace Island	04-Jul-04	4.1	4.1	
Wallace Island	03-Jul-06	3.7	3.9	
Wallace Island	16-May-07	4.1	4.0	
Wallace Island	14-Jun-09	10.6	6.5	1.9
Wallace Island	18-Jul-10	5.6	5.0	1.9
Wallace Island	28-May-12	6.2	6.2	2.4
Seymour Pt.	14-Jun-09	7.3	5.0	1.9
Barristers Bay	04-Jul-04	5.5	4.8	
Barristers Bay	11-Aug-07	6.5	6.4	
Barristers Bay	28-Jun-08	13.2	15.0	2.3
Barristers Bay	14-Jun-09	6.5	6.9	1.9
Barristers Bay	18-Jul-10	5.8	5.4	1.9
Barristers Bay	28-May-12	4.4	6.2	2.3
Bark Bay-Inlet	05-Jul-04	4.1	3.6	
Bark Bay-Inlet	03-Jul-06	4.9	5.0	
Bark Bay-Inlet	11-Aug-07	6.1	6.9	
Bark Bay-Inlet	28-Jun-08	7.0	5.1	2.2
Bark Bay-Inlet	05-Jul-08	6.8	6.3	2.3
Bark Bay-Inlet	14-Jun-09	9.9	9.5	1.9
Bark Bay-Inlet	18-Jul-10	6.6	6.6	1.9
Bark Bay-Inlet	28-May-12	5.8	5.0	2.3
Dam-Outlet	04-Jul-04	3.9	4.5	
Dam-Outlet	28-Jun-08	6.4	6.6	2.2
Dam-Outlet	28-Jun-08	11.0	12.3	2.2
Dam-Outlet	14-Jun-09	8.4	6.9	1.9
Dam-Outlet	18-Jul-10	5.8	9.2	0.7
Dam-Outlet	28-May-12	4.6	7.0	2.3
Telephone Bay	03-Jul-06	3.9	4.4	
Telephone Bay	14-Jun-09	9.5	6.5	1.9
Telephone Bay	18-Jul-10	6.6	5.6	1.9
Telephone Bay	28-May-12	5.0	5.2	2.3

Courtesy of MOE Nov 2012

NOTE – In 2004, MOE changed the method of analysing samples, resulting in very different readings. Those values should not be used when comparing later samples.

Readers may view more recent results at the MOE Lake Partner web site:

http://www.ene.gov.on.ca/en/water/lakepartner/index.php

Trophic status, based on TP concentrations, is considered a good indicator or measure of a lake's ecosystem health. Many limnologists place lakes into three broad categories with respect to nutrient status. Lakes with less that 10 ug/L (micrograms per litre) are considered to be oligotrophic (like Koshlong). Lakes with a TP level between 10 and 20 ug/L are termed mesotrophic. These lakes can be

clear and unproductive at the bottom end of the scale or susceptible to moderate algal blooms when their TP level approaches 20 ug/L. Lakes with readings over 20ug/L are classed as eutrophic and may exhibit persistent, nuisance algal blooms.

Calcium

Until recently the importance of calcium has been neither appreciated nor understood. However, there is now growing interest in calcium, since it necessary for bone formation in fish and shell development in crayfish and turtles.

Dr. Norman Yan, a professor at York University who also worked part-time at Dorset Environmental Science Centre, has been studying the threat of calcium decline in Muskoka for the last few years. He is proposing a nationwide study to address the problem.

The following is a summary of key conclusions that he has reached:

- All living things need calcium, and typically are composed of approximately five per cent calcium on a dry weight basis,
- Daphnia, a group of tiny crustaceans better known as water fleas, won't survive without a certain level of calcium in the water,
- Daphnia are like little aquatic canaries in the coal mine,
- When a lake's calcium level reaches less than 1.4 milligrams of calcium per litre, Daphnia will die,
- They are beneficial in that they act as water filters and are food for fish,
- They clarify the water by consuming large quantities of algae, bacteria and various organic detritus,
- Daphnia are near the bottom of the aquatic food chain. When they die off, it sets up a chain reaction that can have an adverse effect on all higher-level organisms in the lake,
- Trees also need calcium (up to 20% dry weight on some maples),
- Trees that are cut down should not be removed from the property, as this will deplete the calcium,
- Spreading wood ash (after a tree is burned) will help to maintain calcium levels on your property.

To its credit the Ministry of the Environment (MOE) has been using the water samples submitted by lake volunteers (as part of the Lake Partner Program) to analyse the calcium levels. This testing began in 2008 and the results were released in 2011. Unfortunately, the readings are no longer publicly available on their web site, but can be obtained upon request. See Figure 5.2 for the results from Koshlong.

Other Factors

There are other factors that affect the water quality. Among these are dissolved metals such as iron and mercury, as well as fecal coliform, bacteria, acidity (pH) and dissolved oxygen. There has been no

known testing of these agents for a variety of reasons. Because they are quite small and very localized, fecal coliform and bacteria are very difficult to capture in a limited number of samples. Two samples taken at the same time, but separated by a few centimetres can show very different readings. Detecting dissolved metals has never been a priority in the Lake Partner program. Acidity and alkalinity were once hot buttons, but interest has waned on these factors after the acid rain issue was addressed. However, it should be noted that at this point acid rain has been reduced but not eliminated. Rain is 50% less acidic than it was in 1980. Therefore, lakes in Haliburton are still slightly acidic and the levels have stabilized.

Dissolved Oxygen

Just like us, fish cannot live without oxygen. They need a level of dissolved oxygen of at least 7ppm (parts per million). A reading of 12-13ppm is considered to be saturated. Dissolved oxygen can only be measured by very expensive probes that cost several thousands of dollars. Luckily, MNR has such equipment and has been monitoring oxygen levels on a regular basis, but not in consecutive years. Measurements are taken in August and September and the process involves taking readings (along with temperature measurement) at various depths.

In 2003 the oxygen reading in Koshlong was 6.3ppm and 2007 the reading was 7.66ppm. It should be noted that a lake with a reading of 7ppm is considered to be ‘at capacity’, meaning that Crown land will not be sold for development. Since these levels have quite stable in the past, measurements were not taken on an annual basis. But, due to the most recent readings, Koshlong is considered to be ‘under review’ and reading may be taken on a more regular basis.

NOTE – If lake trout were not found in Koshlong, the lake would not be considered to be at capacity. If the lake was not ‘at capacity’, then MNR could and probably would start selling crown land. It is therefore very important that the KLA taken steps to ensure that trout are present in the lake. These steps include supporting the HHOA and their lake trout stocking program.

5.2 Major Water Quality Concerns

Water quality is affected by make factors. Among these are turbidity, nutrient enrichment and toxic substances – which are explained below:

a) Turbidity (Siltation) - Reduction of the sun's ability to penetrate water is the result of the suspension of fine particles, such as clay, in surface water. This affects the entire food chain by: inhibiting the growth of phytoplankton (small floating plant life); creating lower oxygen levels, which interfere with respiration in fish and macro benthos (small animals living on the bottom of a lake); impairing the visual range of fish, thereby impacting their ability to feed; and degrading fish spawning beds.

Factors Influencing/Creating Turbidity:

1. Large and small scale construction activities, including unprotected placement of fill or disturbance of soil at or near the shoreline creates the opportunity for fine soils to enter the lake water, particularly during spring run-off and rain storms.
2. Erosion created by replacing natural shoreline structures with lawns, causing fine soil particles to be washed into the lake waters rather than being filtered.
3. Storm water run-off from site-specific storm water management systems create greater opportunity for fine soil particles to be washed into a lake.
4. Increased and inappropriate boating practices create shoreline erosion through excessive wake action and disturbance of the clay and silt on the lake bottom.

b) Nutrient Enrichment - An increase in nutrient loads, phosphorus in particular, may accelerate the eutrophication (ie. the gradual nutrient enrichment) process and increase the growth of algae and aquatic plants in a lake.

Factors Creating or Increasing Nutrient Enrichment:

1. Nutrients, particularly phosphorus, occur naturally in nature as well as being generated from man-made sources. These nutrients enter Koshlong Lake through the streams that flow into the lake and the natural flow that occurs during the spring run-off.
2. Fertilizers used on lawns and gardens that border the lake introduce nutrients into lake water through run-off or groundwater.
3. Nutrient loading of Koshlong Lake can also occur as a result of septic systems that are poorly designed, out of date, not operating properly, or not pumped out regularly. This is the most significant source on most lakes.

c) Toxic Substances - A toxic substance is generally defined as a substance that causes harm to the environment, animals or human beings (Environment Canada, 1993). Many toxins are man-made

synthetics and include polychlorinated biphenyls (PCBs), pesticides, dioxins, and furans. Other substances, such as mercury, can be a natural occurrence or a by-product of human industrial activity. Toxins present in lake waters accumulate in long-lived fish such as Lake Trout and Bass and accordingly, can present a danger to animals and humans when the fish are consumed.

Factors Creating or Increasing Toxins in Lake Water:

1. Mercury occurs in trace amounts in air, water, rocks, soil, and plant and animal matter and can be leached out by the acidity in the water. Naturally occurring mercury anomalies are associated with fault zones in the bedrock, and streams can be a source of mercury entering the lakes.
2. Toxins were regularly used in industries until the 1970s and many have entered the water systems through industrial discharges into the air.
3. Pesticides, herbicides and fertilizers used at or near the waterfront or streams can enter the watershed.
4. Soaps and cleaners containing phosphates and other chemicals used in the vicinity of the lakeshore.
5. Untreated storm water run-off (eg. from roadside trenches) will transport toxins.

Conclusions

Unfortunately, there is insufficient data available to make accurate assessments of how water quality is changing over time. Water quality sampling has been conducted sporadically, at different times and at different locations. Continued monitoring and consistent water quality sampling would provide a more detailed picture of how water quality is changing.

More rigorous and regular water sampling (as part of the Lake Partner Program) will provide data that will help to address any trends before they become problems. Continued monitoring programs and activities aimed at improving water quality will help to achieve the goal of a healthier Koshlong Lake ecosystem.

5.3 Observations – Water Quality

- *In 2004, MOE changed the method of analysing samples, resulting in very different readings*

- *Water testing on Koshlong Lake has occurred sporadically, resulting in a lack of consistent data available to make accurate assessments on how water quality is changing over time.*
- *Based on the information available, water quality seems to be fairly acceptable.*
- *Secchi Disk readings indicate that the lake is oligotrophic, which means that Koshlong Lake water has low turbidity or is relatively clear.*
- *The total phosphorus readings are consistently - below 10 µg/L, which is below the Provincial Water Quality Objectives (PWQO).*

5.4 Recommendations – Water Quality

37. ***Support MNR classification and the Municipality of Highland East's Official Plan policy to recognize Koshlong Lake and Bark Bay to be "at capacity".***
38. ***The KLA should continue to collect water quality information, through MOE's "Lake Partner Program", but on a more rigorous basis.***
39. ***KLA should investigate what other agents should be analyzed and establish a volunteer-based program to monitor them.***
40. ***An annual report showing the results of the water testing appears in each edition of Wavelength.***
41. ***MNR should be encouraged to continue taking dissolved oxygen measurement more often and to inform KLA about the readings.***
42. ***MOE should be encouraged to measure additional agents that may affect water quality.***
43. ***A phosphorus free life style should be promoted around the lake.***
44. ***Through an education program, members should be encouraged to properly maintain septic systems including regular pumping out of tanks.***
45. ***The use of fertilizers and pesticides should be discouraged.***
46. ***Start to identify and protect sensitive natural areas (wetland, fish spawning areas, etc.) as well as littoral and riparian zones.***

5.5 Vegetation

Fisheries and Oceans Canada has an excellent publication called, The Shore Primer – A Cottager's Guide to a Healthy Waterfront, that describes basic shoreline protection and rehabilitation procedures.

"Thanks to thousands of years of practice, natural shores are among the world's most effective, least expensive erosion controls. The mix of plants, shrubs, and trees form a complex web of roots and foliage that knits the waterfront together, holding the bank in place and fending off the impacts of wind, rain, waves, and boat wake. The bulwark against erosion is the shoreline, the place where land and water meet. In its natural state, the shoreline is a profusion of stones, native plants, shrubs, fallen limbs, and tree trunks. But it's also a busy intersection, with animals, insects, and birds traveling back and forth. Overhanging vegetation shades and cools the water, and acts as a fast-food outlet for fish by producing a rain of aphids, ants and other insects that slip from their perches above".

Shore Primer, Department of Fisheries and Oceans Canada

The naturally occurring vegetation found in the water, in wetlands, on the shoreline, and on the uplands adjacent to a lake is important for maintaining the health of a lake system. The benefits of retaining a naturally vegetated shoreline include:

1. Preventing soil erosion and loss of landmass by wind, waves and rain through vast rooting systems and foliage, which contribute natural cover to anchor soils and to prevent the runoff of sediments into the lakebed, and protecting spawning beds;
2. Preventing the fertilization of lake water and sediments by trapping the nutrient rich precipitation and runoff;
3. Shading and cooling the lake water;
4. Preserving the ecological integrity of the ecosystem; and
5. Increasing the beauty of the surrounding landscape.

Natural shorelines contain three distinct zones, each with its own characteristic communities of organisms.

Littoral Zone - the section from the water's edge to the area of the lakebed where the sunlight cannot penetrate to the bottom.

Riparian Zone - the area at the water's edge (may extend *up to approximately 30 metres inland*).

Upland Zone - the zone beyond the riparian zone.

Although each of these zones provides a separate function to the health of the lake, it should be noted that the shoreline is a natural progression of each zone seamlessly transitioning into the next.

Therefore, alteration of any zone affects the entire shoreline by diminishing the shore's ability to support life on the lake.

Littoral Zone

The littoral zone extends out from the shoreline into the lake towards a point where sunlight is no longer capable of penetrating the water column down to the lakebed or bottom. It is a highly productive transitional zone between terrestrial and aquatic ecosystems. Many plants and animals fulfill part of or their entire life-cycle (i.e., live, feed, grow and reproduce) within this zone including several rare species of dragonflies, frogs, turtles, and fish - including lake trout and bass. This area acts as a nursery, daycare and cafeteria for these species, offering the nutrient-rich, warm, protected waters required for fish and amphibians to grow. Many migrating ducks, such as American Blacks and Mallards forage in this zone for the vegetation required for their diets. Loons also hunt in the area.

Aquatic plant species, such as water milfoil and water lily, act as the lungs of the lake by converting sunlight into food and releasing oxygen in the process. They also capture nutrients and sediment, and they filter many toxins from the terrestrial and atmospheric components of the watershed.

The surface of submerged wood is covered with tiny plants and invertebrates, thereby becoming a diner for turtles, crayfish and small fish. Stones and rocks in a lake provide protection for spawning and incubation of fish and amphibians. Nutrients such as calcium, nitrogen and phosphorus that are vital to the health of aquatic plants, fish and amphibians are released from the rocks in and around a lake. It is this rich diversity of habitat and food sources that provides for the abundance of fish and wildlife.

Aquatic macro-invertebrates, such as mayfly and caddis fly nymphs, not only provide a great food source for the minnows, frogs, birds and mammals feeding in the area, but they are also good indicators of healthy water quality since they respond to changes in water quality after short exposure. These insects require well-oxygenated water to survive, so if the water quality deteriorates, these species will start disappearing and reduce the biodiversity of the aquatic ecosystem including the food web.

The littoral zone around Koshlong Lake has been subjected to many disturbances, including shoreline development, fluctuating water levels, increased recreational activities, vegetation removal, acid precipitation, and increased sediment runoff, over the past century. These disturbances have had a negative impact on its long-term health.

Riparian Zone

The combination of trees, shrubs and other plants along the natural shoreline makes up the riparian zone of the lake, which is the area immediately adjacent to the shoreline. The riparian zone is an exceptionally important portion of transitional land between the lake, river, stream, floodplain or wetland and the upland ecosystems such as forests. It forms a natural buffer that helps to filter out undesirables such as fertilizers, excess phosphorus and sediment from entering a lake.

As well as being a valuable filter, the riparian zone is also a refuge for wildlife including water birds for both nesting and feeding and animals that visit the lake for their daily intake of water. Vegetation, which overhangs the near shore waters, provides shade, windbreaks, insects and woody debris for the littoral zone.

The typical vegetation of the riparian zone includes a mixture of deciduous and coniferous tree and shrub species such as eastern hemlock, eastern cedar, white birch, poplar and other upland species tolerant to shade and/or wet soil conditions. The riparian zone provides shelter, feeding grounds, and a nesting refuge for wildlife including colonial water birds, songbirds, raptors, turtles, frogs, snakes, beavers, muskrats, raccoons, mink and otters as well as many other species.

The vegetation, which overhangs the near shore waters, provides shade that helps to keep the water temperatures cool. It provides a habitat for insects, which are a food source for amphibians, fish and other species. Leafy and woody debris helps to maintain the nutrient cycles and provides micro-habitats in the littoral zone. There is a significant relationship between good water quality and diverse micro-habitats, and the density of shoreline vegetation and woody debris in the riparian zone. With a well-functioning riparian zone, water quality is maintained and the aquatic systems are able to support life and life cycles such as spawning fish.

Upland Zone

The upland zone is that area of a lake's shoreline that extends beyond the riparian zone. It is an area typically forested with trees that take advantage of better drainage than is found in the riparian zone. The
majority of trees in this zone include maples, pines, spruce, popular, hemlocks and birch.

Their dense foliage buffers the shore from winds while the forest canopy cools the area with its shade and boosts the humidity around the lake. This zone provides shelter for wildlife including; deer, fox, squirrels and chipmunks and home for a great variety of birds. Another healthy effect of the upland and riparian zones is the filtering of an estimated 90 % of run-off from winter snow and rains before it enters the lake. This filtering is important to ensure that silt and sediments from shoreline development do not reach the lake.

The effects of development in the upland zone have been greater in terms of change than has occurred in the Riparian Zone. Higher density development and intensity of use have a more severe and negative impact on forested areas than would be felt with lower density development.

5.6 Observations - Vegetation

- *Shoreline and aquatic vegetation is important for maintaining water quality and the protection of fish and wildlife habitat as well as the aesthetics of the landscape.*
- *Urbanized landscape development often has an adverse effect on the health of the lake and the many species that inhabit the riparian and upland zones.*
- *Ideally, 75% of the shoreline lot should remain in a natural state, with the exception of marinas.*

5.7 Recommendations – Vegetation

47. ***Lakefront property owners should be encouraged to restore their shoreline areas back to a natural state by protecting and retaining the existing native vegetation and planting only native species (grasses, sedges, shrubs and trees) wherever possible.***
48. ***The KLA should endorse the county's Tree Preservation Bylaw and encourage the municipalities to ensure that new development protects the integrity of the natural shorelines.***

5.8 Wetlands

Wetlands are land types such as swamps, marshes, fens, bogs and areas of shallow open water. They occur intermittently across the landscape among lakes, rivers and streams, or in any area where the ground water table is close to the surface. Wetlands assist in controlling flooding, and provide an important habitat for wildlife, including heronries, fish spawning sites and turtle nesting grounds. They

also provide conditions to support a wide variety of vegetation including rare and unique species such as manna grass and bog rosemary.

Koshlong Lake has an abundance of wetlands in its watershed. But very little exploration and documentation of these areas has occurred.

The Ontario Wetland Evaluation System identifies four wetland types: marsh, swamp, fen and bog; all four wetland types may be found around Koshlong Lake.

Swamps

The soil in swamps is usually saturated, especially during early spring after the snow melt and the rains have flooded the area. In some areas, soils may experience dryer conditions by late summer. The soil is often neutral or moderately acidic and shows little deficiency in oxygen or in mineral nutrients.

Marshes

Marshes are wet areas of standing or flowing water, frequently interspersed with channels or pools of deep or shallow open water. Marshes may be bordered by a peripheral band of trees and shrubs (ie. swamps), but the predominant vegetation consists of a variety of emergent, non-woody plants, such as cattails and reeds, and narrow or fine-leaved grasses, sedges and rushes.

Typical marsh vegetation such as cattails provide a good source of nest building materials for birds, including the marsh wren, red-winged black bird, and American bittern, as well as a food source for other animals and birds such as the muskrat that eat the young plants. If you have ever seen a mound of cattail leaves on the side of a pond or marsh you have located the home of a muskrat.

The substrate usually consists of mineral or organic soils that have a high mineral content, but in some marshes there may also be as much as two (2) metres of peat accumulation in slightly acidic waters. The water chemistry of marshes is dependent upon several environmental factors, such as the soil and the plant community, but it is usually neutral to slightly alkaline and has a relatively high oxygen saturation level.

Bogs

A bog is an area of wet marshy ground, largely consisting of accumulated decomposing plant material. It supports vegetation such as cranberries and moss and may ultimately turn into peat.

Other names for bogs include mire, quagmire and muskeg; alkaline mires are called fens. They are frequently covered in shrubs rooted in the Sphagnum moss and peat. The gradual accumulation of decayed plant material in a bog functions as a carbon sink.

Bogs occur where the water at the ground surface is acidic and low in nutrients. In some cases, the water is derived entirely from precipitation, in which case they are termed ombrotrophic (rain-fed). Water flowing out of bogs has a characteristic brown colour, which comes from dissolved peat tannins. In general the low fertility and cool climate results in relatively slow plant growth, but decay is even slower owing to the saturated soil. Hence peat accumulates. Large areas of landscape can be covered many meters deep in peat. Bogs have a distinctive group of plant and animal species, and are of high importance for biodiversity, particularly in landscapes that are otherwise settled and farmed. *[Definition courtesy of Wikipedia.]*

Fens

Fens are characterized by their water chemistry, which is neutral or alkaline, with relatively high dissolved mineral levels but few other plant nutrients. They are usually dominated by grasses and sedges, and typically have brown mosses. Fens frequently have a high diversity of other plant species. They may also occur along large lakes and rivers where seasonal changes in water level maintain wet soils with few woody plants. *[Definition courtesy of Wikipedia.*]

5.9 Observations – Wetlands

- *Little is known about the wetlands around Koshlong.*
- *Wetlands are a valuable component of the ecology and should be explored and documented.*

5.10 Recommendations – Wetlands

49. *KLA should develop a volunteer-based project to explore and document the wetlands within 100 metres of Koshlong.*
50. *KLA should encourage municipalities to update official plans and zoning by-laws to protect wetlands.*

5.11 Streams

Streams are a significant feature of the landscape. Eighteen small streams flow into Koshlong Lake. They are either permanent or intermittent in nature but all are an important feature for the fish and wildlife habitat of the lake. The aquatic organisms and nutrients found in most of these permanent and intermittent streams supply a notable food source for the species of organisms that frequent the streams.

Until recently the streams of Koshlong Lake have not been studied or inventoried, but in the summer of 2012, a Koshlong resident was kind enough to review all of the streams and report back – as follows.

This research was conducted by Bob Harrison, during the week of July 30 – August 3, 2012. Note that this was a very dry summer and most of the streams had little or no water flowing during the times of the observations. Most of the streams are fed by wetlands areas that are shown in light-blue on the following map.

There are many other small creeks that only flow into the lake during or after periods of rain. These rivulets drain very small areas and are considered to be seasonal or temporary water flows rather than streams.

According to the topographical map (Figure 5.3) there are 18 streams indicated as flowing into Koshlong Lake and one stream that flows out. The outflow is controlled by a dam at the western extremity of the lake and provides input into the Trent – Severn Waterway, via the Burnt River system. The volume of the outflow is controlled by Parks Canada.

The drainage area of each stream flowing into the lake is a best guess estimate based on topography and on-site observations. For the sake of simplicity each stream has been marked with a small red starburst starting from the dam and running in a clockwise direction on the north side of the lake.

Figure 5.3 – Topographic Map of Koshlong

Map is courtesy of Anthony vanLieshout Holdings Inc. and Stephen Foster

Stream 1

Located approximately 100 metres east of Elephant Rock or 150 metres east of the dam.

This stream is very seasonal in nature and really only supports run off from a very small area. It was dry and overgrown at the time of the survey.

Drainage area approximately 750 hectares.

Stream 2

Located in Dysart Bay around the mid-point of the north shore and west of the old marina.

At the time of the survey there was no flow of water. There is a beaver dam about 25 metres inland from the lakeshore. The water level behind the dam appeared to be the same as the lake level. The riverbed forms a well-defined path indicating that water flows in the spring and during periods of wet weather.

Drainage area approximately 2000 ha.

Stream 3

Located in Dysart Bay in the northeast corner. There was no water flow at the time of the survey. A small but discernible streambed was visible. This stream could be an overflow from Colonel Kenny's Lake, as well as a normal drainage of surface water. The path roughly parallels Koshlong Lake Road for about a kilometre and drains from a lowlands area just at the west end of Col. Kenny's Lake.
Drainage area approximately 625 ha.

Stream 4

Located at the end of Finns Bay. There was no water flow, although a streambed was evident. Very small drainage
Drainage area approximately 30 ha.

Stream 5

Located on the main part of the lake, a few hundred metres north of Finns Bay. Outflow from Col. Kenny's Lake. No flow was evident. The beaver dam on this pond is not active, nor has it been for several years. Heavy blow-down across the actual dam may have discouraged beaver maintenance of this dam.
Drainage area approximately 150 ha.

Stream 6

Located on the west shore of Camp Wanakita. It runs year round, but was just a trickle at the time of survey. Several beaver dams upstream maintain a steady supply of water.
Drainage area approximately 2000 ha.

Stream 7

Located on Wanakita property, between the East and West sections. No stream flow at time of survey.
Drainage area approximately 300 ha.

Stream 8

Located on Wanakita East property. The stream runs through the beach area, in the family camping section. This stream runs year-round. There seems to be a spring that augments this flow, as the drainage area is quite small.
Drainage area approximately 50 ha.

Stream 9

Located on the north shore of Telephone Bay. There was only a small water flow at the time of the visit. Property owners say that the flow depends on beaver activity. This stream will dry up if the beaver dam is broken and not maintained.

Drainage area approximately 320 ha.

Stream 10

Located in the bottom of Dead Beat Bay, adjacent to the boat launch area. No flow at time of visit. Looks to be part of the same drainage area as stream 11.

Drainage area approximately 1500 ha.

Stream 11

Located at the extreme east end of the lake – near the Rock of Gibraltar. This is a year-round stream. The flow was very small, even though the drainage area is quite large. Several beaver dams could be on the system.

Drainage area approximately 7500 ha.

Stream 12

Located in Bark Bay about mid-point on the east shore, just north-west of the boathouse. Deep cove but no stream flow was evident. This might just be a narrow cove, instead of an actual stream.

Drainage area approximately 20 ha.

Stream 13

Located at the end of the shallow area on the east side of Bark Bay. This stream appears to be associated with the same large drainage system as stream 11.

Drainage area approximately 2400 ha.

Stream 14

Also located in Bark Bay, on the west shore just at the mouth the same shallow area as stream 13. A slight flow was observed and a beaver dam was built across the mouth. The water level was 6 inches higher behind the dam.

Drainage area approximately 300 ha.

Stream 15.

Located in the bay beside Blueberry Point, which is directly south of Hutton's point on south shore of main body of the lake. There are two streams in this bay and this is the southerly one. This stream is the outflow from a large pond, which in turn is fed by two streams. Drainage area approx. 1200 ha.

Stream 16.

This is the second of two streams in this bay located beside Blueberry point. Stream is located in the north-west corner of the bay. It also receives water from a nearby pond, but no flow was found. Drainage area approximately 1000 ha.

Stream 17.

Located at the far end of the bay to the east of Diver's Rock. No water flow was present. Drainage area approximately 499 ha.

Stream 18.

Located opposite Adam and Eve rocks along south shore of the narrows. No water flow. Drainage area approximately 400 ha.

5.12 Observations – Streams

- *There are 18 streams that flow into Koshlong Lake, some of which are fed by ponds and marshes, and their health will impact the future health of Koshlong Lake.*
- *There is still a lack of data about the wetlands that feed some of these streams*

5.13 Recommendations – Streams

51. ***Further exploration and documentation should be done on the streams flowing into Koshlong Lake.***
52. ***MNR should be contacted in order to obtain a set of criteria to be used when investigating the streams.***
53. ***KLA should provide local municipalities with information on the streams, so that Official Plans and Zoning by-laws can be developed to protect them.***
54. ***KLA should initiate a contest to name the major streams. Perhaps encourage the young cottagers to participate in a "name that stream" contest.***

5.14 Fish Community

Smallmouth Bass is the only native sport fish species in Koshlong Lake. They nest and spawn along shorelines, where they excavate gravelly nests that can be seen from the water's edge. Shoreline

development, and competition by rock bass, may be contributing to any perceived decline in their population.

The Koshlong Lake fish community has changed significantly over the past years through the introduction of Lake Trout (planned and encouraged) and Rock Bass (inadvertent). Although trout stocking is still occurring, the overall fish population and diversity has essentially stabilized.

MNR has fisheries management programs, including fish stocking, population surveys, spawning habitat remediation and the accumulation of baseline date to develop appropriate management strategies. But this information has not been broadcast to the Koshlong Lake community.

Fish Stocking and Introductions

In the year 2000, MNR began regular stocking of Haliburton Gold Lake Trout into Koshlong Lake. This is a species unique to Haliburton. In 2004 the lake was stocked with 1,500 Haliburton Gold, in 2006 the number was 2,000 and in 2009 it was 2,900. This program has met with limited success, but continues with the hope that the trout will eventually become self-sustaining.

The latest stocking program that began in 2004 is now shared with Trent University (Genertics Research Unit) and the Haliburton Highlands Outdoor Association (HHOA). MNR collects the trout eggs from Halls and Kingscote lakes, and then HHOA raises them (and others) at its hatchery on County Road 1, just south of Haliburton. Stocking was initially done over four consecutive years, but is now continuing on a less regular basis.

MNR is monitoring the Haliburton Gold population to determine whether it is self-sustaining. Whereas this species has a 5-6 years generation cycle, monitoring is done by taking samples according to a five-year cycle (two years netting and then three years off). Stocked fish have a certain fin clipped to show when it was raised at the hatchery. Therefore any fish caught without that fin mark has been a product of natural spawning. Current thinking is that the stocking will continue, but if the species does not regenerate adequately they will have to reconsider this initiative. An austerity movement at the provincial level in 2013 has placed a strain on the stocking program and more private financing is now needed for it to continue.

Fish Habitat

Essential fish habitat (especially spawning and nesting areas) is primarily located in the littoral zone and near shore areas of the lake. Nesting and feeding sites vary among species, but a lake with a variety of habitats that include an ample supply of vegetation, such as woody debris, shade and rock, are indicative of good water quality and a healthy ecosystem. Unfortunately, the potentially negative impacts from human development are a loss of habitat and subsequent reduction in fish productivity.

Smallmouth bass and rock bass generally inhabit rocky areas of shallow, warm water lakes and warm reaches of streams. Spawning occurs mid-May, after the adult males have excavated shallow nests in the gravelly substrate so that the female is able to deposit her eggs. Many nests can often be found clustered together in suitable habitat within the littoral zone, where the young bass are able to survive by feeding on benthic invertebrates and other small marine life. It is the male bass who guard the nests and ward off any predators.

Pumpkinseeds inhabit weedy bays of warm water lakes, preferring clear water with a vegetative cover. Adult males dig shallow nests in areas of slow moving water on hard bottoms within areas of aquatic vegetation, and guard the young when they hatch.

Minnow habitat preference and spawning schedules vary. More information on these communities is needed.

Fish Contaminants

At this time, there has been no research done on contaminants that will have an impact of fish stock in Koshlong Lake. Most fishermen will agree that each of the species in Koshlong (ie. lake trout, smallmouth bass and even rock bass) are ‘good eating’, but it is wise to consult the MNR tables to determine how much of any species should be eaten on a monthly basis.

Lake Trout

Lake trout live in deep cold water. They can survive in water temperatures below 15°C and dissolved oxygen concentrations above 4 mg/L, but their optimal habitat is found at temperatures below 10°C, with dissolved oxygen concentrations above 6 mg/L. Excessive nutrients and the resulting algae and

plant growth and decomposition can cause a decrease in deep-water oxygen levels and, therefore, reduce the availability of lake trout habitat, especially juvenile lake trout habitat.

Lake trout spawning shoals are found tight to shore—usually within 1-2 metres of the shoreline. They are not wide, and are established over broken rock and rubble. An artificial spawning bed was created by the HHOA in 2006 and GPS readings were taken to note the exact location. However, it is still too early to know whether his initiative was successful. More research is required to determine the impact of that the low water levels in October are having on this site.

The fall draw down exposes the "sensitive habitats" within the littoral zone to freezing. This kills many species including amphibians, reptiles and invertebrate eggs and larvae, which are essential to the freshwater food chains. Lake trout spawning beds are one of these sensitive habitats, and there is a concern that the autumn drawdown may expose the spawning beds to very cold temperatures and ice over the winter.

Lake trout is recognized as a valuable sport fish, but it is also a great indicator of water quality and the overall health of the lake's ecosystem. Lake trout tend to be more sensitive to negative impacts, such as a decrease in dissolved oxygen, an increase in water temperature, or increasing turbidity, than most other species of fish, therefore, the presence of and the spawning and recruitment success of lake trout populations is used as an environmental indicator to assess the health of Koshlong Lake.

In general, lake trout are only found in 2000 of Ontario's lakes (less than 1%). Unfortunately, in the past decade, these populations have been gradually declining due to the combination of various environmental stresses. Lake trout are particularly vulnerable to temporary acid shock as well as toxins displaced during spring runoff. Koshlong is fortunate to be part of the small percentage of Ontario lakes that have lake trout. The residents and other and off-site fishermen should make an effort to protect this great natural resource.

5.15 Observations – Fish Community

- *Haliburton Gold is a unique type of lake trout that is found only in a few lakes in Haliburton.*
- *The Lake trout in Koshlong is not indigenous, but due to an MNR-HHOA stocking program.*
- *Rock bass are also not native to Koshlong but a result of accidental release by fishermen.*
- *Cyprinid species (minnow) populations have not been thoroughly inventoried; information concerning spawning requirements and habitat is lacking.*

- *MNR has not been proactive in providing information regarding species inventory, community index, and spawning and habitat requirements to the Koshlong community.*

5.16 Recommendations – Fish Community

55. ***KLA should encourage MNR to continue stocking trout until they become self-sustaining***
56. ***KLA should recruit volunteers to assist the MNR with any fish surveys.***
57. ***Lakefront residents that have significantly altered or disturbed the shoreline habitat should be encouraged to return a significant portion of their shoreline property to as natural a state as outlined in county policy and municipal by-laws.***
58. ***KLA should continue sponsoring the Rock Bass derbies, but inform fishermen about the regulations concerning the use of fish that are taken.***
59. ***KLA should obtain fish spawning and habitat information on fish communities and provide this information to the shoreline property owners.***
60. ***KLA should work with the MNR to conduct a study on the impact of the early drawdown of the lake level on lake trout population.***

5.17 Wildlife and Wildlife Habitat

Each individual animal, besides being an essential part of the ecosystem, adds to our personal enjoyment of the area. Just look into a child's eyes when it sees a firefly light up. Doesn't the call of a loon still bring joy to your ears, no matter how tired you may be? The area around Koshlong Lake has a rich diversity and abundance of wildlife. Figure 5.4 shows some of the diversity of the rich wildlife surrounding the lake. In the 2008 survey, 96% of respondents indicated that seeing wildlife was an important aspect of enjoying their lake experience.

Figure 5.4 - List of Common Mammals in the Koshlong Lake Area

White-tailed Deer	Porcupine	Woodchuck
Moose	Bats	Mice
Elk	Weasel	Moles
Raccoon	Red Fox	Shrew
Black Bear	Eastern Chipmunk	Vole
Lynx	Squirrels	Beaver
Mink	Wolf	Muskrat
Bobcat	Marten	Hares
Northern River Otter	Fisher	Rabbits
Striped Skunk		

Source: Koshlong Survey 2008

Since wildlife cannot thrive without their natural habitat, the protection of that habitat it of prime importance. Unfortunately, our very presence disturbs that environment. The more that we urbanize our property, the greater the impact on the wildlife that we enjoy.

The seasons also play a critical role in the lives of wildlife. While ducks and other migratory birds fly south to more favourable climates, other animals do not have that choice. Each of them has developed their own way of surviving the harsh winters of the Algonquin Region. Many mammals, including bats and the black bear, enter into hibernation or torpor (sporadic periods of hibernation) where they sleep for extended periods of time during the winter months. Other mammals, such as the white-tailed deer, moose, weasel, beaver, vole and bobcat remain active year-round, but may adapt their behaviours according to the local climate.

The following section focuses on certain animals that probably add most to our enjoyment and provides comments, observations and recommendations that generally apply to all wildlife.

5.18 Significant Mammals

White-tailed Deer

Due to the harsh winter conditions in Ontario, White-tailed deer in Haliburton are understandably at the limit of their northern range. Fortunately, these deer have adapted themselves to survive the cold and snow by congregating into ‘deer yards’. These areas offer a food source of woody browse from hardwood trees and/or conifer needles from white cedar and hemlock trees. They also provide a degree of “camouflaged” protection against predators.

Another benefit of 'Yarding' is the creation of trails or travel corridors. Here the snow is less deep and this helps deer conserve energy and provides an easier escape from predators.

The signs of a 'deer yard' are:

- Raggedly browsed vegetation—ripped or torn instead of neatly clipped due to lack of incisors;
- "buck rubs"—polished scars or missing bark from low saplings, shrubs, or small trees due to bucks rubbing their antlers; and
- "buck scrapes" or pawed depressions in the ground, scat, or body-sized depressions in leaves or on snow.

During a long snowy winter, the food supply in a 'deer yard' might become too low to sustain the herd. Some cottagers will augment the natural food sources by scattering deer food (usually alfalfa pellets) and salt licks in 'deer yards'. In very harsh winters, MNR will also provide addition food. This prevents a large loss of wintering deer, but this creates an artificial carrying capacity, resulting in high reproduction. The downside of that is that large deer numbers in a given area can cause unintended consequences. Starvation will occur when the limits of a finite natural food supply are exceeded.

For further information on deer habitat and deer ecology contact the MNR Minden office or visit http://www.mnr.gov.on.ca/MNR/ .

Moose

Moose is the largest member of the cervid or deer family, standing six and a half to seven and a half feet tall. Moose feed on woody and leafy plant material found in wetlands. In the winter their diet is mainly willow, trembling aspen, red maple, white birch and balsam fir. In the summer they focus on aquatic plants, particularly yellow pond lily and pondweed species.

During June and July, moose are able to get sodium and minerals from the new growth of aquatic plants, but must rely on natural or

artificial mineral licks, including roadside ditches and salt blocks, during the winter. Therefore, moose are often spotted grazing out in the open in shallow bays, beaver ponds, or along roadside ditches.

Moose feeding areas are incredibly important to protect because they provide the necessary mineral and dietary intake to sustain the species throughout the summer months, especially during calving season in late May-early June. Like many other cervids, moose lose weight during the winter and need to regain it during the summer. During the summer a moose will consume 50-60 pounds (22-27 kg) of plant material per day, but in the winter that drops to 40-50 pounds (18-22 kg) a day.

Late September and early October is the beginning of the rut season in Ontario. Bulls will travel long distances in search of a receptive female. During this time and the calving season, moose behaviour is unpredictable and dangerous.

Wolves are the main predator of moose, but they have been eradicated in many areas of North America. Now, humans and cars are the main problems for a healthy moose population.

Where deer and moose habitats overlap, moose frequently develop a fatal illness—brainworm disease, which remains dormant in deer but is easily contracted by moose from deer feces. Around 2005 a young moose became a common sight in the village of Haliburton. He was very friendly and 'Morris the Moose' became a village pet. It wasn't until he suddenly died that people realized that the reason for his friendly attitude toward people was brainworm.

Since the mid-1900s, Canadian moose have been subjected to a relocation-rehabilitation project, with the aid of the Ontario Ministry of Natural Resources, to repopulate Michigan's Upper Peninsula moose population. Native moose in Northern Michigan had become extirpated due to brainworm, predation, over-harvesting and loss of habitat in the early 1900s.

Although not as plentiful as deer, moose have often been sighted near Koshlong.

Black Bear

The black bear is a nocturnal, omnivorous animal, feeding primarily on vegetation, insects, fish and small mammals. They usually move slowly and appear awkward, but they are quite fast (running up to 50 km or 30 mph), good climbers, and great swimmers. These bears have poor eyesight, but a well-

developed sense of smell (one of the keenest in the animal world) and hearing. Black bear have an array of distinct calls, which include an angry growl, a whining call, a short huff, various sniffing noises, and moaning or teeth chattering sounds to threaten other bears.

Bears hibernate during the winter months and breed in the spring. In the winter, the mother, gives birth to naked newborns, which feed on her milk during hibernation. Note that sows with cubs are quite protective; therefore, never approach a black bear in the wild.

Black bears are primarily solitary, except during breeding or when feeding at dumps. Nuisance bears have become a major problem in Ontario because of open dumps or human encroachment on their natural habitats. Nuisance bears can become dangerous because they begin to lose their fear of humans. Therefore, never encourage a bear by leaving food or garbage exposed on your property.

Many black bears are killed by poachers only for body parts, including the teeth, claws, and especially the gall bladder, which many Chinese view as an aphrodisiac. One gall bladder can be worth several thousand dollars on the black market. This illegal trade in black bear parts is one of the biggest threats to their existence.

In 1992, the Ontario government banned the spring bear hunt. This was done to reduce the number of orphaned cubs because of mother bears being indiscriminately killed during the spring hunt. There has

been a lot of pressure, by the hunters, to reinstate the spring bear hunt, but so far the policy remains unchanged.

Koshlong is definitely in bear country and sightings are fairly common.

Brown Bats

With a face that only a mother could love and the legend of blood-sucking creatures from Dracula movies flying through our minds, it is a small wonder that bats are not our favourite animals. But there is more to these fascinating creatures than meets the eye. Furthermore, for humans they are not only harmless but very beneficial.

They can be found in all of the Canadian provinces and all American states except Florida and Texas. They usually live near streams or lakes and prefer places where there are forests, buildings or caves – and of course insects. They are quite small, with a body length of 6-10 cm (2½ - 4 in.), a wingspan of 23-28 cm (9-11 in.) and weighing in at 4¼ - 14 grams (1/8 – ½ oz.). Adult bats can crawl through an opening as small as 1cm wide. Their glossy fur is various shades of brown above and light grey below. Although they seem to resemble mice, they are classified as 'Chiroptera', which means hand-wing. Genetically, they are closer to primates rather than rodents.

Now for the interesting stuff.

Some consider them by far the best insect killer anywhere, in that they are capable of eating more than 600 mosquitoes in one hour and can consume more than half their body weight per night. They dine on a variety of flying insects, including gnats, moths and flies. But their preference is probably beetles. Their hunting technique is quite unique. Not just because they use eco-location to detect their prey (and avoid obstacles) but in addition to catching a bug with their mouths they can coral the insects with their wings, scooping them into the membrane between their hind legs and then reach down for them with

their tongue and sharp teeth - all while flying. They will usually hunt for a two hours after sunset and then for a couple more hours just before sunrise.

A bat's wings are not feathered, but rather folds of skin, stretched over thin and elongated fingers and arms. The lack of feathers allows bats to slice through the air quietly and with high manoeuvrability.

Unlike many small mammals, they can live for more than 30 years, but half will die in their first year.

Bats hibernate through the winter months, but due to their small size they need to find warm caves or buildings to do so. Without a suitable shelter, they would freeze. Most will therefore migrate to southern states and congregate in large clusters. Although mating season is the fall, fertilization does not occur until the spring when females form huge nursing colonies sometimes numbering over one thousand members. Males will either roost alone or form small colonies. The gestation period is two months and the female gives birth to only one baby or pup, usually in June. Surprisingly, a newborn baby can weigh as much a 30% of the mother's weight. That's like a 120 lb woman giving birth to a 30 lb baby. During birth, the female hangs right-side up and catches the pup in the membrane between her hind legs. During the two-week nursing period, the pup will cling to the mother's belly, even while she is flying. Three weeks after birth, the pup will be able to fly and catch its own food.

Aside from natural predators (like owls, mink and squirrels) and loss of habitat there is a new problem facing bats. This is known as white-nose syndrome, so named for its appearance. It does not harm the bats, but makes them uncomfortable and wakes them up during hibernation. Without a supply of insects, the awakened bats will starve.

There are many myths surrounding bats:

- They do not drink blood. They are harmless insects eaters and do not bite people or other animals.
- They are not blind. Their eyesight is actually quite good, but they eco-location is much more effective when hunting at night.
- They do not get tangled in a person's hair. They may come close when hunting, but are very adapt at avoiding people and obstacles even in pitch-black darkness.

Other Interesting Mammals

Other interesting, but rarely seen, animals within Koshlong watershed are the bobcat and Canadian lynx; the grey and eastern red (Algonquin) wolves; several bats species including the northern long-eared bat; various rodents including, muskrat, woodchuck and southern flying squirrel; American marten, fisher, short-tailed and long-tailed weasel, mink and northern river otter.

Some of these mammals are provincially rare species in Ontario. One example of this is the northern river otter. Its population has drastically declined in Ontario and much of its North American range because its fur was extensively trapped in the past and, more recently, toxic pollutants especially mercury has taken its toll on the remaining populations.

It is also very important to understand the intricate role that each of these species plays in the balance of nature and how they help to maintain and conserve the local ecosystem's biological diversity. Animal diversity is vital for a healthy natural ecosystem because the loss of just one species offsets the balance. For example, without bats that consume more than half their weight in insects every night, Koshlong could be overrun with mosquitoes, moths and other flying insects.

5.19 Significant Birds

"Birds are the affirmation of life. They symbolize freedom.
The whimsy of their songs has filled our souls with joy and wonder."
Ornithologist, Roger Tory Peterson

Koshlong Lake is home to a great variety of bird species. Many of these species are migrant songbirds that fly in from the USA or South American regions to breed in Ontario during the spring and summer months. Others like crow and blue jays are year-round residents.

The variety of birds is a product of the various natural habitat, as well as food sources (both insects and vegetation) and nesting sites found in the region. Certain wetlands, particularly the Heronry in Bark Bay, have great waterfowl staging, moulting and breeding areas as well as significant stopover areas. It is therefore important for KLA members to ensure that the current variety of existing habitat, particularly in the littoral and riparian zones are maintained and protected.

Ducks

American black ducks (like the one to the right) and mallards are occasionally found in a few areas around Koshlong and have adapted to the increased population and boat traffic, whereas other water birds, such as the wood duck, prefer the more secluded and protected wetland areas away from human activities. Sometimes American black ducks have been known to make their nests in spring in the Heronry.

Diving ducks found on the lake, such as the common merganser (pictured below) and the common loon, live primarily on the open waters. These two birds can dive to great depths to pursue their prey and will roam over the entire lake in search of food.

During the spring and fall migration periods, Koshlong becomes a staging area, attracting a great variety of ducks that commonly nest further north. The most common of these visitors is the Bufflehead. The attraction to our lake is the availability of food. Ducks prefer the areas of the lake that have significant patches of aquatic vegetation, primarily found in the littoral zone.

Loons

What would it be like without loons on our lake? The loon's haunting call has become a symbol of the peace and solitude of northern living. Their presence is often used as a biological indicator of the ecosystem's health.

The common loon is the provincial bird of Ontario. They are called primitive birds because they are relatives to dinosaurs and have been around for about 25 million years. They generally live for 10-15 years, but some have survived for 30 or more years. Although born and raised in our lakes, young loons spend their first two or three years in coastal waters before making their first trip back to the North Country. While in the brackish coastal waters, loons absorb a great deal of salt from the water and the fish that they eat. However, they are able to get rid of this excess salt by expelling it from a pair of glands located slightly above and between their eyes. These glands drip almost constantly when in salty coastal waters.
Adults generally return to the same lake, years after year, but only a few breeding pairs will inhabit a lake at one time. It would be difficult to imagine Koshlong without nesting loons, but unfortunately, this is becoming an unacceptable reality. Some years there have been little or no reports of loon chicks on the lake. When they do breed, it is usually the only pair in Bark bay that is successful.

Loons are particularly sensitive to disturbances. Power boaters that cause excessive waves and noise will disturb nesting loons. Sensitivity to such disturbances will often cause loons to abandon nesting sites and/or the lake completely.

The loon's streamlined body and webbed feet are built for maximum efficiency underwater. Their wings are relatively small and most suited to swimming, but they are strong fliers and can attain a speed of 110Km/hr. Unlike other marine birds, loons have dense bones (instead of hollow bones) which permit them to dive to depths of 200 feet and remain submerged for 5 to 10 minutes.

But, this design makes them very awkward on land. Therefore, loon nests are located on small islands, close to the shore so that they don't have to move very far to get to the water. The nest is usually no more than a pile of twigs or a hollowed-out area. The proximity of nests close to the water allows for a quick escape route from danger. Unfortunately, it also exposes their nests to flooding or swamping from wave action.

A loon usually lays two large eggs (olive green with dark spots). Both mates take turns incubating the eggs, which take about a month to hatch. A new chick will often enter the water within a few hours of hatching. At that stage they are quite defenceless. They are weak and float like corks, but cannot dive. You can often see the adults carrying their young on their backs across the lake.

Because they are so small, boat drivers who are distracted or not properly watching can inadvertently come close to loon chicks. Although rare on Koshlong, it is not uncommon to hear about yahoos in powerboats chasing loons. Adult loons can escape by diving, but young chicks that cannot dive are often victims of this senseless activity. Luckily there have been no incidents like this reported on Koshlong in many years.

Unfortunately, there is no open season on yahoos and ramming their boats is not recommended. If anyone sees such mindless activity, they are asked to try to stop it, but not at the risk of personal injury. They are also asked to jot down all relevant information on a KLA Incident Form and quickly report the illegal activity directly to the OPP and MNR.

For more information on specific bird species or to report a sighting, please contact Bird Studies Canada at http://www.birdstudiescanada@bsc-esc.org, the Ontario Breeding Bird Atlas at http://www.birdsontario.org/atlas/, the Long Point Bird Observatory at http://www.bsc-esc.org, or the Natural Heritage Information Centre at http://www.mnr.gov.on.ca/MNR/nhic/nhic.cfm.

5.20 Significant Reptiles and Amphibians

The word "amphibian" is derived from the Greek words "amphi" and "bios" which means ‘two lives’ and refers to the aquatic tadpole and the terrestrial adult stages of all salamanders, newts, frogs, and toads. In a process called metamorphosis, which usually occurs over the course of a few weeks, the larval tadpole transforms into its adult frog and toad form with which we are familiar.

Amphibians hatch from eggs laid in the water and pass through a distinctive tadpole/larval stage (a month for toads and up to three years for bullfrogs). The larvae of most species are aquatic and possess gills and prominent fins. Frog and toad tadpoles graze on algae and small organisms in the water; larval of salamanders and newts are carnivorous and feed on aquatic insects. During metamorphosis, they acquire legs and lungs. Significant changes in the digestive system coincide with changes in feeding behaviour.

Amphibians do not drink. They absorb water and much of the oxygen they need through their skin, although they also use their lungs to breathe. Some species are active at night and avoid the drying effects of the sun. Others shelter in moist habitats under logs, rocks, leaves or mosses and ferns. Amphibians shed their skin about once a week. Most frogs and toads eat their skin which splits down the back and which they then pull into their mouth with their front legs. We must not look at these animals as if they were less advanced. Amphibians are superbly adapted to their environments.

Amphibians breathe through both their skin and their lungs. When they bury themselves in the mud under a pond, their skin is able to obtain enough oxygen in their lethargic state to keep them alive until temperatures warm up again in the spring.

Mammals and birds use the energy in food to keep their bodies warm while amphibians and reptiles absorb heat directly from their environment. As a result, amphibians do not have to eat as often or as much as birds and mammals, and they do not eat at all during the six months of winter hibernation – that's right, hibernation.

During the cool winter months Ontario amphibians hibernate by:

1. Burrowing below the frost line (common toad - below);

2. Resting underwater in rivers, lakes, and ponds (leopard frog – at right). These Amphibians must be deep enough that they will not be frozen into solid ice, and the water must have an adequate amount of oxygen;

3. Hiding in forest leaf-litter (wood frog – below). Amazingly wood frogs can become living ice cubes because they produce a sugary antifreeze that prevents their body cells from freezing, but the remaining body fluids freeze. The wood frog is the only North American frog to live north of the Arctic Circle.

In the past 20 years, there has been a significant decline in the world's amphibian population – particularly frogs. This decline has been linked to a variety of factors; such as habitat loss, acid rain, the diminished ozone layer, greenhouse gases, toxins and chemicals leaching into wetlands. All of these are direct result of human and industrial activity.

Frogs and salamanders need both healthy aquatic and terrestrial habitats to complete their life-cycle. The loss of shoreline vegetation, increases in water temperature and ultra-violet light, are detrimental to these species' eggs. Chemicals can easily leech through their sensitive skins, with deadly results.

According to the Nature Conservancy of Canada, Salamanders and newts are not lizards (who belong in the order Reptilia), although they are often mistaken for them because of their similar appearance. What separates salamanders and newts from lizards is their life history and some less noticeable physical characteristics. Salamanders have soft, moist skin without scales and lack claws and external ear openings.

Salamanders and newts may live a totally aquatic, semi-aquatic or terrestrial life. Semi-aquatic species spend most of their life on land, but have one or more aquatic phases. The red-spotted newt, an inhabitant of Ontario forests, lives its juvenile phase as a terrestrial eft, but lives its adult phase as a semi-aquatic animal usually wintering on land.

Salamanders and newts have tadpole-like larvae with external gills, which can feed immediately after hatching from frog-like eggs. Both larvae and adults are carnivorous and eat insects and small invertebrates. Larger adults are able to eat fish, frogs and other salamanders. Salamanders and newts are generally nocturnal and spend their days hidden underneath leaf litter or rotting logs.

In Ontario, there are 14 species of salamanders and newts, as well as two Jeffersonian/blue-spotted hybrids.

Jefferson Salamander and Blue Spotted Salamander

Frog Questions and Answers (Courtesy of Nature Canada)

Q: Why are frogs so gross and slimy?

A: Frogs are not slimy. They do not produce slime. Frog skin is dry, unless it has been in water. It is important for a frog to have wet skin once in a while to keep it healthy. Frogs breathe through their skin as well as through their lungs. So the same way that your lungs are wet, their skin is wet.

Remember, beauty is in the eye of beholder. The more you learn about a creature, the more interesting it becomes, and the more beautiful it becomes. We are afraid of things we know little about.

Q: What is a frog's body temperature?

A: Frogs do not have a single "normal" body temperature. Like all amphibians, frogs are "poikilotherms" — meaning they are unable to precisely self-regulate their body temperature. They cannot create their own body heat and are dependent on environmental temperature.
Frogs have temperature tolerance boundaries — meaning they can survive between a minimum and maximum temperature. This varies on the species. A frog species from Canada can survive at much lower temperatures than a tropical frog while a tropical frog can survive at much higher temperatures than a Canadian species.
Having said that, some frogs have specific adaptations to allow them some control over their temperature (for example some species can survive partial freezing), and behaviours to allow them to escape temperature extremes (for example they will look for shade, sit on warm rocks).

Q: Do you know of a frog or toad that burrows in the ground but leaves a perfect, round hole?
This is in eastern Manitoba and the soil is sandy.

A: In eastern Manitoba the only frog/toad that burrows into the soil is the American toad (*Bufo americanus*) or Canadian Toad (*Bufo hemiophrys*). They burrow into soils to avoid dry conditions, and in winter burrow beneath the frost line. When emerging they can leave a distinct hole in the soil. Note the Canadian Toad is not found in extreme southeastern Manitoba beyond the Red River Plains — the American Toad is the toad species in the woodlands of southeastern Manitoba. There is an overlap/intergrade zone at the edge of the wooded land.
Also, note that other species of frogs in the area also burrow into the upper soil litter and top soil horizon to overwinter — wood frog, boreal chorus frog, gray tree frog, and spring peeper. They might also leave a small hole upon exiting but it is more likely a toad was responsible for the hole.

Q: Where do frogs go in the winter?

A: In the winter, frogs find refuge in the leaf litter (e.g. gray treefrogs), in the mud at the bottom of lakes (e.g.bullfrogs and leopard frogs), in the debris at the bottom of lakes (green frogs) or in burrows under rocks and logs beneath the soil (e.g. wood frogs).

Q: How long do frogs live?

A: Frogs live for a varying length of time, at least 3-5 years depending on the species. In captivity though, the American toad has been known to live for up to 35 years!

Q: What do frogs do in the winter? I always thought that they went into a type of hibernation, but then realized that they bury themselves in the mud in the fall, so how do they breathe

A: Toads hibernate generally by burrowing intro the ground, whereas frogs usually hibernate in the mud. In the fall, their respiration and circulation gradually lessen and they become more lethargic.

Snakes

Unfortunately, snakes are often injured or killed because of misidentification. For example, the eastern Massasauga rattlesnake is Ontario's only venomous snake and is primarily found in the Georgian Bay area. However, many other non-lethal snakes resemble the rattler, including the eastern hog-nose snake and the eastern milk snake. They have been intentionally killed because of misidentification and lack of education. **Everyone should realize that there are no poisoness snakes around Koshlong** and that snakes are an important and integral part of all ecosystems.

Species At Risk

In the Haliburton County, there are 13 species that are classified as Species at Risk (SAR). This list includes the Blanding's Turtle, Spotted Turtle, Five-Lined Skink, and the Eastern Hog-Nosed Snake. Their status provides a certain level of legislated protection (Ontario Endangered Species Act and the Species at Risk Act) against "wilful" persecution and habitat destruction. But, their real protection lies in our understanding and appreciation of them.

Turtles

There are nine turtle species in Ontario - eight of them native to Haliburton and the Kawarthas. Unfortunately, turtles have also declined dramatically over the past 20 years. Their loss has been a result of habitat destruction, road traffic, and direct persecution. Many turtles lay their eggs in nests built into sandy shorelines or gravely roadsides. The adults are often killed by traffic, prior to or after the laying of these eggs. The eggs and young are much sought after by racoons, fox and other predators.

The most common turtle found in Koshlong is the Snapping Turtle. It is the largest freshwater turtle native to Ontario and can attain a shell length of up to 50 cm (19.5 in.) and weight exceeding 15 kg (33 lb.). It is thoroughly aquatic, leaving the water only to nest, bask in the sun or migrate to another water body. In late fall, as the water temperatures begin to drop they burrow into the sediment of the lake's shallow waters and hibernate over the winter. During this period, they do not breathe. Instead, they extend their head out of the mud and absorb oxygen through membranes in their mouth, throat and elsewhere. During hibernation, they are completely defenceless and easy prey for otters. Since they have a low metabolic rate and very few natural enemies, their live expectancy is quite long. Adults can expect to live past 50 and even up to 100 years, but it takes 15 – 20 years before they become adults. And yes, they can smell though their butt.

"Snapping turtles, are the embodiment of turtles who shared the earth with the dinosaurs for a time and are now obliged to share it with the human species, and might well report that the former companions were far less stressful."

Carroll DM 1996 The Year of the Turtle: A natural history.

Snapping turtles are a bottom walking species, which means that instead of swimming they crawl or bounce along over the bottom in shallow water. They can only float as long as they hold a significant amount of air in their lungs. Like most reptiles, snapping turtles lay eggs. This is done in May or June and the young usually hatch in September or October. The gender of the turtle depends on the temperature at which the egg was incubated, with warmer temperatures producing female turtles, and cooler temperatures producing males. This is a primitive feature retained from before sex chromosomes and heritable sex evolved.

Common snapping turtles are defensive if confronted on land, but in the water, they usually slip quietly away from any disturbance.

One fascinating thing about many turtles (including the snapping turtle) is their ability to breathe though their butt. This does not mean that there is a direct link between their butt and their lungs. Instead, they use two relatively large sacs call cloacal bursae to absorb oxygen. These bursae are located inside and along the sides of the back-end orifice and absorb oxygen from the water that can be flushed in and out of their bodies. No turtle does cloacal breathing as its main technique, and the cloaca is not really a 'butt'; however, the basic idea is true. In some turtles, this way of breathing can account for up to 68 percent of their oxygen needs. This strange characteristic is not unique to turtles. It is also a trait of dragonfly nymphs and sea cucumbers.

If you find a turtle's nest or an injured turtle on your property or along the roadside, please contact the Kawartha Turtle Trauma Centre at http://www.kawarthaturtle.org/ or the Toronto Zoo at http://www.torontozoo.com/ to find out how you can help.

5.21 Observations

- *There is a wide variety of wildlife on and around Koshlong Lake.*
- *Ducks and other waterfowl, including loons, are found on Koshlong Lake, but their prime nesting habitats are quite limited.*
- *There is a constant theme when researching all wildlife native to Koshlong; namely that the loss of their natural habitat is one of their greatest threats. It is in their interest, as well as ours, to preserve it as much as possible.*
- *Shoreline vegetation is very important for the wildlife around Koshlong Lake.*
- *Deer yards are an important means to maintain deer population during the winter months.*
- *MNR has a black bear population index program, which is conducted each year, and a public advisory program about nuisance bears.*
- *Roads (particularly highways) pose the greatest danger to slow-moving amphibians. Try to avoid running over them and if you can; safely move turtles off the road (in the direction that they were travelling).*

- *Snapping turtles have a nasty disposition when on land and can deliver a quick and very powerful bite if provoked.*

5.22 Recommendations – Wildlife

61. ***The KLA should establish a volunteer-based program to locate the nesting sites of loons, ducks, and other waterfowl in order to identify important habitat areas.***
62. ***The KLA should sponsor and support a loon nest project (construction and maintenance).***
63. ***Literature that promotes the protection of wildlife habitat and shorelines should be made available to property owners.***
64. ***An inventory of the animal species sighted around Koshlong should be prepared.***

5.23 Invasive Species

It would be comforting to think that there are no invasive species in Haliburton, but unfortunately that is not the case. Data collected from anglers, Conservation Officers, cottagers and residents across Ontario shows that several invasive species are present in this county.

Invasive species are the second most dangerous threat to native species – only surpassed by habitat loss. Exotic, invasive or non-indigenous (non-native) species are terms that describe organisms that have been introduced into local habitats. The introduction of these invading species often causes widespread and unpredictable changes to habitats and is a worldwide problem. They can threaten the local biological diversity and overall health of the ecosystem, especially in aquatic environments.

In the absence of natural predators, competitors, diseases and parasites, populations of exotic species can explode and decimate native species. Once established, they are almost impossible to eliminate.

Two organizations that have a major role to play in the realm of invasive species are the Ontario Ministry of Natural Resources (MNR) and the Ontario Federation of Anglers and Hunters (OFAH) OFAH.ORG. MNR is responsible for the classification of invasive species and OFAH for the tracking and monitoring of those species. Detailed information is available upon request at either of those organizations. More information on invasive species can be found at (http://www.invasivespecies.com/).

Invasive Species List (Haliburton County 2010)

Lake	Invasive Species
Bark Lake	Spiny Water Flea
Basshaunt Lake	
Beech Lake	Rainbow Smelt, Spiny Water Flea
Bentshoe Lakes	
Big East Lake	
Big Hawk Lake	Spiny Water Flea
Black Lake	Rainbow Smelt
Boshkung Lake	Rainbow Smelt, Spiny Water Flea
Canning Lake	Spiny Water Flea, Zebra Mussel
Drag Lake	Rusty Crayfish, Spiny Water Flea
Grace Lake	Spiny Water Flea
Grass Lake	Zebra Mussel
Gull Lake	Rainbow Smelt, Spiny Water Flea
Halls Lake	Spiny Water Flea
Head Lake	Rusty Crayfish, Spiny Water Flea, Zebra Mussel
Horseshoe Lake	Rainbow Smelt, Spiny Water Flea
Kabakwa Lake	
Kashagawigamog Lake	Rusty Crayfish, Spiny Water Flea, Zebra Mussel
Kelly Lake	
Kennisis Lake	Spiny Water Flea
Koshlong Lake	Rainbow Smelt
Kushog Lake	Rainbow Smelt
Lipsy Lake	
Little Boshkung Lake	Spiny Water Flea
Little Hawk Lake	Spiny Water Flea
Little Kennisis Lake	
Loon Lake	Spiny Water Flea
Maple Lake	Rainbow Smelt, Spiny Water Flea
Moore Lake	Rainbow Smelt, Rusty Crayfish
Mountain Lake	Spiny Water Flea
Nehemiah Lake	
Paudash Lake	Zebra Mussel
Plastic Lake	Rainbow Smelt
Port Hope Creek	Lamprey (reported, but not confirmed)
Raven Lake	Zebra Mussel
Red Pine Lake	Spiny Water Flea
Redstone Lake	Spiny Water Flea
Sherborne Lake	
Soyers Lake	Spiny Water Flea
St. Nora Lake	Rainbow Smelt, Spiny Water Flea
Twelve Mile Lake	Rainbow Smelt, Spiny Water Flea
Region	**Invasive Species**
Fishtail Lake	Giant Hogweed
Loon Lake	Purple Loosestrife
Tory Lake	Giant Hogweed (reported, but not confirmed)
Cardiff	Purple Loosestrife
Harcourt	Giant Hogweed

Although we can take comfort in not having any of the destructive invasive species (as identified in the above list) in Koshlong, the struggle will be in keeping it that way. Boaters and fishermen must ensure that their boats are properly cleaned after visiting another lake and fishermen must also clean their equipment and never empty their bait buckets into the lake.

Rainbow Smelt

They were originally introduced into Lake Ontario from the Finger Lakes in N.Y. and into the upper Great Lakes from Green Lake, Maine. They were probably brought into lakes in Haliburton as bait for Lake Trout when ice fishing. The main problem with this species is that it is a voracious feeder of young or small native fish and crustaceans. But, they are an important food source for larger native fish so they are not a significant issue. Currently, the only bothersome and non-indigenous species in Koshlong Lake is rock bass.

General Characteristics

- Body is slender and cylindrical. Back is silvery pale green and the sides are iridescent purple, blue, and pink. The underside is white. The body has 26-35 gill rakers, a dorsal fin, an anal fin, pectoral fins, pelvic fins, an adipose fin, and a deeply forked tail fin. It has a pointed snout and large black and silver eyes.
- The average size when full-grown is 7 – 9 inches.
- Weight: 3 oz.

Rock bass

Rock bass were probably introduced into Koshlong Lake in the late 1940's or early 1950's, and quickly became an established resident as early as 1960s. Rock bass are "hardy fish", tolerant of stressed aquatic systems and are, therefore, an aggressive competitor for many species. Rock bass populations may be negatively impacting the bass population by feeding on their fingerlings and the lake trout through direct competition for food.

Other Invasive Species

As shown in the previous list, several other invasive aquatic animal species have been found in other lakes in the county. This does not mean to say that other species are not present in Haliburton, but those on the list have been confirmed to exist in our lakes. The following is a brief description of these species.

Zebra mussels

Zebra mussels were first seen in Lake St. Clair in 1988. They are from Eurasia and are in Ontario as a result of discharges from the ballast of the ocean going ships. Zebra Mussels can easily attach to the hulls of commercial and recreational boats and have come to Haliburton via the Trent-Severn waterway.

Even though they live only 2-3 years, a female can produce up to one million eggs per year and like all invasive species they have few natural enemies in Ontario. They live on phytoplankton, which is a core element in the food chain and therefore have an adverse effect on many native species.

From a human perspective, they have a positive and negative effect. An adult can filter one litre of water per day, so they increase water clarity. But their excrement increases the phosphorous level and encourages algae and other plant growth. By attaching to hard surfaces they have caused millions

of dollars in damage to power generating facilities, water treatment plants and home/cottage water intakes. Their shells can also cut swimmer's feet.

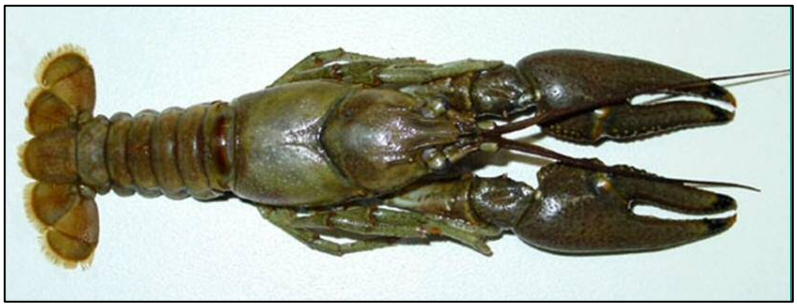
Interestingly, the slightly acidic nature of Koshlong and other lakes in Haliburton (due to acid rain) is beneficial when considering Zebra mussels. Their shells are softened by the acidic Ph level and this affects their longevity and breeding. We've turned acid rain into lemonade! This acidity may have mitigated their impact, but has not stopped their spread into our lakes. So far, no zebra mussels have been found in Koshlong. But again, members are asked to report any potential sightings.

Spiny Water Flea

Originally from Eurasia, this tiny crustacean was first noticed in 1982. Its lifespan varies from several days to a few weeks, and females may reproduce with or without male involvement. When environmental conditions are good, females produce 1 – 10 eggs asexually which all become females. This cycle can repeat itself every two weeks. Under stressful environmental conditions, males are produced. The eggs produced sexually may remain dormant over long periods of time (even out of water) and then hatch when conditions improve. They feed on zooplankton and can consume three times as much food as native species. Although not harmful to humans, they can have an adverse effect of native species that rely on a zooplankton food source.

Rusty Crayfish

This is a native crustacean from the Ohio River system and was first noticed into the Kawartha Lakes in the early 1960's. One of 350 members of the North American crayfish family, their claws are larger and more robust than native Ontario crayfish and they can live for 3-5 years. It competes for food with native crayfish and fish and will prey on fish eggs. They are much more aggressive than native crayfish and will chase them from their hiding locations making them very susceptible to being eaten by predators. Unlike native crayfish, these may pinch a dangling finger or toe.



Purple Loosestrife

Purple loosestrife is a plant native to Europe and Asia that has seriously impacted wetland habitats since its introduction to North America as an ornamental plant. It has been in Canada since the early 19th century and has been confirmed in a couple of locations in Haliburton County. There are several plant species that look similar to the loosestrife such as fireweed, blue vervain and water-willow or swamp loosestrife, but these plants are native.

Caroline Savage, St. Lawrence Centre

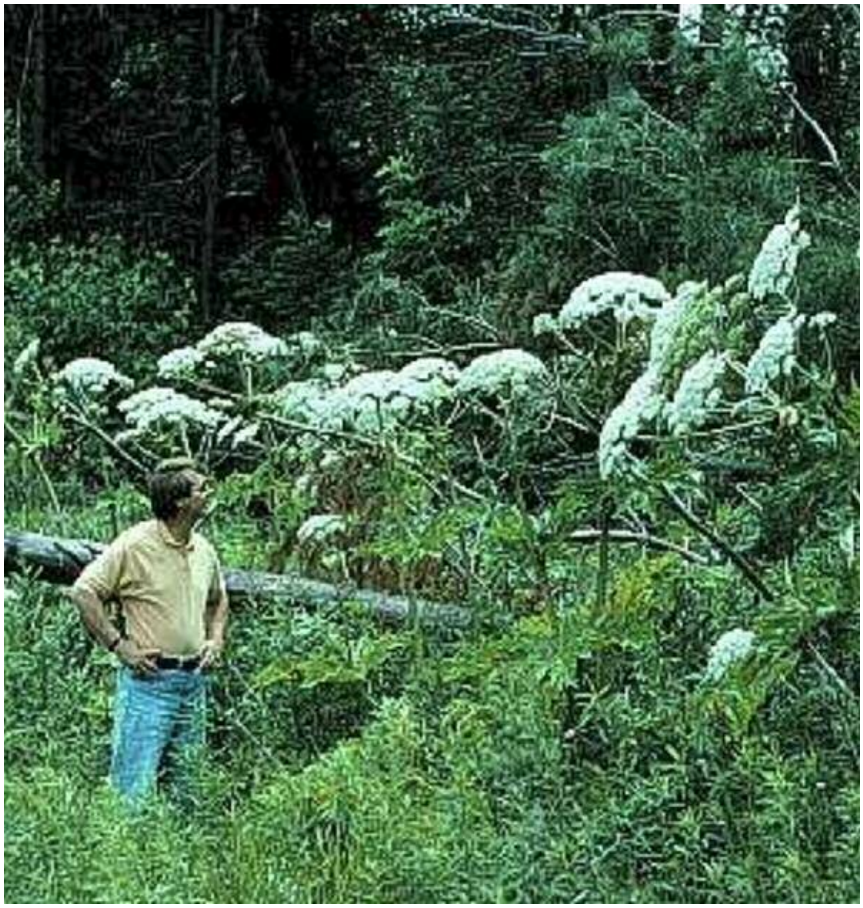
Although attractive, it is a hardy plant that can spread easily along roads, canals and drainage ditches, as well as marshes and lakeshores. It displaces native plants and indirectly reduces numbers of native birds and invertebrates.

Unfortunately, complete eradication of this plant is impossible, because there are no native herbivores that have the potential to control it. However, in recent years research has focused its attention on several native purple loosestrife pathogens and parasitic insects from Europe and Asia. Selected species were chosen from the beetle and weevil family because of their association with purple loosestrife in Europe, their mobility and their good host finding abilities. At several release sites, in Ontario, complete defoliation of large purple loosestrife stands has been reported with reductions of more than 95% of the biomass. However, it is not yet clear what adverse results may occur.

No purple loosestrife has been found in and around Koshlong, but people should report any possible findings.

Giant Hogweed

This plant really is a giant as it can reach a height of 5.5 metres under ideal conditions and is by far the most hazardous of these invasive species. The clear watery sap contains toxins that can cause serious skin problems within 48 hours, particularly when exposed to the sun. Effects include redness, a burning sensation, blisters and even scarring. Eye contact with the sap may cause temporary blindness, so immediately flush the eyes and seek urgent medical attention. Do not try to burn or compost this plant and it is wise to hire a professional to eradicate it. In spite of these dangers, it is often used as a garden ornament in its native southwest Asia. The white flower clusters resemble Queen Anne's Lace, but can form a flower head of one metre in width. Readers are encouraged to seek more information in order to become familiar with the appearance and dangers of this plant.



With the exception of the two plants (Purple Loosestrife and Giant Hogweed) it is impossible to eradicate these invasive species. All we can do is take steps to mitigate the problem by limiting the chances of their spreading.

5.24 Observations – Invasive Species

- *Other than rock bass, Exotic no serious invasive species have been reported in Koshlong Lake.*
- *Invading Species Hotline (1-800-563-7711) is a toll-free number for the public to report sightings and obtain free information on invasive species.*

5.25 Recommendations – Invasive Species

65. *The KLA should set up a volunteer-driven awareness program to find out more about invasive species and inform stakeholders about the problem.*
66. *The KLA should maintain signage at all launch points regarding invasive species and the procedures to ensure protection of the lake.*
67. *Visitors and residents should report the potential sighting of any invasive species in the Koshlong watershed.*
68. *Boaters, anglers, sailors, canoeists and water-skiers should take precautions to prevent the transport of exotic species from another lake, river or stream into Koshlong.*

5.26 Rare Species and Species at Risk

Species at Risk (SAR) include animals, plants and insects that are rare, threatened or endangers. The causes of rarity or scarcity of a species are many and varied, and may be natural or related to human activity. Rarity may be the result of habitat destruction or the lack of suitable habitat (particularly breeding habitat), invasive species, lack of migratory stopover areas, poor winter habitat, predation, unregulated hunting, disease, pollution, over-collecting or global warming. Rarity may also be due to the fact that the particular population is at its natural limits of its distribution range.

Significant species at risk are those regarded as provincially or regionally rare or sparse with a natural heritage feature. The Natural Heritage Information Centre (NHIC) (http://www.mnr.gov.on.ca/MNR/nhic/nhic.cfm) collects, manages, and ranks Ontario species based on a number of factors. Species being tracked by the NHIC are generally known as fewer than 100 occurrences across the province, and are often designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and/or the Committee on the Status of Species at Risk in Ontario (COSSARO) as 'species at risk'. This is an official status, which may afford the threatened and endangered species some protection in Ontario and Canada.

Another group, one that is focused on Haliburton County, is the Haliburton Highlands Land Trust (HHLT). Its goal is "to protect the plants, wildlife and clean water of Haliburton County to ensure a legacy of forests, fields and wetlands, and the species that they nurture". As part of its research mandate, it has produced a Species at Risk Journal for Haliburton County. Information about this group and its activities can be found at their web site – www.HaliburtonLandTrust.ca

The HHLT list of Species at Risk (at this time) is:

- Five-linked Skink — Special Concern
- Eastern Hog-nosed Snake — Threatened
- Eastern Milksnake — Special Concern
- Eastern Ribbon Snake — Special Concern
- Bladding's Turtle — Threatened
- Snapping Turtle — Special Concern
- Spotted Turtle — Endangered
- Stinkpot Turtle — Threatened
- Wood Turtle — Endangered
- American Ginseng — Endangered
- Butternut — Endangered
- Engelmann`s Quillwort — Endangered
- Bald Eagle — Special Concern
- Bobolink — Threatened
- Canada Warbler — Special Concern
- Chimney Swift — Threatened
- Common Nighthawk — Special Concern
- Golden-winged Warbler — Special Concern
- Olive-sided Flycatcher — Special Concern
- Peregrine Falcon — Threatened
- Whip-poor-will — Threatened

The classification of terms used to identify the degree of risk within Ontario is:

- Extirpated - A species that no longer exists in Ontario but still occurs elsewhere,
- Endangered – facing imminent danger of extinction or extirpation in Ontario,
- Threatened – at risk of becoming endangered in Ontario,
- Special Concern – is sensitive to human activities or natural events,
- Not at Risk – has been evaluated and found to be not at risk.

The protection of endangered and threatened species and their habitats from wilful harm or destruction is included in federal and provincial law, but it is still necessary to monitor all species for evidence of decline and to contribute efforts to slowing or preventing population declines.

More information regarding the laws and regulations in place in Ontario for the protection of fish and wildlife is available at the MNR web site http://www.mnr.gov.on.ca/MNR/.

Locally rare in the central region of Ontario (Regionally Significant plant species for Haliburton County) include (2003 data and 2004 NHIC confirmation):

- Least bur-reed; a small distribution in Ontario with only a single site listed in Haliburton County; therefore, it is rare
- Bog candle (Leafy white orchid); most orchids are sensitive to habitat change and are, therefore, considered rare species in Ontario

5.27 Observations – Rare Species and Species at Risk

- *There are fifteen rare or significant faunal species recorded for the Haliburton.*
- *All turtle species, except for the more common snapping turtle and western and midland painted turtles, are being tracked in Ontario by the NHIC.*
- *Rare species inventory for vascular plants, invertebrates, crayfish, molluscs, fish and reptiles (turtles and snakes) need to be assessed.*
- *The eastern hog-nosed snake is protected under the Provincial Policy Statement (PPS) and Schedule 9 of the provincial Fish and Wildlife Conservation Act (FWCA),*
- *Peregrine falcon are protected under the PPS, the provincial Endangered Species Act (ESA,) and the federal Species at Risk Act (SARA).*
- *If you are undertaking planning application work for locations with SAR species, the Natural Heritage Reference Manual states that COSEWIC endangered species, such as the Spotted Turtle, will receive policy protection under the Provincial Policy Statement.*

5.28 Recommendations – Rare Species and Species at Risk

69. ***KLA should work with MNR to obtain information on species at risk,***
70. ***KLA will educated members about the provincial and federal legislation regarding species at risk and the incentives that are in place for private stewardship efforts,***
71. ***KLA web site should be updated to include information and links regarding the identification and protection of rare and endangered species' habitat and how to naturalize their property to encourage rare species establishment.***

NOTE – *The identification and location of endangered or threatened species should be reported promptly to the Natural Heritage Information Centre—the Ontario Ministry of Natural Resources, Peterborough or our local MNR office in Minden.*

The location of rare and "species at risk" nesting, basking, hibernating or other habitats should not be publicized since many of these species are rare or "at risk" due to direct contact human.

Chapter 6 Surrounding Area

The land immediately surrounding Koshlong is in many ways as important to our enjoyment as is the lake. Some would argue that it is even more important, because it is this land that we inhabit. It is where we build our cottages and homes, where access roads have been constructed, where development occurs and where commerce is situated.

It is therefore important to examine the physical aspects of the surrounding area. Soils, floodplains, wetlands, steep slopes, the forests, renewable and non-renewable resources, and minerals and aggregates are discussed in this chapter.

One interesting, but hardly known aspect of the land in Haliburton is the ancient history of this area. The study of tectonic plate movement is still an emerging science, but it is generally accepted that 400 million year ago two tectonic plates (Baltica and Laurentia) collided. That encounter created a massive upheaval and resulted in the formation of a huge mountain range. That set of mountains is now known as the Appalachian Mountain Range and the Laurentiens and they were as high as the Himalayas. It is highly unlikely that the peaks in Haliburton Highlands were nearly as high but they were probably significant. After all, the Haliburton granite is one of the oldest and strongest rock formations on earth and Algonquin Park is located in an area commonly known as the Algonquin Dome. Tectonic plate movement, ice ages and erosion have taken their toll on these once mighty mountains, but this is still the Haliburton Highlands.

6.1 Soils

The soils around Koshlong Lake cover Precambrian bedrock. They are thin, sparse and seldom flat. This kind of terrain has little promise for productive agriculture and is perhaps why the area was not settled until the popularity of camping and cottaging began to explode. Fortunately, the soils in this area are well suited to mixed forest vegetation.

The geological features around Koshlong Lake are consistent with those of the Algonquin Highlands Physiographic Region. The bedrock is mostly plutonic rock of granite and Precambrian sedimentary rocks. Due to the lack of limestone, the water in Koshlong Lake is slightly acidic and is sensitive to acid rain. Similarly, the topsoil is generally acidic due to the historically dense coniferous vegetation and acid rain.

The soils exhibit various textures including coarse, medium and fine sand gravel, and were deposited via a mix of glacial movement and the flowing action of rains, creeks and rivers.

6.2 Observations - Soils

- *The overall thin soil cover of rocks, silt and fine sand makes many areas susceptible to erosion.*
- *Erosion is mitigated mainly by the natural vegetation that covers the landscape.*
- *At construction sites, improperly contained fine soil particles and clay can result in uncontrolled erosion and the introduction of sedimentation into the lake.*

- *Silting and sedimentation leads to water turbidity, which has the potential to affect the entire food chain.*
- *This type of soil and its susceptibility to erosion underlines the importance of a natural vegetative buffer along the shoreline*

6.2 Recommendations - Soils

72. KLA should raise member awareness about the character and sensitivity of soils around the lake.

73. Any development that results in major alteration of landscape and soils should be required to submit Storm Water Management and Construction Mitigation Plans. Construction specifications should include:

a) Appropriate assessment of soil characteristics causing sedimentation and erosion; and

b) Construction measures (silt fences, hay bails, runoff ponds) that are needed to prevent silting and erosion of banks of water courses.

6.3 Floodplains

From a technical perspective, development in floodplain areas has the potential to put property and the health and safety of residents at risk. In addition, the dumping of fill into floodplain areas displaces water, introduces probable contaminants and has downstream consequences. Local plans and zoning by-laws should recognize any 100-year floodplain elevation identified by MNR and include policy that prohibits development and the filling of these areas.

6.4 Observations - Floodplain

- *Floodplains near Koshlong Lake are quite limited and flooding is not a concern.*

6.5 Minerals and Aggregates

Aggregates such as sand, gravel and rock, used for construction, industrial, manufacturing and maintenance purposes, are commonplace in Haliburton County. However, no sand and gravel pits are currently in operation in the watershed and lands around Koshlong Lake.

6.6 Observations - Minerals and Aggregates

- *There are, at present, no active mining operations in the Koshlong Lake area.*
- *The municipalities should include Official Plan policy to prohibit mines, pits and quarries within a certain distance of the lake.*

6.7 Recommendations - Minerals and Aggregates

74. Mineral and aggregate extraction sites and quarry development should be regulated to prevent negative impacts on wetlands and streams feeding Koshlong Lake, and on residential areas.

75. Municipalities should adopt a Pits and Quarries By-law that includes requirements for watershed protection and requirements to rehabilitate resource properties after operations are closed.

76. Official Plans and by-laws should be amended to prohibit the creation of pits and quarries within 300 metres of lake and drainage areas.

77. Official Plans and by-laws should be amended to prohibit the creation of mining sites within 1000 metres of lake and drainage areas.

6.8 Steep Slopes

Shoreline properties with steep slopes often provide lovely views of the lake and surrounding landscape. But shoreline access can present challenges for recreational, cottage or residential development. Poorly planned development on or near steep slopes can result in substantial alteration of the natural landscape and visual impact due to the prominence and location of development,

The background statement in the County of Hastings Official Plan states:

> "*Residential development should not take place on lands having environmental constraints and is discouraged in areas possessing important natural characteristics. Buildings should be set back far enough from the crest or toe of steep slopes to ensure structural stability and to avoid erosion hazards and visual intrusion into the landscape. Natural features should be altered as little as possible*."

The Official Plan for the Municipality of Highlands East contains policies regarding the construction of buildings in hazardous areas, but does not deal with the visual impact of development in these areas.

6.9 Observations – Steep Slopes

- *Design of buildings on steep slopes must receive special attention to take into account safety, terrain alterations.*
- *Several undeveloped areas surrounding the lake have steep slopes.*

6.10 Recommendations – Steep Slopes

78. Special municipal standards should be developed for Koshlong to address building location, density, location of septic systems and buffer zones on lots with steep slopes.

6.11 Forestry

There are different government control mechanisms regulating tree cutting in Crown forests and privately owned forests. The following section was prepared by Bruce Fleck, Bancroft District Forester, MNR.

Crown Land Forestry

A portion of the forested land surrounding Koshlong Lake and adjacent to many cottage properties is under Crown ownership. All forest management activities on these lands may only be carried out in accordance with the approved Forest Management Plan (FMP) for the Bancroft Minden Forest 2006-2026 (to be renewed effective, 2010).

Forest management plans are prepared with public participation. Notices inviting input are posted in local newspapers, and cottage associations are individually notified at appropriate stages of plan preparation. A Local Citizens' Committee (LCC) is part of the system of public participation. MNR seeks local participation so that members of the Koshlong community can represent the concerns of lake residents and cottagers as a member of the LCC. The current plan can be viewed at the MNR offices in Bancroft, Minden and Peterborough during regular business hours.

A forest management plan establishes objectives for the Crown forest and strategies for their achievement for a twenty year period. The locations of proposed operations are established for a five year period. Every five years the plan is reviewed, updated and a further five years of operations are determined. Details with respect to access, harvesting locations, harvesting methods, renewal and maintenance activities, and environmental and fish and wildlife habitat protection are described. For a complete and up-to-date list of environmental protection guidelines, contact any Ministry of Natural Resources office or visit their web site at http://www.appefmp.mnr.gov.on.ca/eFMP/home.do.

Private Land Forestry

Tree cutting on privately owned forest lands in Haliburton County must be in accordance with Tree Cutting By-law No.2655 dated November 26, 2003. This by-law applies to forests greater than four (4) hectares in size. It does not apply to trees cut for personal use, to construct buildings for which a building permit has been issued, trees along roads, injured trees, or trees on lands for which council has approved their destruction to allow for other land uses.

The by-law requires landowners or logging contractors to apply for a permit to cut trees; to cut trees only in accordance with an approved permit; prohibits tree cutting in provincially significant wetlands or areas of natural and scientific interest (ANSI's) designated by the MNR; restricts clear cutting using a residual tree density rule; establishes diameter based restrictions for different tree species; and allows logging operations to be carried out beyond the diameter limit where a prescription has been prepared by a Registered Professional Forester(RPF) and trees are marked by certified tree markers.

Further, tree cutting within 15 metres (m) of the high water mark of any lake, river or watercourse, or 15 m of any maintained public road is prohibited unless designated by a certified tree marker or RPF. There are significant penalties for individuals and for corporations for contraventions of the by-law.

Figure 6.1 – Minimum Diameter for Selected Species
County of Haliburton Trees By-law 2655 (Table 1)

	Point of Measurement in cm above ground level (inches)	Minimum Diameter in cm (inches)
Sugar maple, red maple, yellow birch, basswood, white ash, black cherry, red pine, hemlock, spruce	30.48 (12) 20.32 (8) 10.16 (4)	35.56 (14) 43.18 (17) 50.80 (20)
Red oak, white pine	30.48 (12) 20.32 (8) 10.16 (4)	40.64 (16) 50.80 (20) 60.96 (24)

Tree Cutting and Natural Shorelines

In 2010, the Haliburton County Official Plan was amended to include the following statements:

> Clearing of natural vegetation along the shoreline should be restricted to that needed for access, recreational use, limited view of the water and safety of residents. Development and site alterations shall be setback a minimum of 30 metres (100 feet) from the high water mark of lakes, rivers and streams.
>
> The shoreline frontage of the lot should be maintained in natural shoreline vegetation, including trees, in the water and upland along the water's edge. The extents of removal in the shoreline areas will be considered within the following parameters:
>
> a) A maximum of 30% of the shoreline frontage or up to 15 metres, whichever is the lesser, for shoreline/linear residential development;
> b) A maximum of 30% of the shoreline frontage or up to 30 metres, whichever is the lesser, for commercial development, or waterfront landings;;
>
> The maintenance of shoreline vegetation is beneficial to:
>
> - Protect the riparian and littoral zones and associated habitat
> - Prevent erosion, siltation and nutrient migration
> - Maintain shoreline character and appearance
> - Provide fish habitat
>
> The County encourages the retention of natural vegetation, including trees, in the full setback from water as identified in the local official plans. The county will implement a tree cutting by-law for shoreline areas. It is not the intent of this official plan to limit the removal of dangerous trees, either through damage or disease. The County forestry officer should be consulted and the forestry by-law reviewed prior to removal of trees.

This marked the first time that the county recognized the importance of a natural shoreline and tried to encourage property owners to change their landscape in order to gain the many benefits to the ecology. It is now up to us to comply. Not because it is an official bylaw, but because it is the right thing to do. In fact

we should go one step further by planting indigenous shrubs and plants along the shoreline to reduce runoff and enhance the natural beauty of the shores.

Members are encouraged to find out more about this issue. One excellent source of information is the Coalition of Haliburton Property Owners' Associations (CHA) web site (WWW.COHPOA.ORG) where one can find a host of tips, a list of recommendations and a set of links to more reference material.

6.12 Observations - Forestry

- *The 2010 Haliburton County tree cutting policy prohibits the cutting of trees in provincially significant wetlands, ANSI's and within 15 m from a shoreline. However, the by-law only applies to properties that are greater than 4 hectares (10 acres), and does not deal with the visual impact of tree removal.*
- *Local by-laws are being developed to determine minimum setback and trunk dimensions for tree cutting.*
- *Although tree cutting has taken place on private lands, no forestry activity has occurred on Crown lands around Koshlong Lake in over 50 years.*
- *Forestry activities on Crown land must be in accordance with the approved Forest Management Plan for the Bancroft Minden Forest 2006-2026. The Plan will be renewed by 2010.*

6.13 Recommendations - Forestry

79. Property owners should be encouraged to follow sound forestry practices and good stewardship guidelines, especially near lakes and streams.

80. The KLA should review the Forest Management Plan for the Bancroft Minden Forest 2006-2026 to determine implications on the Koshlong Lake watershed.

81. Municipalities should be encouraged to impose stricter requirements for commercial operations and to address visual impact, in accordance with the County's Official Plan.

Chapter 7 Land Use & Bylaws

The purpose of this chapter is not to catalogue the details and nuances of every property, but rather to provide a snapshot of how things were at the turn of the 21st century, so that it will be easier to compare how things have progressed in 20, 50 or 100 years from now. This chapter will attempt to describe the current land uses around the lake and to provide a background and overview of the municipal official plan and zoning by-law policies for private land.

7.1 Current Land Use

Until now, very little has been documented about the history of Koshlong Lake, particularly the history of the early cottages that dotted the lake. It is therefore very difficult to see how things have changed since the first pioneers began building on the shores.

7.1.1 Summary of Land Use

A high level picture of the current land use around the lake is shown on the general Koshlong Lake map entitled 'APPENDIX B – Highlands East Land Use Designations'. (NOTE – *The map was provided by the Municipality of Highlands East and does not include any area in Dysart et al. Therefore the northern parts of Dysart Bay and Camp Wanakita are not shown.)*

The shoreline is predominantly seasonal with a smattering of permanent residential properties, and only two commercial establishments (Camp Wanakita and the former Koshlong Marina and Haliburton Boat Covers). Most buildings are set back at least 66 ft., in accordance with building codes, and have a shoreline buffer of natural vegetation; but some cottages are much closer to the shore, as they were built at a time when regulations were not developed and their footprint has been grandfathered.

According to KLA records in 2009, there were 231 private shoreline lots and four inhabited islands on Koshlong Lake. This included 219 seasonal residential lots, 8 permanent residential lots, 3 commercial lots (two of them are Camp Wanakita) and 6 vacant lots.

Due to the annual water level variation, all of the docks are floating and there is only one active boathouse on the lake.

7.2 Interesting facts from MPAC

Although the Municipal Property Assessment Corporation (MPAC) has been a bane to most cottagers, it has provided a lot of detailed information about our lake. (NOTE - s*ince Camp Wanakita is so large, its data would distort the findings, so its information has been excluded from the following figures.*)

According to the information available from the 2005 assessment, the average shoreline frontage of privately owned lots is 265 ft. and the average acreage is 2.16 acres. It should be noted that frontage values of the four inhabited islands has also been excluded. If the island information was included, then the average shoreline would be 252 ft. and acreage would be 2.11 acres.

Looking at the assessed value of properties also provides an interesting read, from an individual perspective as well as a municipal perspective (for taxation). The analysis shows:

- Average assessment based on 2005 values was $190,119
- Average assessment projected to 2009 was $269,486
- Average assessment increase (2006-2009) was 42.67%

The rationale for the above values is difficult to determine, because assessment increases are quite varied. The minimum increase was 13% and the greatest increase was 103%. These variations were usually not based on cottages being upgraded or replaced, but rather due to changes in the algorithms used to determine property assessment values. If the MPAC model was more rigorous, there would not be such a great variation in property increases.

From a municipal perspective is also interesting. The total assessed value of all private residential properties (again excluding Camp Wanakita) in 2005 is $42,021,000. This value increases to an equally staggering value of $59,287,000 in 2009. This makes Koshlong Lake the most valuable tax resource in Highlands East.

It should be noted that the properties in Dysart have been included in all of the above figures, in order to show the information for the whole lake, without regard for municipal boundaries.

Property owners should realize that they can appeal an assessment every year. Factors such as obstacles to land usage, like the hydro right-of-way and the community road on ones property, can and should be used to reduce an assessment value.

7.3 Observations

- *Aside from crown land, there are very few undeveloped properties on the lake. This greatly enhances the natural beauty of the lake.*
- *Commercial development on Koshlong Lake provides some significant benefits to the area, including winter plowing and a business requirement for high-speed internet access. The same can be said as more people decide to take up full-time residence on the lake.*
- *Information about the size of cottages/homes and the number of outbuildings (garages, bunkies, boathouses, etc.) is available from MPAC, but has not been analysed in this version of the lake plan.*
- *In the survey of 2008, almost 63% of respondent indicated that restrictions should be placed on the building of boathouses. But 20% stated that no restrictions should be laid.*

7.4 Recommendations – Land Use

82. The balance between natural state and built sections of the shoreline should be appropriately maintained by regulations to restrict the cumulative size and location of buildings.

83. The zoning by-laws for Highlands East and Dysart should provide consistent direction with respect to boathouses and other buildings.

84. A natural vegetative buffer, at least 20 m in depth and covering 75% of the shoreline, should be required on all residential lots.

85. Applications for rezoning and subdividing shoreline property should receive careful and scrupulous attention, with the involvement of all interested parties. Notices of applications should be sent to the Koshlong Lake Association.

86. Research should be done to determine the number and size of buildings, in order to establish a historic baseline for future comparisons.

7.5 Residential Occupancy

In 1980, there were only two permanent residential properties on Koshlong Lake (the director of Camp Wanakita and the owners of Koshlong Marina). In 2012, the number of permanent residential properties had grown to ten.

According to the general survey conducted in 2008, 3.3% of all seasonal property owners indicated that they would consider either retiring or becoming a permanent resident on Koshlong. This trend, of cottage conversion from seasonal to permanent use, appears to be continuing.

The number of people living on and using the lake at any one time can have a direct effect on water quality and will have an impact the natural elements of the lake. In the following figure (7.1), occupancy refers to the number of people using seasonal cottages (not full-time residences) and the length of time that they stay on the lake. As you would expect, the numbers shows that (for cottagers) the summer season (June, July and August) had the highest percentage of days occupied, followed by fall, spring and winter seasons. However, 40% of cottagers (that were not using their cottages in the winter), would do so if their road was plowed.

Figure 7.1 – Seasonal Occupancy by Season

	Average No. of Days Used	Percentage of Days Occupied
Spring	13.5	15.0%
Summer	45.3	50.3%
Fall	19.7	21.9%
Winter	7.6	8.4%

Note – Based on 90 days per season

Figure 7.2 indicates the number of occupants per seasonal property by season, when the property is in use. During the winter, spring and fall seasons, about half of all cottages were occasionally occupied by one or two people (47-53%). Curiously, on a percentage basis, the number of cottages with an occupancy rate of 3-4 people did not change much by season (23-27%).

Figure 7.2 – Number of Occupants, by Season

No. of Occupants	Spring	Summer	Fall	Winter
1 - 2 persons	47%	28%	48%	53%
3 - 4 persons	23%	22%	27%	23%
5 - 6 persons	19%	27%	19%	19%
7 - 8 persons	3%	12%	3%	5%
9 or more people	3%	11%	3%	0%

NOTE – *A first glance, the numbers in Figure 7.2 might appear confusing. Each season should be viewed separately. For example, in the winter, most properties (53%) were visited or occupied by 1 or 2 people and none by 9 or more.*

Longer stays at the cottage and increases in the number of visitors tend to increase the amount of phosphorus generated through sewage. Fortunately, this has not been an issue on this lake and should remain such as long as proper maintenance is done on septic systems.

7.6 Observations - *Residential Occupancy*

- *Ninety seven percent (93.5%) of all properties on Koshlong Lake are seasonally occupied and 3.5% are permanently occupied.*
- *A small, but growing, number of seasonal residents have plans to convert their cottages to permanent residences.*

7.7 Septic Systems

The Ministry of the Environment (MOE) conducted a review of Septic systems in 1977 through the Cottage Pollution Control Program. The provincial program was initiated in 1970 “to detect and have corrected faulty private sewage disposal systems of cottages located on recreational lakes. The objective of the program is to investigate and, in conjunction with the owner, to undertake abatement work on those systems found to be faulty”.

KLA considered the results of this initiative to be a private matter between the property owners and the municipalities. Therefore no information was gathered on the number of properties that were not in compliance or the number of systems that were updated.

According to the KLA survey of 2008, the vast majority (95%) of respondents indicated that a lake plan should be used to educated property owners about the proper usage and maintenance of septic systems. To address that request, the following information about a video and a tip sheet (see APPENDIX T) has been added to the original draft.

In 2013, a fascinating 22 minute video on this topic was produced. It starts out with the following quote from Gordon Miller, the Chief Environmental Officer from the Province of Ontario who states, ”**18,000,000,000 litres of treated, semi-treated and untreated sewage enter the Great Lakes Basin every day**”. The speaker then goes

on to say that this sewage waste eventually goes into our beautiful lakes and streams. Those statements are meant to both shock and inform viewers about the magnitude of the problem. It is big.

Fortunately, most of this sewage is properly dealt with. Unfortunately, some of the sewage is not properly handled and it works its way into our lakes and streams. Even though Koshlong does not exhibit any signs of stress from sewage, it is probably safe to say that some of our sewage is working its way our once pristine water.

The video (euphemistically called "Poop Talk") was produced by the Haliburton Highlands Stewardship Council (HHSC) and the Coalition of Haliburton Property Owners' Associations (CHA). Links to this video are available from the KLA web site (WWW.KOSHLONGLAKE.CA) and the CHA web site (WWW.WOHPOA.ORG) and all KLA members are encouraged to view it.

The least that we can do is to have our septic systems pumped out every 3-5 years (depending on the number of people that are using the cottage/residence and the number us weeks that it is in use). There are two tanks in every normal septic system and both should be pumped out. When the pumping is finished it would be a good idea to ask the technician for some feedback on the health of the system. They can usually tell if the system is working properly.

The other important thing is to be careful about what is put into the septic system. These sensitive systems are not the same as those in major urban areas and cannot handle much more than our normal human digestive waste. They are not designed to handle oil, paint, chemical products like Drano or CLR and soaps should have as little nitrates as possible. See APPENDIX T for more details.

7.8 Observations – Septic System

- *Fecal coliform and chemical contamination are present in the lake, but have not been a problem on Koshlong.*
- *Septic system regulations are constantly changing, so older systems may no longer be in compliance with new rules.*

7.9 Recommendations – Septic Systems

87. *A Septic System Usage and Maintenance Guide should be developed, to ensure that property owners are aware of the proper care of their systems.*

7.10 Crown Land Usage and Regulations

There are a wide range of activities carried out on Crown lands and waters, all within the watershed of Koshlong Lake. These include daytime activities like diving and jumping from Divers Rock and hiking to Bark Lake, as well as overnight camping at designated locations. These have generally been benign activities, are part of the enjoyment of our lake setting, and ought to be encouraged.

However, on occasion boisterous parties have broken out in some locations. Since these parties have been disturbing to nearby residences and sometimes intimidating, the KLA has developed a policy on reporting such occurrences and an Incident Reporting form to use when doing so. The policy and form are readily available on the Koshlong Lake web site (KoshlongLake.ca). If you see something that is potentially harmful to the environment or loud and annoying, then report it. That is the only way that these activities can be contained or discouraged.

It should be noted that overnight camping is not permitted on Umbrella Island.

7.11 Public Lands Act

The Ministry of Natural Resources (MNR) is responsible for the management of Crown land, pursuant to the Public Lands Act, which includes acquisition, disposition and management of Crown lands and waters. The Ministry tries to administer all Crown assets in the best interest of the public. It should be noted that Chapter 413, Part 1 and 3 of the Public Lands Act states that 25% of all Crown shorelines will be set aside for public recreation and access.

7.12 Ontario's Living Legacy

The MNR's 1999 Ontario's Living Legacy (OLL) Land Use Strategy outlines the intended strategic direction for the management of Crown lands and waters throughout Ontario. The OLL strategy sets a framework for future land and resource management on Crown lands. It provides guidance and direction on what activities are preferred in certain areas and what activities will not be permitted. Any new or revised plans for Crown lands must be consistent with the intent of the OLL strategy. The OLL strategy will replace current direction provided in existing planning documents such as the District Land Use Guidelines.

Figure 7.3 – Ontario's Living Legacy Land Use Strategy

Permitted Uses

Use	Provincial Park Addition
Commercial timber harvest	Not permitted
Commercial hydro development	Not permitted
Mineral exploration and mining	Not permitted
Bait fishing, commercial fishing, fur harvesting and wild rice harvesting	Existing uses only
Sport hunting	Permitted
Sport fishing	Permitted, except in sanctuaries
Seasonal recreational camps	Existing uses only
Tourism facilities and recreational trails	Existing uses only
Road construction across waterway parks	Identified prior to regulation

Source: Ontario Living Legacy Land Use Strategy

7.14 Observations – Ontario Living Legacy

- *Public use of crown land is not only legal, but also encouraged, within guidelines.*

7.15 Recommendations – Ontario Living Legacy

88. The KLA should encourage the proper use of crown land, in all seasons
89. The KLA should continue to educate property owners on the correct way of documenting and reporting inappropriate or illegal use of crown land.

7.16 Municipal Planning Regulations

The purpose of this section is to describe the municipal planning regulations and bylaws that apply to Koshlong Lake, so that readers are aware of them.

Within all municipalities there are policies and regulations that govern land use. Official Plans provide general land use policy statements on how land should be used. Whereas, municipal by-laws establish the actual regulations on how land can be used. An Official Plan is prepared with the input of the public and updated on a regular basis, and it tries to ensure that future planning and development will meet the needs of the community.

All development must conform to the Official Plan and Zoning By-laws, which even regulate the use and location of buildings and structures. Site Plan Control By-laws and Consent Agreements can also ensure certain construction and design standards are maintained.

Over 95% of the shoreline of Koshlong Lake is in the Municipality of Highlands East. Only the northern tip of Dysart Bay is in the Municipality of Dysart et al. Although the plans and by-laws of these two municipalities are similar, they are not exactly the same. To avoid confusion, this chapter will focus only on the plans and by-laws of Highlands East.

7.17 Official Plans

Koshlong Lake falls under the umbrella of three official plans. The Official Plan for the County of Haliburton provides a general policy framework and development strategy. More detailed policies are in the Official Plans of the Municipalities of Highlands East and Dysart et al. It is these municipal plans that establish the land use regulations that residents must abide by. All Official Plans are subject to a review and update on a five-year cycle. The most recent review took place in 2010.

7.17.1 County of Haliburton Official Plan

The County of Haliburton operates as a two-tiered system of government. The County Plan establishes general policy and guidance whereas detailed planning is carried out through the local official plans in conformity with the County Plan. All plans are subject to approval by the province. The county is the initial approval authority for local Official Plans and amendments, but final approval remains with the Ministry of Municipal Affairs and Housing.

The policy framework for the Official Plan covers three general areas: environment, resources and settlement pattern.

> *Environment* - The County Official Plan notes that there is a need for innovative approaches to protecting, sustaining and restoring Haliburton lakes, forests and habitats, and outlines approaches based on watershed, lake capacities, and remedial actions to sustain and improve environmental quality and ecological function. Local official plans will identify natural heritage lands, and these areas will be protected from incompatible development. As well, strategies for the protection of ground and surface water resources will be included in local Official Plans. These may include lake

capacity estimates, waterfront setbacks, shoreline protection and forest buffers. Development must also respect and not encroach on natural hazards.

Resources - Mineral deposits will be protected for future use. Development of sand, gravel and natural stone deposits will incorporate buffer zones and rehabilitation plans. Policies to control watershed flow management will be developed in co-operation with local and senior levels of government. Local plans will contain policies to address the conversion of Crown lands to private ownership and use.

Settlement Patterns - Four main settlement patterns have been identified; one of them being identified as "cottage communities". The official plan ensures that the development of cottage communities is environmentally sustainable and properly serviced.

7.17.2 Municipality of Highlands East Official Plan

The Municipality of Highlands East was created on October 6th, 2000, as the amalgamation of the former Townships of Glamorgan (*where Koshlong lies*), Monmouth, Cardiff, and Bicroft. The Official Plan was the first for the municipality and was been prepared "with regard" to the draft County of Haliburton Official Plan as well as the Provincial Policy Statement. The Municipality of Highlands East Official Plan was adopted by Council on October 14th, 2003, and has since been approved by the Ministry of Municipal Affairs and Housing.

Principles - The Official Plan establishes principles for Growth and Settlement, the Environment and the Lakes, the Economy, the Rural Area, and Municipal Infrastructure. The strongest principles appear to address the environment and the lakes. Policy 1.2.2.1 states that "Council will respect the environment and will follow the principle of sustainability, and will consider the cumulative impacts of planning decisions, while recognizing that development proposals cannot be addressed on an individual basis in isolation from past and future decisions." The Official Plan will put forward an "environment first approach" in evaluating land use developments. Policy 1.2.2.4 states "Land uses in close proximity to the shoreline will be regulated in an effort to minimize impacts on lake water quality and to protect shoreline areas from degradation."

Development Policies – Development policies provide specific direction for a range of matters. The following provides an overview of those that are most relevant to maintaining the quality of life around Koshlong Lake.

Crown Land (2.1.9) – Development on Crown land must have regard for planning policies of the Municipality.

Mineral Exploration and Mine Development (2.1.10) – Exploration and mine development is encouraged and requires an Official Plan and Zoning By-law amendment.

Division of Land (2.2.2) - Consents will only be considered if they conform to all requirements of the municipality's zoning by-law and septic system requirements. Lot creation, such as these, will not be permitted in wetlands, areas susceptible to erosion, flooding, or within significant wildlife, fish and/or biological areas. Development may be permitted outside of these areas provided there is no negative impact on the natural feature and/or its function. An Environmental Impact Statement may be required.

Environmental Impact Study (2.3.2) – Environmental Impact Studies (EIS) are required for major development proposals including Official Plan Amendments and Plans of Subdivision. Where an EIS is required within 300 metres of a lake, it shall include a Lake Impact Assessment to demonstrate that the proposed development will not impair water quality or compromise MOE water quality objectives.

Vegetation Cover (2.3.5) - New development in the shoreline shall be sensitive to the preservation of tree cover and vegetation so as to prevent erosion, siltation and, if possible, nutrient migration. The implementing Zoning By-law will establish shoreline setbacks and regulations to protect natural vegetation.

Lake Management Plans and Strategies (2.3.6) - Council supports the preparation of Lake Management Plans that assess issues such as carrying capacity, shoreline development, vegetation retention, shoreline erosion, cottage conversion, septic system maintenance, and other important issues. Plans, such as these, are encouraged to establish monitoring programs. Amendments to the official plan and zoning by-laws will be considered for matters, not already addressed in the Official Plan and Council may undertake peer reviews of Lake Management Plans.

Wetlands (2.3.16) – Provincially and locally significant wetlands are to be protected and maintained in their natural state. However, development is permitted, within the wetland or within 120 m of the wetland, provided an EIS is prepared. The results of which ensure that the development will not result in the loss of wetland function, conflict with existing wetland management practices, or result in the loss of contiguous wetland area or wetland complex.

Development Policies also apply to endangered and threatened species, floodplain management, groundwater resources, and hazardous slopes, which may need to be addressed when evaluating development proposals. In the case of steep slopes greater than 1 in 3, an increased setback from tops of bank is required.

Land Use Designations – There are four different types of land use designations in the Koshlong Lake watershed: Residential Limited Service, Rural, Shoreline and Environmental Protection. Residential Limited Service refers to the private properties where residential buildings are either already standing or may be approved for construction. The Environmental Protection designation applies mainly to wetlands. The remaining areas are designated Rural. Shoreline refers to crown land. There are no areas designated for Aggregate Resources within the watershed.

7.18 Observations - Municipality of Highlands East Official Plan

- *The Municipality of Highlands East's Official Plan provides comprehensive land use direction and promotes the principle of "environment first".*
- *The Council supports the preparation of lake management plans and will consider official plan amendments on matters not already addressed in the official plan.*
- *Koshlong Lake is identified as being at capacity and new development within 300 metres of these water bodies will not be permitted except on an existing lot of record, or where the septic tile bed is located more than 300 m from the lake, or where an environmental impact statement demonstrates that there will be no impact on water quality.*
- *Provincially and locally significant wetlands are designated Environmental Protection, and no buildings or structures may be constructed. Permitted uses are limited to resource management activities. However, development is permitted in provincially significant wetlands provided an EIS demonstrates no negative impact.*
- *Policies regarding steep slopes do not require an increase in frontage when new lots are being considered.*
- *The current Official Plan does not include policies about: narrow water bodies, lighting and privacy, or shoreline activity areas – but these might be addressed in the update.*

- *The Official Plan generally encourages the preservation of tree cover and shoreline vegetation, but does not provide detailed policy direction to be implemented in the zoning by-law.*

7.19 Recommendations – Municipality of Highlands East Official Plan

90. The Official Plan should be strengthened with policies that implement the principle of "environment first". More specifically, the official plan should provide more detailed policies with respect to the following:

a) Shoreline vegetation preservation including width, tree cutting, permitted uses, and restoration;

b) Development constraints related to steep slopes including a definition and a requirement for increased lot frontages;

c) Allows the enhancement of certain policies for specific lakes (like Koshlong) provided the necessary background information is available;

d) Lighting, noise and privacy concerns;

e) The prohibition of aggregate and mining operations within 500 metres of Koshlong Lake; and

f) Prohibits any development or site alteration within provincially significant wetlands and within 120 metres of the wetland.

7.20 Social Etiquette and Official Rules in Cottage Country

Many people visiting cottage country for the first time are not aware of the generally accepted behaviour or the official rules and by-laws that govern behaviour or building regulations. Although the following points are by no means complete, this section is meant to be a handy reference list that should be known by all cottagers and visitors.

NOTE – the by-laws that are quoted in this section were taken from Highlands East in 2009. These bylaws are subject to change and may already have been altered. For details on the current bylaws, the Highlands East municipality should be contacted (either in person or via their web site), particularly when considering a change to the buildings or landscape. Also, those who own property in Dysart et al should contact that municipality before making any changes to their property, since its by-laws may be different.

NOTE ALSO – the by-laws have been taken verbatim from the municipal records, so in some cases you might have to contact the by-law enforcement officer to translate the wording into plain English.

7.20.1 Shore Road Allowance

During the initial layout of public road allowances in Ontario, 66-foot road allowances were established next to many rivers and lakes. The crown reserved rights to this land so that travelers on the waterways could stop and set up camp without asking permission of private landowners; and so that later roads could be built along the shores where needed. In most cases, these shore road allowances have never been opened as public highways and are generally used and enjoyed by the owners of the cottage lots that abut these lands.

Recently the provincial government has provided municipalities with the option to sell these shoreline rights to abutting property owners. Koshlong Lake property owners can now apply to buy their shore road allowance from the municipality. For purchases in Highlands East there is a fee (Municipal Administration fee=$250.00 + Deposit=$500.00 for the first 150 feet of water frontage- $2.00 per foot plus G.S.T. of frontage thereafter), along with legal and survey costs. Ultimately, the process can take up to a year and can cost a few thousand dollars.

Although a large number of Koshlong property owners have purchased their road allowance, many have not done so. For those who are thinking about buying their shore road allowance, you should be aware of the following rules and certain situations that may arise:

- **Illegal Structures**: If there are buildings on the Shoreline Road Allowance that are illegal, (eg. buildings that have been enlarged or a use change in past few years) the Building Department may request the Applicant to remove the building(s) before completion of the closure and conveyance of shoreline.

- **Septic Systems**: If there is a septic system or a Class 1 system (privy) on the Shoreline Allowance, the Applicant shall supply the Municipality with a copy of the sewage system inspection report and use permit issued by the local Health Unit.

- **Legal, Non-Conforming Status**: Some cottages may fall under non-conforming status due usually to age of the structure. The acquisition of the shore road allowance may disrupt this status, and prompt other changes to the property, such as set back requirements, site plan agreement, and environmental considerations.

- **Cost**: The cost to close a shore line allowance may be substantial, depending on the property in question. Owners are expected to cover costs such as survey, purchase price of shore road allowance and costs associated with negotiations with the municipality

- **Fish Habitat Considerations**: The Ministry of Natural Resources has a mandate to protect the fish habitat, and thus complicated negotiations may ensure and affect the costs, timing and amount of land which may be conveyed.

7.20.2 Noise By-Law

According to the Highlands East By-Law No. 2006-45 regulating noise,

No person shall make, cause or permit to be made, either on a highway or elsewhere in the Municipality, **commencing from 11:00 p.m. on any given evening to 6:00 a.m. on any given morning**, any unnecessary noise or unnecessary sound which disturbs the quiet, peace, rest, enjoyment, comfort or convenience of any other person or is the result of any activities described in Schedule "A" and that is audible to:

a) a person in a premises or vehicle other than the premises or vehicle from which the noise is originating; or

b) a person in a residence other than the residence from which the noise is originating.

NOTE – *Although this is a municipal by-law, it is also an example of common courtesy and plain old common sense. As you know, sound travels great distances over water. People several hundred metres away can easily hear sounds that are not thought to be loud (eg. the sound of two hands clapping). So, try to keep your radio down to an easy listening level and if you're having a party in the evening take it inside after 11:00 pm. Your neighbours next door and on the other side of the lake will appreciate it.*

7.21 Zoning By-laws

Municipality of Highlands East Zoning By-law

On December 7, 2004 the new Official Plan for the Municipality of Highlands East was approved by the Ministry of Municipal Affairs and Housing. With the new Official Plan in force, council adopted a new Comprehensive Zoning By-law to implement the Official Plan on June 14, 2005.

The purpose of the zoning by-law is to translate the Official Plan policies into specific provisions that regulate land use (permitted uses) and that restrict the location, massing and density of buildings and structures.

The shoreline of Koshlong Lake is largely zoned Shoreline Residential Limited Service Residential (LSR) with select Environmental Protection (EP) zones. There are also two shoreline properties zoned Tourist Commercial (CT-7, CT-8) which make up Camp Wanakita. The surrounding area is predominantly crown land with some pockets designated as Rural (Ru). **See the map in Appendix B for details.**

The following provisions from the Municipality of Highlands East Zoning By-laws regulate a range of matters that are most applicable to the issues and concerns related to lake residents:

Dwelling on a Lot (Section 3.5)
Unless of otherwise permitted, no more than one dwelling unit shall be permitted on a lot.

Setbacks from High Water Mark (Section 3.31)
No building or structure, including septic systems, should be located within 20 metres (66 feet) of the normal or maintained high water mark of the lake. This provision does not apply to docks, marine facilities, pump houses, bridges, flood control devises or other like facilities. But, it does apply to decks.

Non-Complying Lots, Buildings and Structures (Section 3.20)
Of course, there are many cottages that legally exist within this 20 metre (66 feet) setback. Such dwellings are recognized as “legal, non-complying buildings or structures,” having been constructed prior to the effective date for legal non-conformity (as defined by each of the former municipalities). The zoning regulations do permit the replacement, renovation or reconstruction of existing dwellings, so long as the replacement does not further encroach on high water mark setback, and all other provisions in the zoning by-law are complied with.

This being said, a legal non-complying dwelling unit may expand its ground floor area by no more than 25% of the ground floor of the dwelling provided that the expansion does not cause the existing shoreline setback to be further reduced (*ie. – it is not closer to the water*), or that the expansion does not exceed 40% of the frontage of the lot to a maximum of 18 metres. This provision does not apply to the expansion of other detached structures such as boathouses, bunkies or sheds which encroach into the required

shoreline setback.

Non-Conforming Uses (Section 3.21)

The use of any existing lot, building or structure, for a purpose prohibited by the by-law, is allowed to continue; when the use ceases for two years, the use is deemed discontinued. A building, such as this, cannot be enlarged unless it is to be used for a purpose permitted in the by-law. Interior alterations and the restoration of a damaged building to a safe condition are permitted.

General Provisions - General provisions regulate a range of matters that are similar across many zones. The following general provisions are the most applicable to the issues and concerns addressed by the Lake Management Plan:

1. *Accessory Building Structures and Uses* (Section 3.1)
    a. The *total lot coverage* of all accessory buildings and structures, excluding decks, shall not exceed 5 % of the lot area or exceed a height of 4.5 m (14.8 ft).
    b. A *boat dock or launching ramp* may be erected provided it is located no closer than 4.5 m to the side lot or the 90 degree projection of the side lot line where it meets the tangent of the front lot line at the shoreline.
    c. A *boathouse* must comply with Section 3.31, which requires all buildings and structures to be setback from the high water mark.
    d. An *attached or detached private garage* may only be erected with an interior side yard of a minimum of 1.5 m (4.9 ft). The maximum area of any garage or boathouse shall be 70 sq. m. (753.5 sq ft).
    e. *Decks, steps, balconies or patios* may project into any required yard at a maximum of 2.0 m (6.6 ft), but not closer than 1.5 m to any lot line. Where the floor of any porch balcony or deck is in excess of 1.0 m above finished grade, the side and rear yard requirement for the principal building shall apply.
    f. *Gazebos* may be permitted in the front yard of a lot adjacent to a water body provided that:
        i. The maximum area is 10.0 sq. m. (107.6 sq. ft.);
        ii. The setback from the normal average or maintained high watermark is at least 4.0 m (13.1 ft);
        iii. The setback from the side lot line is at least 2.0 m (6.6 ft); and
        iv. The height shall not exceed 2.5 m (8.2 ft).

g. A *guest cabin* is permitted in all shoreline residential zones provided that:
   i. No cooking facilities are located in the building;
   ii. The building has an area of 25 sq. m. (269.1 sq. ft.) or less;
   iii. The building is single storey and the height does not exceed 4.5 m (14.8 ft); and
   iv. The building complies with all of the setbacks that apply to the principal building on the lot.

2. *Dwelling on a Lot* (Section 3.5) – Unless of otherwise permitted, no more than one dwelling unit shall be permitted on a lot.

3. *Environmental Protection Area* (Sections 3.6 and 3.7) – Lands zoned Environmental Protection (EP) (except lands under water) may be included in the calculations of lot area and yard requirements. Setback requirements shall be measured from the limit of the normal or maintained high watermark. Section 3.7 states that the setback for buildings and structures shall be a minimum of 30 metres (100 ft) from any EP zone boundary.

4. *Frontage on Public Roads, Private Roads or Navigable Waterways* (Section 3.8) – Permits a use, building or structure on existing lots of record in accordance with the specific zone requirements.

5. *Home Occupation* (Section 3.10) – A home occupation is permitted in a dwelling subject to restrictions on signs; people employed in the occupation; no retail; not more than 25% of the gross floor area is used for the home occupation; and no external storage of goods. A bed and breakfast or unlicensed day nursery is permitted.

6. *Mobile Homes* (Section 3.15) – Mobile homes may be used as dwelling units provided they meet certain requirements.

7. *Natural Vegetation Area—Shoreline* (Section 3.19) – Where existing natural vegetation exists on a shoreline lot, the development of new residential uses shall not result in the removal of more than 70% of the natural vegetation in the required setbacks from the high water mark for the purpose of establishing access to or a view of the waterfront.

8. *Non-Complying Lots, Buildings and Structures* (Section 3.20) – Where a building is located on an undersized lot or within the minimum required setbacks, the building can be enlarged, reconstructed or repaired with certain requirements. An undersized lot may be built on, provided all other applicable provisions are adhered to and that a sewage system complies with the Building Code.

9. *Non-Conforming Uses* (Section 3.21) – The use of any existing lot, building or structure, for a purpose prohibited by the by-law, is allowed to continue; when the use ceases for two years, the use is deemed discontinued. A building, such as this, cannot be enlarged unless it is to be used for a purpose permitted in the by-law. Interior alterations and the restoration of a damaged building to a safe condition are permitted.

10. *Outdoor Storage* (Section 3.23) – Outdoor storage is limited to 15% of the lot area.

11. *Setback from Rivers and Streams* (Section 3.29) - No building shall be located within 30 metres of any river, stream, creek or watercourse.

12. *Setbacks from Slopes* (Section 3.30) – No building shall be located within 20 metres (65.6 ft) of a slope or embankment that exceeds 33% or 3 to l.

13. *Setbacks from High Water Mark* (Section 3.31) – No building or structure except marine facility and pump houses, shall be located within 20 m (66 ft) of the normal or maintained high water mark or any lake, river, stream or other watercourse. All buildings in a commercial zone must be setback a minimum of 30 m (98.4 ft).

14. *Trailer and/or Boat Storage* (Section 3.37) – Only two vehicles (boats, tourist trailers, motorized mobile truck camper, or other similar vehicle) can be stored in the side or rear yard as long as such boat shall not exceed 7 m (22.9 ft) in length and 10 m (32.8 ft) for other vehicles, and that such a vehicle is not used for human habitation.

Specific Zone Provisions

Shoreline Residential Zone Provisions (SR-1, SR-2, LSR, S) - The uses permitted in all of the shoreline residential zones include single detached dwellings and a home occupation, which may include a bed and breakfast. The specific regulations for these shoreline residential zones are as follows (NOTE: these are the minimum measures, except for the `Maximum Height' requirement):

Figure 7.4 – By-law Requirements for Zones on Shoreline – Highlands East

Requirements	**LSR**	**S**	**CT**
Lot Area*	0.8 ha	4.0 ha	4.0 ha
Lot Frontage*	60 m	100 m	60 m
Lot Coverage*	10%	10%	20%

Front Yard*	20 m	20 m	15 m
Side Yard*	6 m	6 m	6 m
Rear Yard*	8 m	15 m	15 m
Max. Height	10 m	10 m	10 m

Commercial Zones (CT-7 and CT-8) -- Within all of the Tourist Commercial Zones, the permitted uses can include: cabin establishment, camping establishment, cottage establishment, hotel, marina, motel, restaurant, tourist resort, accessory assembly hall, convenience store, and a single detached dwelling. The specific regulations are shown in Figure 7.9 (above).

Additional regulations are required for camping, cottage, cabin establishments, and tourist resorts located in Tourist Commercial Zones (Figure 7.10):

Figure 7.5 – Lot Requirements for Camping, Cottage and Cabin Establishments – Highlands East

	Requirements
Minimum Lot Area	5.0 ha (12.4 ac)
Minimum Site Area	150 sq m (1615 sq ft)
Minimum Open Space`	50% of lot area
Maximum Lot Coverage on all sites	15% of lot area

Rural Zones (Ru) -- There are no shoreline properties zoned for Rural uses. The permitted uses in this zone include: single detached dwellings, agricultural uses, farm, hunt camp, kennel, logging, lodging or boarding houses, portable asphalt plant, riding stables, and veterinary hospital, amongst other uses.

Environmental Protection (EP) – The purpose of the Environmental Protection Zone is to prohibit development within naturally sensitive areas, and the only uses that are permitted are resource management, which are defined to mean the preservation, protection and improvement of the components of the natural environment. No building or structures are permitted.

7.22 Observations – Highlands East Zoning By-law

- *The proposed by-law is quite comprehensive and deals with many of the issues that are important to the lake community.*
- *Shoreline Structures – There is no limitation on the size, shape, length and width of docks and boathouses (however, federal regulations might apply).*
- *Mobile homes are permitted as dwelling units, and this is not in keeping with the existing development in the shoreline area.*

- *There are no minimum sizes documented for an existing lot of record, and significantly undersized lots may be developed provided they meet the yard setbacks and lot coverage.*
- *Lots with small shoreline frontage and large areas are permitted to construct very large buildings on the shoreline that may be out of character with the lot frontage. For example, lot coverage on a 0.8 ha (2 acre) lot will permit a ground floor area of 809.3 sq. m. (8,712 sq. ft.) regardless of the amount of shoreline frontage. Other "cottage country" municipalities have adopted provisions to prevent this from occurring.*
- *The height of buildings is measured as being halfway between the eaves and the ridge. As a result, the roofs of new shoreline buildings tend to be more steeply pitched than traditional cottages and, as the pitches become steeper, the top of the desired roof becomes higher. As well, it should be clearly stated that the height of a building is measured on the side of the building that faces the lake.*

7.23 Recommendations – Highlands East Zoning By-law

91. The KLA should work with the Municipality of Highlands East to have the following adopted as an amendment to the zoning by-law:

a) A restriction on the width of shoreline structures such as: "the total cumulative width of docks and boathouses shall not exceed 25% of the lot frontage up to 10 feet (33.2 feet,) whichever is less";

b) Mobile homes should not be permitted as dwellings in the shoreline area;

c) Property owners should be encouraged to provide a natural buffer along the shoreline, in order to retain the natural shoreline and its associated natural habitat, aesthetic values, ecological benefits and the provision of privacy;

d) Existing lots of record in the shoreline residential zones should have a minimum lot frontage and lot area. A minimum lot size of 30 m (100 ft) frontage and 1393.5 sq. m. (15,000 sq. ft.) area is used in many Ontario cottaging areas;

e) The height of buildings should be measured to the highest point of the building on the side that faces the lake;

7.24 Consent Agreement (51/26)

Under Section 51(26) of the Planning Act, a municipality or approval authority, or both, may enter into agreements imposed as a condition of the consent of the agreement, but it can relate to vegetation

retention, tree planting, the use of site plan agreements, or the incorporation of recommendations from reports on such items as fish habitat and storm water management.

Any agreement under this section of the Planning Act can be registered on title and is, therefore, binding on successive owners; however, it cannot apply to existing lots of record.

7.25 Observations – Consent Agreement

- *Consent Agreements can be registered on title to properties that are being subdivided, and the terms are binding on subsequent owners.*
- *Consent Agreements can be used to address matters such as retention of natural buffers, provision of storm water management measures, and conditions to mitigate impacts of fish and wildlife habitat.*

7.26 Recommendations – Consent Agreement

92. ***The Municipality must ensure that the terms of the Consent Agreement are not violated by providing adequate site inspections before, during and after completion of the project.***

Chapter 8 Conclusions

Conventional theory says that Lake Plans are living documents that should be updated on a regular basis – usually every five years. In theory this is quite true. But in practice it is difficult to regenerate the conviction and momentum that went into producing the original copy and costly to publish and distribute updated versions.

So, what should be done to the Lake Plan in the coming years?

The answer is in the hands of the subsequent KLA Boards of Directors. However, this author has the following suggestions:

1) Use the list of prioritized recommendations, as documented in '*APPENDIX S - Result of the Survey on Lake Plan Recommendations - August 2010*', to develop and implement projects that should help to improve or maintain the ecology and the social character of Koshlong Lake. KLA members should be kept informed on how each project is proceeding to give a sense of progress, accomplishment and closure.

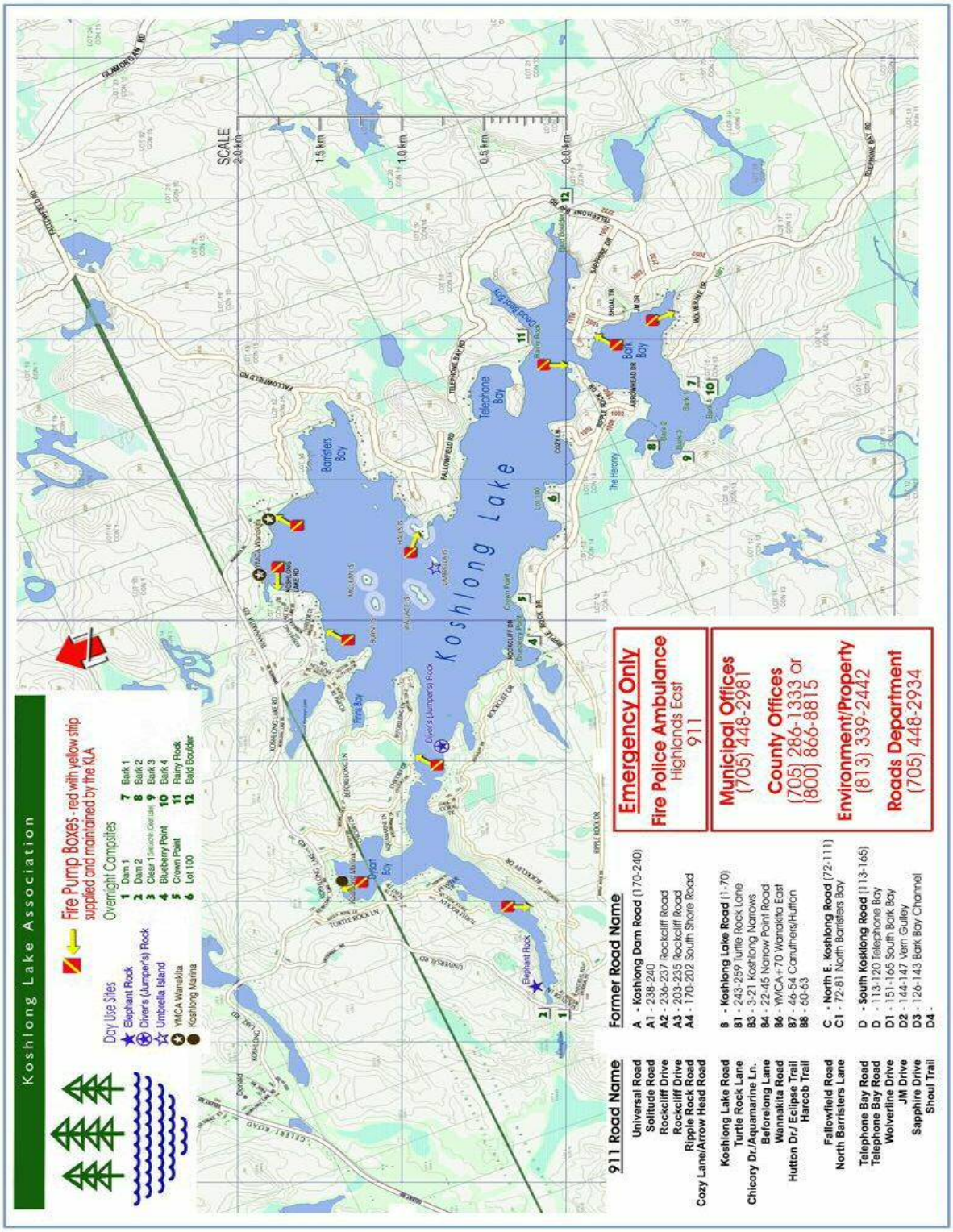
2) Give high priority to researching and documenting the interesting characteristics of native species (both plants and animals) around Koshlong Lake. When members understand the traits and needs of the animals that surround the lake, the easier it will be to co-exist with them. Members will also gain an appreciation of how these species fill an important role in the natural and intertwined web of our ecosystem. This kind of information can tweak and satisfy the curiosity of members at all ages. It can also be shared with other lake associations and they may reciprocate with research that they have done.

3) Ensure that at least every two years one project is devoted to the history or the lake. The history can be on either an interesting person or an activity that happened in the lake area. There is a rich history to the lake, but it will be easily lost if no one takes the time and energy to investigate it and document it. Like the missing editions of Wavelength, they may never be recovered.

4) Try to encourage the members to be volunteers in the various initiatives and projects. This will enhance the spirit of a Koshlong community as people work together on a common cause and will also provide notable benefits to all members.

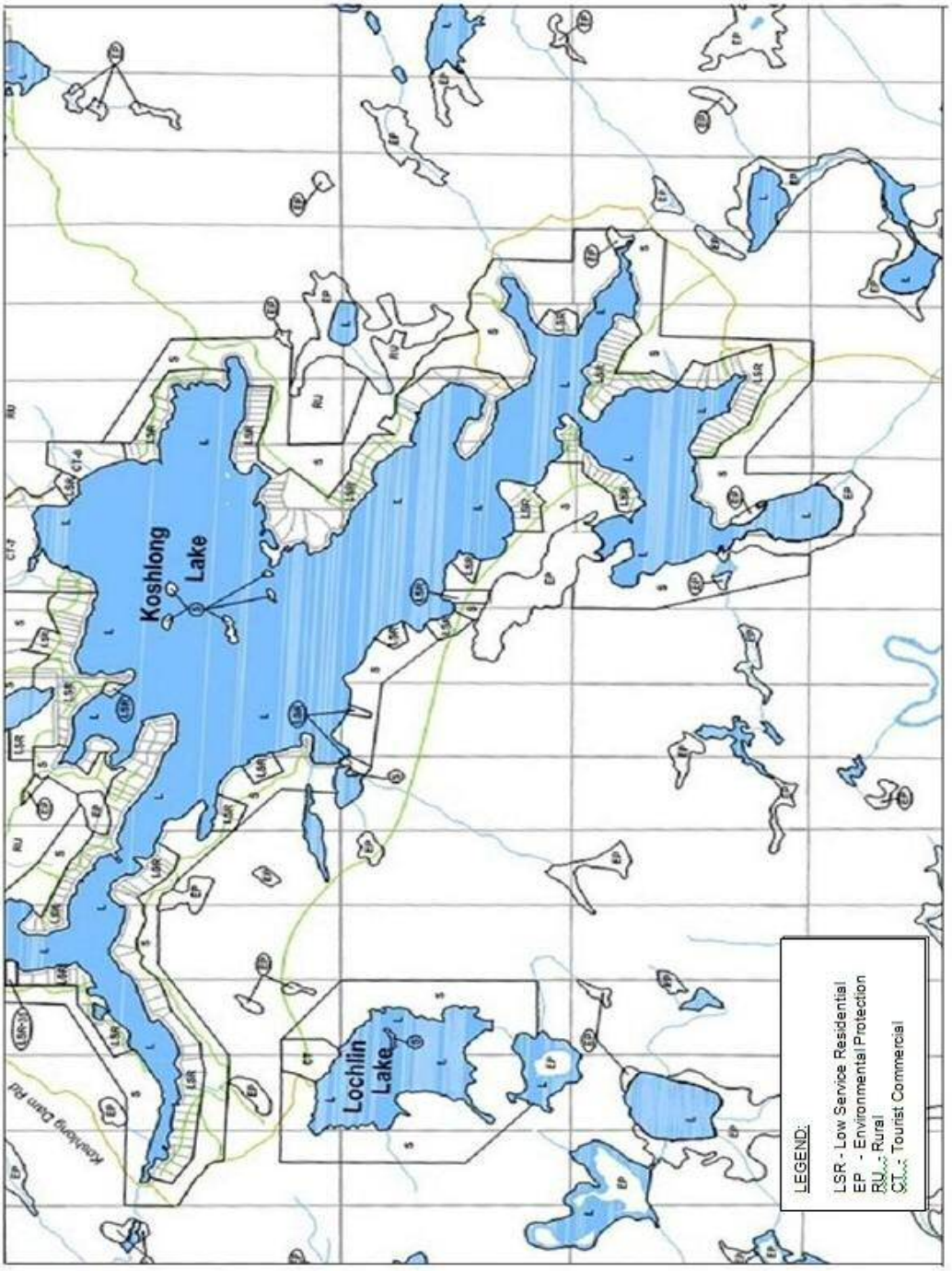
This concludes the first edition of the Koshlong Lake Plan.

APPENDIX A – KLA Map 2008



APPENDIX A – KLA Map 1008 (with points of interest)

APPENDIX B – Highlands East Land Use Map



APPENDIX C – Calcium in Healthy Lakes

Calcium
in Ontario's Inland Lakes

Calcium is a nutrient that is required by all living organisms. For example, water fleas (*Daphnia*, Figure 1), which are tiny organisms called zooplankton, are very sensitive to declining calcium levels. *Daphnia* use calcium in the water to form their calcium-rich body coverings when they moult.

***Figure 1**. Image of a calcium-rich* Daphnia. *(Photo credit: Dr. Derek J. Taylor)*

Recent experiments by Dr. Norman Yan (York University Professor) and his colleagues have shown that the reproduction of most *Daphnia* species is jeopardized at lake calcium concentrations below 1.5 mg/L. There are many other aquatic animals that need calcium, such as mollusks, clams, amphipods, and crayfish. A literature review by Dr. N. Yan and A. Cairns found that calcium concentrations of 0.5 mg/L and between 1-2.5 mg/L are the survival thresholds for daphniids and crayfish respectively. However, these results are based on laboratory experiments; in nature, where organisms must cope with multiple stressors, limiting calcium concentrations could be higher.

Based on a dataset of 770 lakes in Ontario, approximately 35% currently have calcium levels below 1.5 mg/L. Many lakes on the Precambrian Shield in Ontario are nearing or have recently crossed this important threshold.

Ecosystem Disturbances & Lake Calcium Decline

Under natural conditions (i.e., without human influence), calcium levels in soils are governed by inputs from mineral weathering of rocks and atmospheric deposition of calcium-rich dust, and losses through uptake by growing forests, and leaching to lakes and rivers (Figure 2a).
The two main human causes of calcium decline in soils, and thus in lakes, are acidic deposition ("acid rain") and forest harvesting, which are described below.

Acid rain

The majority of Ontario's lakes are located in the Precambrian Shield region where the bedrock is very hard and resistant to weathering. This is why most Ontario lakes have soft waters that are low in calcium. These low calcium concentrations can make lakes vulnerable to acid rain because they are less able to neutralize or 'buffer' incoming acids.

In the early days of acid rain (early to mid-1900s), calcium was leached from watershed soils into lakes faster than it could be replenished through weathering or through deposition from the atmosphere (e.g., dust). This accelerated leaching of calcium from watershed soils likely led to a period of increased calcium levels in some lakes (Figure 2b).

In recent years, acid deposition rates have fallen, and rain is 50% less acidic now than it was in the 1980s. This means that less calcium is being leached from watershed soils into lakes. In addition, with no or very slow replenishment of calcium to watershed soils, the available pool of calcium has slowly decreased in size. This has resulted in noticeable declines in calcium concentrations in lakes and streams (Figure 2c).

Forest harvesting

Acid rain is not the only stressor affecting calcium levels in Ontario's Precambrian Shield lakes. As mentioned previously, forest growth is one way in which calcium is removed from watershed soils. The removal of timber, and the re-growth of forests following timber harvesting, can further diminish the supply of calcium in soils that is available for export to lakes (Figure 2c).

Climate change

Calcium decline is likely exacerbated by climate change. A recent study examined the last 29 years of calcium data from three intensively-studied lakes in south-central Ontario and found that calcium decline has worsened with recent warming. Climate change in this region has led to decreased water flow, resulting in less calcium being exported from watersheds to lakes.

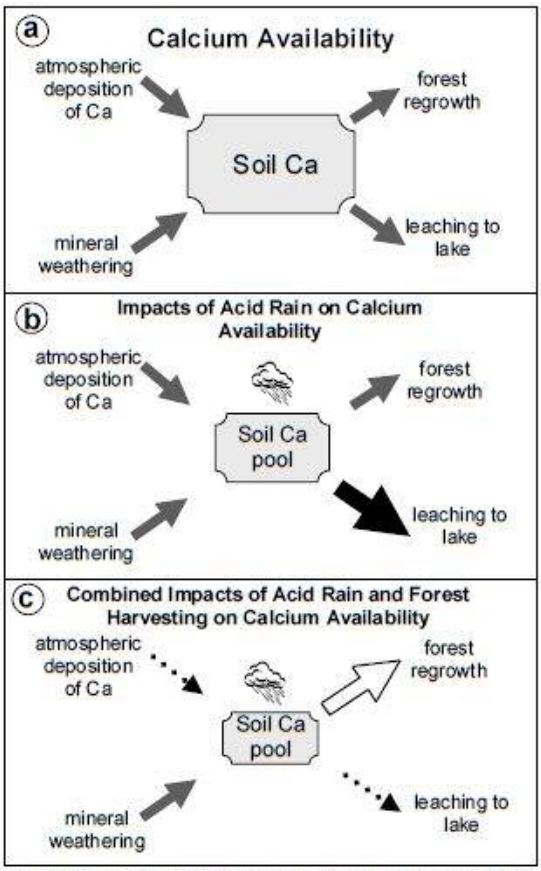
How is the Ministry of the Environment monitoring calcium in Ontario?

- Scientists at the Ministry of the Environment's Dorset Environmental Science Centre (DESC) have been monitoring calcium levels in south-central Ontario lakes and streams for over 30 years. They have found that calcium concentrations have declined significantly over the period of record in the long-term study lakes.
- Calcium concentrations have been measured from water samples collected by the Ministry's Lake Partner Program volunteers for the past 4 years.
- The DESC is also involved with monitoring lakes for water chemistry (including calcium) throughout the province as part of the Ministry of Natural Resources' Broadscale Monitoring Program.

What can we do to reduce the potential impacts of calcium decline?

Calcium in soils is normally replaced by the weathering of bedrock, which is a slow process. Long-term, sustainable solutions for the calcium decline problem have yet to be developed. Here are some examples of what that we can do to reduce the potential impacts of calcium decline:

1. *Support the government's efforts to reduce SO_2 and NO_X emissions to reduce acid deposition rates;*
2. *Work with the Ministry of Natural Resources and Stewardship Councils to consider soil nutrients, especially calcium status, when they set logging quotas;*
3. *Join Ontario's Lake Partner Program to help to gather more monitoring data for Ontario's lakes. You can visit www.ontario.ca/lakepartner for more information.*



Modified from Smol J.P., 2010. *Freshwater Biology* 55:43-59

Figure 2. *(a) Calcium availability prior to human influence. In this undisturbed ecosystem, calcium concentrations remained relatively stable because calcium outputs were balanced by inputs. Specifically, mineral weathering of rocks and atmospheric deposition of calcium-rich dust were the main sources of calcium to soils. The major outputs were forest re-growth and the leaching of calcium to lakes and rivers; (b) the impacts of acid rain on calcium availability. During the early stages of acidic rain (early to mid-twentieth century), the leaching of calcium from watershed soils was accelerated, and the calcium available in soils decreased over time; and (c) the combined effects of acid rain and forest harvesting on calcium availability.. Eventually, with continued acid rain, the pool of available calcium in watershed soils was diminished to the point that calcium leaching was greatly reduced. In addition, other disturbances, such as forest harvesting, caused an additional loss of calcium from the ecosystem. As trees re-grow following harvesting, more calcium is removed from the soil for tree growth.*

APPENDIX D – The Donald Woodworking Plant

Most people refer to the ruins at the beginning of Koshlong Lake Road as 'the Chemical' or the Standard Chemical Plant. But the original company was actually the Donald Woodworking Plant, so named after it founder Mr. R. A. Donald. The hamlet of Donald still bears his name. Although it is hard to imagine now, in its heyday 'the Chemical was the largest employer in the county and Donald was the economic engine of the entire region.

In order to appreciate why this location in Haliburton was chosen, it is necessary to understand the commercial situation at that time. Until the 20th century Canada had imported iron, steel and metal finished products from the UK and the USA. The industrial revolution was still in full swing and countries that produced iron and steel were enjoying strong economic and political growth. Not until the turn of the century would Canada become self sufficient in the production of iron and steel with its smelters working at capacity.

The USA had vast deposits of coal, so it was the fuel of choice in blast furnaces and industrial plants. With no coal resources in its industrial heartland of Ontario, Canada turned to its immense forests as a source of fuel. As production increased, charcoal became cheaper than imported coal and charcoal kilns began springing up - first near industrial sites, then further north closer to the forests.

In order to be prosperous, a charcoal kiln needed three elements – an abundant supply of hardwood, a water supply (for the wood distillation process) and a railway (to transport its products). These were all available in Haliburton area.

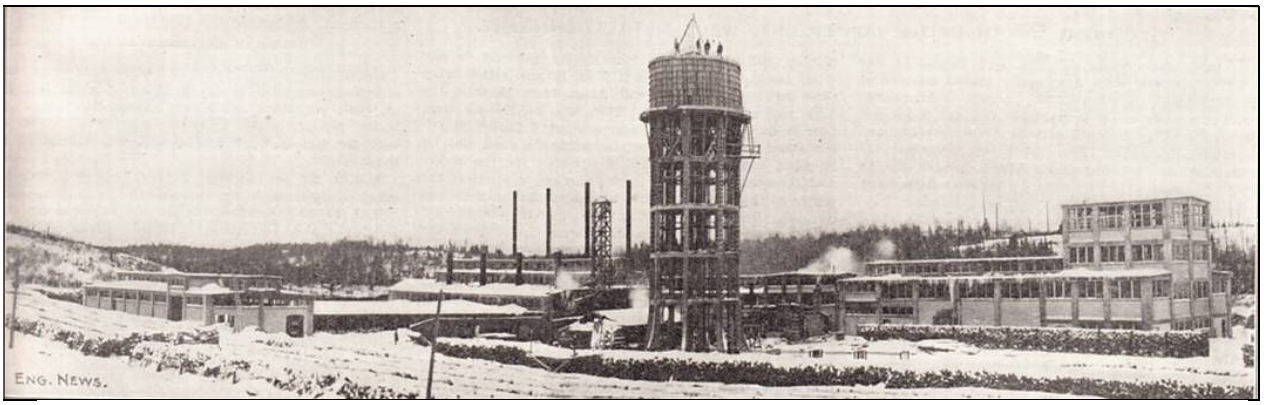


Figure D1 - Under Construction - Courtesy of an article in Engineering News – January 28th, 1909

http://www.ebay.com/itm/1909-Article-Wood-Products-Co-Distillation-Plant-Donald-ON-Ontario-Canada-/230877289833

After a thorough search RA Donald bought some property in 1906. Production began after a two-year construction effort and an expense of one million dollars.

This cost was exceptionally high. In the year 2000, this would be the equivalent of about $25,000,000, but the result was an exceptional facility that set new benchmarks for construction and processing. All buildings had reinforced a concrete floor, framework and roof. Flint limestone bricks from Fenlon Falls were used in the walls. It was the first plant in Canada to use chain reinforcing in the roof.

Some of the supporting columns in the Still House were 22 inches in diameter and 22 feet high. For maximum strength these columns were poured in a continuous stream using a specially graded mixture of concrete which minimized separation of the aggregate. (*Common practice was to only use continuous pouring of concrete when columns were up to 12-14 feet high*.)

To build such a complex facility in an area far from a major city was a construction marvel in itself. Costs were reduced by using sand from local quarries to make concrete. The main processing buildings (the Still House, Boiler House, Oven House and Acetate House) were integrated to maximize efficiency. (*See Figure D2 for the overall plant layout*.) These buildings were unique and it was arguably the largest reinforced concrete plant in Canada. Only three other concrete buildings from that era still exist in Ontario. A 214 ft. dam was constructed across the Burnt River in order to maintain a constant water supply.

The raised concrete water tower bears special mention. It was 93 ft. high with a 50,000-gallon concrete water tank at the top and the first of its kind in North America. Once again it was decided to use a continuous pour technique when constructing the walls of the tank. After the forms for the walls of the tank and a roof were finished, the concrete was winched up through a 3-foot square opening in the roof. The concrete was then poured over the roof form and it flowed down into the wall forms. The pour took 36 hours to complete. At times the temperature dropped to -13C so the concrete had to be heated. Not bad engineering and construction for the year 1908.

The main product was charcoal, which was needed by the insatiable appetite of the Industrial revolution and its burgeoning steel mills. In its heyday, the plant employed 300 fulltime and part time workers and operated 24 hours per day. Only about 80 of these worked in the Chemical. The rest worked in the bush. The plant produced charcoal and two by-products - wood alcohol and acetate. Every cord of wood would produce 52 bushels of charcoal, 200 lbs. of lime acetate and 8 gallons of wood alcohol. Logs were brought in originally by horses and skids or sleighs (mainly in the winter) then later by trucks and rail. So great was its appetite that logs were transported from many of the

surrounding townships, including Glamorgan, Dysart, Minden, Snowdon, Dudley, Monmouth, Harcourt and eventually as far away as Huntsville.

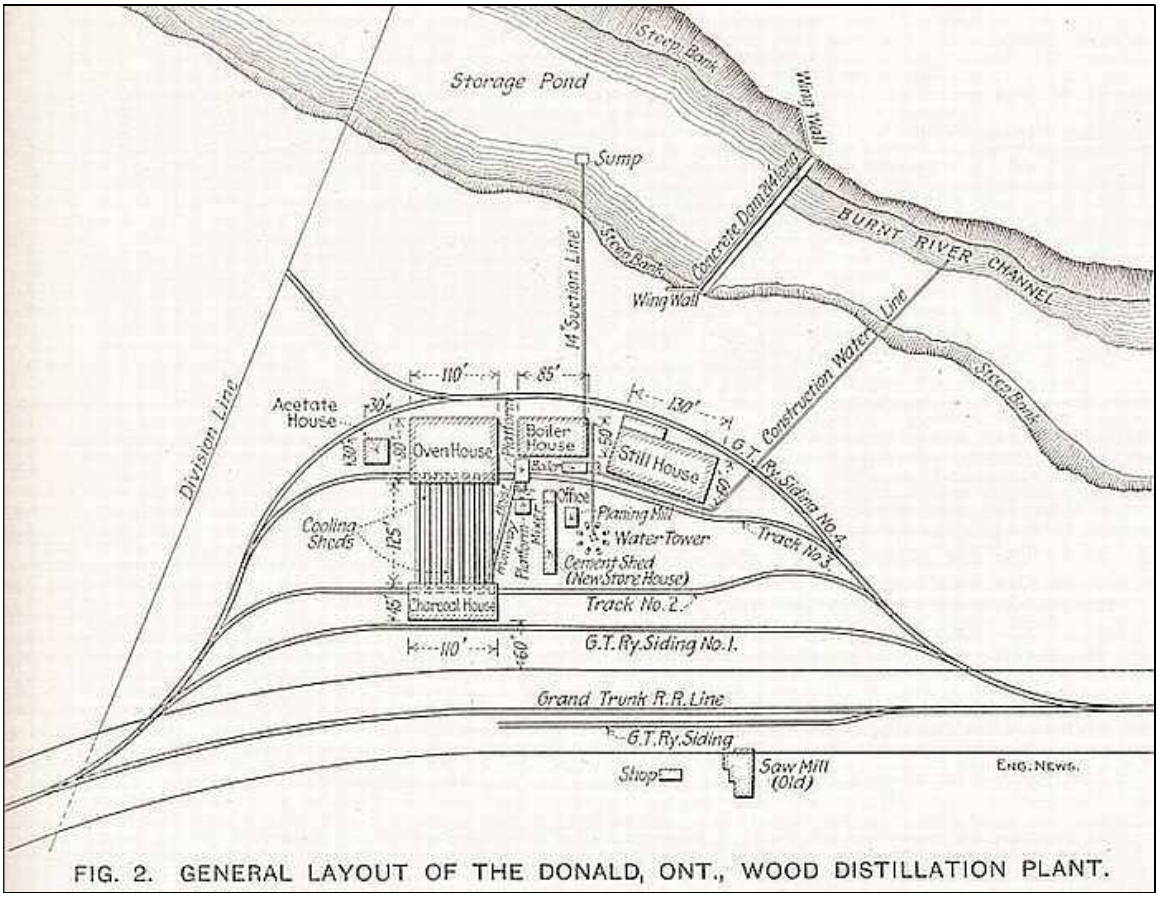


Figure D2 - Courtesy of an article in Engineering News – January 28th, 1909

The best wood for making charcoal was maple. Huge quantities of it were trucked in to Donald and great piles were stacked all along the road to the bridge, where they dried for up to two years. When they were ready to use, the logs were put on buggies - each of which held more than a cord of wood (a full cord being 4'x4'x8'). These were pulled on rails into the ovens. Each oven accommodated four buggies. Fires were lit and the wood was baked. The ovens were airtight so none of the gas escaped. The gas was collected into a condenser where it turned from gas to liquid. No method of producing synthetic wood alcohol had been developed at that time and during the war it was an important product because of its use in making gunpowder. What was left on the buggies was baked wood. If that baked wood was maple, the result would be high quality charcoal. If it was beech, white birch, yellow birch or other similar woods, then the result would be a pile of ashes.

For the first five years the plant was extremely successful, but then the charcoal market became saturated and an industrial downturn started. In 1915, Mr. Donald sold his debt-ladened company to

Canada Wood Products Ltd. for one dollar. A few years later the plant was leased to the Standard Chemical Company (*lead by Mr. Peuchen, a Titanic survivor*) that ran it until it closed at the end of World War II.

Standard Chemical had three similar plants, the one in Donald, one at Longford Mills on Lake Couchiching and one at South River. The demand for wood alcohol was so great during the war that these plants worked 24 hours a day, seven days a week. The l930s were depression years and so an operation like this was very important to the economy of the area.

Work peaked during World War I, mainly because of the acetate. Acetate was a primary ingredient in the making of explosives and was described as “the ingredient that gave the kick to cordite”. The need for acetate was so great that the British War Office signed a contract for the company’s entire output of acetate. Charcoal and its by-products were still in demand after the war and the plant continued through the twenties, the recession and into World War II. But all things must come to an end and this plant was no exception. Petroleum and its many new and revolutionary by-products reduced the demand for what the Donald plant had to offer and the ovens had consumed most of the good hardwood in the county. Unable to remain profitable, the plant closed in December 1945. Upon closing, walls were smash in to get at the metal and machinery that was sold for scrap. The remarkable Chemical and the lifeblood of Donald were gone.

Time and a major fire in 1951 took their toll on the complex. The fact that much of Charcoal Hose and the main beams and some walls of the other main buildings are still standing shows that the buildings were made to last.

Credits:

Engineering News - Vol. 61 No. 4, January 28 1909

Additional information may be found at the Kinmount web site (www.Kinmount.ca), under the GAZETTE tab and at the Haliburton Museum, which has a copy of the original Engineering News article from January1909.

Modernity, Metaphor and Maples (the Landscape created by the Wood Chemical Plant in Donald) by Andrew Hamilton, Trent University, April 1992

Credit to Margaret Emmerson and to Andrew Hamilton’s report

http://buildingbetween.ca/eco-innovation-centre/the-story-of-the-chemical

Jermalism web site - http://jermalism.blogspot.ca/2011/11/abandonment-issues-standard-chemical.html

APPENDIX E – A NATURAL STUDY of KOSHLONG LAKE

A NATURAL STUDY of KOSHLONG LAKE

By
Karl Holliday
Aaron Barnes

Co-ordinator
Alison Pentland

Monday December 14, 2009

INTRODUCTION

Koshlong Lake is a diverse and significant area to both wildlife and the people that occupy the area. In order to better understand the area, four different aspects of the lakes area were examined in October 2009. These four aspects while not a whole picture do give a picture of the ecosystem. The different species of animal that make up the watersheds ecosystem were looked at, both those passing through and those that permanently reside there. The vegetation that makes up the watershed was examined along with how it impacts the White-tailed Deer and Moose populations that reside in the area. The chemistry of the water was examined and interpretations were made on how the different parameters affect the aquatic life and the health of the human inhabitants. The sources of water for the lake were also examined; these sources of water can also be sources of contamination for the lake. Any contamination upstream of one of the tributaries will also cause pollution downstream. As students of Sir Sandford Fleming College in the Fish and Wildlife program we are biased towards the protection and management of the environment and the animals that reside in it. We come from a background of hunters and support hunting in a sustainable manner. We do not attempt to hide our bias but for the purpose of this report have attempted to put them aside. We have attempted only to provide the facts and our interpretation of their meaning in a way that is clear to the reader. An overview of what might be done next to help clarify the picture of the lakes environment has been placed at the end of the report along with any problems that may have been associated with the methods used.

WILDLIFE OBSERVATIONS

A total of approximately five days were spent out on Koshlong Lake (primarily in Barristers Bay), searching for different wildlife signs such as bird/mammal calls, tracks in the mud or sand, signs of any dens or caches, and any sightings as well. Throughout the days canoeing around the lake habitat such as sandy beaches and muddy areas near a small stream running into the lake

Figure 1: Gray Fox Track in the sand

was a perfect spot to have any sort of track findings due to the grounds soft surface that can give evidence of mammals or birds presence. Due to the recent moose hunting season, the shoreline of the lake was to be used instead of doing analysis in the forest itself. Several tracks were found out on the sandy shores and muddy areas around the lakes perimeter. They consisted of mostly canids (Domestic dogs, Grey Fox), White-tailed deer, and the odd raccoon, beaver, and fisher tracks were found. In some spots the there were more the one deer track suggesting that there were possibly a doe with her fawn close by. Most of the tracks recorded were approximately between one to two days old.

While tracks were being determined and recorded, several other wildlife signs had come to attention. Markings on birch trees and Eastern Hemlock that were made by either different types of woodpecker or even a form a sapsucker but cannot be identified for sure. These markings in the bark of these trees were possibly made for these woodpeckers or sapsuckers trying to get food from the grubs or other insects that live more in the depth of the tree. A possible den site and beaver dam were also observed. The den site could have possibly belonged to a fisher that is within the area that was being observed. Evidence of this was fisher tracks leading back and forth from the den site. A beaver dam site was also observed during the duration of this field placement. Obvious beaver tracks made in the mud around the dam site as well as piles of stick and other woody debris making this dam.

Figure 2: Woodpecker holes in a White

Sightings and calls were also observed during the wildlife observation portion of this field placement. The most common sightings happened around the shoreline, within the water body and even waterfowl and other birds flying overhead. The most common species that were sighted were Black-Capped Chickadees and both male and female Mallards. Other species that were sighted were American Crow, Common Raven, Tadpoles, Red Squirrel, Red Tailed Hawk, Ruffed Grouse, Snow Geese, male White Tailed Deer, King Fisher, Black-Backed Woodpecker and Red-Breasted Merganser. Most of the species that have been sighted have also been included in the calls portion of the field placement. The most common species that have been recorded in the call section are Black-Capped Chickadee, Red Squirrel, and American Crow. The other species that have been heard doing calls are Common Ravens, possible Common Loon, and Eastern Phoebes.

VEGETATION

There are many tree species that make up the watershed are surrounding Koshlong Lake. Fifteen different plots were taken around the perimeter of the lake with a radius of fifteen feet. All tree stems with a diameter at breast height of grater then 1.5 inches were included. The following tree species were found in the vicinity of Koshlong Lake.

Lake Area Tree Totals

Common Name	Scientific Name	Count	% Area
Balsam Fir	Abies balsamea	105	35.35%
White Birch	Betula papyrifera	31	10.44%
Red Pine	Pinus resinosa	29	9.76%
Eastern White Pine	Pinus strobus	28	9.43%
Eastern White Cedar	Thuja accidentalis	25	8.42%
Red Maple	Acer Rubrum	23	7.74%
Eastern Hemlock	Tsuga canadensis	10	3.37%
Hard Maple	Acer saccharum	9	3.03%
Large Tooth Aspen	Populus grandidentata	9	3.03%
White Spruce	Picea glauca	7	2.36%
Yellow Birch	Betula alleghaniensis	6	2.02%
Mountain Maple	Acer spicatum	4	1.35%
American Elm	Ulmus americana	3	1.01%
Black Spruce	Picea mariana	3	1.01%
Downy Serviceberry	Amelanchier arborea	2	0.67%
Red Oak	Quercus rubra	2	0.67%
American Beech	Fagus grandifolia	1	0.34%
Total		297	100.00%

Using the Field Guide to Forest Ecosystems of Central Ontario published by the Ministry of Natural Resources, the Ecosites for each forest plot were determined and the deer or moose habitat they provide was examined. As a whole the area surrounding Koshlong Lake provides Moose early and late winter habitat. It also provides White-tailed Deer winter habitat and preferred browse producing habitat with thermal cover.

Moose are found throughout the forests of central Ontario. Good Moose habitat contains an abundant source of browse material that is within a short distance of cover. A moose's home range can vary from 10 to 40 km^2 and the requirements for food and cover can be classified into three 'seasonal habitats'. These habitats are summer, early winter and late winter. In table 2 of the appendix the different plot Ecosites are shown with the type of habitat if any they provide for Moose. The area around Koshlong Lake currently provides both the early and late winter habitat for moose. Early winter habitat contains a high quantity of deciduous brows with coniferous cover. The early winter habitat is occupied from the end of the growing season until the snow depth forces the moose into their late winter habitat. The Moose late winter habitat consists of dense coniferous tree stands, moose seek out these dense stands in winter because snow depths of greater then 70cm restrict their activity.

White-tailed Deer is a very common species throughout central Ontario. They occupy two seasonal habitats summer and winter. The summer range is occupied during the growing season while the winter range is occupied from around November to April or May. In their summer habitat deer feed on different herbaceous plants and deciduous trees and shrubs. The deer also require coniferous stands that are used to shade themselves and relieve thermal stress. In winter the deer habitat consists again of both deciduous and coniferous trees. The deciduous trees provide browse for the deer while the coniferous stands provide suitable cover for warmth and a reduction in snow depth. Koshlong Lake currently provides both summer and winter habitat for White-tailed Deer.

The area around Koshlong Lake provides excellent habitat for both of these animals in its current state. An increase in logging or in the number of cottages on the lake can alter the habitat suitability dramatically however. Care must be taken to continue to provide proper habitat suitability to these animals.

CHEMISTRY

In order to better understand the chemistry and biodiversity of Koshlong Lake three key indicators were measured. In order to attempt to obtain an average reading of the lake the chemistry was taken from the approximate center of the three arms of the lake. The three key indicators are Dissolved Oxygen, Alkalinity, and pH.

Dissolved Oxygen is literally the amount of O^2 that is dissolved in the water body. This is an indicator of how many aquatic animal species a water body can support. The Dissolved Oxygen at the time of testing in the lake was 11.2 mg/L. This value indicates that the levels of Oxygen are quite high and are capable of sustaining a large population of aquatic animal species. If the amount of Dissolved Oxygen in the lake drops below 5 mg/L it begins to put stress on aquatic life. If the level drops below 1-2 mg/L it can cause large fish kills. This value cannot be used as the best source of data however. As water temperature decreases the amount of oxygen it can hold increases.

Alkalinity is the buffering capacity of the water body. The Alkalinity of a water body is determined by the amount of calcium carbonate present in the water. The calcium carbonate is dissolved out of the bedrock at the bottom of the lake. Due to the nature of the granite bedrock on the Canadian Shield the lakes have a lower alkalinity then lakes found in areas with limestone bedrock. This makes the lakes in the shield much more vulnerable to lake acidification. The pH of pure water is 7 on the pH scale making it the center and neither acidic nor basic, water in the environment has contaminants and minerals in it and can range from 5-8. The lower the pH the more acidic and the higher the more basic. Water with a pH much lower then 7 enter the lake due to acid rain and runoff from man made sources. As acidic water enters the lake it is neutralized by the calcium carbonate keeping the pH level neutral. When there is not enough calcium carbonate to balance the acid then the lake begins to become acidified. The alkalinity of Koshlong Lake is 23.94 mg/L, this value indicates that the lake still has a large enough buffering capacity to prevent acidification. The Alkalinity is not very high however, once the alkalinity drops below 10 mg/L the lake has very little buffering capacity left and measures must be taken to prevent further loss of alkalinity. Once the pH level of the lake hits a certain point aquatic species begin to die off. Eventually what is left is a very clear, dead lake with a low pH and little to no life. Because Koshlong Lake is a shield lake it must be watched carefully to make sure the pH stays within a normal range.

The pH of Koshlong Lake was determined using a narrow range pH testing kit. The pH was determined to be 6.3 on the pH scale. This value indicates the pH of Koshlong Lake is more acidic then pure water but still well within the normal range. If the pH of the lake water drops below 5 it can cause problems both for aquatic life and can make the water more harmful for human consumption.

TRIBUTARIES TO THE LAKE

There are 15 different tributaries found to contribute water to Koshlong Lake. The tributaries were counted using a direct count method. There are many different sources for the water that enters the lake; the sources include other lakes, wetlands, and groundwater sources. The geographic coordinates of the tributaries were recorded so that at a later date the chemistry of the water entering the lake can be tested and monitored. Most of the tributaries were creeks of varying sizes and shapes but determining the location of the inlet was difficult. The water level in Koshlong Lake for the fall of 2009 was very low; this means that the entrance of the tributaries will be different at different points of the year. The ground water sources that contribute to the lake appear to be seasonal in nature and may dry up, these are not likely to cause problems for the lake because ground water is fairly clean and the amount added is quite small. Other tributaries must be carefully observed however; any pollutants that occur upstream will enter the lake. Many different wetlands contribute water to the lake; wetlands are an excellent source of water. Wetlands act as a natural water purifier removing contaminants and sediment from the water, the also act as a carbon sink meaning that as plants that take in carbon dioxide from the air die their nutrients are kept in the wetland and carbon dioxide is kept out of the atmosphere. More and more wetlands are being dredged and destroyed however; this can cause the trapped sediments and toxins to be released downstream into the lake. Any source of pollution that occurs in another lake will also flow downstream towards Koshlong Lake. Any mining or factory that discharges waste into a water body or causes an accidental spill will create problems for the whole watershed. In order to prevent the contamination and pollution of Koshlong Lake the entire watershed must be considered and all communities in the area be involved in keeping the water clean

Figure 3: An average tributary creek of

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RECOMMENDATIONS AND FURTHER ACTION

In order for a more accurate picture of the lake to be presented there is a larger amount of work that needs to be completed. In order to better understand the vegetation that is in the watershed an FRI map should be obtained from the Ontario Ministry of Natural Resources, this will allow for an accurate count of all the tree species in the area. A count of the different shrubs species should also be performed because these are as important as tree species in producing food for species around the lake.

In order to achieve a proper view of the chemistry of Koshlong Lake at least three sites should be sampled from every bay on the lake. At every site the chemistry should be taken at different depths. The amount of chlorophyll a should be tested so that the amount of algae and other light using organisms in the water can be determined. The Dissolved Oxygen Test should be performed during the summer months, because water can hold more oxygen when it is cooler. If the Dissolved Oxygen is tested in the when the water is warmest then the lowest sustainability of the aquatic ecosystem can be found.

The Tributaries of Koshlong Lake should be more thoroughly examined by performing a chemical analysis of each of the tributaries to the lake. The sources of the tributaries should also be examined; where wetlands are the source of the tributary an Ontario Wetland Evaluation should be performed to determine if the wetland is provincially significant.

While the work that was performed in this study is a start it is not the definitive answer. There are many things that can be done to further the amount of information about Koshlong Lake but the process is an ongoing one. The data for the lake changes constantly and in order to manage it properly new data must be taken on yearly basis.

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APPENDIX F – Fires

With the arrival of the 21st century, fires on Koshlong have not been an issue. Only two fires were reported and no major damage resulted. But it was not always like this.

On August 17th, 1949, a major fire (The Snowden Fire or The Big One) broke out in Haliburton County. More than 500 men from the area (including some from Koshlong) were commandeered to fight it. In those days all able-bodied men were required to participate in fire fighting. Smoke could be clearly seen and smelled from this lake.

It and many other fires were caused by a severe lightning storm on that day. Unfortunately, observers in the closest lookout tower had mistaken it for another fire that was already being fought and two days passed before that error was recognized. It then took over a week to get it under control, with crews working day and night. Even after the visible fires were out, the fire continued to smoulder, mainly through root systems. This kept additional crews busy for another month.

By the time it was over more than 1,300 men had fought it and 12,000 acres had burned in a region between Bark Lake and Miserable Lake (yes, that is its real name). It was so big that even the Globe and Mail reported on it, with the headline ‘Haliburton families flee homes’. That was the biggest, but by no means the only fire to have an impact on Koshlong. Between 1980 and 2012, there were 11 fires. Three were grass fires and two were tree fires. All others destroyed cottages and outbuildings.

One fire in April 1984 was particularly notable. Not just because it decimated the main cottage at lot #58 (1820 Koshlong Lake Road), but rather that it pointed out the poor condition of firefighting equipment. There was only one serviceable pump on the lake and the hoses were in dire condition. Each hose had so many splits that more water came out of those holes than flowed through the nozzle. When it was over, all that was left of the cottage was the stone chimney. The cause of that fire was a lighting strike that travelled down the main hydro wires, through a fuse panel and out a socket that was near a basket of papers. Those papers caught fire and the fire roared inside until a neighbour noticed it. Fortunately, no one was in the cottage at the time.

Splits in Hose

Only the Chimney and Harold are Standing

Most of those who responded had never used firefighting equipment and didn't know how to properly fight a fire. But their energy and effort put out the fire and saved many trees, even before the fire crew from Haliburton arrived.

The lessons learned from that incident had a lasting impact and are still evident today. The main points learned were to ensure that:

- well-maintained pumps, hoses and equipment are strategically placed around the lake,
- location of fire stations should be readily accessible by water or by road,
- pumps and equipment should be tested on a regular basis,
- instructions on how to start and operate the equipment are needed in each fire station,
- property owners are encouraged to try out the equipment to become familiar with it,
- horns be placed in each fire station so that the fire warning (3 strong blasts – repeated) can be sounded to bring volunteers,
- instructions on how to make a 911 call are regularly posted in Wavelength,
- property owners are cautioned about stacking leaves in one spot for several years as this is likely to create ideal conditions for spontaneous combustion.

A firebox fund (made up from voluntary contributions) was established to provide money necessary to purchase new equipment and replace old equipment as needed. That fund has grown to the point that it covers the foreseen fire equipment needs and has been expanded into a contingency fund that may be used for legal and professional services needed.

One point to remember is that cottages and homes can be replaced but people cannot. So be careful when fighting any fire. Always place your personal safety above all other concerns when fighting a fire and never go into a burning building even when the fire seems to be under control. Also bear in mind that buildings and many possessions can be quickly replaced, but a burned out forest will take many years to come back. So when fighting a fire, also ensure that trees are protected, particularly when the buildings are too far gone to be saved. It is also easier to clean up after a building has been completely destroyed instead of one that has been partially burned. Finally, as a safety measure please ensure that your own fire alarms and are in good working order and test them on a regular basis.

MNR also learned from their fires. Instead of fire towers, they now use helicopters to spot and manage fires. A computer system called D-**FOSS (Daily Fire Operations System Support)** helps to track fires. The local MNR office on Head Lake is responsible for managing a region of 2-million acres between Bancroft and Sebright, Tweed and Dorset.

It is wishful thinking to hope that fires won't happen, but with common sense and proper use of equipment any damage from future fires can be minimized.

Fires on Koshlong Lake, since 1980:

When - May 1982
Location - North shore of main lake
Cause - A lightning strike that travelled down the power lines and ignited a basket of paper that was in front of an electrical wall outlet
Result - Cottage and several trees destroyed

When - July 1985
Location - West shore of Dysart Bay
Cause - Spontaneous combustion in a pile of branches and leaves that had been thrown into a small depression over a number of years
Result - Fire was noticed early and contained to the depression. A few shrubs near the fire were destroyed.

When - May 1986
Location - North shore at entrance to Telephone Bay
Cause - Spontaneous combustion in a pile of branches and leaves that had gathered in a location behind a bunkie
Result - Fire spread 300 metres up a grassy hill but was extinguished quickly. No buildings burned. Shrubs and some smaller trees in the fire area were destroyed.

When - October 1989
Location - Hutton's Point

Cause - Burning leaves on a windy day with inadequate supervision and no fire extinguishing equipment at the ready
Result - Help arrived quickly and fire extinguished. Shrubs in the fire area were destroyed.

When - November 1989
Location - At the end of Rockcliff Road on the shore opposite to Blueberry Point
Cause - Unknown, but possibly an electrical fault
Result - Cottage and several trees destroyed

When - July 1990
Location - Seymour's Point at south shore of Telephone Bay
Cause - Unknown
Result - Cottage and several trees destroyed

When - Mid-1990's
Location - North shore of Telephone Bay
Cause - Unknown
Result - Cottage and several trees destroyed

When - Mid-1990's
Location - Near Lot 100
Cause - Unknown
Result - Cottage completely destroyed

When - Mid-1990's
Location - West shore of Dysart Bay
Cause - Propane heater left unattended in a camping trailer
Result - Camping trailer and several trees destroyed

When - Mid-2000
Location - Camping site near the dam
Cause - camp fire migrated into the roots of a nearly tree. Off-lake campers had no firefighting equipment (other than ne bucket) but quickly contacted the fire department via 911
Result - One tree destroyed

When - July 2012
Location - Near Bark Bay #1 Camp site on east shore of Bark Bay
Cause - Lightning struck a tree and set the top of it on fire and spread to the tops of nearby trees
Result - Three burned trees cut down by fire department to ensure that the fire was out.

APPENDIX G – Glossary

Algae - microscopic, light-synthesizing single-cell plants, commonly found in water; there are many species, and are often found in colonies of strands, blobs or floating individually.

Bathymetry - The measurement of the depth of bodies of water, particularly of lakes and oceans.

Bedrock - The solid rock that underlies loose material, such as soil, sand, clay, or gravel

Benthic - The animals of plants living at the bottom of a sea or lake.

Cervid - Any member of the deer family, caribou, elk, deer, moose, characterized by antlers in the males or both sexes.

Conifer - A plant (mainly evergreen trees or shrubs) producing naked seeds in cones or single naked seeds as in yews, but with pollen always borne in cones. Common examples of coniferous plants are pine, spruce and fir. The wood of conifers is known as 'softwood' and is a valuable resource for timber and paper products.

Eutrophic - (of a lake) characterized by an abundant accumulation of nutrients that support a dense growth of algae and other organisms, the decay of which depletes the shallow waters of oxygen in summer

Fluvial - Land that is produced by or found in a river.

Glaciation - To be covered by a glacier; Ice Age.

Hardwood - Wood from deciduous trees, like maple, oak, beech, ash, apple and cherry. Hardwoods have a more complex structure than softwoods and the main distinguishing feature is the presence of pores or vessels. They are generally denser than softwoods and logs from oak, cherry and apple will burn hotter and longer than logs from pine trees.

Littoral - The region of freshwater lakebeds from the sub-littoral zone up to and including the damp areas on shore.

Mesotrophic - (of a lake) characterized by an intermediate accumulation of nutrients that support variety of algae growth and other organisms.

Oligotrophic - (of a lake) characterized by a low accumulation of dissolved nutrient salts, just supporting a sparse growth of algae and other organisms, and having a high oxygen content owing to the low organic content.

Plutonic - Noting or pertaining to a class of igneous rock that has solidified far below the earth's surface.

Precambrian - Noting or pertaining to the earliest era of earth history, ending 570 million years ago, during which the earth's crust formed and life first appeared in the seas.

Phytoplankton - Free-floating microscopic plants

Sedimentary - Formed by the deposition of rock and organic matter; related to rocks formed when sediment is deposited and becomes tightly compacted.

Softwood - Wood from conifers. Softwood is easy to work with and is the source of 80% of the world's timber. Softwoods are not necessarily softer than hardwoods.

Sub-littoral - Related to the deepest part of a lake below the area in which rooted plants grow.

Substrate - the surface or medium on which an organism lives or grows.

Sub-watershed - A smaller basin within a larger drainage area where all of the surface water drains to a central point of the larger watershed.

Surficial - Pertaining to or occurring on or near the earth's surface; "a surficial geologic deposit"

Topography - The mapped representation of a portion of the earth's surface showing the natural and man-made features such as rivers, streams, ditches, lakes, roads, buildings and most importantly, variations in ground elevations for the terrain of the area. (can also apply to planets, moons, and asteroids)

Trophic Status - Refers to the level of nutrient supply

Turbidity - Clouded; opaque; obscured; not clear or transparent because of stirred-up sediment;

Watershed - The drainage area; the region or area drained by a river or stream

APPENDIX H – Haliburton Hockey Haven

It is often said that hockey in woven into the DNA of most Canadians. It is also likely that a deep love of nature is woven into our souls, particularly of those who live in Haliburton. With these two traits rushing through his veins it is easy to see why Wren Blair dreamed of combined them into a unique development in Haliburton. He knew that boys would love to learn how to play hockey from some of the best players in the world and also have a great camping experience. All he had to do was to convince a partner and gain some financial backing.

That partner turned out to be Jim Gregory who was the coach and General Manager of the St. Michael`s hockey team. Jim also wanted to start a hockey school, but his idea had a conventional day school format, in or near Toronto. Even though Blair was the General Manager of the rival Oshawa Generals hockey team, he talked Gregory into coming to Haliburton and explained how a combination of a camp and a hockey school was a better idea. After spending a day in the county, Gregory was sold on the idea.

They selected an area on Koshlong Lake, just east of Camp Lagakelo,

In 1965 the village of Haliburton had built a new arena with a modern ice making system capable of providing a skating rink even in the summer. The relationship between the town and the camp benefitted both side. The camp needed an arena with summer ice capability and the town needed a partner to rent the arena and justify the cost of building that facility.

In the 60`s, professional hockey players made a decent living, but nothing like the mega-bucks that they get now. Many of them had to supplement their income with summer jobs. The camp not only met that goal but gave them an opportunity to make friends with other NHL players and stay in shape. The list of players that taught at the camp reads like a chapter from the NHL Hall of fame and includes such legends as Bobby Orr, Ron Ellis, Red Kelly, Bernie Parent, Johnny Bower, Darryl Sittler, Gump Worsley, Ron Stackhouse, Bernie Nicholls and Walt McKechnie.

These players didn`t just show up for a few days, sign some autographs and leave. They spent at least three hours a day on the ice teaching youngsters how to shoot and pass and skate. It was not unusual to see Ron Ellis on the ice after regular practice sessions sharpening the skills of some lucky campers. The players also participated in the off-ice camping activities telling stories and bonding with the kids.

Eventually, Blair and Gregory worked their way into the NHL – Blair as general manager of the Minnesota North Stars and Gregory as coach & GM of the Toronto Maple Leafs. Those positions did not leave a lot

of time for running the camp so in 1976, Blair and Gregory sold the camp to Bob Smith. Blair used his money from that sale to start the development of the Pinestone Inn.

Hockey Haven did not suffer under Smith`s management. Occasionally some super stars like Steve Yzserman, Dale Hawerchuk, Paul Coffey and Wayne Gretsky would make guest appearances. What a dream come true.

The camp was the first of its kind. It combined a hockey school with a complete human experience. But all things must end. Under the pressure from other camps and rising player salaries, the camp was sold to Camp Wanakita in October 1988.

However, the legend does not end there. In 2013, Hockey Haven was reborn, just not on Koshlong. Its new location is at our neighbour Bark Lake. It is too early to say how that venture will fare, but the Hockey Haven legend lives on – not just in the memory of the players and campers that were lucky enough to participate in its glory days on Koshlong.

APPENDIX I – Interesting People

The Kaye Family and Their Legacies

– (extracted *from the Haliburton Rotary Club*)

The camping movement was at the heart of the business and personal interests of Haliburton Rotary's third president Alvin Kaye, and his legacy lives on in the form of Camp Wanakita and the prefabricated Kaye Built cottages.

W. Alvin Kaye was born in Port Carling, Muskoka, in 1898. Following his primary and secondary education in Bracebridge he attended the University of Toronto to become a school teacher. For several years he taught in Porquois Junction and then moved to Scarborough Township where he was appointed principal of Birchcliffe Heights School.

In 1937 he purchased property in Haliburton on Koshlong Lake, and a year later, he opened Camp Lagakelo, a summer camp for children. *(The name was derived from the names of the family members - LAGAKELO - **L**ilian, **A**lvin, **GA**rth, **KE**lvin, **LO**is.)*

By 1942 he was ready to pursue the camping business full time. He left teaching and moved to Haliburton to operate his camp year round. In 1953, Mr. Kaye sold the camp property to the Hamilton YMCA, and it was renamed to Camp Wanakita.

Seeking a new challenge, Mr. Kaye purchased the old Standard Chemical property in Donald, where he opened a prefabricated plank-wall cottage factory. He operated a business on this site until his retirement. His unique designs can still be seen on many properties in Haliburton and Muskoka. Several Kaye Built cottages are still standing on the shores of Koshlong.

Mr. Kaye was married to Lilian Richards, and they had three children: Garth Kaye, Kelvin Kaye and Lois Anderson. In his leisure time he was an avid collector of antiques, especially Canadiana. Part of his collection can still be seen at the Bird House Museum in Bracebridge. He also rode and showed horses, collected coins, enjoyed leatherwork, and liked to travel.

Work on Rotary Park and Beach was the club's main project during Alvin Kaye's presidency. The club also sponsored a trophy at the Haliburton County Music Festival. From 1950-52, Mr. Kaye served as secretary of the Haliburton club. He was also a member of the Masonic Lodge, and an active supporter of the Ontario Camping Association. He died in 1981.

APPENDIX J – What are Algae?

(***This write-up is courtesy of the MOE Lake Partner Office***)
In freshwater lakes, algae are tiny aquatic plants containing chlorophyll and are usually green in colour. They make their food in the form of starches or oils by using the energy of sunlight and nutrients from the water. They grow in many forms. Some species are microscopic single cells; others can grow as mass aggregates of cells or in strands. They can even resemble higher plants.
All plants require nutrients and sunlight for growth. The depth of sunlight penetration limits the depth to which plants can grow. Algae can affect water clarity. It is usually the amount of available nutrients (in particular nitrogen and phosphorus) that will limit algal growth in a lake. A black and white Secchi disc (a round, flat, sinkable disc) is used to measure the water clarity.

Types of Algae

Several thousand species of algae live in Ontario's waters. Algae are extremely diverse in form, colour, habit and habitat. We have broken them down into four general groups:

(i) Blue-Green algae
(ii) Green algae
(iii) Diatoms
(iv) Pigmented flagellates

(i) Blue-Green Algae - are unicellular, colonial or filamentous. Some forms are gelatinous masses of various shapes floating in the water.
(ii) Green Algae - are primarily of two types. One is attached and the other is free-floating. Filamentous greens (or attached algae) range from several millimetres to a metre in length. In many cases they are not found as isolated filaments but develop into large colonies of floating or attached mats. A few have been given common names such as pond silk, green felt, frog-spawn algae and elephant snot. These may produce a slime that can interfere with some industrial uses of water. Algae are a mixed blessing in that they help to purify the water and maintain a favourable oxygen level. However, they can also be responsible for causing odours in water and filter clogging.
When a "bloom" of blue-greens develops, the algae sometimes drift into bays or along beaches where they decompose. Soluble pigments can be released when cells break, giving the water a bluish or pinkish colour. They have a pleasant grassy odour while healthy, but this may change to an unpleasant musty smell or to a rather revolting foul odour upon disintegration and decomposition. Poisonings of animals and waterfowl have been attributed to the ingestion of lethal doses of toxic blue-greens accumulating along the shores of lakes..

(iii) Diatoms - are algae commonly found in both fresh and salt waters. A feature that helps distinguish them from other algae is the silicon wall that encloses them. These silicon walls are often marked with intricate patterns. Diatoms are the main food source for many aquatic microscopic animals. This is the group of algae most likely to cause filter-clogging problems. The rigid silica walls of diatoms are not subject to decomposition. Some diatoms produce tastes and odours in the water. When taste and odour are a problem in less eutrophic northern lakes, diatoms may be the cause.

(iv) Flagellated Algae - All flagellated algae possess one or more flagella per cell. A flagellum is a whip-like appendage that acts as a propeller. These algae can sometimes produce strong tastes and odours when present in water supplies. For example, Synura, a yellow, colonial flagellated alga can impart a perceptible cucumber odour to raw water even when present in low numbers.

Factors that Affect Algal Growth

There are a number of environmental factors that influence algal growth. The major factors that determine the type and amount of algae in your lake are:

- the amount of light that penetrates the water (determined by the intensity of sunlight, the amount of suspended material and water colour)
- the concentration of nutrients in the water
- water temperature
- the physical removal of algae by sinking or flushing through an outflow
- grazing on the algal populations by microscopic animals and fish
- parasitism by bacteria, fungi and
- competition from aquatic plants for nutrients and sunlight

The Overgrowth of Algae

Nutrient enrichment of water bodies (*a process known as eutrophication*) is enhanced by many human activities. Nutrient sources include farm runoff, detergent wastes, sewage discharges, septic tank seepage, and fertilizer runoff from lawns and gardens. All of these sources fertilize the water and can result in increased algal growth.

Excessive growth of one or more species of algae is termed a “bloom”. Blooms of algae can destroy the appearance of water, result in unpleasant tastes or odours, reduce clarity, and colour the lake a vivid green, brown or yellow.

Filamentous and colonial algae are especially troublesome. They can mass together and form scums or mats on the lake surface. These mats can drift and clog water intakes, foul beaches and ruin many recreational opportunities. They may also provide habitat for bacteria. Shoreline areas in front of cottages can become unsightly and uninviting. Peeling paint and staining on

boats and docks are partially the result of algal growth. Some species actually produce acids that may chemically corrode submersed metal pipes and concrete. Death and sickness to animals have been attributed to certain algae, mostly blue-green bloom-forming species.

The Connection to Oxygen Depletion

The amount of oxygen in the water is an important indicator of overall lake health. Oxygen plays an important role in determining the type of organisms that will live in a lake. Some species, such as trout, need consistently high oxygen levels to survive.

Algae produce oxygen as a by-product of photosynthesis but they also require oxygen for respiration. Respiration occurs all the time, but photosynthesis occurs only when sunlight is available. Consequently, a lake that has a large population of algae can experience a great fluctuation in dissolved oxygen concentration during a 24-hour period. Extreme oxygen fluctuations place great stress on fish and other animals in the lake.

When algae die, they provide food for decomposers (bacteria, fungi, and other organisms living in or on the lake sediment). They need oxygen to break down organic matter. In this way oxygen is steadily consumed. Several chemical reactions occur within the lake sediments when dissolved oxygen concentrations reach less than one part per million. Phosphorus, often the most essential plant nutrient in our lakes, is released from its association with sediment-bound iron and becomes available for algal uptake. This internal loading of phosphorus can directly accelerate lake degradation.

APPENDIX L – Camp Lagakelo (1937 – 1953)

The camping movement was at the heart of the business and personal interests of W. Alvin Kaye. He was born in Port Carling, Muskoka in 1898. Following his primary and secondary education in Bracebridge he attended the University of Toronto and North Bay Normal School where he met his future wife, Lilian Richards. He taught for several years in Porquois Junction and then moved to Scarborough Township where he was appointed principal of Birchcliffe Heights School.

During the 1930s he spent part of each summer at boys' camps usually as a handcraft instructor. The summer of 1936 he was the handcraft instructor at Camp Kilcoo on Gull Lake in Haliburton and it was during this time that he got the idea that he would like to own and operate his own boys' camp. During August of the next summer several weeks were spent looking for a suitable site for a children camp. One such property was on Koshlong Lake and arrangements were made to meet with the owner, a man named Hamilton (Ham) Harrison, in a village called Donald.

The small hamlet of Donald was a thriving place in the early 1900's. The main business was the Standard Chemical Company that manufactured wood alcohol and as a by-product, charcoal. Donald had a general store run by John Emmerson, nineteen houses and a boarding house. There were also two large houses that were used by the two bosses at the plant and of course the large factory.

In August of 1937, Alvin arranged for a meeting and drove to Donald with his family. Strangely Hamilton Harrison was not there, and he had not been seen in the village that morning. Knowing that the Harrison's cottages could be reached by following the road to Koshlong Lake they continued on through the village and

within two miles found him standing beside his disabled vehicle. Together they carried on to Ham's place, where the road ended. Arrangements were made for the Kaye family to stay in one of the Harrison cottages overnight and explore the property the next day.

To see the land that was for sale required a quarter mile hike from the cottages through thick bush. A lot of the property was covered with this very thick balsam bush. It was impossible to see more than ten feet unless you were on the lakeshore. At the water's edge a thousand feet of shoreline could be seen as well as two good sand beaches.

Koshlong was a dam-controlled lake - as it is now. The Burnt River is one of the main waterways that flow south from Haliburton. The lakes that drain into this river are used as reservoirs for the Trent Canal system. This is also true of the lakes on the Gull River system. The dams were built in the early 1900's at the time when the Trent system was being developed. The water level started to drop in July and continued throughout the summer. Each time a log was taken out of the dam, the lake went down another foot. Being August the water level was quite low allowing a lot of the beach to show as well as a small stream flowing through the middle of the property. There was no consideration given to the cottagers on these reservoir lakes.

Negotiations for the purchase of the future site of the camp progressed favourably and before leaving the next day an offer was made for a 26-acre lot with 500 metres of shoreline and two sand beaches. The sale (for the grand price of $3,500) was finalized within a month.

At the same time 6 acre piece of property at the far end of the lake was purchased from a different owner for $75.00. This was a six-acre point with a beautiful view of the lake. The original deed was dated in the 1800s, and the

name of the lake appeared to be “Cocwayong” or “Coowayong”- a fold on the map made the third letter hard to read. Some old timers recalled the lake had been known as “Cock-a-long” before it was called Koshlong. This property at the entrance to Bark Bay (on the west side of the gap) became known as Coowayong Point (later called Porcupine Point) and was used for years as a destination for out- trips from the camp.

With the purchase of the property completed, the first order of business was to decide on a name for the Camp. Serious thought was given to GAKELO – a word made up of the first two letters of the names of the Kaye children – Garth , Kelvin and Lois. However, the youngsters thought that their parent’s names should be included, and so L for Lilian and A for Alvin were added, creating LAGAKELO as the name of the new Camp.

Then the real work started! An advertising folder had to be prepared. Land was cleared for buildings. A road had to be cut through the bush to the water. Boats of some sort had to be bought or made. The list was almost endless.

In order for work to begin on the property that autumn, it was obvious that building the road must take priority. Local men were hired to extend the existing road (that ended at the Harrison cottages) through the bush that separated it from the lake and to create a turn-around at the end. [*This extension is the final part of the road that now ends at the government dock, at the west entrance of Wanakita.*]

Areas for three sleeping cabins and a dining hall also were cleared that fall. Work on the dining hall began before the first snowfall. It was an interesting structure, consisted of a closed-in kitchen area with a room at each end to be used as bedrooms during the fall and the following spring. The rest of the

building consisted of a large floor area with a super structure to hold the huge canvas that formed the roof and the walls.

The main clearing was for the dining hall. Paths were then cut fifty feet out running east and north to the sites of three cabins. All the lumber and materials for these buildings was carried along these paths. The bush was so thick that although the cabin sites were only fifty feet apart one could not see from one building to another. Following a pioneering theme all the buildings were given names of places or people from the early days of Canada's exploration. The three clapboard cabins that were built that year were called Ville Marie, Cartier and Hudson.

At the east end of the property was an old log cabin that was still sound. With some repair and a good cleaning it was made useable and named Cumberland House - a name that remained for the life of Camp Lagakelo. It became a dormitory and gathering spot for the boy's senior staff. The small beach at the east end of the property was destined to be the boy's camp swimming area and it became known as the "boy's beach". There was also a boat house and a rail & pulley system used to haul boats from the lake.

The inaugural boys camp started on July 2nd 1938 and lasted for six weeks. It was followed by a two-week camp for girls. In the planning stages the intent was that the camp be only for boys, which explains the uneven allotment of time. However, at the end of the boy's camp period that first year some of the boys asked if, with their parent's permission, they could stay for the remaining two weeks. After careful thought, this was accepted as an experiment in running a boys' and girls' camp at the same time.

Campers came from Toronto, Scarborough and Hamilton. Average weekly attendance (including staff) was 21. The fee of $8.00 a week will give one a good

idea of the cost of things during the depression. (It should be noted that for the second year of operation, the rates went up 25% to $10.00 a week.)

The two camps held joint events with one or two campfires. Kitchen staff had a half-day off each week, from after lunch till after breakfast the next day, so out-trips would be arranged for those days. There were no camping tents except those that were set up permanently for staff, and so the out-trips would only be held if the weather was favourable.

On one day when kitchen staff was off, a mixed group of campers went on an out-trip for supper on Coowayong Point. They were accompanied by Grandad Kaye - who had built the rowboats being used for their trip. Part way down the lake dark clouds started to come in quickly from the northwest. Since they were too far out to turn back, they headed for the closest cottage to get off the water. The cottagers were not there and everything was locked up. The beach they were on faced the coming storm and the only protection was to stand in the lee side of the cottage, out of the wind but not out of the rain. Two of the girls hoped to find shelter in the outhouse, but it too was locked.

The storm was a typical Koshlong thunder storm with strong winds, heavy rain and lots of lightning and thunder. As the young people huddled out of the wind a bolt of lightning struck very nearby. Suddenly a heavy gust of wind brought down a good-sized balsam tree, right on the outhouse - flattening it. Realizing what a close call they had, some of the girls started crying in a state of relief. Fortunately the storm soon abated, the sun came out and preparations were underway to continue the trip.

Everyone but Grandad was chilled, miserable and dripping wet. While the storm was raging he had been snug and dry in the shelter of one of the boats, which he had tipped on its side and propped up with the oars. The rest of the trip was

uneventful. On returning to camp, there were interesting exchanges of stories about what happened during the day's storm.

Later that evening another memorable event unfolded. As mentioned earlier, the dining hall was an unusual structure. It consisted of a closed-in kitchen area with a room at each end to be used as bedrooms during the fall and the following spring. The rest of the building was the dining area with a wooden floor and a canvas roof and walls. The canvas had been put up before the camp opened that summer and an interesting problem was discovered whenever it rained. The canvas was not new and could not be stretched too tightly over the ridge because it would rip easily. When it rained, the roof sagged down allowing the water to collect near the top of the walls. The accepted way of dealing with this was to take the brush end of a broom and very carefully push the sagging canvas up until the water flowed over the edge and down the wall. During the storm, a visitor witnessed this procedure and decided to help. Unfortunately, this helper used the handle end of the broom to push, which resulted in him poking a hole through the canvas. The weight of the water was too much. The hole rapidly expanded into a major tear allowing gallons of water to flood the dining hall. What a mess. The tables had been set for the next meal, and everything was soaked. All the dishes had to be washed again, and the tables and benches dried off and moved to a dry spot. Dinner was late that day.

Not too far from Donald there was a small settlement called Scots Dam. Most of the people living there were Finns and the men were excellent builders of log cabins and houses. In the fall of 1938 some of these men were hired to build five log cabins. The new cabins were called Donacona, Stadicona, Hochelaga, Fort Gary and Lachine. Two would be used in the new boys' camp area on the other side of the stream dividing the property. Two were for the girls' camp, which would be located on the original site. The remaining cabin was used to link two existing cabins on the west side of the road. This area was intended the adult

part of the operation, but often used for guests visiting the camp. The rental fee was $1.50 per day or $8.00 per week.

That summer (or perhaps the next) a small three-room cottage with a stone fireplace was built at the very west boundary of the property. This was to be a self- sufficient rental building. By the end of that summer there were three cabins for the boys' camp, five for the girls' and three plus "The Cottage" in the adult section. Directly opposite the adult section on the other side of the road there was another cabin designed for use as a hospital. It had two hospital rooms and sleeping quarters for the camp nurse.

Camp opened each year on the Saturday immediately following the closing of school for the summer, and closed on the Labour Day weekend. The camping season 1939 started on July 1st. The experiment of boys staying during the girls' camp schedule had worked well, and so it was decided to operate the camps concurrently. The girl's camp used the original site and had one new log cabin. The boy's camp was located at a new site and had 3 log cabins. Earlier that year, the dining room was made larger to accommodate the number boys and girls dining together. Average attendance (including staff) was now up to 38. Campers came from Scarborough, Toronto, Leaside, London, Islington, Oakville, Stratford, Carleton Place, St. Thomas and Moose Jaw.

The camps would have separate programs with occasional joint events, but all campers would eat together so that only one kitchen with a larger staff would be needed. The camp activities followed the same pattern throughout each week. Breakfast was at eight o'clock followed by cabin cleaning – inside and out. After cleaning came the morning activities. Each cabin-group participated in the same set of activities. These were such things as rowing instructions, leatherwork, basketry, camp craft, and learn to swim or improve your swimming. During the morning each group would attend two three-quarter hour sessions followed by

general swim. Lunch was served at noon and then followed by a one-hour rest period. Afternoons included the same events, but instead of participating as a group each camper could go to the activities of their choice. Dinner started at 6:00 o'clock. In the evening the program was usually a campfire with each cabin taking turns being responsible for a skit or a ghost story. Once a week there was a special program. When it was regatta day the events took place in the morning and afternoon, with the awards presentations made at suppertime.

That year, tennis and canoeing were introduced and the camp acquired three horses and two Shetland ponies. The next year improvements made to the tennis court and a new stable was built to house the growing herd of seven horses. The introduction of riding (which offered instruction and out-trips on horseback) was a major addition to the camp program. Some riders rode in the parades and competed at the fairs in Minden, Haliburton and Kinmount. The Shetland ponies Peggy and Paddy, with their pony cart, were always a great attraction at these affairs. During the off seasons the horses were stabled with local farmers.

In the first year, the camp navy consisted of three large rowboats that Grandad Kaye had built. These were sturdy sixteen foot, flat bottom boats with two sets of oarlocks. For out-trips they held as many as ten campers, with four of them doing the rowing. This was, of course, before there were any regulations concerning life jackets - so there were none.

The second summer saw the addition of three second-hand canoes. One of these was a 'Sunnyside Cruiser' meant strictly for paddling on a lake. It had about a three-foot deck at the front that came back from the bow. Another was called a double-skinned canoe. It had planking running from bow to stern, as do most wooden canoes, but it also had interior planking running from gunwale to gunwale. Both canoes were very heavy and not designed for portages.

It was around this time that the first icehouse was built. Before then, ice was purchased from the Emmersons who had an icehouse at the lake. Ours stood across the driveway from the kitchen. The ice was cut from the lake in the winter and stored in the icehouse. The ice was covered with sawdust to keep it from melting and it lasted easily through to autumn.

Cutting the ice in the winter was a big job, and getting ice out of the icehouse in the summer was also a lot of work. Even then, the available iced boxes were barely adequate for the amount of fresh food that needed to be stored.

During those first years there was no electricity or telephones at the camp. Electricity did not reach the lake until 1957. However the lack of a telephone was a bigger problem. The Emmersons, who owned the store in Donald, would move to their cottage (located just across the bay from the camp) after the ice was off the lake and the road was clear. Mr. Emmerson would stop by in the morning on his way to his store and if provisions were needed he would bring them when he returned in the evening. But, this didn't work if a shortage was discovered during the day. So it was decided to run a telephone line between the store and the camp. It was a grounded system that ran on batteries. A single strand of wire ran along the side of the road from Donald to the camp. It worked quite well for a number of years, but if a tree branch touched the wire the grounding wouldn't work properly, which meant someone had to follow the line to find the problem and fix it.

In the dining hall light was provided by large Coleman lanterns, which ran on naphtha gas. Coal-oil lanterns serviced the cabins and other buildings. Everyone was aware of the fire danger and took great care. The only fire accident was caused by lightning striking a tree on the northeast side of the property, behind the boys' beach. A district fire ranger first saw smoke from his fire tower in Dorset. He phoned the store in Donald and then John Emmerson

relayed the message to the camp. The ranger had plotted the location of the fire to within a few yards of the site. The burning tree was felled and a bucket brigade of campers was organized to extinguish the blaze with water from the lake.

There was one only other fire incident. It was the result of an improperly extinguished campfire. That fire burned underground through the root systems, leaving a hard crust on the surface. Fortunately an early morning walker broke through the crust creating an ankle-deep hole and exposing the glowing roots. The fire had been smouldering underground through the night and travelled a distance of fifty feet from the original site of the campfire. Had it not been discovered and extinguished it would have grown in size and strength. All it would have needed was a good supply of oxygen to become a roaring blaze!

At the end of the 1939 season the campers had all gone home by September 2nd and the Kaye family were the only people at the camp. The next evening some of them went down to the beach to have a better view of a spectacular display of the Northern Lights putting on a magnificent show of colour. Great shafts of green, blue and pale yellow waving light covered half the sky. One of the family remembered hearing an old wives' tale that such a significant display foretells a war. The next morning while everyone was at breakfast, Mr. Emmerson arrived and announced that he had heard on his battery radio that "England had declared war on Germany". World War II had started.

In 1940 the camps opened on June 29th. There were 4 new tent cabins in girls' camp and a new three-room cottage in Adult section, an improved tennis court, 7 Horses and new Stable. Average weekly attendance (including Staff) was up to 80. Campers came from Scarborough, Toronto, Leaside, Stratford, Ottawa, Oshawa, Port Credit, Forest Hill Village, Pickering, Swansee, Kingsway and Summit NJ.

The war had an impact on the camp in many ways. Food was rationed and ration cards were needed for the purchase of such things as sugar, butter, meat and tea. However, this did not cause any major hardship at the camp because the quota allowed usually exceeded the need for most things except sugar. Campers often brought their ration cards with them and could use the appropriate coupons to cover the purchase of extra or specific foods.

Gas rationing had a major effect on the camp. There were various degrees of rationing. If a car was essential for your work you could get a larger amount of gas than if your use was considered non-essential. Children's camps were considered of some importance, because in many cases for the first time in Canada, both parents were working and camps provided a place where children could be sent for part or all of the summer. As a result the camp was allocated a slightly larger gas quota.

Monthly ration books were issued with gas coupons, each of which was originally good for five gallons of gasoline. As the war progressed a coupon was good for only four gallons. When your coupons were gone, you could not buy any gas until your next book arrived. Gas rationing affected not only the camp supply but also that of the parents.

Trains that ran daily five days a week, from Toronto's Union Station to Lindsay and from Lindsay to Haliburton, became the prime method of transportation for the campers. The "down" train left Donald at 6:30 a.m. and the "up" train arrived at 4:00 p.m. Campers who were leaving had to catch the morning train in order to make room for the new campers arriving in the afternoon.

Wartime also affected the availability of counsellors for the boys' camp. Since most of the older teenagers and university students were required to take 'war work' jobs in the summer, the supply of counsellors was limited. A government

rule stated that students who took full-summer jobs at children's camps were excused from that requirement. However, there was a strong feeling across the country of "doing your bit "and furthermore 'war work' paid much better than camp wages. Because of this, it was impossible to find anyone suitable to be the camp director of the boys' camp in the summer of l944. Garth had just finished his first year of University, and for the past three years had been a counsellor and director of waterfront activity, and so he was given the responsibility of camp director. Wilbur Howard, (who later became Moderator of the United Church of Canada), was at Lagakelo for the first six weeks that summer and agreed to be Garth's coach and mentor in this endeavour.

Many additions were made during the years between 1940 until 1953. in 1041, the dining hall was greatly enlarged. Two-storey additions were added at two corners. They jutted out on a 45-degree angle from the main building. The one on the southwest corner had living accommodations for the Kaye family. The other addition provided a much-needed expansion for the kitchen and the upstairs was used as living space for the kitchen staff.

In the boys' camp, Onalea Lodge was built providing enough space for campers and staff to use for rainy day activities. This two-story building provided a large open space and a room for the programme director downstairs and sleeping accommodation for two cabin groups upstairs. A footbridge to the boys' camp was built. Additional cabins were built in the girls' camp.

In 1942 the Hospital accommodation was improved and the campfire site was enlarged. A stage was introduced for the outdoor theatre, tent cabins were all closed in and a workshop/garage was built.

Around this time a Delco refrigeration system with a generator was purchased. But it proved inadequate to handle the refrigeration that was needed. Then an

Onan generator was bought from the man who ran the Molou theatre in Haliburton. It was ingeniously wired with a 'demand system', which meant that whenever there was a need for power the generator would start automatically. It would also shut down when the last switch was turned off and no more power was needed. This provided lots of power for a "walk-in" refrigerator, and for lighting in various parts of the dining hall. It also made the icehouse redundant, so it was reconfigured to provide an office and Tuck shop on the main floor, and living quarters upstairs. The office space in the main building was converted into a sitting room for the Kayes.

During this period the camp enrolment grew steadily. In 1941 the average weekly number of campers was 120. From that time on, no advertising was needed. By 1945 the average weekly enrolment was 172. In the early years campers were accepted for periods of one week to the full eight weeks. The last two weeks of July and the first two weeks of August emerged as the most preferred time and the camp was full during that period. In the mid '40s the policy was changed to state that campers staying only one or two weeks would be accepted only on one of the light periods at the beginning of July or during the last two weeks in August.

There was no strict rule about when parents could visit their children, but they were encouraged to come on Sunday. The camp programme on Sundays was limited to chapel in the morning, then morning and afternoon swim periods with sometimes a hike or nature walk for anyone who was interested. Otherwise it was a free day.

Many parents would stay for lunch when they visited and so a meal count was always made to see if a new record had been set. With the girl's camp running at about 90 girls and the boy's camp at 60 – plus a total staff of 40 or 50 – it didn't take many guests to exceed a total of 200 plates.

During his annual health check in 1941 Alvin Kaye was told that running a school and the camp was too much of a load and he would be well advised to give one of them up. The camp was growing quickly and productively and so he decided to stop teaching and spend all of his time developing the business.

Summer camps at that time were just that - summer camp. Usually they sat idle from the end of August until the end of school the next summer. The Kayes always spent Thanksgiving weekend at the camp and so it was decided to offer this time to families and teenagers. For a number of years there was a group of fifteen people who regularly spent Thanksgiving at the camp.

After two or three family Christmas periods spent at the camp it was felt a winter week could also be offered. This would require the log cabins to be equipped with stoves. Since the road was not ploughed from Donald into the camp, sleighs would be needed with a team of horses kept at the camp. This was a necessary addition anyway to allow the Sr. Kayes to stay at the camp on a semi-permanent basis. (At this time the camp employed one-man full time and hired others as needed.) A good set of sleighs was bought, as well as a Cutter, which was a two-seater sleigh with a curved 'dashboard' and could be pulled by a single horse. Later a set of light sleighs that were equipped with seats was bought.

A mile or so of trails had been cut through and around the property and there were two good hills for skiing. The road was snow covered all the way to Donald. A portion of the lake was cleared as a skating rink. The best remembered winter camps were all before the road was kept open and the campers had to be met at Donald with the sleighs. Most of them came and went by train, which meant more early morning departures at temperatures quite unlike those in the summer (*or our present-day winters*). One winter camp in the late 1940s was attended

by about fifteen campers of all ages. The Christmas camp idea was a good one, but maybe forty years before its time.

Camp Lagakelo was a successful operation. While the three children completed their education to follow their chosen careers (Kelvin in Engineering, and Lois and Garth in Teaching) they lived in a house in Scarborough. After the three youngsters had started to work, the camp was the only home the parents had. Unfortunately, Alvin's wife Lilian was not happy in this somewhat isolated situation. What else may have influenced the sale of the camp is not known.

The camp was sold to the Y.M.C.A. after the summer operation of 1953. The camp became Camp Wanakita and was expanded by the purchase of Hockey Haven, which had been developed on the property previously owned by the Emmersons. There is a very large year- round operation there now.

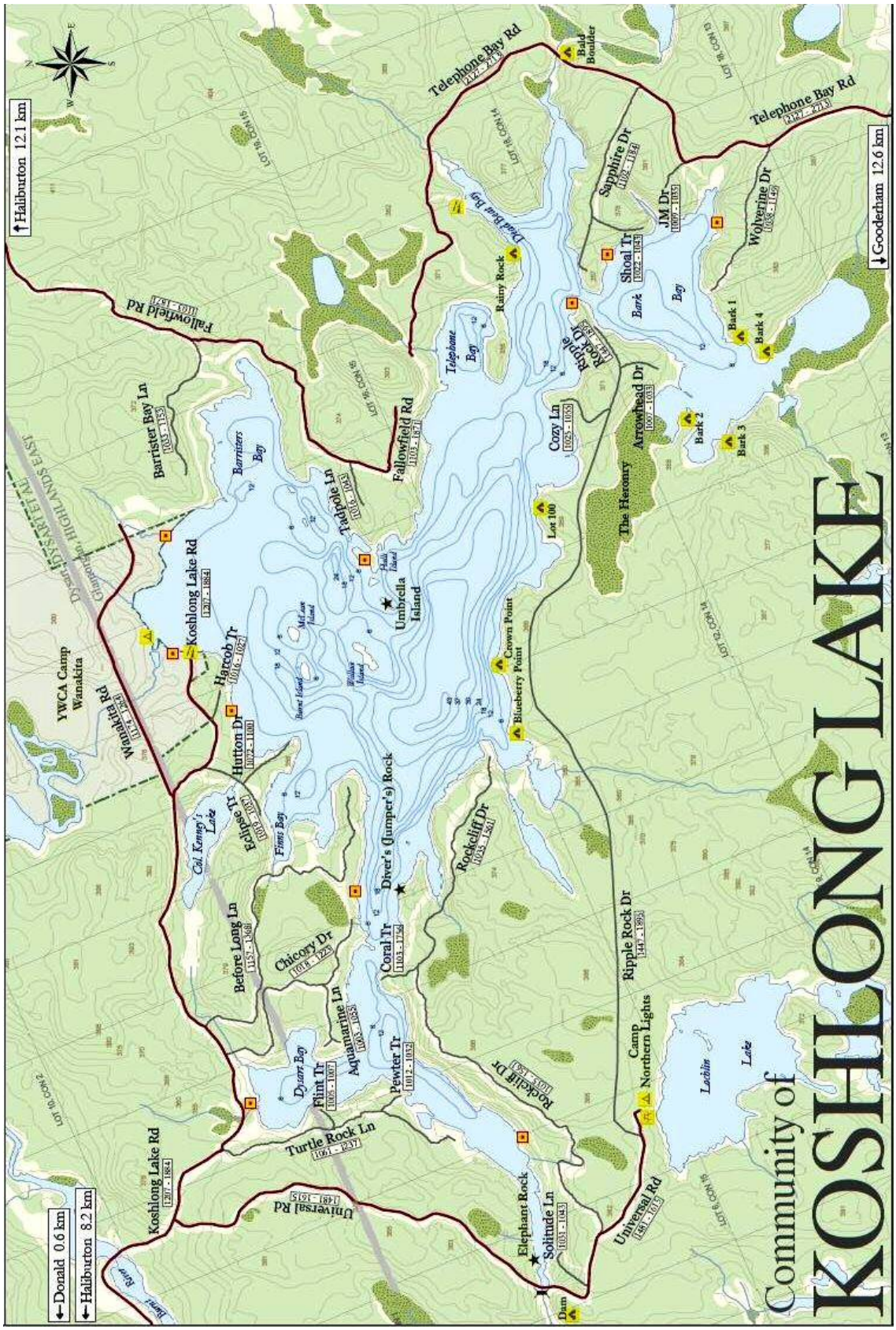
The senior Kayes bought a house on the highway just west of Haliburton. Lilian Kaye was hired by the local school board to teach in the elementary school in the village. Alvin Kaye spent his time improving the house and lot, and starting his new woodworking business. He purchased part of the old Standard Chemical property in Donald and ran a successful pre-fabricated plank-wall cottage factory from there for several years until he retired in the l960's. They then sold the house in Haliburton and lived for a brief period in Lindsay. Then they bought a 40 acre property a few miles east of Cobourg. Here Mr. Kaye's antiques were displayed in a building especially built for the purpose. His collection was donated to the Bird House Museum in Bracebridge and when that facility reorganized, it was donated to the Haliburton Museum. Mrs. Kaye died in l971 and Mr. Kaye in the winter of 1981. They are buried in the family plot in St.Thomas cemetery in Bracebridge.

Written by Betty Kaye

Acknowledgement (by Betty Kaye):

My introduction to Camp Lagakelo was not until 1942 when, along with other classmates from Scarborough Collegiate I spent part of the Christmas holidays at the camp.
I was not a part of the early years of the camp and gathering the history of that period of its development has been a challenge.
Fortunately my brother-in-law, Garth Kaye, included information about the camp when writing his family memoirs. I thank him sincerely for allowing me to use that source, unreservedly.
Other information about Alvin Kaye was taken from a special publication celebrating 50 years of Rotary in Haliburton, entitled Profiles of the Presidents.
In 1947-48 he was the third President of the club.

APPENDIX M – Bathymetric Map of Koshlong Lake

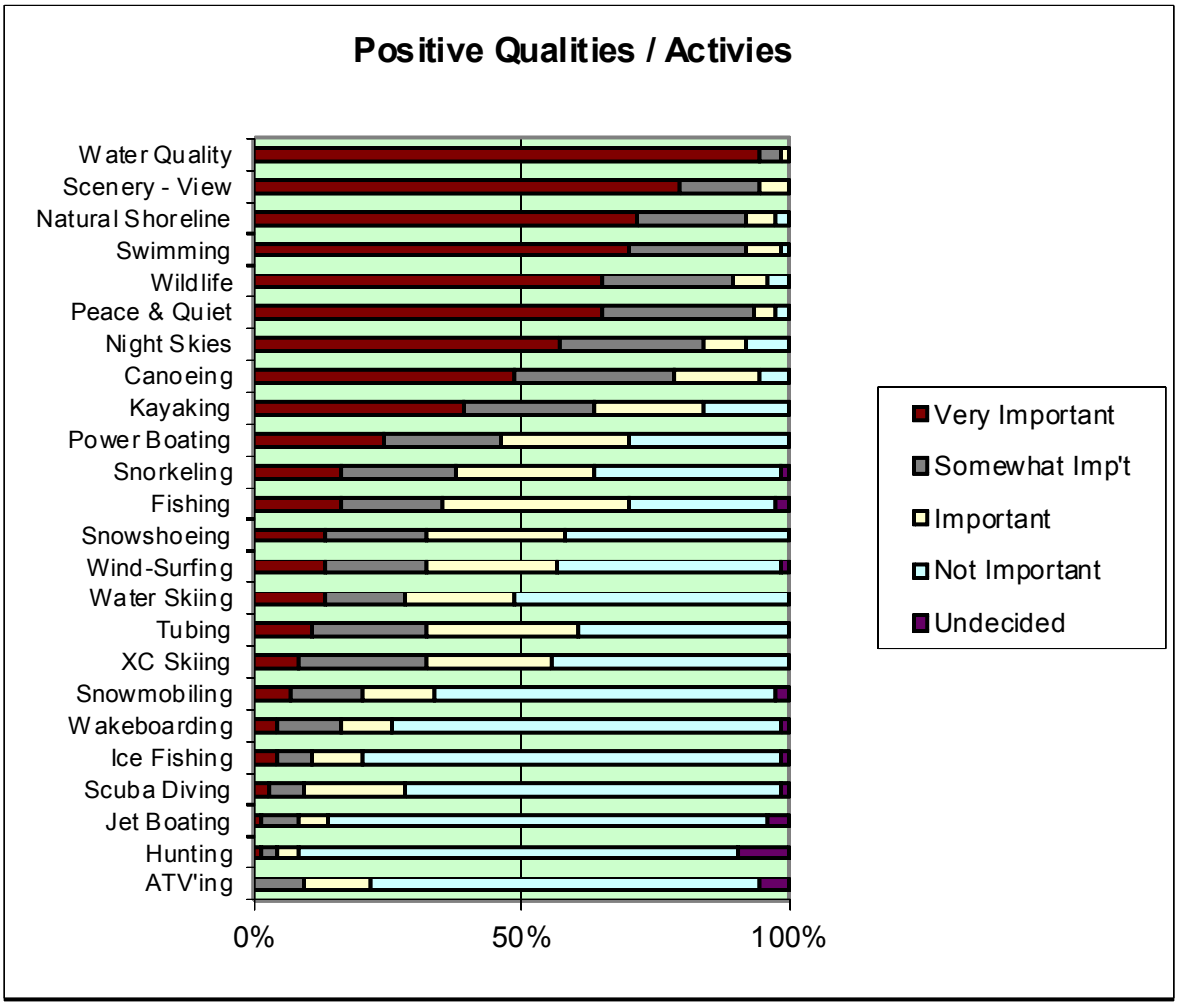


Courtesy of **Anthony vanLieshout Holdings Inc. and Stephen Foster**

APPENDIX S – Survey Results (2008 and 2011)

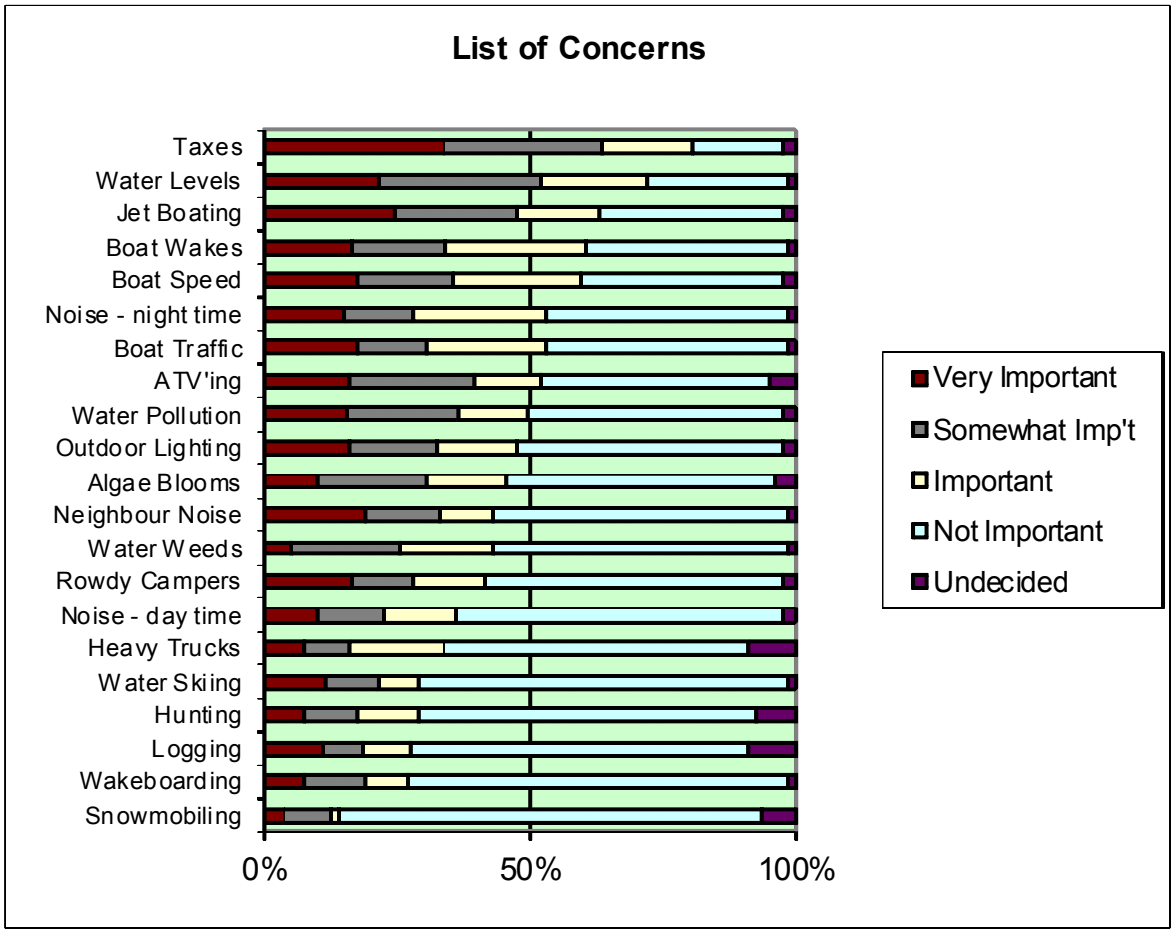
Survey on Values

In July 2008 a survey was conducted with KLA community to identify the elements that determined the quality of life at the lake. The responses were grouped into two sets. The first set highlights the Positive Values (namely the elements that add to one's personal enjoyment of the lake). The following graph shows those values:



Other activities that members enjoyed included walking or hiking, reading, good neighbours, the abundance of crown land and the lack of development. Note also the significance of Night Skies which is something often overlooked by those living is large cities.

The flip-side of the Positive Values was the Negative Values or the Concerns that diminish ones enjoyment of the lake.



The first two concerns, Taxes and Water Levels are not in our control. But members should note the other items – many of which are related to our activities. Of particular note was the issue of Outdoor Lighting, which was an issue with almost half of the respondents. We should all try to reduce our lighting and aim it so as not to disturb others.

It was reassuring to look at the responses on wildlife. Most survey respondents have seen ALL of the wildlife that were listed in the survey, including Moose, Deer, Salamanders, Bear, Fox, Bull Frogs, Garter Snakes and Beaver. It was heartening to learn was that some members have even seen Mink, Wild Turkey, Wolves, Lynx, a pair of Otter and even a Wolverine. Generally speaking, wildlife might be diminishing in cottage country, but it is still present and quite diversified around Koshlong.

It would really help if people kept records of any unexpected or unusual wildlife that is seen (including the date and location) and send KLA directors an email or note of your sightings. Flying Saucer reports will also be accepted, but it those cases your name will not be used. There's so much more to learn from the survey so check it out.

Survey on the Lake Plan Recommendations

Another survey was conducted in August of 2011. A draft copy of the Lake Plan had been distributed to all members of the Koshlong lake Community and they were asked if the agreed or disagreed with each of the 92 recommendations.

Only 38 members replied and some will argue that this is not a statistically valid result. However, there was such an overwhelming similarity in the responses that the result can be taken as valid.

In some cases, a respondent neither agreed nor disagreed with a recommendation. In those cases, the absence of an agreement cannot be taken as a disagreement. To account for this 'undecided' response, the results were also shown on a percentage basis.

The results of this survey can be used by the KLA Directors to focus their energy and limited resources on those recommendations that are most important to the lake community. It would also be meaningful if KLA members were kept informed as to the progress on each initiative that was undertaken by the KLA Board.

Subsequent updates to the Lake Plan can show what recommendations have been adopted by the KLA Board and when they have been completed. This will then serve as a historical chronology of Board accomplishments.

Result of Survey on Lake Plan Recommendations

August 2011

Recommendation	Item	Responses	# Agree	% Agree
Advocate for Retention of Crown Land	20	38	38	100.0%
Partner with MNR & HHOA in Stocking of Lake Trout	55	38	38	100.0%
Establish a Protect Wildlife Habitat Education Pgm.	63	38	38	100.0%
Encourage Responsible Lake Living	2	37	37	100.0%
Ensure Navigation Hazard Awareness	8	37	37	100.0%
Gather Lake History from Members	6	36	36	100.0%
Initiate a Natural Shorelines Program	47	36	36	100.0%
Encourage Phosphorous-Free Living	43	38	37	97.4%
Recommend No Fertilizers & Pesticides	45	38	37	97.4%
Identify and Research Loon Nesting Areas	61	38	37	97.4%
Invasive Species Signage at Boat Ramps	66	38	37	97.4%
Establish an Environment Education Program	1	37	36	97.3%
Encourage Property Owners to Think Globally	3	37	36	97.3%
Municipal Maintenance – Public Boat Ramps	17	37	36	97.3%
Education Program on Proper Septic Maintenance	44	37	36	97.3%
Encourage Good Forestry Education Program	79	36	35	97.2%
Assist MNR in Assessment of Lake Trout	11	38	36	94.7%
Establish a Shoreline Education Program	19	38	36	94.7%
Establish a Cottage Watch Program	34	38	36	94.7%
Fish Community Education Program	59	38	36	94.7%
Invasive Species Reporting	67	38	36	94.7%
Boat Cleaning Education Program	68	38	36	94.7%
Write on Koshlong History	4	37	35	94.6%
Advocate for No More Boat Ramps	18	37	35	94.6%
No Vegetation Removal Education Program	28	37	35	94.6%
Ensure 'At Capacity` Status is Retained	37	37	35	94.6%
Continue Annual MOE Reporting	40	37	35	94.6%
Investigate Archaeological Findings	7	36	34	94.4%
Identify and Research Sensitive Natural Areas	46	36	34	94.4%
Identify and Research Wetlands	49	36	34	94.4%
Post Species at Risk Info on Web Site	71	36	34	94.4%
Participate in Municipal Official Plans	29	35	33	94.3%
Advocate a Mining Setback - 100 Metres	77	35	33	94.3%
Discourage Resource Mgmt (Mining)	27	34	32	94.1%
Pit & Quarries Setback - 300 metres	76	34	32	94.1%
Encourage Protection of Wetlands	50	38	35	92.1%
Continue Rock Bass Derby	58	38	35	92.1%
Initiate Loon Nesting Projects	62	38	35	92.1%

Regulation of Mining Advocacy	74	38	35	92.1%
Pits & Quarries Bylaw	75	38	35	92.1%
Wildlife Education Program	32	37	34	91.9%
MNR Fish Surveys	56	37	34	91.9%
Species at Risk Research	69	37	34	91.9%
Species at Risk Education Program	70	37	34	91.9%
Identify Historic Sites	26	36	33	91.7%
Continue Lake Partner Program	38	36	33	91.7%
Improve Water Monitoring	39	36	33	91.7%
Noise & Light Education Program	30	38	34	89.5%
Crown Land Education Program	88	38	34	89.5%
Encourage Safe Swimming	24	37	33	89.2%
Establish a Harmful Plant Education Program	33	37	33	89.2%
Identify and Research Streams (with MNR)	52	37	33	89.2%
Natural Shoreline Adherence	57	37	33	89.2%
Research Koshlong Area Fires & Disasters History	5	36	32	88.9%
Encourage Additional MOE Partner Monitoring	42	36	32	88.9%
Influence Out-Building Municipal Regulations	82	36	32	88.9%
Influence Harmonizing of Waterfront Regulations	83	36	32	88.9%
Advocate for Environmental Products on Roads	16	35	31	88.6%
Encourage Safe Boating	23	38	33	86.8%
Invasive Species Awareness Education Program	65	38	33	86.8%
Crown Land Infraction Reporting	89	38	33	86.8%
Influence Municipal Ecological Bylaws	9	37	32	86.5%
Work With CEWF	12	37	32	86.5%
Research and Identify Streams	51	37	32	86.5%
Impact of Water Draw-down on Trout	60	37	32	86.5%
Explore Surrounding Watershed	10	36	31	86.1%
Document Animal Sightings	64	36	31	86.1%
Soils Education Program	72	36	31	86.1%
Investigate Official Forestry Management Plans	80	36	31	86.1%
Visual Impact for Commercial Operations	81	36	31	86.1%
Dissolved Oxygen Monitoring	41	35	30	85.7%
Influence Stream Protection Bylaw	53	38	32	84.2%
Influence Major Landscaping Bylaws	73	38	32	84.2%
Document Appropriate Lighting	31	37	31	83.8%
Encourage Incident Reporting	35	37	31	83.8%
Influence Natural Shorelines Bylaws	48	37	31	83.8%
Develop a Septic Usage & Maintenance Guide	87	37	31	83.8%
TSW - Remote Water Level Sensors	13	36	30	83.3%
Encourage PDF Wearing	25	36	30	83.3%
Consent Agreement Co-operation	92	36	30	83.3%
KLA Role in zoning & subdivision Applications	85	37	30	81.1%

Steep Slope Bylaws	78	34	27	79.4%
Boat Safety Education Program	21	37	29	78.4%
Municipal OP Co-operation	90	37	29	78.4%
Zoning Bylaw Co-operation	91	37	29	78.4%
Develop Septic Guide	84	36	28	77.8%
Document Out Building on Koshlong	86	35	26	74.3%
Name the Stream Competition	54	36	26	72.2%
Remotely Operated Dam	14	35	23	65.7%
Develop a Boat Safety Guide	22	35	19	54.3%
Acquire Engraving Pens for ID of Articles	36	35	18	51.4%
Advocate for Hydro Power from Dam	15	35	17	48.6%

APPENDIX T – Do's and Don'ts of Septic Usage

In the Bathroom:

Don'ts	Do's
Use automatic toilet bowl cleaners Use anti-bacterial hand soap Put paper towel, tissue, hair, baby wipes (even ones marked 'flushable'), or feminine hygiene products (tampons) down the toilet	Use non-bacterial soaps Use biodegradable cleaners that are phosphate and chlorine free Use peroxide cleaners Limit the amount of toilet paper used Conserve water to avoid septic overload

In the Kitchen:

Don'ts	Do's
Use anti-bacterial products Pour fats, oils and grease down the drain Use chlorine bleach	Use non-bacterial soaps Wash dishes with phosphate-free detergents Run dishwasher only when completely full

In the Laundry:

Don'ts	Do's
Do more than 1 laundry load per day Use chlorine bleach Take a shower or bath when doing the laundry	Use washing soda or oxygen bleach instead of chlorine bleach Use peroxide stain removers Use phosphate-free detergents Wait for laundry load to finish before draining a bath or taking a shower

NOTE:

- Be aware of how much water is going into the septic system, as it cannot handle large volumes of water at one time
- Using washing soda or oxygen bleach in your laundry will not only whiten and brighten your clothes but also help to keep the septic system healthy

APPENDIX W – Camp Wanakita (1953 - present)

The name Wanakita is a native term meaning Guardian spirit.

The camp that we now call Wanakita has had a storied life. Details of its history can be found in other sections of this Lake Plan, so the following is a high-level chronology of the main events that shaped its history (*provided by Al Raposo of Camp Wanakita*):

1935 John E. Emmerson purchases 500 acres of crown land on the north east side of Koshlong Lake for $500.00, with the stipulation that he build on it within a year.
Hamilton Harrison owned the property to the west by the beach, and the road.

1936 In June, construction of the Emmerson residence was started. It was named Red Haven (*later the Vaughan Cottage, and now the Hamlin Lodge*).

1937 Kaye family purchases their first lot (6 acres) from H. Harrison for $75.00. Later named Porcupine Point.
The Kaye family purchase a wood lot property from H. Harrison for $3,500.00
20 acres of property on the north end of Koshlong lake becomes the site of Camp Lagakelo, with 500 meters of shoreline and two sand beaches.
The name of the camp was derived from the names of the family members
L – Lillian, A – Alvin, GA – Garth KE - Kelvin LO – Lois
Emmerson family builds West Haven next to Camp Lagakelo.
Kaye Family starts to build road from Donald to the camp property.
Hires Finnish carpenters from the nearby community at Scot's Dam to build the following:

- five log cabins on the camp site
- three cabins on the East side of camp originally named Ville Marie, Cartier and Hudson. (now Sunrise, Middle Waterfront and Sailing/Outtripping)
- two rental cabins on the west side of the road known as the adult area
- the Waterfront Cabin on the west side of the camp road. (Old hospital Lakeside/Chateau}

1938 Kaye family adds to their growing resort by building Glen Haven, Fair Haven, Little Haven and East Haven on the point. Also the Boat House, with rail and pulley system to retrieve the boats from the lake.
First year of Camp Lagakelo

Kitchen and dining floor erected in the spring. Consists of a closed-in kitchen area and a dinning floor area, with canvas walls and roof.
6 weekly male sessions starting July 1st
2 weekly female sessions starting August 6th
3 camper cabins, kitchen, dining floor with canvas walls and roof
Average weekly attendance including staff 21
Initial cost $8.00 per week
2 cabins on the east side of camp (adult area) were available to parents for a daily rental at $1.50 or $8.00 weekly

1939 Telephone lines extended from the General Store in Donald to Lagakelo camp and then up to Red Haven.
Dinning floor is enclosed along with the addition of office space.

1940 Camp adds new three-room rental cottage in adult area, west of the camp road. Later became the old Directors' Cabin.

1941 Onalea Lodge built.

In 1952 the Hamilton YMCA formed a group, spearheaded by C.L. Brown, to select the site of a new children's outdoor camp. The next year, Camp Lagakelo in Haliburton was chosen from a long list of candidates. Purchase price - $50,000.

1953 Within six months of the property purchase from the Kaye family, YMCA Camp Wanakita welcomed its first campers.
First camp director was E. Keith Smith.
Camp site was 29.97 acres
7 program staff
7 kitchen staff
1 nurse
20 counselors
3 junior counselors
373 summer campers
3 2-week period sessions
2 weekend groups in spring

1954 experienced a 26% increase in attendance
4 2-week sessions (increase of one week)
5 weekend groups (2 of which were father and son)

By the end of the year major improvements included moving two cabins from the previous adult area to the east side (now located just east of the current Health Center).
Stables converted to sheds.
Physo Cottage donated and built by the Hamilton Y's Physo Club.
21 buildings painted
Replaced wood burning stoves to propane
Hydro lines run into camp
Hamilton Y' men's club donated 3 ton truck

1955 Emmerson family sells West Haven to Rattray family
Camp at capacity

1956 Causeway built by the Prentice Excavating Company at a final cost of $650.00
Swamp at back of property filled in to create a playfield.
First sail boat acquired Nordberg NK-1 15 class
Site at capacity
Emergency warning system initiated along with a fire alarm system.
Began negotiations with Emmerson family to purchase land to the east of the camp.

1957 Master rehabilitation plan conceived to upgrade and increase the camp structure.
Hurricane Audrey hits on first day of camp. Beaver dam above the property broke and washed out ten feet of the causeway and playfield. The causeway had to be rebuilt and the playfield enlarged and leveled at a cost of $1,000.00
New cedar log hospital (Bayer Den) erected at a cost of $3,000.00
1 new log cabin built
First life preservers at camp purchased
New canoe dock built

1959 Loan from Hamilton Y MCA Board of Directors enables the building of the Rec Hall (New Dinning Hall/ Longhouse)

1962 Emmerson's sell property east of Red Haven to Bishop Real Estate
Including the Boat house and Glen Haven. The wee road was developed to facilitate Access to the new Hockey Haven site. Glen Haven was burned down in the development of the facility.

1964 Purchase of Rattray Cottage (now called Corey's Place)
Emmerson's sell Red Haven to the Vaughan family (Hamlin Lodge)
30 acres of woodlot beyond the causeway starts to be developed with the move of several cabins.

1967 Fenton Hall completed (renovated 2012)

1969 First co-ed camp with 47 girls, 2 weeks in July

Al Knox hired to turn camp around from its struggles of the 60's.

1973 Year round outdoor education program

Operational from May to September and weekends thru the winter

$2.00 per day per person

$5.00 with 3 meals

$15.00 extra with staff

Camping for Christmas & New Year holidays

Wayne Perkins takes over as Camp Director in the autumn

1974 Plan is to turn Wanakita into a year round operation initiated.

Becomes a 4-season co-ed camp

First staff winter camp - Christmas to New Year period

Dean Collinson arranges for donations of skis and the start of X-country skiing at camp

Lakeside used as the first ski lodge

1977 Wintario Grant to upgrade Rec Hall (Long House)

Dave Black becomes the first year round on site staff member.

1978 Duplex built

Directors House and Ski Lodge (Snowshoe Hut) built

Start of trails development on back 900 acres

- Green Island Loop
- Beaver Dam to Falls (Burnt River)

Transition from Kybos to flush toilets

1979 Rob Heming becomes the Director

1983 Reached 100% capacity

1984 5.87 acres purchased from Allan Francis

Built bridge to Adult Camp beach – Corey's Place

1986 Purchase a lot from Alan Francis

1988 Purchase Hockey Haven on October 21st.

34.97 Acres

1200 feet of waterfront

22 buildings

Cost $625,000

2005 Purchase of Vaughan Cottage property (Hamlin Lodge)

The following is a complete list of camp directors:

1953 – 59	E. Keith Smith
1960 – 62	Mearl Thompson
1963 – 64	Dennis McLelland
1965	Dick Woods
1966 – 68	Al Moffat
1969	Earl Davis
1970 – 73	Al Knox
1973 – 79	Wayne Perkins
1980 – 97	Rob Heming
1997 – 2010	Steve Heming (Rob's brother)
2010 –	Andrew Gruppe (and G.M.)

Anyone familiar with Koshlong is well aware that Camp Wanakita is a large, impressive and thriving year-round operation. It is also the biggest employer and taxpayer in the township of Highlands East. In 2013 (when the Lake Plan was written) the camp encompassed nine property rolls with almost 1,000 acres of property (987.5 acres to be exact) stretching from the north shore of Koshlong to the Burnt River. Its shorelines are also impressive, with 3,529 feet of sand beach on Koshlong and another 8,389 feet along the Burnt River.

Although it is often thought of as one camp - it is actually two distinct camps. On the west side is the children's camp (usually called the Kid's Camp). On the east side is the Family Camp. All told there are 142 buildings (44 kids cabins, 43 family cabins, 2 health centres)

References:

'My Memories of Red Haven on Koshlong Lake' by Margaret Emmerson

Modernity, Metaphor and Maples (The Landscape Created by the Wood Chemical Plant in Donald) – by Andrew Hamilton, Trent University, April 1992

Engineering News (A Journal of Civil, Mechanical, Mining and Electrical Engineering)
Vol. 61 No. 4 - 28 January 1909

There's Something About This Place – by Charlie Teljeur

Calcium in Ontario's Inland lakes – Ontario Ministry of the Environment

Additional information may be found at the Kinmount web site (www.Kinmount.ca), under the GAZETTE tab and at the Haliburton Museum, which has a copy of the original Engineering News article from January1909.

Web Sites:
http://buildingbetween.ca/eco-innovation-centre/the-story-of-the-chemical
http://jermalism.blogspot.ca/2011/11/abandonment-issues-standard-chemical.html

Notes:

Notes