
Growler Lake Plan


Growler Lake Property Owners' Association
www.growlerlake.ca
October 2015
Revised: February 2106

Official Cover Photograph - Stuart Thomson

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Jeanne Lafranier

# 1.0 Introduction

## 1.1 Purpose & Scope of the Lake Plan

The purpose of the *Growler Lake Plan* is to guide the members of the Growler Lake Property Owners' Association Inc. (GLPOA)[1] in the long-term protection and maintenance of the natural, social, and physical features of Growler Lake[2], the surrounding lands, local watershed, and, ultimately, downstream areas. Figure 1.1 outlines the approximately 368 hectares within the boundaries of the Growler Lake Community. While the *Growler Lake Plan* is specific to this area, it is also relevant to the Growler Lake catchment area (Figure 3.3), local area residents, and communities downstream. The *Growler Lake Plan* (sometimes referred to hereafter as the *Plan)* documents pertinent information about Growler Lake based on applied science (e.g. on-going water quality monitoring), research, and community input.

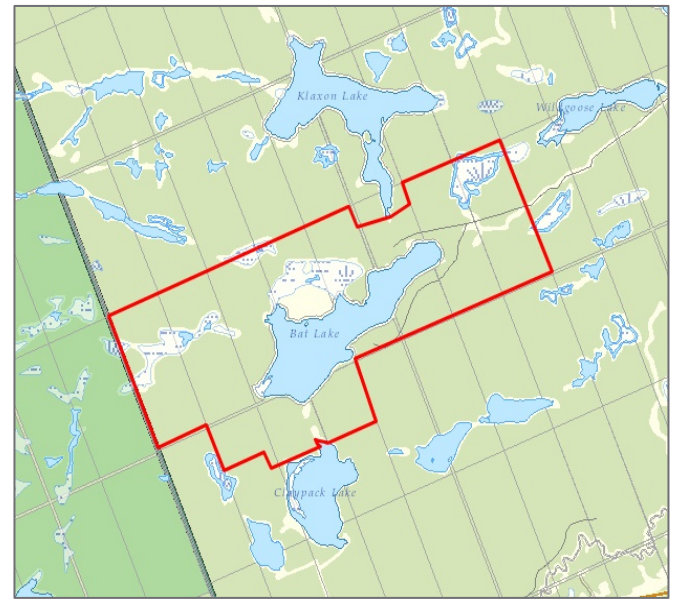



Figure 1.1
Growler Lake – Community Boundaries

The *Growler Lake Plan* is the beginning of a long-term process of assessment, evaluation and adaptive management. As such, it is a living document which may be revisited in order to recognize and address new issues. The *Growler Lake Plan* is neither a legal document nor a policing document, and it does not reflect a single interest position.

## 1.2 Planning Approach

In October 2011, the members of the Growler Lake Property Owner's Association Inc. unanimously supported the motion to create the Growler Lake Conservation Committee whose mandate was to explore the development of a lake conservation plan and/or guidelines for maintaining the health of our lake and its surrounding areas. Understanding the magnitude of the task and the limited resources available, the Growler Lake Conservation Committee wholeheartedly adopted the planning approach, processes, and reporting format outlined by the Federation of Ontario Cottagers' Associations (FOCA) in *Lake Planning Handbook for Community Groups*. As recommended by FOCA, the Committee relied heavily on the processes, research, experiences, and publications of other lake associations.

[1] *Land Registry Instrument Number H212102 – Severance Agreement*, discussed in greater detail later in this document, requires, among other things, that all owners of property abutting the shoreline or original Shore Road Allowance of Growler Lake be a member of the incorporated road association which is responsible for the ongoing maintenance of the private roadway.

[2] All GIS mapping applications using the Ontario Ministry of Natural Resources' Land Information Ontario (LIO) database, including the County of Haliburton Community GIS program, reference Growler Lake as Bat Lake. In the 1997 Severance Agreement and in practice, the Lake is referred to as Growler Lake.

## Growler Lake Conservation Committee

Carol Brayman (Chair)

| | | |
|---|---|---|
| Alan Abelsohn | Jeanne Lafranier (Secretary) | Brenda Leis |
| Edwina Follows | Linda Holmes | Susan Vorvis |

The Committee identified the following desired outcomes of the planning process:

- identify our specific lake values
- establish a future vision for our lake
- recognize and document the unique character of the Growler Lake watershed
- create a current inventory of resources
- identify current and emerging issues and their impacts
- set environmental and social targets
- identify and recommend appropriate stewardship and educational activities
- promote community education, discussion, and responsible action.

The Growler Lake Conservation Committee began its work early in 2012 by surveying all owners about their interest in the lake and conducting some preliminary research on lake history and characteristics. From its inception, the *Growler Lake Plan* has been developed by strategically engaging a wide variety of stakeholders (property owners, local residents, etc.,) in an open and transparent way, facilitating consensus through information and discussion. Despite a wide variety of individual interests, there was significant agreement as is evident in the results of our surveys and interviews. Committee members consulted with Ian MacNab, a highly respected water research engineer, and in August 2012, hosted a workshop with Mr. MacNab for all GLPOA members. At that time, Mr. MacNab toured the lake and made recommendations for the care of shorelines and property, as well as a water testing program. In the fall of 2012, the Growler Lake website was launched.

At the Annual General Meeting on October 20, 2012, the Committee provided members with a comprehensive environmental resource package and presented its preliminary recommendations. GLPOA members supported a motion to explore prohibiting the use of motorized personal watercraft (PWC's) on Growler Lake. There was a serious discussion of limited boat motor size and of promoting the use of electric motors only. As some members already owned boats and as the GLPOA members had already voted to keep Growler Lake open to motorboats, a decision to provide guidelines and education about boating laws and to encourage the continued prudent and considerate use of motor boats was reached. A GLPOA Code of Conduct was discussed and sent back to the committee for further work. A motion giving the Growler Lake Conservation Committee a mandate to develop a lake management plan was carried.

Throughout 2013, work and research on the *Lake Plan* continued, including interviews with local community members, town officials, and experts from the Ontario Ministry of Natural Resources (MNR). A bylaw to prohibit motorized personal watercraft (PWC) was researched and drafted. Committee members met with Peter Schleifenbaum, an environmentalist and the owner of the Haliburton Forest and Wildlife Centre. At the Annual General Meeting on October 19th, members approved the proposed outline of the *Growler Lake Plan* and passed GLPOA By-law #11 (Appendix 4) which prohibits the use of motorized personal watercraft on Growler Lake. Further, members approved the Committee's revised GLPOA Code of Conduct (Appendix 3) for members, families & guests.

During 2014, work continued on drafting the *Growler Lake Plan*. At its May 2014 meeting, the Directors of the GLPOA requested that a draft of the *Plan*, including an Executive Summary, be made available for review at their August meeting. A draft of the entire *Growler Lake Plan* was made available to all GLPOA members in advance of the 2014 Annual General Meeting for review and discussion at the meeting. A final draft of the *Plan* incorporating comments, revisions, and new information from the 2014 GLPOA Annual General Meeting was provided to the membership prior to the 2015 Annual General Meeting. The *Plan* was accepted by the membership on October 17, 2015.

## 1.3 Information Sources & Support

The Conservation Committee of the Growler Lake Property Owner's Association would like to thank all those who participated, supported, and assisted in the development of the *Growler Lake Plan*, particularly the directors and members of the GLPOA, the residents of the hamlet of West Guildford, the Municipality of Dysart et al, the County of Haliburton and the Ontario Ministry of Natural Resources and Forestry.

The fullness of Section 3.2 Historical Development is due largely to those people who generously shared their own stories and those handed down through their families, telling of the lives, joys, and tragedies of the people who played a part in the history of Growler Lake.

In particular, the Committee would like to express their sincere appreciation to those who took the time to share their stories and/or lend their expertise in the development of this *Plan*:

### 3.2 Historical Development

Ron & Sharon Bacon (West Guilford, Ontario)

Brenda Bain (West Guilford, Ontario)

Marshall Barry (West Guilford, Ontario)

Dave Baxter (Fergus, Ontario)

Garry Cooper (West Guilford, Ontario)

Ruth Cooper (West Guilford, Ontario)

Dick Henderson (West Guilford, Ontario)

Iris Miscio (Minden, Ontario)

Pat Morrison (West Guilford, Ontario)

Paul Wilson (Minden, Ontario)

### 5.3.3 Mushrooms & Fungi

Linda Soeder – (Kitchener, Ontario)

### Appendix 7 - Paleolimnology Study of Growler Lake: A 270-Year Record of Environmental History Stored in the Sediments of Growler Lake

Dr. Brent Wolfe (Wilfrid Laurier University)

Dr. Roland Hall (University of Waterloo)

While not always appropriately and fully credited and/or cited in this document, the development of this document relied heavily on information extracted from a number of publications, GIS mapping databases, documents, and websites. A more complete listing of the Information Sources is included in Appendix 1.

Luke Schell

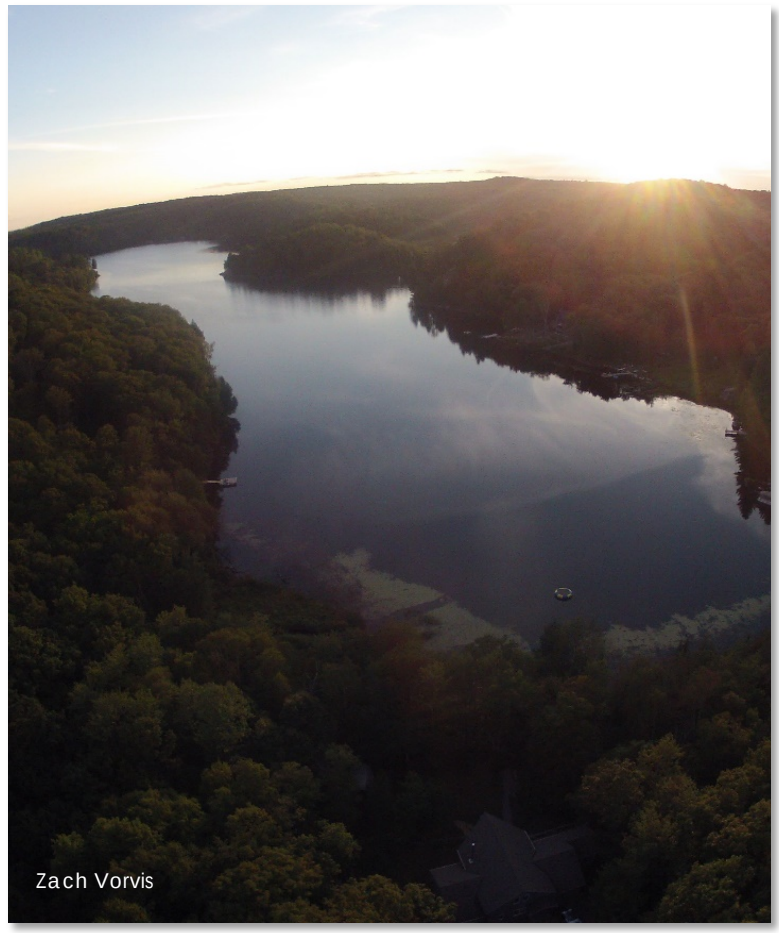
# 2.0 Vision, Principles & Targets

## 2.1 Vision & Mandate

The 2012 GLPOA Survey (Section 8.0) found that members unanimously agreed that protecting the natural habitat and water quality of Growler Lake was important to them and that they were committed to maintaining the lake's water quality. They also identified privacy, quiet, and natural beauty as the top three reasons they purchased property on Growler Lake. Many had relocated from cottages on larger, more developed lakes. The conservation values that members hold are reflected in their adoption of a number of environmental recommendations and their support of the work done on the *Plan*.

Perhaps the most important finding of the GLPOA Survey was the owner response when asked what they wanted Growler Lake to be five or ten years in the future. The response was unanimous. Owners wanted "Growler Lake to look and be the same as it is today – clean, quiet, pristine, and beautiful!" This is clearly the shared vision for Growler Lake.

*... to look and be the same as it is today – clean, quiet, and beautiful*


Zach Vorvis

Therefore, the mission of the *Growler Lake Plan* is to provide recommendations and best practices that will ensure the protection of the pristine nature of the lake, air, shoreline and lands of the Growler Lake Community. Such recommendations and best practices will help minimize harmful impacts to the local environment during development and beyond and they will safeguard the natural habitat of the fish, water fowl, animals, birds, and humans that depend on and/or enjoy it. To this end, the *Growler Lake Plan* environmental initiatives highlight the importance of water quality, natural shorelines, and animal habitats.

## 2.2 Principles & Targets

### Principles

Establishing a set of guiding principles and targets for key elements will help focus the *Growler Lake Plan* and start the process of making our vision a reality

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**Protect Lake Character**
The natural, social, historical character of the lake is to be protected and enhanced.

**Focus on Results**
Devise realistic actions which will achieve the results that respond to high priority issues.

**Guide Implementation**
Implementation of the *Plan* will favour stewardship and educational approaches through voluntary compliance rather than through legislation and regulation.

### Targets

**Water Quality**

- maintain or enhance the current pristine nature (existing contaminate and nutrient levels) of Growler Lake

**Fish & Wildlife**

- support a sustainable fish population including optimum habitat for naturally reproducing fish species and OMNR stocked lake trout
- maintain stability in the biodiversity of wildlife species and their habitat
- prevent the introduction of aquatic and terrestrial invasive species (e.g. zebra mussels and purple loosestrife)

**Natural Shorelines**

- protect Growler Lake's shorelines and creek/ stream contours to increase the amount of natural shoreline and support a diverse range of fish and wildlife species

**Trees & Vistas**

- maintain the natural vistas from Growler Lake so that buildings and structures have a minimal impact on the natural appearance of the shoreline and on the viewscape of the lake

Cooper Hunt Camp
Jeanne Lafranier

# 3.0 Lake Description

## 3.1 Pre-History Development

Growler Lake is situated on the southern boundary of the Canadian Shield. The Shield rocks were formed well over a billion years ago during the Precambrian era, the first chapter of geological history. This rolling landscape of bedrock, clearly visible around Growler Lake, may once have been part of a towering mountain range which was then worn down by water and ice over the ages. The advance of glaciers during the last ice age of over 10,000 years ago scored the Shield, carving striations in the bedrock; the glaciers retreated leaving deposits of gravel, sand and other glacial materials. These poorly drained depressions, as well as natural faults in the bedrock, form the millions of lakes, ponds, and wetlands in the Shield, including Growler Lake.

## 3.2 Historical Development

*The following history was compiled from records in the Haliburton Land Registry Office, Nila Reynolds' In Quest of Yesterday, Gordon MacKinnon's "The Forgotten History of Lake Kennisis," Pelham Mulvaney's 1884 "History of the County of Peterborough", Trent University's archives, The Toronto Star, the Browndale website, and numerous personal interviews conducted by Conservation Committee members Carol Brayman, Jeanne Lafranier and Brenda Leis. Note: Growler Lake is referred to in historical materials with both its previous names – Bear Lake and Bat Lake – while Claypack was formerly known as Mud Lake, and Klaxon Lake was formerly known as Horn Lake. References to all names appear for clarification.*

### First Nations & Early Settlers

No history of Growler Lake would be complete without considerable attention paid to the igneous and metamorphic rock of the Canadian Shield. Seen today in the rolling hills of the Haliburton Highlands, the Shield literally and figuratively shaped the community and industry of Dysart et al, including Growler Lake.

Although First Nations peoples did not create long lasting, permanent villages in the surrounding area, some Mississauga and Ojibwa claimed the region as their ancestral hunting grounds while maintaining permanent settlements elsewhere. Small groups of Iroquois also claimed land after the Huron were expelled in the seventeenth century.

Two hundred years later, the nearly impenetrable terrain continued to challenge eager immigrant farmers anticipating fertile land, forcing the earliest settlers to turn to the Highlands' most valuable natural resource – timber – in order to earn a living. The lumber industry made life in Haliburton County viable in the late nineteenth century, and it eventually ensured transportation routes would link it to the rest of the province. Ultimately, once a burgeoning cottage loving populace discovered the region in the latter part of the twentieth century, a surge in population helped foster economic diversification.

Logging has always required robust and tough-minded individuals, and Growler Lake – known then to local families as Bear Lake – boasted several such men. Today the oral histories of their descendants offer that rare but relished glimpse into lives of fortitude amidst harsh conditions that embodies the iconic Canadian story. They reveal the role Growler Lake played not only in the lives of local families, but also in the fortunes of those living thousands of miles away. From Confederation through the Great Depression and on to World War II and the turbulent social movements of the 1960's, the lake's story unfolds as the 'little lake that could'.

## Canadian Land & Emigration Company Comes to Haliburton

Growler Lake is nestled entirely within the boundaries of West Guilford, a village appropriately named after Guildford in the county of Surrey in England. Known for its mature woodlands, the British county is still the most wooded of all in Great Britain. Likewise, West Guilford in Ontario quickly became valued for its timber. In 1867 the Crown sold the entire village to the Canadian Land and Emigration Co., a group of English businessmen based in London. The CL&E Co. found it difficult to entice emigrants to settle the area and so first granted timber rights before eventually selling all the land to W.H.L. Gordon and J.M. Irwin.

Irwin had been known for lumbering in the area for some time and was in fact in partnership with Mr. Mossum Boyd of Messrs. Boyd, Smith & Company of Port Hope. These lumbermen had obtained all timber rights in Haliburton. While the lumber business caused an economic boom in the region during the early 1870's, little timber was cut in the 1890's and ultimately Irwin declared bankruptcy in 1895. The Canadian Bank of Commerce then took possession of his rights and interests.

Thomas Chandler Haliburton
1st Chairman of the the CL&E Co.

During this time, Letters of Patent had been issued by the Province of Ontario in 1889 incorporating the new Canadian Land and Immigration Company of Haliburton Limited. In the 1920's, this company bought back the timber cutting rights previously licensed to Irwin from the Canadian Bank of Commerce.

Just prior to WWII and the skyrocketing demand for lumber, in 1938 the Dysart Land Company Ltd. sold the lands surrounding Growler Lake to Ernest Cooper. For nearly a half–century afterwards, Growler Lake then belonged to the Cooper and Peck families who used the land to hunt and fish. Both families erected hunting camps in two separate spots on the south end of the lake. Ernest's camp was on the west side (Parcels #2 and #3) of the lake while his daughter Gladys (Cooper) Peck and her husband Bill's camp was on the east side (Parcel #25).

According to the best records of those still living in the West Guilford area, logging did not occur on a large scale on Growler Lake prior to the twentieth century. Growler's earliest logging targeted softwood lumber because the softwood could float on the lakes and rivers. Valuable hardwood logging commenced once practical means of transporting the logs emerged. Aside from some early attempts by the CLE & Co to build roads and bring a rail system to Haliburton County, sound infrastructure would not link the region north of Redstone Lake until the demands for wood during World War II and its aftermath intensified.

The south portion of Growler Lake, therefore, became the primary focus for the earliest logging. The portage route that still exists from Growler Lake (then Bear Lake) to Claypack Lake (then Mud Lake) with its close proximity to Barry Line Road allowed timber to be hauled out of Growler. It was also the route locals used to access the fishing and hunting grounds of Growler Lake.

## Growler's Bounty

Members of both the Cooper and Peck families still reside in the West Guilford area along with others who fished, hunted or logged along the shores of Growler Lake. Garry Cooper, a descendant of Ernest Cooper, has both happy and tragic memories of his family's time spent on Growler Lake. An incident familiar to many local townspeople involves Garry's great uncle and avid hunter, Ernest Cooper, the man who purchased the lake from the Dysart Land Co. A year after his purchase, in 1939, Ernest was mistaken for a bear and shot by a fellow hunter who happened also to be his son–in–law, Bill Peck. Married to Ernest's daughter, Gladys, Bill Peck had a small hunt camp on the shores of what is now Parcel #25 while his father–in–law had a small hunt camp on the opposite shore (Parcel #3).

Old Pail

Remnants of the Cooper camp, including part of a cabin, a stove and some utensils can still be seen between Parcel #2 and #3. Following the tragic accident, Ernest's widow, Louella (née Sawyer) Cooper, took possession of the property and in 1949 as Louella Cooper Dawson, the Growler land was divided between her brother–in–law, William Cooper (Garry's grandfather) and her daughter, Gladys Peck. The Pecks maintained the small camp on the shores of Growler for years afterward. Gladys Peck was known as an excellent 'lady trapper.'

Dick Henderson (whose family's homestead was adjacent to Ernest Cooper's on Busy Road off Rt. 118) remembers fishing with friends for brown trout, speckled trout, lake trout, and, in later years, splake and small and large mouth bass on Growler Lake with friends. Many referred to the large rock along the shoreline of Parcel #9 as Haystack Rock. Reminiscent of the sea stacks called Haystack Rock that dot the Oregon coast in the U.S.A., Growler's own Haystack Rock, like sea stacks or rock pillars in general, is a favourite shelter and nesting spot for migratory birds.

The boys accessed Claypack Lake (then Mud Lake) from the Barry Line Road with permission from then owner Irie Barry and from there they portaged through to Growler (then Bear) Lake. This route is still familiar to many in the area and used by snowmobilers and ice fishermen each winter. While the MNR had once marked and maintained this portage trail, the ministry no longer has the funds to continue this, but encourages the current local owners of Parcel #26, the Leis family, to do what they can.

Haystack Rock

Garry Cooper believes this portage holds significant historical value as a 'survival route' during the Great Depression of the 1930's when families were large and employment and food scarce. At that time hunting for venison was a way of literally putting food on a family's table. Since the hunting grounds surrounding Growler Lake were renowned, the portage was a much valued access point for the community.

Four decades later, in the early 1970's Dave Baxter, current owner of Parcel #25, was a frequent visitor to Growler Lake. He also recalls seeing the Peck's old red hunt cabin, never imagining then that the land on which it stood would one day belong to him. Dave was staying on nearby land owned by his sister when he was nineteen years old, and now describes the old camp as having had several bunk beds and even an outdoor sauna. Many in the area used it for hunting and fishing. The cabin was never locked, but instead left open and welcome for use by those wanting to spend the night on Growler Lake.

Stove Pieces

Although beginning in 1967 the Cooper and Peck land was sold off in parts to Brown Camps Leasing Ltd., and then beginning in 1988 to Paul Wilson, the old hunt camp was not dismantled until approximately 2002–03. Over the years of his ownership, Paul Wilson, a local surveyor, divided the land into parcels and sold the land around the hunt camp to Graham Mottram who built another cabin on the property's point in 2003. When the Municipality of Dysart et al realized the cabin violated set back regulations; Mottram sold his property to Windy Ridge Developers who by then owned the remaining parcels surrounding Growler Lake with a view to developing cottage properties. This cabin still stands as the Baxter's cottage, though it has been expanded upon and moved back from the shoreline in order to satisfy zoning regulations by its current owner.

## Growler Lake during The Great Depression & World War II

Just as Growler's wildlife was important for the sustenance of some local families during the Depression, so too did the timber from many of the yellow birch trees became valuable during the Second World War. Wood from the yellow birch proved to be key in the production of the de Havilland Mosquito bomber/fighter planes as noted in Gordon MacKinnon's notes on "The Forgotten History of Lake Kennisis:"

> *In 1942, Hay and Company of Woodstock, the Canadian subsidiary of the United States Plywood Company, bought 15,000 acres in northern Guilford and much of Eyre, Havelock and Harburn. A steam powered saw mill was built two years later at Havelock Depot to take advantage of the increased demand for lumber during the Second World War. Yellow birch, a hardwood, became a valuable commodity during the war because it was used in the manufacture of plywood veneer used in the wooden bodies of the de Havilland Mosquito fighter/bombers being built in Downsview, Ontario and in the United Kingdom. This airplane, nick–named the Wooden Wonder, was the fastest bomber in use before the creation of the jet aircraft. Over 7,000 were built and so the yellow birch (partly from West Guilford) was virtually essential for some of this construction. Since the hardwood did not float well on the lakes, and had to be transported out to the railway for shipment to Woodstock, the road out of West Guilford was extended from Redstone Lake starting in 1942 by one of the first bulldozers seen in the county and by autumn of 1943 had been completed all the way to the mill at Havelock Depot (today the site of the Haliburton Forest Base Camp).*

Extending the county road facilitated the production of the Mosquito and it provided an access point from which logs pulled out of Growler Lake's north could be transported. The 'log skidder road' that connected Growler Lake to County Rd. 7 eventually became Growler Lake Drive, a private road which today is maintained solely by the Growler Lake Property Owners Association.

Pat Morrison, who grew up on Eagle Lake and who today owns a logging and excavation company in West Guilford, used the log skidder road when he helped log Growler in the 1970's. He also remembers the Peck camp from the 1960's when he and his friends fished on Growler Lake noting that Harold Peck, Bill and Gladys's son, used the camp then.

de Havilland Mosquito Bomber

Morrison helped Rick Bain log parts of Growler for its pine and maple in the 1970's on the north end from what is now Klaxon (then Horn Lake) south to Growler and east towards Silver Valley/Pivot Lake. Bain had obtained logging rights to this parcel of 1200 acres from John Brown of Toronto and he logged the area for six years. While working for Bain, Morrison recalls that all the logs from Klaxon Lake and Growler were processed on a cleared landing that today is Parcel #17. The old logging road that still hugs the shoreline in front of Parcels #13 to #17 was used to transport all the logs to this landing site where they were then processed and ultimately taken out to County Road 7/Kennisis Lake Road.

Brenda Bain, married to Rick Bain's cousin, Roger Bain, recalls that her family also logged parts of the south end of Growler, with nearly a second tragedy occurring not far from where Ernest Cooper met his untimely death. Brenda's father, Brent Stamp, logged Growler for the winter of 1965. Pulling the logs across the ice was still a job for teams of horses in the 1960's, and Stamp borrowed his father–in–law, Arthur Barry's, team of horses. One horse went through the ice and nearly died in the harsh winter conditions. The trapped horse, freed by a bulldozer, did live to pull logs another day after returning to Brenda's grandfather's barn. This barn and farm would soon help write another chapter in the history of this close–knit community: the formation of Browndale/Haliburton.

## Browndale/Haliburton

John Brown was an American–born social worker who became famous in Ontario in the 1950's and early 1960's for his revolutionary approach to the care of children suffering from mental health issues at Warrendale in Toronto. He bought not only Arthur Barry's farm in the late 1960's, but also that of Arthur's brother Irie Barry (now the land of Dunloe Farms), and many of the surrounding farms and homesteads including the 1200 acres around Growler Lake. Brown's innovative – and sometimes contentious at the time – approach for the care of children who had serious mental health problems focused on housing the children in residential centres with family–like environments rather than in hospital wards.

Browndale/Haliburton (other Browndale programs existed in other parts of Canada, the USA, Holland and France) itself was not a camp, but a number of group homes located at eight farmhouses in Haliburton County, two of which were those that he had bought from Art and Irie Barry. The children, mostly boys between the ages of seven and eighteen and Crown Wards, were often from troubled or disturbed families. Most had suffered some form of abuse. The Browndale philosophy was to offer a therapeutic re–parenting experience in loving, supportive and nurturing environments where life was consistent and predictable. Each house had staff and was set up like a family with supervisors overseeing two or three houses.

From September to June those children who could attended school on Eagle Lake and they were often taken to town in large vans for clothes, medical appointments and grocery shopping. During the summer months the children camped outdoors at rudimentary campsites with little protection from the elements or insects near Growler Lake. While no camp facilities were erected on Growler Lake property, the counselors came to appreciate the lake for its tranquility.

According to Sharon Bacon, who along with her husband Ron, worked at Browndale in the 1970's, there was only one permanent building at the campground, a laundry, and this building still exists as a private home off Binscarth Trail. There was also a nurse's station and the camp's main office located on Marigold Road. While the children had access to water from The Redstone River, the counselors knew about the beauty of nearby Growler Lake and sometimes went there to camp when they themselves needed respite. Sharon Bacon also recalls that on occasion the counselors would take along one of the children on such camping excursions to Growler as a 'special reward.' They would camp on and near what is now Parcel #26 owned by the Leis family who have found remnants of these excursions to Growler in the form of a partially buried wooden box containing dishes and in the remains of an old dock left on the property.

Although John Brown was eventually convicted of fraud for the misuse of government funds leading to his bankruptcy in the late 1980's, his legacy lives on in the realm of children's mental health and social work. Having won a seat in the Ontario Legislature as a member of the NDP in 1967, Brown was an Opposition member during the PC government of Premier Bill Davis and upon his death in 2004, the Ontario Legislature devoted time to acknowledge his contributions to increasing awareness of children's mental health needs. While Browndale/Haliburton received mixed responses from the community during their time, the pristine beauty of Growler Lake was universally acknowledged as a calming balm for all involved.

Browndale/Haliburton Building

Some logging continued on Growler Lake into the late 1980's, and on some parcels, such as Parcel #23, there is evidence of logging as late as the 1990's. In 2003 Windy Ridge began developing the lands around Growler Lake for Halliburton's growing cottage population. Within a decade nearly all the parcels on the lake were sold and by the time of this writing in 2015 many families enjoy the natural beauty of the little lake that could, and does, refresh, renew and respond to those who appreciate her.

Paul Vorvis

## 3.3 Population

Growler Lake was first populated on a seasonal basis more than seventy–five years ago when Ernest Cooper built a hunting cabin on what is now Parcel #3 and Bill and Gladys Peck built a red hunt cabin on what is now Parcel #25. For almost sixty–five years, the red cabin, open to anyone who wished to use it, was the only structure on the lake and those who used it, its only residents. Even today, only fifteen of the twenty–seven seasonal–residential parcels have been developed. It is roughly estimated that the current peak population is less than fifty people (owners and immediate family) at any one time. Even fully developed, it is unlikely that the peak population will exceed 100 people.

The small Growler Lake community, however, is part of the larger community of West Guilford. Considering the 2011 census data for the Municipality of Dysart et al, three points are noteworthy:

- The municipality has an extraordinary proportion of seasonal residential dwellings/households: 5,966 people reside permanently in the municipality and an estimated 11,092 people reside seasonally. Of the 7,093 households, just over more than one–third are primary residences (2,656) and the remainder (4,437) are seasonal residential.
- Compared to the 2006 census, the average growth of permanent residents in the municipality (8%) is significantly higher than the provincial or national (6%) average.
- The permanent residents of the Municipality of Dysart are generally older than the provincial and national averages; more than one in four municipal residents is over the age of 65 years (27%) as compared to the national average of only 15%; the median age of local residents is 53 years (up from forty–nine years in 2006) compared to 40 years of age in Ontario and 41 years of age in Canada.

These census characteristics support the belief that people are retiring to the cottage at an increasing rate. Since the stated intentions of many Growler Lake property owners reflect this trend, the increased use of seasonal residences for permanent occupancy or for more frequent and longer stays will have an impact on the water quality of Growler Lake and its catchment basin. Increased human activity can accelerate eutrophication, the process by which a body of water becomes enriched in dissolved nutrients that stimulate the growth of aquatic plant life, usually resulting in the depletion of oxygen.

## 3.4 General Location & Lake Characteristics

### 3.4.1 Location

Growler Lake, previously known as Bear Lake and Bat Lake, is situated in the south–west corner of the north–west quadrant of Guilford Township in the Municipality of Dysart et al in the County of Haliburton (highlighted in red in Figure 3.1) within the province of Ontario. Growler Lake's map coordinates, at its center, are X: 685842.0552, Y: 5002018.6971.

The approximately 368 hectares within the boundaries of the Growler Lake Community includes Concession 9 Lots 1, 2, 3, 4, 5, 6 (PRT), 7, 8, and Concession 8 Lot 2 (PRT), 3 (PRT) and 4 (PRT). [3] In addition, Growler Lake Drive is situated on parts of Concession 9, Lots 9 through 14.

Figure 3.1
Growler Lake – Location

### 3.4.2 Lake Characteristics

Growler Lake is a relatively small, deep, elongated lake covering an area of approximately forty–eight hectares, with a total shoreline measuring approximately four kilometers. The Lake is fed by seven inflowing streams and has only one outflowing stream. Like most lakes positioned within the Canadian Shield, Growler Lake is predominately Precambrian granite and oligotrophic (poor in nutrients and plant life but rich in oxygen). It is generally deep and its low levels of phosphorus and chlorophyll along with its high secchi depth readings/great water clarity provide the ideal conditions for supporting cold–water fish such as trout.

Table 3.1
Lake Characteristics

| Characteristic | Detail |
|---|---|
| Length (km) | 1.73 |
| Width – Maximum (km) | 0.66 |
| Width – Minimum (km) | 0.17 |
| Shoreline (km) | 4.13 |
| Surface Area (ha) | 48.0 |
| Shape | elongated |
| Maximum Depth (meters) | 29 |
| Lake Type | oligotrophic |
| Basin | single |
| Streams – Inflow | 7 |
| Streams – Outflow | 1 |
| Catchment Area (ha) | 1,000 |
| Height above Mean Sea Level (meters) | 365 |
| Latitude & Longitude (deepest point) | 45° 8' 54.5 N 78° 38' 0.3 W |
| Map Coordinates (deepest point) | X: 685842.0552 Y: 5002018.6971 |

[3] County of Haliburton Community GIS Mapping Disclaimer - Areas and measures determined by GIS applications are approximate, and are not necessarily accurate to mapping, surveying, or engineering standards; map coordinates may be in error by several metres.

### 3.4.3 Bathymetry

Bathymetry is the study of underwater depth of lake or ocean floors. In other words, bathymetry is the underwater equivalent to land topography. Figure 3.2 illustrates the bathymetry of Growler Lake, indicating a single basin and depths illustrated in colour gradation from light (shallow) to dark (deep). The deepest point is approximately twenty–nine metres.

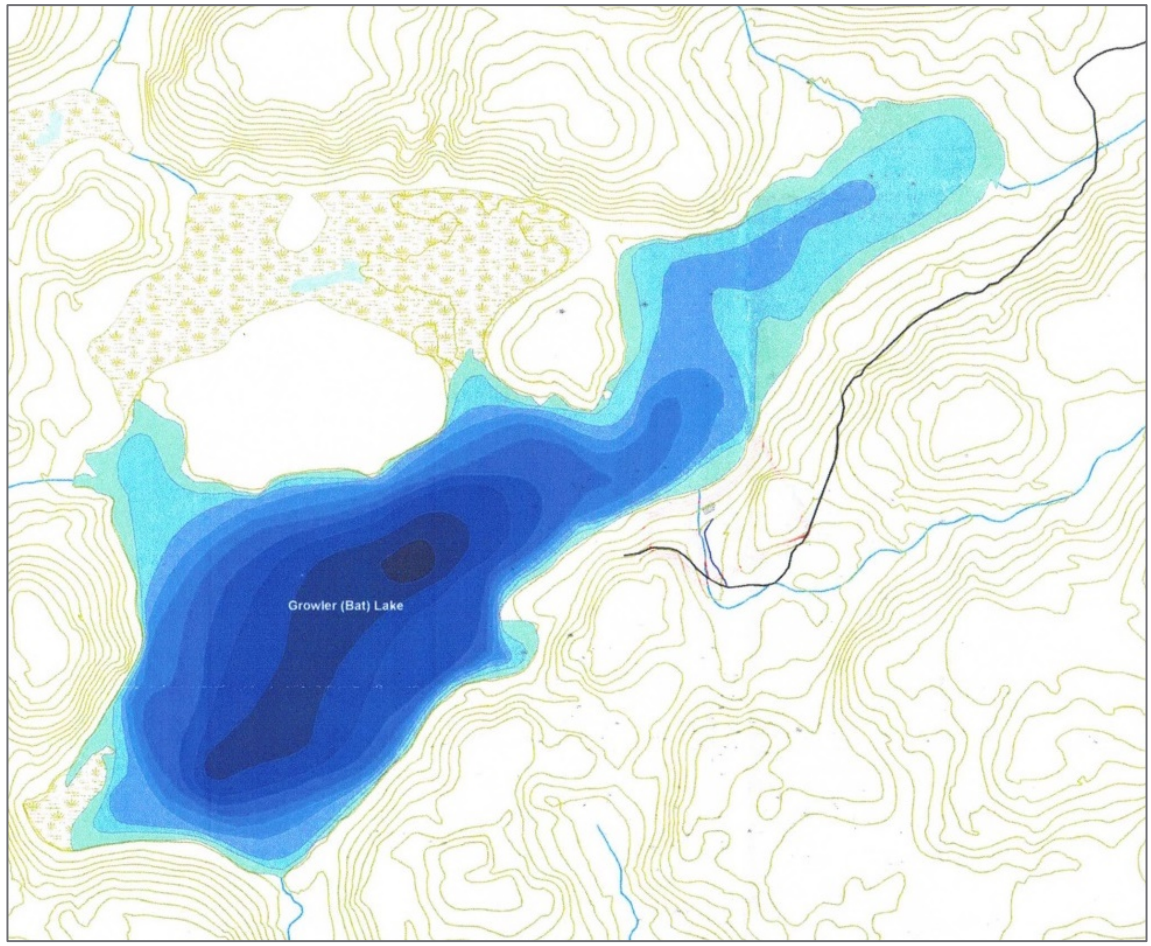



Figure 3.2
Growler Lake – Bathymetry
(Source: Glenside Ecological Services Limited)

## 3.5 Watershed Characteristics

A watershed, also known as a catchment or drainage basin, is defined as an area of land where all the surface water drains into the same place, whether it is a creek, a stream, a river or an ocean. Therefore, all precipitation that falls on a watershed ends up flowing to the same place. Watersheds are populated with freshwater features such as lakes, ponds, reservoirs, groundwater aquifers, snow packs, glaciers and ice fields. With very few exceptions, watersheds in Canada are open and flow, often through a series of watersheds, to an ocean. Because all the water in a watershed flows to the same place, it shares the same fate. Industrial pollution, development of any sort, agricultural runoff, erosion and logging, untreated sewers and more can affect water quality not just in one lake, stream, or watershed but in all others downstream.

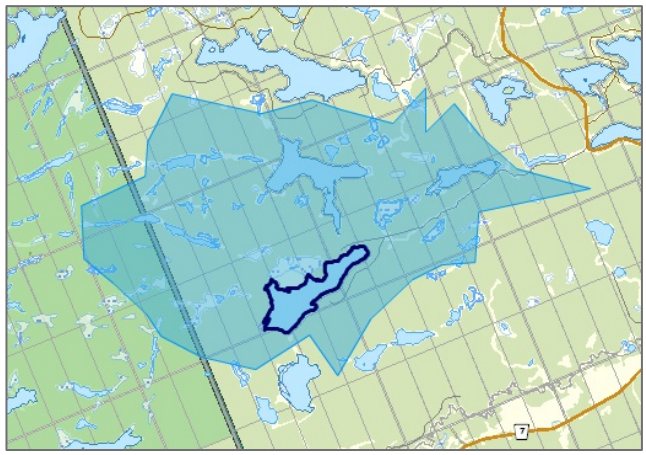


Figure 3.3
Growler Lake - Catchment Area

The Growler Lake catchment area covers approximately 1,000 hectares. As illustrated in Figure 3.3, the Growler Lake basin, charted based on peak elevations, includes Klaxon Lake to the north, Wildgoose Lake to the east, and a series of wetlands, beaver ponds, and streams surrounding the lake. A total of seven streams – three year–round and three seasonal – flow into Growler Lake. The single outlet of Klaxon Creek at the south west edge of the lake drains the Growler Lake catchment area into Claypack Lake.

As noted above, the quality of water flowing from upstream water bodies can have a significant impact on downstream water bodies. Because development within the Growler Lake catchment area is minimal – a single seasonal dwelling on each of Klaxon and Wildgoose Lakes and, at present, only fifteen seasonal dwellings on Growler Lake – it is possible to limit adverse effects of contamination by the human population. Further, with the exception of the seasonal stream which inflows from Klaxon Lake, the remaining inflowing streams that enter Growler Lake first flow through a series of wetlands (see Section 5.3 ) which naturally act as a filter to remove sediments, absorb nutrients and biologically change many chemicals into less harmful forms. In short, the quality of water draining into Growler Lake is essentially pure (see Section 5.2). The quality of water flowing out of Growler Lake is, and will continue to be, directly related to the lake stewardship of the Growler Lake property owners.

At a regional level, the Growler Lake catchment basin is situated within the Gull River Watershed, one of the eleven river watersheds that make up the drainage basin of Lake Ontario. Growler Lake drains into Klaxon Creek, which passes through Claypack Lake into the Redstone River, joins the Redstone watershed, and then empties into Green Lake. From Green Lake, water flows through Maple Lake, Beech Lake and into Boshkung Lake, where it meets water from the Kennisis watershed. The Kennisis Lake and Redstone Lake watersheds are the primary headwaters of the Gull River Watershed. From Boshkung Lake, the water flows through Twelve Mile, Mountain, Horseshoe, and Gull Lakes. The Gull River Watershed is outlined (heavy black line) in Figure 3.4; the flow of water from Growler Lake is illustrated by highlighted (red) shorelines.

The outlet of the Gull River and the termination of the Gull River Watershed is in the Town of Coboconk where the Gull River enters Balsam Lake. The Gull River Watershed is upstream of the Trent River basin and thus drains into the Trent River. With a drainage area of approximately 1,350 square kilometers, the Gull River Watershed makes up approximately 10% of the total drainage from the Trent River watershed into Lake Ontario.

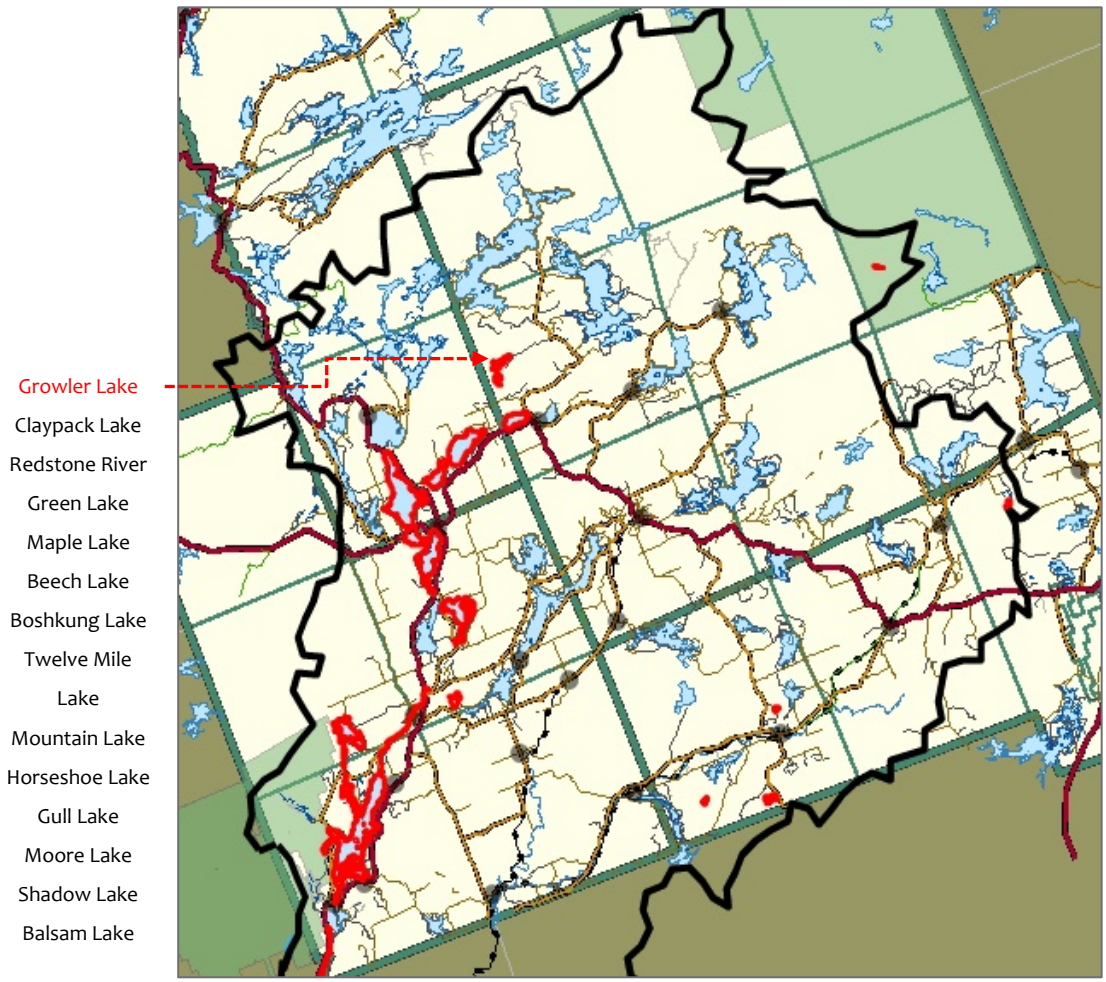



Figure 3.4
Gull River Watershed

## 3.6 Water Levels

Variations in the water level of Growler Lake are minimal and, for the most part, naturally occurring and short–lived. Such variations generally reflect a normal cycle of natural precipitation, evaporation and drainage from within the catchment area. Melting ice and snow and heavy or prolonged rains during the spring contribute to higher than average water levels while summer droughts may contribute to a somewhat lower than average water level. Based on ten years of observations, variations in water levels range from 0.7 meters above the average water level to as much as to 0.4 meters below average water levels. As noted above, drainage from the Growler Lake catchment area is confined to a single stream: Klaxon Creek. The outflow of this creek is restricted by a granite ridge approximately equal in height to the average surface level of water in Growler Lake.

It should be noted that many of the larger lakes within the Gull River Watershed experience dramatic variations in water levels as a result of the strategic water management of a series of dams and reservoirs that make up the upstream portions of the Trent Severn Waterway. The Trent Severn water management program, however, has no effect on the water levels in Growler Lake.

## 3.7 Location & Access

Growler Lake, as noted in Section 3.4, is situated in the north–west quadrant of Guilford Township. The turnoff onto Growler Lake Drive from County Road 7/Kennisis Lake Road (map coordinates: X: 689636.2087 Y: 5004052.1242) is, by road, about thirteen kilometers from the Hamlet of West Guilford, twenty–five kilometers from the town of Haliburton and twenty–six kilometers from the intersection of Ontario Highways 35 and 118 at Carnarvon. The eastern end of Growler Lake is approximately 3.1 kilometers west of County Road 7, along Growler Lake Drive.


Figure 3.5
Growler Lake – Location & Access

All twenty–seven parcels surrounding Growler Lake are accessible by private road. Growler Lake Drive, a 5.4 kilometer private dirt road, runs west off County Road 7 and follows the north and west side of Growler Lake providing access to sixteen land parcels. Trapline Trail, a 1.2 kilometer private dirt road, turns off Growler Lake Drive at the east end of the Lake and follows the south and east shore of Growler Lake providing access to ten land parcels. A single land parcel on Growler Lake is accessed by a private road running approximately 3.7 kilometers off Barry Line Road.

Figure 3.6
Growler Lake – Private Roads, Public Trails & Portages

Growler Lake Drive and Trapline Trail are constructed along privately owned land and use only a very small portion of the shoreline road allowance. Public access to the lake, therefore, is restricted. According to the Haliburton Community GIS and shown as a dotted line in Figure 3.6, a public portage exists between Klaxon Lake and Growler Lake and between Growler Lake and Claypack Lake. The portage allows limited public access (pedestrian and snowmobile) to Growler Lake; the public's right of passage along this portage is guaranteed in accordance with the *Public Lands Act,* and is documented on registered surveys.

## 3.8 Land Ownership

The Growler Lake community covers about 368 hectares, including the lake, twenty–seven land parcels (commonly referred to as lots by the owners), the shore road allowance, municipal easements, and the road allowance for Growler Lake Drive from County Road 7. All parcels surrounding Growler Lake and the road allowance for Growler Lake Drive (approximately 309 hectares) are privately owned. The Municipality retains ownership of the original shore road allowance which circles the lake at the shoreline, excluding that portion adjacent to Parcel #25. The shore road allowance extends twenty metres back from the high water mark and, in total, covers an area of approximately nine hectares. In addition, the Municipality of Dysart et al retains ownership of the east–west municipal easement between Concessions 8 and 9 and the north–south municipal easement between municipal Parcel #5 and #6, totaling approximately three hectares.


Brenda Leis

# 4.0 Social Elements

## 4.1 Recreational Boating

Canoes, kayaks, and paddle boards abound on Growler Lake forming a collection of brightly colored watercraft visible on most shorelines, even on those not yet developed. There are less than a dozen motorized boats resident on the lake and without exception the operation of motorized boats has been respectful of the environment and other property owners. The use of motorized personal watercraft (e.g. sea–doos) is prohibited on Growler Lake (GLPOA By–Law 11, Appendix 4).

As on any of Ontario's lakes, the primary responsibility for safe boating ownership and experience rests with the individual operator of a watercraft. Boat operators should obey federal and provincial laws governing boating and follow the instructions on safe boating learned when preparing for and obtaining the Pleasure Craft Operators Card. Common sense is expected when boaters are travelling near swimmers, shorelines, fish nesting areas, water fowl as well as areas displaying tell–tale signs of possible shallow water and/or underwater hazards.

The *Personal Code of Conduct for GLPOA Members, Families & Guests* (Appendix 3) includes two items related to recreational boating which bear emphasis in the *Plan*:

4. Clean all watercraft (motorized and non–motorized) with biodegradable products prior to entry and/or re–entry into Growler Lake ensuring that the resulting runoff water does not enter the lake. Make sure live wells are safely emptied prior to boat launching in Growler to avoid contamination with unwanted species.

8. Familiarize yourself and adhere to boating laws and regulations, including speed limits (e.g. no more than 10km within 30 metres/98.5 feet of shoreline), wake restrictions, engine noise, right of way, etc. to ensure safety, enjoyment and minimal shoreline erosion.

Because owners' boats may be trailered to different lakes near and far, it is crucial to the health of our lake that #4 above be followed each and every time a boat arrives or returns and then enters Growler Lake.

## 4.2 Landscapes & Aesthetics

Almost eight in ten GLPOA members indicated on the Survey (Section 8.0) that the natural beauty of Growler Lake and the anticipated view from the cottage were factors in the purchase of their property. Much as there are no two properties the same, there are no two views the same on Growler Lake and the view from one cottage or shoreline often includes, in fact, property owned by another. Thus, the preservation of the landscape and viewscape, beyond what is protected by way of municipal by–law, is dependent upon the development plan of individual owners.

There are two key natural sightlines which can be significantly impacted by development: the shoreline and the tree–line, or horizon. These two lines largely define the landscape when viewed from across the lake; any break or disruption on or between these lines such as structures, significant removal of vegetation or clear cutting, erection of communication towers, etc., will be immediately noticeable and detract from the natural beauty of the landscape. Development plans should thus encourage designs which minimize the impact on the natural landscape.

## 4.3 Noise & Lighting

Quiet and tranquility are frequently identified as values of cottage life. While the shouts of children enjoying a run off a dock into frigid water serves to enhance cottage life, and navigational lighting at night is essential for safety, unwarranted noise and light can be disruptive to the tranquil enjoyment of cottage life, and it may actually interfere with the ecosystems of aquatic and shoreline communities.

Light pollution in cottage communities can be harmful in its impact on terrestrial and aquatic systems. Further, in these communities that value serenity and night skies, light pollution can be disruptive. The International Dark–Sky Association defines light pollution as "any adverse effect of artificial lighting including sky glow, glare, light trespass, light clutter, decreased visibility at night and energy waste." Light trespass is the spilling of a light beyond the area which it was intended to illuminate; this is particularly evident in waterfront lighting. Glare is the uncomfortable brightness of a light when viewed against a dark background, essentially seeing the light itself as opposed to the property it was intended to illuminate. And finally, sky glow is the illumination of the night sky by upward directed or unsheltered light.

Although a relatively new area of study, it is believed that artificial night lighting may have significant harmful effects on ecosystems, particularly aquatic and shoreline communities, and human health:

- harmful behavioral effects on animals include but are not limited to predator–prey relationships, reproduction, foraging, navigation, migration, and communication (e.g. mating call of frogs and singing behavior of song birds)
- impact on mating habits may affect the population of a species
- water quality may be significantly affected by longer photoperiods around shoreline lighting; artificial light affects the diurnal cycles of phytoplankton who feed on algae during dark hours, decreasing natural controls of algae blooms
- human health issues arise from degrading water quality and disturbances of the circadian cycles

Both lighting and noise disruptions are best addressed though education and voluntary compliance with recommended conduct and actions. Community consensus on appropriate hours of quiet and lighting restrictions are outlined in the *Personal Code of Conduct for GLPOA Members, Families & Guests* (Appendix 3). Since the *Code of Conduct* was implemented in 2013, residents and visitors to Claypack Lake report improved and lessened noise reaching them from Growler Lake.

Additionally, the *Comprehensive Zoning By–law Municipality of Dysart et al* (By–law 2005–150) prohibits the installation of lighting above the height of 9 metres and requires that all lighting fixtures direct light downward. The municipal noise bylaw (By–law 1988–18) prohibits making a noise that is calculated or likely to disturb others, considering time, place and the intensity and frequency of the noise.

Stuart Thomson

# 5.0 Natural Heritage

## 5.1 Shoreline

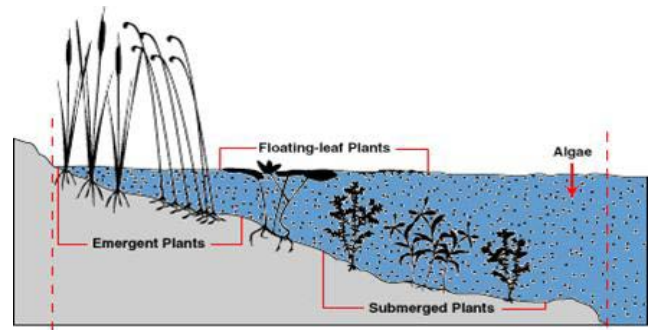
Growler Lake's shoreline remained almost untouched until the twentieth century when the subdivided land was sold for seasonal residential development. There was no major development or change in the natural shoreline that impacted the health of the lake prior to that time. This is evidenced by the healthy characteristics of the lake today. Growler Lake has the common signs of a healthy shoreline which include:

- lots of natural vegetation
- different levels of vegetation (trees, shrubs & plants)
- dead snags and stones
- birds, fish and other wildlife are present

A healthy shoreline is crucial to the continued health of the lake and the environment surrounding it is one of the most important ecosystems that affects the quality of water and natural habitats for aquatic species and wildlife. Therefore, by protecting the natural shoreline and the overall health of the lake, the value of lake properties is ensured.

The natural shoreline has three overlapping but distinct zones beginning underwater and extending upland in a natural progression. Each area transforms into the next in an almost seamless transition. Altering any portion affects the whole, diminishing the ability to support life on the lake.

The shallow water and the first ten to fifteen meters (thirty to fifty feet) of the land that surrounds lakes and rivers is responsible for 90% of lake life which is born, raised and fed in these areas.



Littoral Zone

The water in front of the shoreline, where the sunlight no longer penetrates, is home to organisms such as algae and aquatics plant and species such as fish, amphibians and waterfowl. It provides spawning areas, cover, nursery habitats and food for a range of species. Aquatic plants and fallen trees are a crucial part of the system. The plants convert sunlight into food and releases oxygen in the process which is required to sustain life in the lake. Wood once submerged becomes a major source of food for aquatic insects and small fish. Fallen trees also provide shelter and a place for turtles to lodge and birds to rest.

The natural dense strip of native plants on the shoreline is critical for wildlife habitat in the water and on the shore. Vegetation in this area shades and cools shallow water while the natural shoreline acts as buffer that filters pollutants from snow and water runoff while protecting against soil erosion. The mix of plants, shrubs and trees forms a web of roots that knits the waterfront together and holds the bank together, fending off the impact of wind, rain, waves, ice and boat wake. Changing the natural shoreline by removing most of the vegetation can result in an accelerated runoff, an increase in erosion as well as the amount of nutrients entering the lake, particularly nitrates and phosphates. Large amounts of nutrients are harmful to the aquatic environment and the health of the lake.

Shoreline buffers are a critical component to the shoreline environment. A natural buffer zone between the lake upland areas helps protect the water quality and quantity. It is also home to the various trees, shrubs and wildlife that prefer shoreline habitat.

The results of the GLPOA survey indicated that owners want Growler Lake to look/be like it is today five or ten years from now; preservation of the shoreline is vital to achieving this goal. The Department of Fisheries and Oceans of Canada indicates that the following is required to maintain a healthy shoreline:

- Do leave the natural vegetation on the land and in the water
- Do not replace the shoreline with hardened surfaces
- Do not dump fill along the waterfront. Not only does it destroy the water where fish live, it may increase water currents and erosion on adjacent properties

For speculation purposes, a few properties' shorelines were cleared prior to sale. Current owners of these properties are attempting and should continue to attempt to restore the shoreline to a natural native state for the future health of the lake.

As the lake develops it is also important to be aware not only of the impact on the lake by changing the shoreline, but also of restrictions imposed by both legislation and by–laws of various governing bodies. It is up to each property owner to ensure that any changes to the shoreline are approved by the appropriate governing bodies where required. Unfortunately, since not all governing bodies work together, property owners should bear in mind the shoreline by–laws/legislation that affect Growler Lake.

The County of Haliburton Shoreline Tree Preservation (By–law #3505) applies to all lands, in the County of Haliburton, that are within thirty meters of a watercourse. Two key points addressed in this By–law are:

- The removal or injuring of all trees with a 10 cm diameter or more and a diameter of 1.37 meters from the ground or more
- The prohibition of the removal of any tree of any size in areas adjacent to spawning beds

The Fisheries Act provides for the protection of fish habitat. Under this Act, no one may carry out any projects that result in the harmful alteration, disruption or destruction of fish habitat (HADD) unless authorized by Fisheries and Oceans Canada. The Act also prohibits the release of harmful substances into water containing fish.

For further information on the Shoreline Tree Preservation By–law and changes to the Fisheries Act, refer to:

- algonquinhighlands.ca/documents/County_of_Haliburton_Tree_Preservation_FAQ.pdf
- www.mnr.gov.on.ca/en/Business/LetsFish/2ColumnSubPage/STEL02_165904.html
- www.dfo-mpo.gc.ca/pnw-ppe/pol/index-eng.html

## 5.2 Water Quality

Lakes are dynamic systems, responding to both natural events and the activities of man. All surface waters are subject to potential contamination due to runoff from the surrounding land. Contaminants can be biological, chemical or physical. There are many measurements that could be taken to evaluate the quality of Growler Lake's water including an analysis of chemical properties like nutrients, alkalinity, total dissolved solids, Ph and conductivity. Physical properties such as turbidity, colour and odour could also be measured. Finally, biological properties such as chlorophyll and fecal coliform levels could be measured. Testing, however, for all of these things regularly could be quite expensive and will not necessarily help protect the quality of Growler Lake's water.

In 2013, the Growler Lake Property Owner's Association decided to join the Ministry of the Environment's Lake Partner Program in order to follow best practices for measuring water quality in cottage country. Through this program, total phosphorus concentrations are determined because phosphorus is the element that controls the growth of algae in most Ontario lakes. The Lake Partner Program also tracks water clarity. Clarity is measured by dropping a black and white secchi disk into the water and measuring the depth to which it can be observed. Increases in phosphorus may stimulate algae growth and, in turn, decrease water clarity. Water clarity alone, however, cannot be used to infer nutrient status because light penetration can be influenced by dissolved organic carbon or by non–biological turbidity which in turn may influence the colour of a lake. Nevertheless, water clarity measurements are useful over time because they can track changes in the lake that might not be detected by phosphorus testing alone (e.g. zebra mussel invasions or watershed disturbances).

Tracking both phosphorus and secchi disk measurements over time should provide an economical early warning of water quality problems. Should phosphorus levels rise or clarity decrease, additional testing could be initiated along with a study of changes in the behaviour of humans or the environment surrounding the lake. The Ministry recommends that lakes in the Canadian Shield have one phosphorus test per year in May soon after the ice comes off the lake in order to determine the trophic status of the lake and to track changes in total phosphorus levels between years and over time. Table 5.1 indicates the Total Phosphorus and Clarity test results for 2013 to 2015 inclusive.

Table 5.1
Growler Lake Phosphorus Levels (µg/L)

| | Point 1 | Point 2 | Point 3 |
|---|---|---|---|
| Location | Deepest | Midpoint | North End |
| Depth (m) | 29.3 | 15.2 | 7.3 |
| **Total Phosphorus Levels (µg/L)** | | | |
| 2013 | 7.8, 8.4 | 8.25, 7.15 | 7.65, 6.45 |
| 2014 | 8.4, 23.2* | 7.2** | 6.0** |
| 2015 | N/A | 9.1, 9.4 | 12.9, 10.8 |
| **Average Secchi Disk Measurement (m)** | | | |
| 2013 | 3.5 | 3.5 | 3.9 |
| 2014 | 3.1 | 3.0 | 3.0 |
| 2015*** | 3.3 | 3.3 | 3.2 |

Note: in some cases, duplicate points or test pairs are available and verify the confidence level of the results.

* A significant difference in Total Phosphorus Level values for a single point is usually the result of a contaminated sample (zooplankton, other debris); the higher value is usually the contaminated sample.

** Second sample not tested

*** October secchi disk measures not included in average.

While the Ministry of the Environment pays to test the phosphorus level at the deepest point in the lake, the GLPOA agreed to test two additional locations at minimal cost to the Association at the suggestion of Ian MacNab (water research engineer). MacNab counseled this additional testing be undertaken for the first few years. Since Growler's test results have thus far been similar for all three spots, it is likely that as of 2016 we will need test only the deepest point.

A lake with a total phosphorus level below 10 μg/L is classified as oligotrophic. These lakes are dilute and rarely have algae blooms. Lakes with readings between 10 and 20 μg/L are classified as mesotrophic; at 10 μg/L, they can be clear but closer to the 20 μg/L, they can be susceptible to algal blooms. Lakes over 20 μg/L are termed eutrophic and may be subject to persistent algae blooms. Growler Lake clearly falls into the oligotrophic category. In conclusion, to date, to the extent that our level of testing allows us to conclude, the water in Growler Lake is of very good quality.

In July 2015, the GLPOA joined the Invasive Species Testing Program managed by the Ontario Federation of Anglers and Hunters. Samples of plankton from three selected sites on the lake were collected and submitted for analysis. The results of the analysis will be available in fall 2015.

Another component of the Lake Partner Program is the monitoring of calcium levels. The Ministry of the Environment's Dorset Environmental Science Centre has monitored calcium levels in partner lakes for over thirty years. Many of the long–term study lakes have shown a significant decline in calcium levels. At present, Growler Lake is classified as a low calcium lake. However, without historical data, it is not possible to know if Growler Lake's calcium levels have declined or if they have always been this low.

Calcium enters the soil through mineral weathering of rocks, atmospheric deposition of calcium rich dust and deposition from trees. The three main reasons that calcium levels decrease in soil are acid rain, forest harvesting and climate change. When calcium declines in the soil, there is less available to leach into lakes. Acid rain has decreased since its peak in the 1980's. However, acid rain in the past caused accelerated leaching of calcium into the soil faster than could be regenerated by natural deposition rates. This likely resulted in increased calcium levels in lakes for a period of time. When timber is removed from the land it cannot leach calcium into the soil and exacerbates the calcium shortage in the soil and lake water. Climate change means less water flow from watersheds into lakes and hence another reduction in calcium being deposited into lakes.


Daphinia


Holopedium

Calcium is needed by all living organisms. Creatures like water fleas (daphinia), mollusks, clams and crayfish need calcium to form their body coverings. Daphinia are an important food for many small fish and invertebrates. According to Anna DeSellas, a scientist at the Ministry of the Environment, Growler Lake's average calcium level of approximately 1.4 mg/L over the last two years is below the threshold that is thought to be needed by daphinia to reproduce. Sometimes when this happens, another zooplankton called Holopedium starts to have a population increase. This zooplankton is jelly–covered and looks like tapioca. Fewer organisms can eat the less nutrient rich Holopedium which requires little calcium and may clog water intake pipes.

In conclusion, it is not known whether Daphinia is decreasing and Holopedium increasing in Growler Lake. An historical study is required to determine this. The sediment core sampling which is scheduled to be undertaken in October 2015 should answer this question.

## 5.3 Vegetation

Growler Lake is located within the Great Lakes–Saint Lawrence Forest region, which lies between boreal forest to the north and deciduous forest to the south. The forests surrounding Growler Lake vary in composition according to the topography of the land (e.g., ridges, valleys, slopes, or wetlands) and the tolerances of species for particular soil and moisture conditions.

### 5.3.1 Trees & Shrubs

Growler Lake is surrounded by mixed forests, with both hardwood (deciduous) and softwood (conifers) trees. The sugar maple is the most common tree around Growler Lake. While most of this land was logged during the twentieth century for white pine, maple, hemlock, oak, and yellow birch – with some of the best logs shipped to England to be made into masts for the Queen's ships – relatively quick regrowth has ensured the land surrounding the lake is again forested with trees and shrubs, many of which flower in the spring. These are listed in Table 5.2.

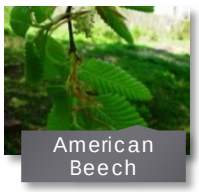
Table 5.2
Trees & Shrubs

| Common Name | Scientific Name |
|---|---|
| Hardwoods | |
| American Beech | *Fagus grandifolia* |
| Basswood | *Tilia americana* |
| Black Ash | *Fraxinus nigra* |
| Black Cherry | *Prunus serotina* |
| Ironwood | *Ostrya virginiana* |
| Large Tooth Aspen | *Populus grandidentata* |
| Poplar | *Populus balsamifera* |
| Red Maple | *Acer rubrum* |
| Red Oak | *Quercus rubra* |
| Sugar Maple | *Acer nigrum* |
| Trembling Aspen | *Populus tremuloides* |
| White Birch | *Betula papyrifera* |
| Willow* | *Salix amygdaloides* |
| Yellow Birch | *Betula alleghaniensis* |
| Softwoods | |
| Balsam Fir* | *Abies balsamea* |
| Black Spruce* | *Picea mariana* |
| Eastern Hemlock | *Tsuga canadensis* |
| Eastern White Cedar* | *Thuja occidentalis* |
| Red Pine | *Pinus resinosa* |
| Red Spruce | *Picea rubens* |
| Tamarack* | *Larix laricina* |
| White Pine | *Pinus strobus* |
| White Spruce** | *Picea glauca* |

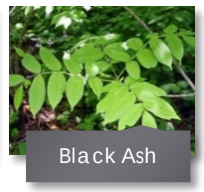
| Common Name | Scientific Name |
|---|---|
| Shrubs | |
| Alternate–Leaved Dogwood | *Cornus alternifolia* |
| Beaked Hazel | *Corylus cornuta* |
| Blackberry | *Rubus allegheniensis* |
| Common Hobblebush | *Viburnum lantanoides* |
| Fly Honeysuckle** | *Lonicera canadensis* |
| Juniper | *Larix laricina* |
| Leatherleaf** | *Chamaedaphne calyculata* |
| Mountain Holly** | *Nemopanthus mucronata* |
| Mountain Maple | *Acer spicatum* |
| Narrow–Leaved Meadowsweet** | *Spiraea alba* |
| Northern Wild Raisin** | *Viburnum nudum* |
| Prince's Pine | *Chimaphila umbellata* |
| Raspberry | *Rubus* |
| Red–Berried Elder | *Sambucus racemosa* |
| Serviceberry | *Amelanchier species* |
| Skunk Currant** | *Ribes glandulosum* |
| Speckled Alder** | *Alnus incana* |
| Striped Maple | *Acer pensylvanicum* |
| Swamp Rose** | *Rosa palustris* |
| Sweet Gale** | *Myrica gale* |
| Velvet–Leaf Blueberry** | *Vaccinium myrtilloides* |

* Found in wetland

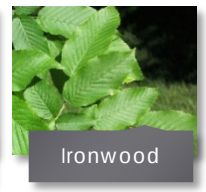
**Found at shoreline


American Beech


Basswood


Black Ash


Black Cherry


Ironwood


Large Tooth Aspen


Poplar


Red Maple


Red Oak


Sugar Maple


Trembling Aspen


White Birch


Willow


Yellow Birch

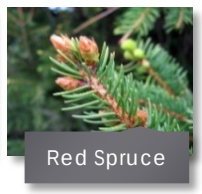

Balsam Fir


Black Spruce


Eastern Hemlock

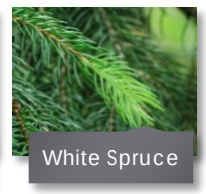

Eastern White Cedar


Red Pine

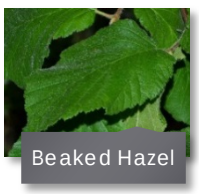

Red Spruce


Tamarack


White Pine

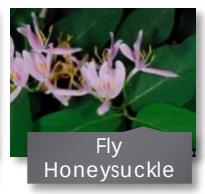

White Spruce


Alternate Dogwood


Beaked Hazel


Blackberry


Common Hobblebush


Fly Honeysuckle

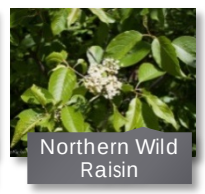

Juniper

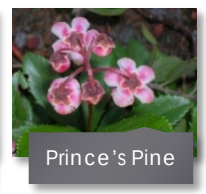

Leatherleaf

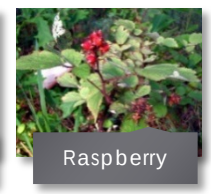

Mountain Holly

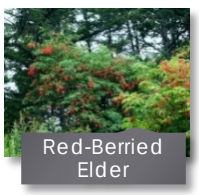

Mountain Maple

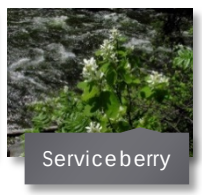

Narrow Meadowsweet


Northern Wild Raisin


Prince's Pine


Raspberry


Red-Berried Elder


Serviceberry


Skunk Currant


Speckled Alder


Striped Maple


Swamp Rose


Sweet Gale


Velvet-Leaf Blueberry

## 5.3.2 Wildflowers, Ferns & Grasses

Flowers require sun to thrive and, as such, flowers on the forest floor are most abundant in May after the snow melts but before the tree leaves shade out the sunlight. Throughout the growing season they appear under gaps in the forest canopy and along roads, paths and streams of Growler Lake.

Table 5.3
Wildflowers, Ferns & Grasses

| Common Name | Scientific Name |
|---|---|
| Wild Flowers | |
| Early Spring | |
| Claytonia | *Claytonia virginica* |
| Red Trillium | *Trillium erectum* |
| Trout Lily | *Erythronium americanum* |
| Late Spring & Summer | |
| Large–Leaved Aster | *Aster macrophyllus* |
| Black–Eyed Susan | *Rudbeckia hirta* |
| Blue Flag Iris** | *Iris versicolor* |
| Blue Weed | *Echium vulgare* |
| Chicory | *Cichorium intybus* |
| Fireweed | *Epilobium angustifolium* |
| Foamflower | *Tiarella cordifolia* |
| Hepatica | *Anemone americana* |
| Lobelia** | *Lobelia siphilitica* |
| Meadowrue | *Thalictrum* |
| Orange Hawkweed | *Hieracium aurantiacum* |
| Orchid | *Amerorchis rotundifolia* |
| Ox–Eye Daisy | *Leucanthemum vulgare* |
| Pearly Everlasting | *Anapahlis margaritacea* |
| Pink Lady's Slipper | *Cypripedium acaule* |
| Spreading Dogbane | *Apocynum androsaemifolium* |
| Toadflax | *Linaria vulgaris* |
| Twinflower | *Linnaea borealis* |
| Blue Marsh Violet | *Viola cucullata* |
| Wild Columbine** | *Aquilegia canadensis* |
| Wild Iris** | *Iris lacustris* |
| Wild Sarsaparilla | *Aralia nudicaulis* |
| Wood Sorrel | *Oxalis montana* |
| Yarrow | *Achillea millefolium* |

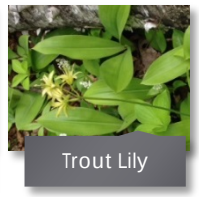
| Common Name | Scientific Name |
|---|---|
| Ground Cover | |
| Bunchberry | *Cornus canadensis* |
| Wild Lily Of The Valley | *Convallaria majalis* |
| Wintergreen | *Gaultheria procumbens* |
| Ferns & Fern Allies | |
| Bracken Fern | *Pteridium aquilinum* |
| Common Polypody | *Polypodium virginianum* |
| Green Lichen | *Flavoparmelia caperata* |
| Ground Pine | *Lycopodium dendroideum* |
| Marginal Wood Fern | *Dryopteris marginalis* |
| Reindeer Lichen | *Cladonia rangiferina* |
| Shining Club Moss | *Huperzia lucidula* |
| Southern Ground Cedar | *Diphasiastrum digitatum* |
| Spinulose Wood Fern | *Dryopteris carthusiana* |
| Yellow Lichen | *Xanthoria calcicola* |
| Grasses | |
| Pickleweed | *Pontederia cordata* |

**Found at Shoreline

As noted in Section 5.1, the natural dense strip of native plants along the shoreline helps prevent erosion and is critical as a wildlife habitat for a variety of species including spawning fish, aquatic insects, turtles, and nesting waterfowl. It also helps protect the water quality of the lake by acting as a buffer that filters snow and water runoff.


Claytonia


Red Trillium


Trout Lily


Large-Leaved Aster

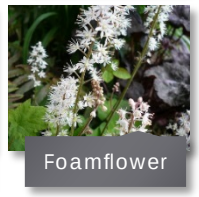

Black-Eyed Susan


Blue Flag Iris

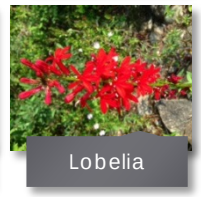

Blue Weed


Chicory


Fireweed


Foamflower


Hepatica


Lobelia


Meadowrue


Orange Hawkweed


Orchid


Ox-Eyed Dailsy

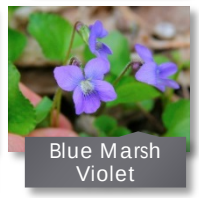

Pearly Everlasting


Pink Lady's Slipper


Spreading Dogbane


Toadflax


Twinflower


Blue Marsh Violet

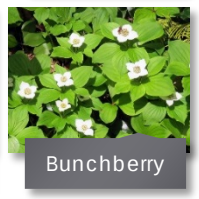

Wild Columbine


Wild Iris


Wild Sarsaparilla


Wood Sorrel


Yarrow


Bunchberry

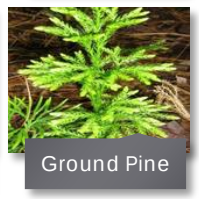

Wild Lily of the Valley


Wintergreen


Bracken Fern


Common Polypody

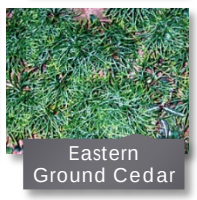

Green Lichen


Ground Pine


Marginal Wood Fern


Reindeer Lichen


Shining Club Moss


Eastern Ground Cedar


Spinulose Wood Fern


Yellow Lichen


Pickleweed


Pitcher Plant

### 5.3.3 Mushrooms & Fungi

Mushrooms and fungi are an integral part of a healthy forest ecosystem. From mycorrhizal fungus/tree root partners to saprophytic wood and leaf rotters, the forests of Growler Lake depend on fungi through all stages of life. Many appear regularly in the same place and at the same time every year while others appear rarely or only under certain weather conditions.

The forests surrounding Growler Lake include many types of amanitas. These are common root partners of many trees found in the forests. Amanitas are poisonous and must not be eaten. The white amanita, commonly known as Destroying Angel, is highly toxic and a common root partner of many evergreens. This mushroom is large, has a white cap, white gills, and a white "sock" in the ground and often has a large white ring on the stem. Everyone should be able to identify this mushroom as it must not be picked or eaten. The white amanita is highly toxic and always fatal if ingested; there is no cure for its poison. Other Amanitas observed around Growler Lake include Panther Amanita, Yellow Patches, Grisettes, and small reddish brown specimens similar to Caesar's amanita.

Some mushrooms are very colorful. The Yellow Jelly Baby, also known as a Lemon Drop, is common around Growler Lake and the Orange Peel Cup is very common along gravel roads and trails in the fall. Chanterelles are common in the summer. Growler Lake has Yellow, Orange and Black Chanterelles; the Black Chanterelles are also known as Black Trumpets.

Other trail dwellers include Red Russulas, Milk Caps species, and colorful Waxy Caps. Large Chicken of the Woods can be seen shelving on the sides of dead stumps. The common Funnel Caps Leucopaxillus giganteus and Clitocybe Gibba are everywhere. There are many members of the Cortinarius group including several poisonous varieties and several that can be used to dye wool bright reds and maroons. The common Autumn Galerina is found in dark, mossy areas but it is also highly toxic as it contains the same poisons as the Amanita.

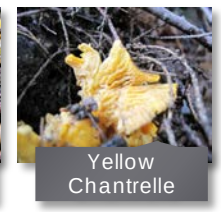
The forests have a large number of bolete species. Again, these are mycorrhizal with a number of trees common to the lake area and include Slippery Jills (covered in a layer of slime when they erupt from the ground), Larch Boletes, Bitter Boletes, and the highly prized King Bolete.

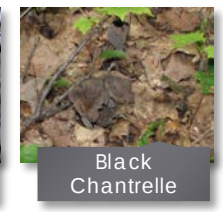
There are many more fungi and mushrooms in the area: blue stainers (will turn wood grain blue), corals in many colors, cauliflowers that look like their name sake, and a bewildering number of tiny agarics that belong to the Mycenae family. There is also a myriad other little brown mushroom families, some of which are edible, some poisonous, but all adding beauty and variety to the forest.


Destroying Angel Amanita

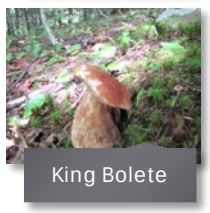

Yellow Patches Amanita

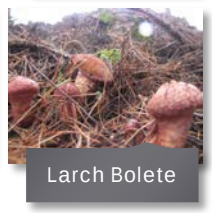

Yellow Jelly Babies


Yellow Chantrelle

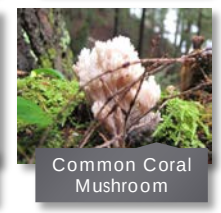

Black Chantrelle


Scaly Chantrelle

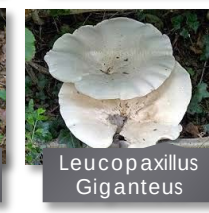

King Bolete


Larch Bolete


Slippery Jill


Common Coral Mushroom

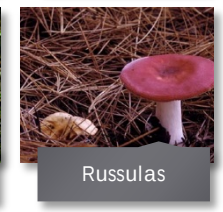

Large Chicken of the Woods


Leucopaxillus Giganteus


Clitocybe Gibba


Bitter Botetes


Autumn Galerina


Russulas


Alan Abelsohn

## 5.4 Wetlands

Wetlands are lands that are wet for a prolonged period and include bogs, ponds, estuaries and marshes. They are among the most important ecological areas on Earth for they are essential in the sustainability of the lake and its surroundings. Their job is endless: wetlands help recharge groundwater, they slow down water flow, they help attenuate floods, they filter the water passing through them, they provide habitats for aquatic and semiaquatic plants, and they form breeding and feeding grounds for birds and mammals. The plant species found within these wetlands are unique, adding to the biodiversity of the area. It is therefore important to preserve and protect wetlands around the lake.

The Growler watershed contains three types of wetland: bogs or fens, swamps and marshes.

### 5.4.1 Bogs or fens

These areas contain organic soils and layers of sphagnum or other peat in the substratum. Acid–loving plants thrive above the wet surface. Bogs are home to some trees, such as black spruce and tamarack, and in open areas low shrubs such as sweet gale and leather leaf, bog–laurel, labrador tea, bog rosemary, cranberries, winterberry, wild raisin, mountain holly, blue flag iris, cotton grasses, sedges, and rushes abound. There are also many pitcher–plants, which are carnivorous plants, present in bogs and fens. These plants have adapted through evolution to the nutrient poor conditions of the bogs by trapping insects to supplement their nutrient needs. Insects are attracted to the leaves by the reddish colour and the musty smell. They become trapped in the tube (a folded leaf) by the hairs lining the inside. The plant secretes enzymes which digests the insects, similar in manner to human digestion.

Figure Parcel #9

### 5.4.2 Swamps

Swamps are wetlands which contain trees such as tamarack, black Spruce, speckled alder, Balsam–fir and eastern white cedar. They often contain many ferns such as sensitive fern, cinnamon fern and royal fern.

### 5.4.3 Marshes

Marshes do not contain any trees. Cattails, horsetails, wild iris and several sedges thrive in marshes. In areas of open water, as well as the shallower water at its edge, there is pickerel–weed, with its characteristic upright purple/ blue flowers, white water lilies and yellow pond lilies whose lily pads are attractive to frogs. Common bladderwort, which has no roots in the ground, lives off a mass of feathery branches which float just below the surface of the water trapping small insects.

There are a number of wetlands around Growler Lake, covering almost twenty hectares within the boundaries of the Growler Lake Community and approximately forty additional hectares within the Growler Lake catchment area. These areas are highlighted in Figure 5.1.

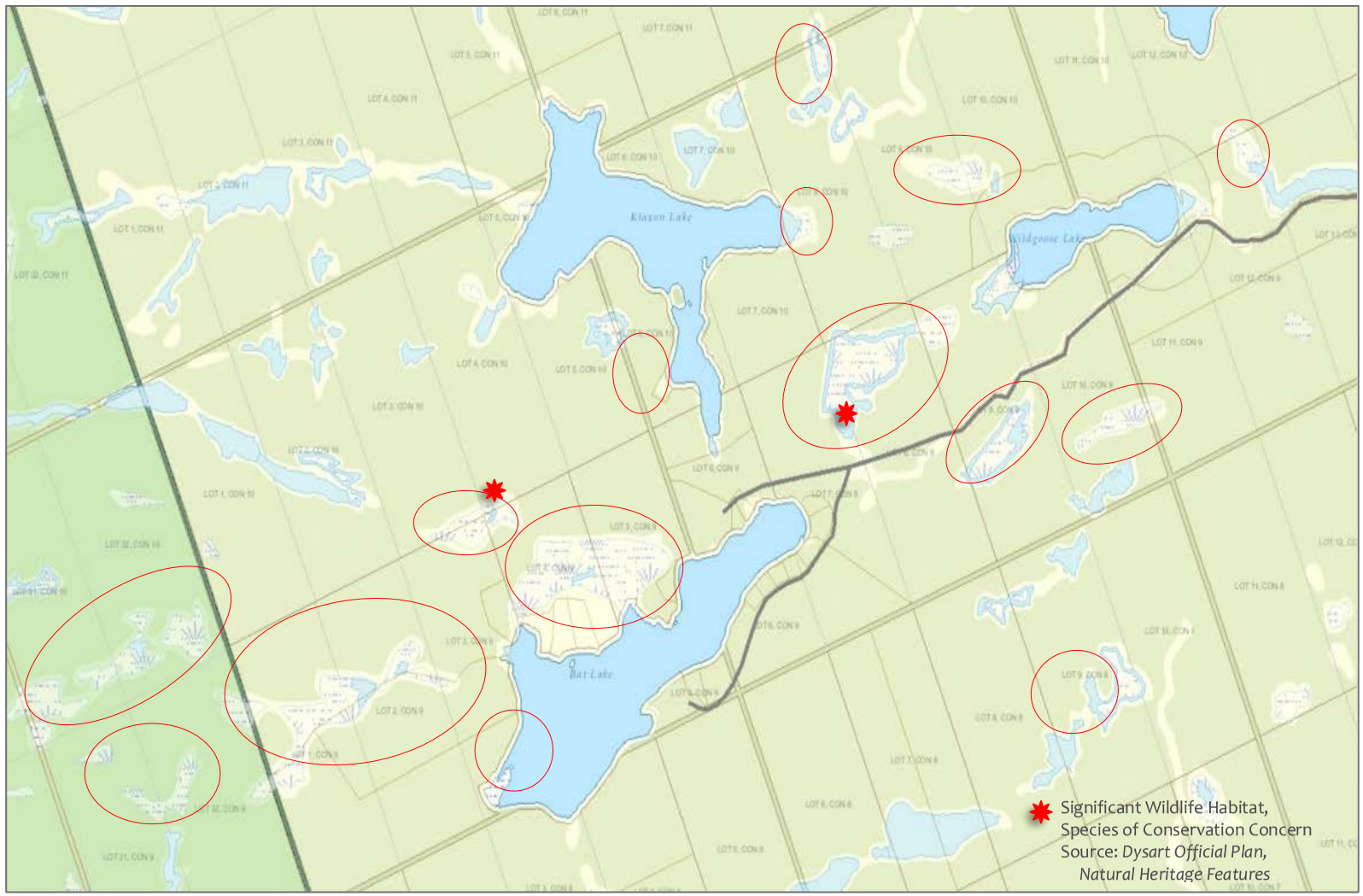



Figure 5.1
Growler Lake Catchment Area – Wetlands

Jeanne Lafranier

## 5.5 Streams

An inventory of streams inflowing to and outflowing from Growler Lake via physical examination and GIS review was undertaken in spring 2014. For the purpose of this document, a stream is defined by the existence of a well–defined channel or official and documented inclusion of its existence by the Ontario Ministry of Natural Resources in the Land Information Ontario database. A total of seven streams/creeks flow into Growler Lake, draining water from within the Growler Lake catchment area; a single stream, Klaxon Creek, outflows from Growler Lake at the south–west end of the lake. Entry points (red dot) and exit point (red arrow) of streams are shown in Figure 5.2. Each of the seven streams inflowing and the single outflow stream are detailed in the table below.


Figure 5.2
Growler Lake – Streams

Table 5.4
Inventory of Streams

| Stream Name | Map Coordinate (entry point) | Flow | Water Source |
|---|---|---|---|
| Parcel #2 | X: 685474.0521<br>Y: 5002199.2259 | year–round inflow | ▪ series of beaver ponds, marsh, and wetlands north and west of Growler Lake |
| Parcel #4 | X: 685559.1164<br>Y: 5002310.0494 | seasonal inflow | ▪ marsh, and wetlands from north of Growler Lake; not included in MNR LIO database |
| Parcel #9 | X: 686037.2862<br>Y: 5002386.3894 | year–round inflow | ▪ fen, marsh, and wetlands from north of Growler Lake |
| Klaxon Creek | X: 686553.7208<br>Y: 5002668.4689<br><br>X: 685769.8911<br>Y: 5001632.6230 | seasonal inflow<br><br>year–round outflow | ▪ Klaxon Lake<br><br>▪ Growler Lake |
| Parcel #17 | X: 686801.7682<br>Y: 5002620.8438 | year–round inflow | ▪ Wildgoose Lake, through a series of beaver ponds east of Growler Lake |
| Parcel #24 | X: 686341.3923<br>Y: 5002172.3741 | seasonal inflow | ▪ wetlands and swamp area south and east of Growler Lake |
| Parcel #26 | X: 686060.9322<br>Y: 5001903.8015 | seasonal inflow | ▪ small beaver pond; not included in MNR LIO database |

A spring is a location where groundwater naturally emerges from the earth's subsurface in a defined flow in an amount large enough to form a pool or stream–like flow. While there is some evidence of spring water both in the lake (temperature variations) and in the lands surrounding the lake (unexplained wet areas/flows), it is not believed that springs contribute significantly to the lake water volume. In instances where the flow is barely detectable, the water emerging is usually referred to as a seep.

## 5.6 Fish Community

The deep and pristine waters of Growler Lake have attracted recreational fishermen to this area ever since the Coopers and Pecks built their hunting cabins and invited both their personal guests and locals to fish freely on the lake over seventy–five years ago. To this day, cottagers can sit on their docks in the early evening hours watching the fish feeding at the lake's surface or jumping clear out of the water. Lake Trout, Small and Large Mouth Bass, Splake, Minnows, Sunfish, Brown Trout, Rainbow Trout and even Perch have been observed by cottagers within the last two years. Refer Table 5.5 for a complete list fish observations (including MNR documented) and habitat.

In springtime cottagers can observe fish laying their eggs and nesting in the shallow waters close to the shoreline. In winter it is not uncommon to find members of the local community along with lake residents enjoying a day of ice fishing followed by a fish fry in the middle of the frozen lake. The 2012 GLPOA Survey revealed that nearly 80% of respondents listed fishing as a key factor in their decision to remain on Growler Lake.

Table 5.5
Fish Observations & Habitat[4]

| Common Name | Scientific Name | Habitat | * |
|---|---|---|---|
| Brook Trout | *Salvelinus fontinali* | ▪ cold–water lakes and rivers | D |
| Brown Trout | *Salmo trutta* | ▪ cold–water streams | O |
| Common White Sucker | *Catostomus commersoni* | ▪ small streams, rivers and lakes | D |
| Creek Chub | *Semotilus atromaculatus* | ▪ creeks | D |
| Lake Trout | *Salvelinus namaycush* | ▪ deep cold–water lakes | D |
| Largemouth Bass | *Micropterus salmoides* | ▪ weedy, stumpy and shallow water | O |
| Minnows | *various* | ▪ various | O |
| Pumpkinseed | *Lepomis gibbosus* | ▪ clear, calm lakes, ponds, with plenty of vegetation | D |
| Rainbow Trout | *Oncorhynchus mykiss* | ▪ cold–water lakes and rivers | O |
| Rock Bass | *Ambloplites rupestris* | ▪ clear, rocky and vegetated streams and pools | O |
| Small Mouth Bass | *Micropterus dolomieu* | ▪ clear streams, rivers, and rocky areas of lakes; natural indicator of a healthy environment | O |
| Splake | *Hyrbid* | ▪ cold, clear water lakes | D |
| Sunfish | *Centrarchus macropterus* | ▪ swamps, lakes, ponds, creeks, and small rivers | O |
| Yellow Perch | *Perca flavescens* | ▪ littoral zones of both large and small lakes | D |

(D) Documented by Ministry of Natural Resources, (O) Observed

The OMNR has identified 6.5% of Growler Lake as optimal habitat and 25.3% as vital habitat for lake trout. Dating back as far as 1926, and every two years since, the OMNR continues the practice of stocking Growler Lake with brook trout, lake trout and more recently, splake. Long–time local resident, Garry Cooper, noted that at one time Rainbow Trout were stocked in this lake but they are all gone now. For more information, refer to:

- www.mnr.gov.on.ca/en/Business/LetsFish/2ColumnSubPage/STEL02_165904.html
- www.ene.gov.on.ca/environment/en/resources/collection/guide_to_eating_ontario_sport_fish/STDPROD_075994.html

[4] 2007 Site Evaluation Report – Part Lot 5 Concession 9, Township of Guilford, Municipality of Dysart et al, County of Haliburton. Glenside Ecological Services Limited.

# 5.7 Wildlife & Wildlife Habitat

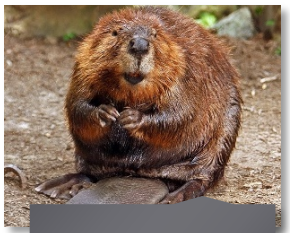
## 5.7.1 Mammal Habitat

At any time of the year visitors to Growler Lake have an opportunity to observe a rich variety of wildlife in their natural habitat. Beavers, moose, black bears, deer, raccoons, hares, snakes, squirrels and chipmunks are just some of the creatures regularly observed around Growler Lake. Fortunately, none of the animals that reside in and around Growler Lake is currently at risk of extinction. It is the intention of the GLPOA to do what is possible to protect natural habitats around Growler Lake. For a list of mammals observed in the Growler Lake area refer to Table 5.6.

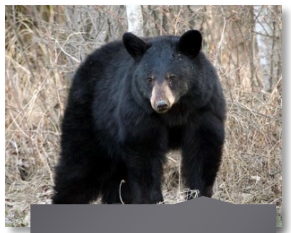
Table 5.6
Mammal Observations & Habitat

| Common Name | Scientific Name | Habitat |
|---|---|---|
| American Beaver | *Castor canadensis* | ▪ streams, rivers, marshes and wetlands; creates dams, a natural system for cleansing water of pollutants and toxins |
| Black Bear | *Ursus americanus* | ▪ forest canopy of hardwoods such as beech, maple, and birch, and coniferous species |
| Common Muskrat* | *Ondatra zibethicus* | ▪ wetlands, rivers, lakes, or ponds |
| Cougar | *Puma concolor* | ▪ dense cover of shrubs, habitats suitable for white–tailed deer |
| Coyote* | *Canis latrons* | ▪ adaptive to wide variety of habitats |
| Eastern Chipmunk | *Tamias striatus* | ▪ deciduous wooded areas and urban parks; prefers locations with rocky areas and shrubs to provide cover |
| Gray Wolf* | *Canis lupus* | ▪ varied, habitat generalist |
| Groundhog | *Marmota monax* | ▪ open country, edge of woodlands |
| House Mouse | *Mus musculus* | ▪ varied, natural and man–made locations |
| Meadow Vole | *Microtus pennsylvanicus* | ▪ adaptive and varied – grassland, moist areas, wooded areas |
| Mink | *Mustela vison* | ▪ close to lakes, streams ponds, marshes, and swamps |
| Moose | *Alces alces* | ▪ Boreal and mixed deciduous forests in temperate to subarctic climates |
| Pine Marten | *Martes americana* | ▪ mature conifer or mixed forest |
| Porcupine | *Erethizon dorsatum* | ▪ forests, deserts, rocky outcrops, hillsides |
| Raccoon | *Procyon lotor* | ▪ lowland deciduous or mixed forests abundant with water and marshes |
| Red Fox | *Vulpes vulpes* | ▪ wooded areas, prairies and farmland; keeps rodent and rabbit population in check |
| Red Squirrel | *Tamiasciurus hudsonicus* | ▪ conifer forest |
| River Otter | *Lutra canadensis* | ▪ close to the water's edge in river, lake, or swamp |
| Snowshoe Hare | *Lepus americanus* | ▪ conifer and mixed forests in all stages of succession; presence of cover is critical |
| White–Tailed Deer | *Odocoileus borealis* | ▪ adaptive to wide variety of habitats |

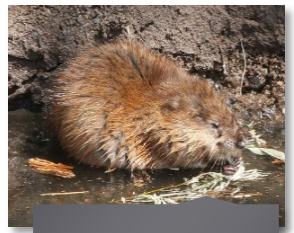
*presence evidenced by scat



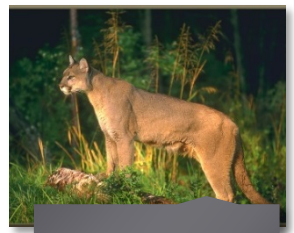
American Beaver



Black Bear



Common Muskrat

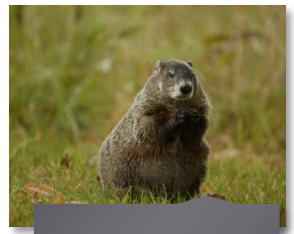


Cougar

Coyote

Eastern Chipmunk

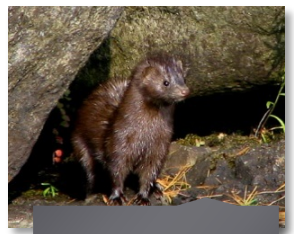
Gray Wolf



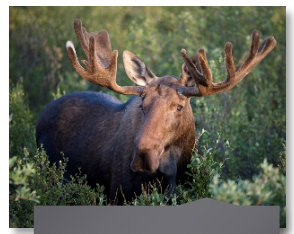
Groundhog

House Mouse

Meadow Vole

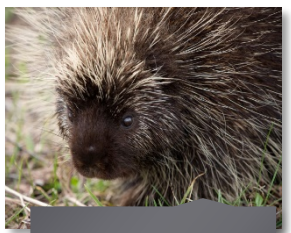


Mink

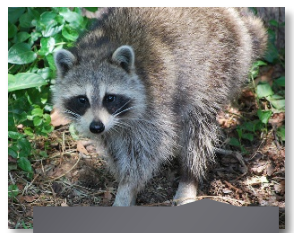


Moose

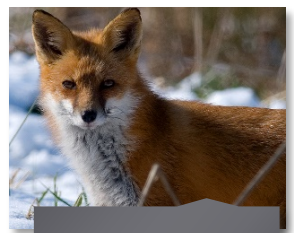
Pine Marten



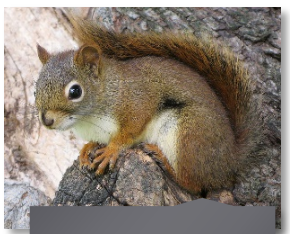
Porcupine



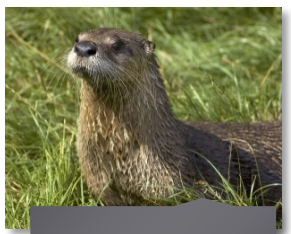
Raccoon



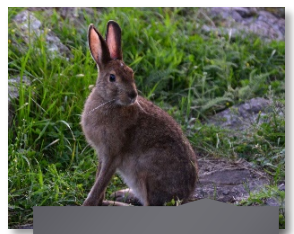
Red Fox



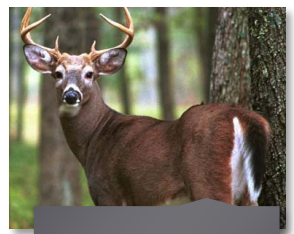
Red Squirrel



River Otter



Snowshoe Hare



White-Tailed Deer

### 5.7.2 Bird Habitat

According to the Ontario Ministry of Natural Resources, there are 483 species of birds in Ontario. A complete list and detailed description of Ontario birds can be found in any number of field guides. A location specific Bird Checklist of bird species which may be expected (or hoped for) in the Growler Lake area is available from Haliburton Forest. Most of Ontario's bird species are migratory and only spend the breeding season in Haliburton; they spend their winters in the southern United States, the Caribbean, or in Central or South America.

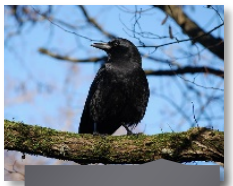
According to the General Status of Species in Canada (2010), over half (235) of Ontario's bird species are ranked provincially as secure; however, sixteen species are considered at risk and a further ten species may be at risk. Habitat loss is the most important factor in the loss and decline of bird populations in Ontario. Other threats include habitat fragmentation, contaminants, pesticides, accidental mortality and domestic predators such as house cats. The following is a list of birds observed around Growler Lake, including their scientific name and common habitat:

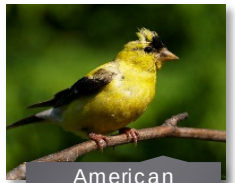
Table 5.7
Bird Observations & Habitat

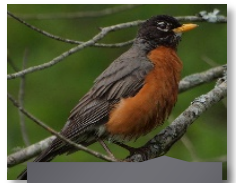
| Common Name | Scientific Name | Common Habitat |
|---|---|---|
| American Crow | *Corvus brachyrhynchos* | ▪ wide range of habitats |
| American Goldfinch | *Carduelis tristis* | ▪ overgrown fields, regenerating woods |
| American Robin | *Turdus migratorius* | ▪ suburbs, parks and woodlands |
| Bald Eagle** | *Haliaeetus leucocephalus* | ▪ forested areas near large bodies of water |
| Black–Capped Chickadee | *Parus atricapillus* | ▪ gardens, woods, forest clearings |
| Black–Throated Green Warbler | *Dendroica virens* | ▪ conifer and mixed woods |
| Blue Jay | *Cyanocitta cristata* | ▪ parks, gardens, forest |
| Canada Goose | *Branta cacadensiis* | ▪ marshes, lakes |
| Common Grackle | *Quiscalus quiscula* | ▪ suburbs, farms, fields |
| Common Loon | *Gavia immer* | ▪ lakes |
| Common Merganser | *Mergus merganser* | ▪ freshwater pools and rivers |
| Common Redpoll | *Carduelis flammea* | ▪ conifers, birches and taiga |
| Dark–Eyed Junco | *Junco hyemalis* | ▪ woodlands |
| Downy Woodpecker | *Picoides pubescens* | ▪ woods, parks and gardens |
| Eastern Phoebe | *Sayornis phoebe* | ▪ farms, suburbs |
| Evening Grosbeak | *Hesperiphona vespertina* | ▪ conifer forest |
| Great Blue Heron | *Ardea herodias* | ▪ ponds, lakes, rivers, marshes, estuaries |
| Hairy Woodpecker | *Picoides villosus* | ▪ dense forests |
| Hermit Thrush | *Catharus guttatus* | ▪ woodlands, scrub |
| Herring Gull | *Larus argentatus* | ▪ near water |
| Hooded Merganser | *Lophodytes cucullatus* | ▪ lakes among woods |
| House Wren | *Troglodytes aedon* | ▪ broad–leaved woods, thickets, near water |
| Belted Kingfisher | *Ceryle alcyon* | ▪ ponds, rivers, lakes and creeks |
| Mallard | *Anas platyrhynchos* | ▪ ponds, lakes, rivers, marshes, estuaries |
| Northern Flicker | *Colaptes auratus* | ▪ ponds, rivers, lakes and creeks |
| Olive–Sided Flycatcher** | *Contopus borealis* | ▪ conifer bogs |
| Osprey | *Pandion haliaetus* | ▪ lakes and slow moving rivers and streams |
| Ovenbird | *Seiurus aurocapillus* | ▪ deciduous forest |

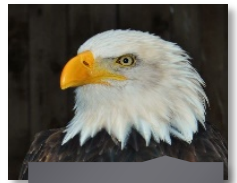
| Common Name | Scientific Name | Common Habitat |
|---|---|---|
| Pileated Woodpecker | *Dryocopus pileatus* | ▪ forests and parks |
| Pine Siskin | *Carduelis pinus* | ▪ conifer and mixed woodlands |
| Purple Finch | *Carpodacus purpureus* | ▪ conifer and mixed woodlands |
| Red–Breasted Nuthatch | *Sitta canadensis* | ▪ conifer forest |
| Red–Eyed Vireo | *Vireo olivaceous* | ▪ woods |
| Red–Winged Blackbird | *Agelaius phoeniceus* | ▪ marshes and fields |
| Ring–Necked Duck | *Aythya collaris* | ▪ lakes and ponds |
| Rose–Breasted Grosbeak | *Pheucticus ludovicianus* | ▪ regenerating woods, waterside thickets |
| Rough–Wing Sparrow | *Stelgidopteryx serripennis* | ▪ near water, along cliffs or rivers |
| Ruby–Throated Hummingbird | *Archilochus colubris* | ▪ woodland edges, gardens |
| Ruffed Grouse | *Bonasa umbellus* | ▪ forests, deciduous and conifer |
| Spotted Sandpiper | *Actitis macularia* | ▪ streams, lakes in open and wooded areas |
| Scarlet Tanager | *Piranga olivacea* | ▪ deciduous forest |
| Song Sparrow | *Melospiza melodia* | ▪ scrub and waterside thickets |
| Starling | *Sturnus vulgaris* | ▪ cities, villages, farmsteads, woods |
| Turkey Vulture | *Cathartes aura* | ▪ open country, roadsides |
| White–Breasted Nuthatch | *Sitta carolinensis* | ▪ conifer, oak, juniper, and other woodlands |
| White–Throated Sparrow | *Zonotrichia albicollis* | ▪ thickets in woodlands |
| Wood Duck | *Aix sponsa* | ▪ woodland ponds, rivers |
| Yellow–Bellied Sapsucker | *Sphyrapicus varius* | ▪ forests, deciduous and conifer |

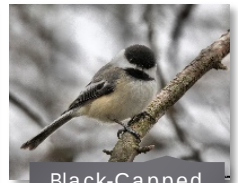
**Species at Risk in Haliburton

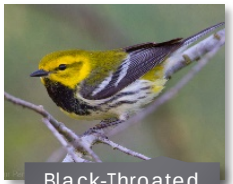

American Crow


American Goldfinch

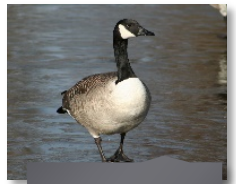

American Robin


Bald Eagle

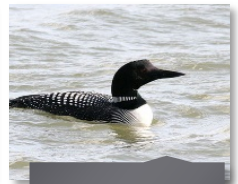

Black-Capped Chicadee

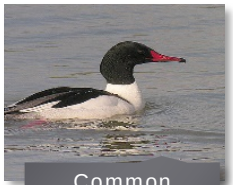

Black-Throated Green Warbler


Blue Jay

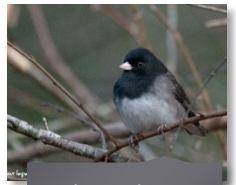

Canada Goose

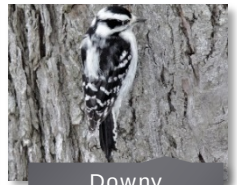

Common Grackle

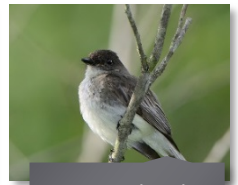

Common Loon

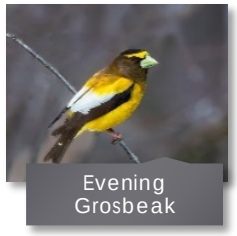

Common Merganser


Common Redpoll

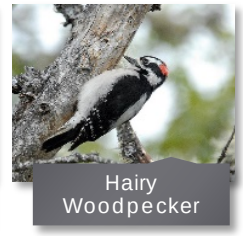

Dark-Eyed Junco

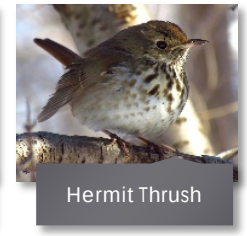

Downy Woodpecker


Eastern Phoebe


Evening Grosbeak


Great Blue Heron


Hairy Woodpecker

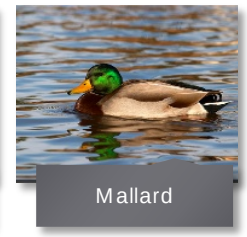

Hermit Thrush

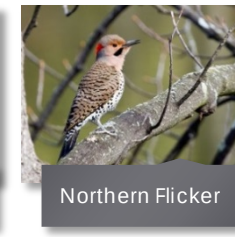

Herring Gull


Hooded Merganser


House Wren

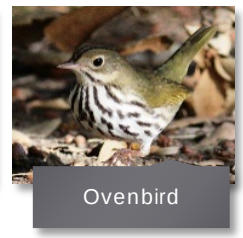

Belted Kingfisher

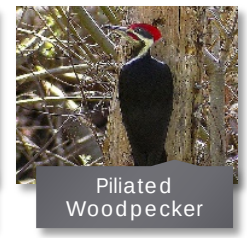

Mallard

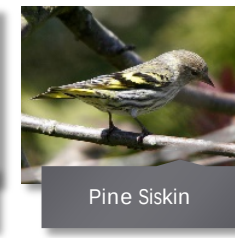

Northern Flicker


Olive-Sided Flycatcher


Osprey


Ovenbird


Piliated Woodpecker

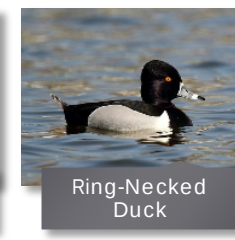

Pine Siskin


Purple Finch


Red-Breasted Nuthatch


Red-Eyed Vireo


Red-Winged Blackbird


Ring-Necked Duck


Rose-Breasted Grosbeak

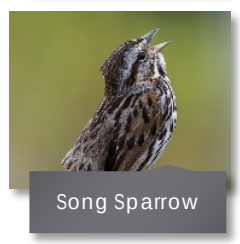

Rough-Winged Sparrow

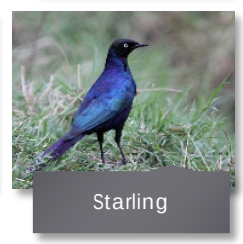

Ruby-Throated Hummingbird

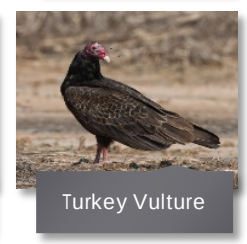

Ruffed Grouse


Spotted Sandpiper


Scarlet Tanager


Song Sparrow

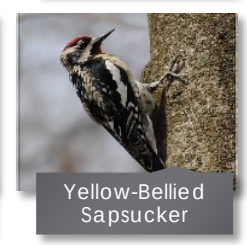

Starling


Turkey Vulture


White-Breasted Nuthatch


White-Throated Sparrow


Wood Duck


Yellow-Bellied Sapsucker

### 5.7.3 Reptile and Amphibian Habitat

In spring, shortly after the ice disappears off the lake, evenings become filled with the sounds of hundreds of frogs chirping for their mates. It's a magical choir that heralds the end of winter and the return of our amphibian friends. A healthy frog population is an important reflection of the health of the natural habitats surrounding the lake. For this reason, we should pay careful attention to the strength of our frog populations. Like the proverbial canary in the coal mine, a major decrease in frog populations or deformities in offspring can be an early warning sign that something is wrong with the shoreline environment. For a list of reptiles and amphibians observed around Growler Lake, refer to Table 5.8.

Table 5.8
Reptiles & Amphibians Observations & Habitat

| Common Name | Scientific Name | Habitat |
|---|---|---|
| American Toad | *Anaxyrus americanu* | ▪ varied – forest, flat grassland |
| Blanding's Turtle** | *Emydoidea blandingii* | ▪ shallow water, usually in large wetlands and shallow lakes with lots of water plants |
| Bull Frog | *Lithobates catesbeianus* | ▪ large, permanent water bodies – swamps, ponds, and lakes |
| Common Snapping Turtle** | *Chelydra serpentina* | ▪ shallow water; often take advantage of man–made structures for nest sites (road sides and gravel pits) |
| Eastern Garter Snake | *Thamnophis sirtalis* | ▪ varied – grasslands, stone walls, moist habitats |
| Eastern Ribbon Snake** | *Thamnophis sauritus sauritus* | ▪ wetlands, and near the edges of ponds, streams |
| Gray Treefrog | *Hyla versicolor* | ▪ forested areas |
| Green Frog | *Lithobates clamitans* | ▪ shallow freshwater ponds, lakes, swamps, streams |
| Northern Leopard Frog | *Lithobates pipiens* | ▪ slow–moving or still water along streams and rivers, wetlands, beaver ponds |
| Painted Turtle | *Chrysemys picta* | ▪ soft bottomed ponds, marshes, lakes and slow–moving creeks, with abundant basking sites and aquatic vegetation |
| Red-backed Salamander | *Plethodon cinereus* | ▪ wooded slopes |
| Ring-necked Snake | *Diadophis punctatus* | ▪ open woodlands near rocky hillsides, or in wetter environments with abundant cover or woody debris |
| Spotted Salamander | *Ambystoma maculatum* | ▪ hardwood forests with vernal pools |
| Spring Peeper | *Psuedacris crucifer* | ▪ live primarily in forests and regenerating woodlands near ephemeral or semi–permanent wetlands |

** Species at Risk in Haliburton

## 5.8 Invasive Species

Next to habitat loss, invasive species are the second greatest cause of native species extinction and loss of biodiversity, annually causing between fourteen and thirty–five billion dollars' worth of damage in Canada. Data collected from anglers, conservation officers, cottagers and residents across Ontario shows that several invasive species are present in Haliburton County. Exotic (non–native, alien) and/or invasive (native to Ontario but non–native to local area) species describes organisms that have been introduced into non–native, new habitats. The introduction of these invading species causes widespread and unpredictable changes to habitats, native populations, local infrastructure and human health. Introductions of non–native and invasive aquatic species to inland lakes have occurred through a variety of pathways including species transported in or on boats and vessels, through natural barrier removal (e.g., Trent–Severn Waterway and dams), and through fish stocking. A lack of education in the general population has also resulted in accidental releases of these species from boat hulls, aquariums, bait harvesters, anglers and the live fish food trade.

Because Growler Lake has only recently been developed, is not part of a larger lake system such as the Trent, and its current phosphorous levels are very low, it is less at risk than many lakes for invasive species or for algae blooms. Nor is there any evidence of other invasive species such as zebra mussels which are a problem for some of our neighbouring lakes. However, in order to keep Growler's pristine nature, our ongoing water testing and *Personal Code of Conduct for GLPOA Members, Families & Guests* will help ensure continued high water quality. Cleaning all watercraft that have been in other lakes prior to entering Growler Lake will virtually eliminate many invasive water species from contaminating the lake. Proper emptying of live wells on land before boat launching will also minimize the risk of contamination.

Known invasive and non–native species that have been identified in Haliburton and within the neighbouring Kennisis Lake sub–watershed (*Kennisis Watershed and Lakes Management Plan*, 2007, p.59) include:

Spiny Water Flea

Originally from Eurasia, this tiny crustacean has a lifespan that varies from several days to a few weeks, and females may reproduce with or without male involvement. Eggs can become dormant over long periods of time. They feed on zooplankton and can consume three times as much food as native species. Although not harmful to humans, they can out compete native species that rely on a zooplankton food source.


Spiney Water Flea

Zebra Mussel

Also from Eurasia, zebra mussels spread quickly, are now in all of the Great Lakes and have come to Haliburton via the Trent–Severn waterway. Even though they live only two to five 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 make the water more clear. But they attach to hard surfaces and cause millions of dollars in damage to power generating facilities, water treatment plants and home/cottage water intakes. Their shell can cut a swimmer's feet.


Zebra Mussel

Rusty Crayfish

The Rusty Crayfish is a native crustacean of the Ohio River system and 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 three to five years. It competes for food with native crayfish and fish and will prey on fish eggs. Unlike native crayfish, rusty crayfish may pinch a dangling finger or toe.


Rusty Crayfish

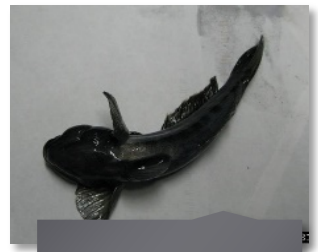
Rainbow Smelt

Originally from the Finger Lakes region in New York, rainbow smelts were probably brought into lakes in Haliburton during ice fishing season as bait for Lake Trout. The species is a voracious feeder of young or small native fish and crustaceans

Rainbow Smelt

Round Goby

Introduced from Europe in ballast water, they have spread naturally as populations expanded and unintentionally spread through the use of live baitfish. They may deplete or seriously reduce native game fish species by eating their eggs and larvae and competing with or preying on native benthic fish species.



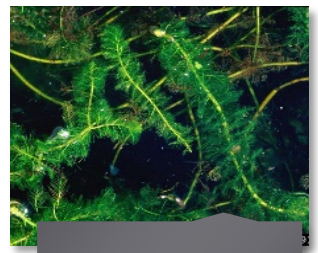
Round Goby

Eurasian Water–Milfoil

Eurasian milfoil is a submerged aquatic plant native to Eurasia and North Africa. The plant reduces biodiversity by competing aggressively with native plants. Decomposing plants reduce lake water oxygen levels thereby killing fish. Thick mats can hinder swimming, fishing and boating while dense stands create stagnant water, an ideal habitat for mosquitoes.

Purple Loosestrife

Native to Europe and Asia, purple loosestrife has seriously impacted wetland habitats. It reproduces at an alarming rate, spreads along roads, canals and drainage ditches, and invades marshes and lakeshores choking out native wetland vegetation. Unfortunately, complete eradication of this plant is impossible even though mechanical removal has been effective in slowing down the spread. The plant is currently undergoing trial bio–controls with a native weevil. There have been two sightings around Growler Lake; however, several native plant species mimic or look similar to the loosestrife: fireweed, blue vervain, and water–willow or swamp loosestrife.



Eurasian Water-Milfoil

Giant Hogweed

The Giant Hogweed can reach a height of 5.5 metres and is by far the most hazardous of the invasive species. The clear watery sap contains toxins that can cause serious and recurring skin problems within forty–eight hours, particularly when exposed to the sun. Its ill effects include skin redness, a burning sensation, blisters and even scaring. Eye contact with the sap may cause temporary blindness; eye contact requires immediate flushing of the eyes followed by urgent medical attention. *Do not try to burn or compost this plant; 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. Although the white flower clusters resemble Queen Anne's Lace, giant hogweed grows much taller and can form a flower head of one metre in width.

Purple Loosestrife

Other Aquatic and non–aquatic invasive species in our area include the Curly Pondweed (associated with the Eurasian Water–milfoil), Flowering Rush, Canary Reed Grass, European Frogbit and Fanwort. Finally, Rock bass and Smallmouth bass were accidentally introduced into Kennisis and Little Kennisis Lake systems in the 1970s and 1980s through bait buckets and unsanctioned stocking (i.e. not by the MNR) and then quickly became established. These fish species are both native to Ontario, but were not a component of the original fish–community prior to this introduction.

Giant Hogweed

## 5.9 Species at Risk

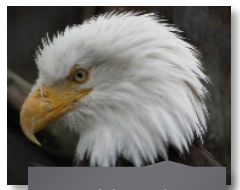
The following chart of species at risk is based on the Ontario Ministry of Natural Resources (OMNR) Species at Risk Ontario (SARO) inventory database of more than 200 at risk species in Ontario, specifically those species designated at risk in the County of Haliburton. The OMNR notes that the decline in the populations of species at risk, almost without exception, involves threats to natural habitats. According to the County of Haliburton Heritage Mapping: A Compilation and Preliminary Assessment, prepared by Glenside Ecological Services Ltd., the Growler Lake community has 'available' habitat for a number of species of conservation priority in the Haliburton area, including the Red–Shouldered Hawk, Hog Nosed Snake, Wood Thrush, Blackburnian Warbler, And The Black–Throated Green Warbler.

Table 5.9
Species at Risk in the County of Haliburton

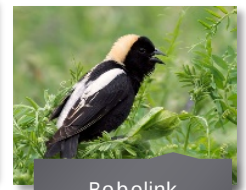
| Common Name | Scientific Name | SARO Status | Habitat* |
|---|---|---|---|
| Bald Eagle** | *Haliaeetus leucocephalus* | Special concern | ▪ large continuous areas of mixed coniferous and deciduous woods with open canopies, near water |
| Barn Swallow | *Hirundo rustica* | Threatened | ▪ live in close association with humans, building nests on man–made structures |
| Bobolink | *Dolichonyx oryzivorus* | Threatened | ▪ tall grass prairie and other open meadows |
| Canada Warbler | *Wilsonia canadensis* | Threatened | ▪ moist mixed forests with a well–developed shrub layer |
| Chimney Swift | *Chaetura pelagic* | Threatened | ▪ old growth forest near water or in structures (i.e. chimneys) |
| Common Nighthawk | *Chordeiles minor* | Special concern | ▪ recently burned–over areas, forest clearings, bogs, fens, marshes, lakeshores, rocky outcrops |
| Eastern Meadowlark | *Sturnella magna* | Threatened | ▪ moderately tall grasslands |
| Eastern Whip–Poor–Will | Caprimulgus vociferus | Threatened | ▪ rocky barrens, early to mid–successional forests, old burns or other disturbed sites, and open conifer plantations |
| Golden Winged Warbler | *Vermivora chrysoptera* | Special concern | ▪ young shrubs surrounded by mature forest |
| Olive Sided Flycatcher** | *Contopus cooperi* | Special concern | ▪ open areas in coniferous or mixed coniferous forests near wetlands |
| Peregrine Falcon | *Falco peregrinus* | Special concern | ▪ tall, steep cliff ledges close to large bodies of water |
| Chorus Frog | *Pseudacris triseriata* | Special concern | ▪ damp meadows, marshes, woodland ponds, and swamps |
| Eastern Hog–Nosed Snake | Heterodon platirhinos | Threatened | ▪ dry mixed and pine/oak forest (P/U) |
| Eastern Milksnake** | *Lampropeltis triangulum* | Special concern | ▪ rocky outcrops, marshes, fields and forest edges |
| Eastern Ribbonsnake | Thamnophis sauritus | Special concern | ▪ wetlands, ponds and streams bordered by low dense vegetation |
| Blanding's Turtle | *Emydoidea blandingii* | Threatened | ▪ shallow water, usually in large wetlands and shallow lakes with lots of water plants |

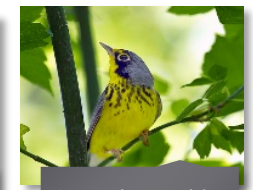
| Common Name | Scientific Name | SARO Status | Habitat* |
|---|---|---|---|
| Eastern Musk Turtle (Stinkpot) | *Sternotherus odoratus* | Threatened | ▪ ponds, lakes, marshes and rivers that are generally slow–moving have abundant emergent vegetation and muddy bottoms |
| Five Lined Skink | *Plestiodon fasciatus* | Special concern | ▪ rocky outcrops, embedded with a matric of coniferous and deciduous forest |
| Snapping Turtle | *Chelydra serpentine* | Special concern | ▪ shallow water; often takes advantage of man–made structures for nest sites, including roads (especially gravel shoulders), and aggregate pits |
| Spotted Turtle | *Clemmys guttata* | Endangered | ▪ bogs and marshes covered with low shrubs and with a prevalence of sphagnum moss |
| Wood Turtle | *Clemmys insculpta* | Endangered | ▪ adjacent to streams and rivers, mixed forest near clear streams with hard sand or gravel |

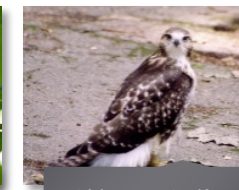
** Observed within Growler Lake Community or Catchment Area

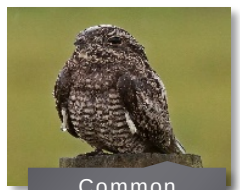

Bald Eagle


Barn Swallow

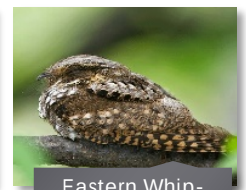

Bobolink


Canada Warbler

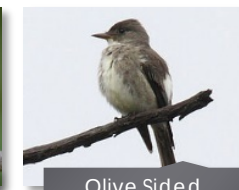

Chimney Swift

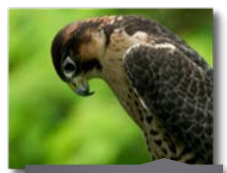

Common Nighthawk

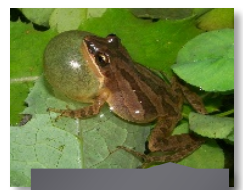

Eastern Meadowlark

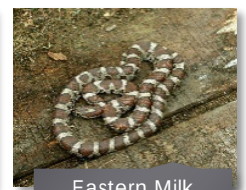

Eastern Whip-Poor-Will


Golden Winged Warbler

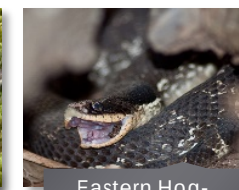

Olive Sided Flyctcher

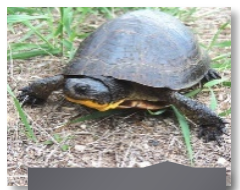

Peregrine Falcon

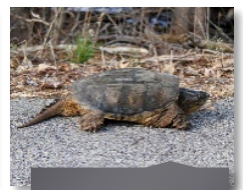

Chorus Frog


Eastern Milk Snake

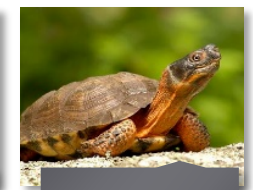

Eastern Ribbon Snake


Eastern Hog-nosed Snake

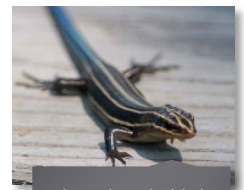

Blanding's Turtle

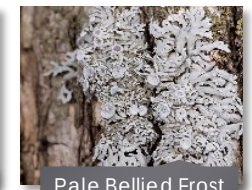

Snapping Turtle


Eastern Musk Turtle (Stinkpot)


Wood Turtle


Spotted Turtle


Five Lined Skink


Pale Bellied Frost Lichen

# 5.10 Ecological Threats/Changes

The climate is changing internationally and across Canada due to increased atmospheric concentrations of greenhouse gases released as a result of human activity. Climate change has caused and will lead to further increases in temperature. The average annual air temperature over Canada has warmed by 1.5°C from 1950 to 2010. These warmer air temperatures also lead to changes in precipitation, less snow cover and many other ill effects which in turn will adversely affect human health as well as the forests and lakes of Haliburton.

## 5.10.1 Forests

Forests are important in mitigating or reducing the effects of climate change as growing trees absorb carbon dioxide from the air and store carbon (carbon sequestration or carbon sink). This stored carbon can be considered an *offset* to emissions of greenhouse gases from automobiles, industries, etc. Growing more trees, growing healthy trees faster and longer, saving and restoring wetlands, or directing harvested wood into longer–lasting wood products are examples of how our forests can be managed to store more carbon.

There are a number of observed and predicted effects on the forests of Ontario.

Forest fires and drought

Climate change is likely to increase the frequency and intensity of forest fires, such that by 2080, the overall area burned by forest fire in Ontario could potentially increase by 50% to 300% (Warren & Lennon, 2014). Most of the increases are predicted to occur north of Haliburton, in the remote northwestern portions of the province. However, with longer periods of drought drying the forest, and warmer temperatures, increased forest fire intensity and a longer forest fire season is predicated across the province.

Pests and diseases

An example of pests and diseases on the increase with the advent of climate change is the spruce budworm. Although its infestations go in cycles, climate models suggest that warmer winter and spring temperatures may result in an extension of the northern limit of spruce budworm defoliation as well as the persistence of the southern limit of defoliation, resulting in an increase in the total area defoliated of between 22% and 25%. The most extreme example of pest destruction in Canada is the Mountain Pine Beetle in the West, whose population is controlled by extreme cold temperatures. Warming has allowed the population of the beetle to increase hugely with devastating effects.

Another threat of great concern is Beech Bark Disease. Likely introduced from Europe, the disease is caused by a combination of scale and fungus that kills American Beech trees. It was first noticed in Ontario in 1999, but by 2012 had spread across most of this area. The disease rapidly kills the trees and there is no effective prevention or treatment. Beech Bark Disease poses a significant threat on two fronts. First, American Beech trees make up about 20% of the mixed forests in the Haliburton region and it is likely that almost all Beech trees will be affected in the next five years. Second, there is concern for increased bear–human interaction as bears that typically feed on Beech nuts will be unable to find live Beach trees and search elsewhere for food. Interestingly, Beech trees can often be identified by the bear claw marks on the bark, as the bears climb to reach the nuts.

Forest growth

Climate change might lead to increased forest growth in some areas while reducing growth through an increased rate of the death of trees in others. Ozone, one of the air pollutants in Ontario that has increased slightly over the last decade and is predicted to increase more with warming, reduces the rate of spring growth.

Species migration

Warming temperatures could permit expansion of the northern range limit of many forest species. The effects of this are currently unclear.

### 5.10.2 Lakes

With earlier spring ice cover break–up and later freeze up, ice cover duration is expected to decrease by up to a month in many Ontario lakes by mid–century. This might affect some fish species as a result of fewer lakes remaining suitable for cold–water trout. It may also help the spread of small mouth bass, which prefer warm water. Lake levels in the Great Lakes are predicted to fall, but it is difficult to predict what the effects will be in smaller lakes with so many other variables affecting water levels.

### 5.10.3 Human Health

Will our health be affected by climate change? It is generally accepted that our climate is already affecting the health of Canadians, and the effects will be greater in years to come.

A range of climate–related natural hazards continues to impact communities, presenting increasing risks to future health. Recent flood and wildfire events have severely impacted communities through destruction of infrastructure and displacement of populations.

There are five main ways that climate change affects health:

Intense storms and flooding

Total precipitation will vary across Canada, but intense rainfall events will increase, as warmer air can carry more moisture, which then drops in intense storms. We have seen the effects on houses (flooding, mould etc.) and infrastructure (roads, bridges, buildings) and how people can be injured or displaced.

Forest fires

Forest fires are a direct threat, and can destroy housing directly, but smoke from forest fires, which can spread over large distances, is toxic and can aggravate asthma and other heart and lung diseases.

Heat waves

The number of hot days, above 30 degrees C, is predicted to increase by 2070 in Toronto from twelve to sixty and in Kingston, from three to thirty (*Canada in a Changing Climate*). Extreme heat spells, especially when the nights are warm as well, lead to increased mortality in people with many chronic diseases. Haliburton will also be affected, but the cities will get hotter because concrete, roads and roofs retain heat (the heat island effect).

Lyme disease

The tick responsible for Lyme disease is spreading its range north due to its ability to survive in the warmer temperatures in these areas. It is moving north at thirty–five to fifty–five km per year, and there has been a steady increase in the number of cases reported in Ontario over the last decade, almost doubling from 2012 to 2013. Most cases are in eastern Ontario, around Kingston and Brockville, but Haliburton–Kawartha–Pine Ridge District had six cases in 2013 (Ontario Agency for Health Protection and Promotion, Public Health Ontario).

We are all going to have to learn to recognize the rash of Lyme disease, and get early treatment to prevent its serious delayed effects.

Air pollution and aero–allergens

As plants enjoy longer and warmer growing seasons, higher pollen counts will occur in both spring and fall and (Ragweed) allergy seasons will become more intense and last longer.

Air pollution is monitored at the Dorset air monitoring station (Ontario Ministry of the Environment and Climate Change). Ozone, which is the main air pollutant affecting health (besides particulate matter from forest fires) in Haliburton area, will show increased concentrations as the climate warms because the formation of ozone requires heat and sunlight. It is a summer pollutant, active from May to September, and its higher levels aggravate lung diseases, such as asthma.

Jeanne Lafranier


BAUER

# 6.0 Physical Elements

## 6.1 Soil

Upland soils are typically less than fifty cm deep with a variable thickness of surface organic layers, and are dry in summer, but they support a large variety plants, shrubs, and trees. On the lower slopes and in the valleys, soils are moist and the deciduous forests keep adding to the blanket of dead leaves, providing more material for the organic layer.

Rocky outcrops (cliffs) support only lichens and mosses. In marshes and bogs, muck or peat may form a layer of up to forty or fifty cm that is underlain by a layer of mixed mineral and humic materials with a sticky unstructured material (gley soil) below.

## 6.2 Minerals & Aggregates

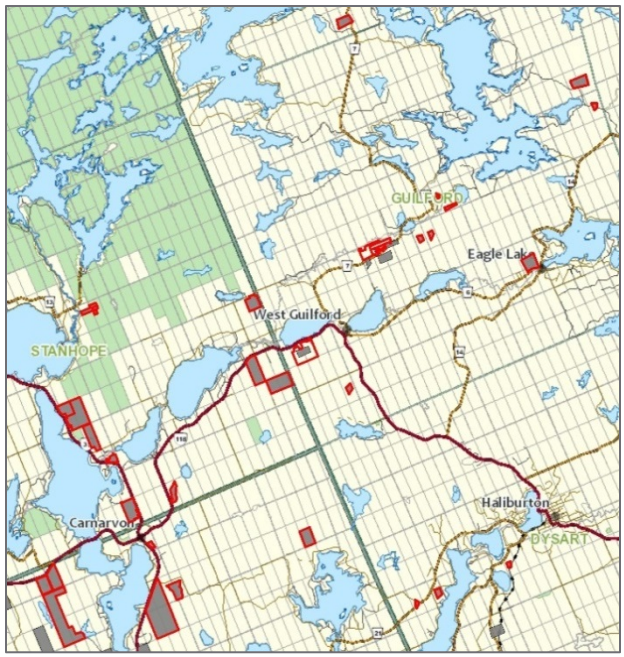



Figure 6.1
Growler Lake Area - Quarries & Pits

The impacts from mining and aggregate operations – sand, gravel, and various types of bedrock – can be substantial when they occur near a lake or along sensitive streams or wetlands. Aggregate and mineral excavation can impact ground water levels, the sedimentation of lakes and streams and result in noise pollution from increased truck traffic, blasting and machinery operation.

The gravel pit located on land Parcel #15 is not being used as a commercial enterprise; however, material from this pit was used in the construction of Growler Lake Drive and Trapline Trail. Quarries in the Municipality of Dysart et al are being mined for white crushed quartz, granite and limestone for use as building and landscaping stone. Many small quarries are in operation and the aggregates are used in general construction. Figure 6.1 shows the pits and quarries (outlined in red) within a ten kilometer radius of Growler Lake.

At this time, there are no active claims under the jurisdiction of the Ministry of Northern Development and Mines on the lands immediately bordering with Growler Lake. Current mining land claims information is available from the Ontario Ministry of Northern Development and Mines (http://www.mndm.gov.on.ca/en/mines-and-minerals/applications/claimaps).

A legal opinion was sought regarding the ability of commercial organizations to stake claims on private property to mine minerals or aggregates. The *Mining Act, R.S.O. 2009* provides protection for property owners. Revisions to the *Act* in 2009 included an automatic withdrawal of Crown mineral rights under privately held surface rights in Southern Ontario and the withdrawal of certain Crown rights where there are privately held surface rights in Northern Ontario. Staking is not permitted within 100 meters of a cottage dwelling or within the property boundary line. For the purpose of this legislation, Northern Ontario is defined as that part of the Province of Ontario lying north of the south shores of the French River, Lake Nipissing and Mattawa River. Southern Ontario is then defined to that part of the province which is not in Northern Ontario. Growler Lake clearly falls well within the definition of Southern Ontario and thus should not be subject to claims by outsiders.

## 6.3 Steep Slopes

Development along steep slopes and rock faces, while highly desirable for the view afforded from the structure, can pose special challenges, both immediate and long–term, to the lake environment. Poorly planned and/or executed development can result in a substantial alteration of the natural landscape, but beyond the visual impact due to structures, increased rates of soil erosion, decreased slope stability, and/or increased storm water run–off are potential indirect impacts which may, in turn, impact lake water quality and fish and wildlife habitat.

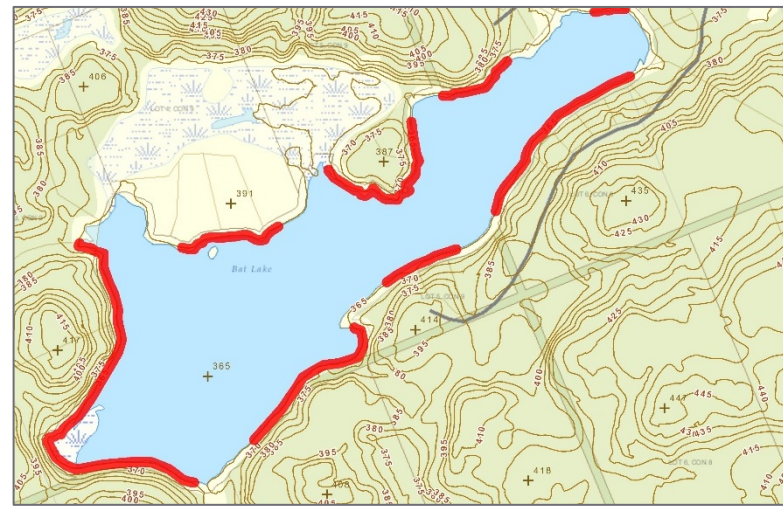



Figure 6.2
Growler Lake – Steep Slopes

The Municipality of Dysart et al. identifies areas of steep slopes within an area zoned as Lakefront Area as an "Area of Use Limitation". In Section 9.2 of the Municipality of Dysart et al's *Official Plan,* areas of steep slopes are defined as "slopes of 25% or more, measured over a horizontal distance inland of 45 metres (148 feet) from the high water mark, along a continuous shoreline frontage of 25 meters (82 feet)." Applying the Municipality's definition, much of the shoreline of Growler Lake is steeply sloped with grades of more than 25% over a 45 meter distance from the high water mark. As illustrated in Figure 6.1, it is estimated that almost 3,000 meters of the 4.1 kilometers of shoreline (slightly less than 75%) is steeply sloped.

A balanced approach to increased set–backs from the edge of a cliff, increased shoreline frontages, and the requirement to maintain a vegetation buffer will minimize the impact of development along steep slopes and rock faces.

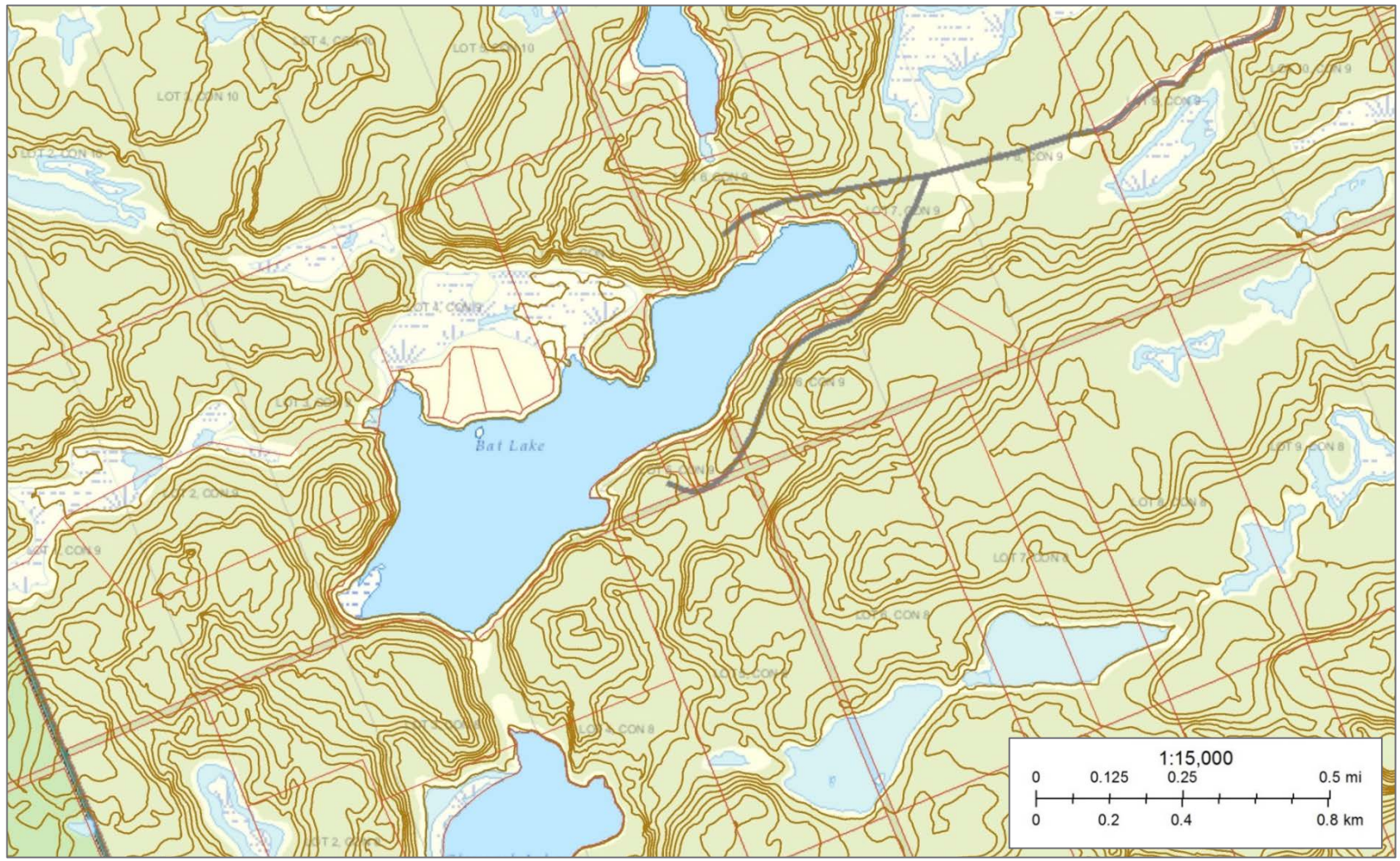



Figure 6.3
Growler Lake - Topography

Stuart Thomson

# 7.0 Land Use

## 7.1 Summary of Land Use

The twenty–seven land parcels that make up the Growler Lake Community are outlined in Figure 7.1. A *Severance Agreement*, dated May 12, 1997, between Harburn Holdings Limited & Paul Wilson and The Corporation of the United Townships of Dysart, Dudley, Harcourt, Guilford, Harburn, Bruton, Havelock, Eyre, and Clyde, severed the single 300 hectares parcel of land into twenty–six separate parcels (commonly referred to as lots by GLPOA owners), each sufficiently large to permit the construction of a seasonal dwelling and on–site sewage system. This *Severance Agreement*, including all its provisions for current and future owners, is registered against each property as *Ontario Land Registry Instrument Number H212102*. In 2007, land Parcel #24 was severed into two parcels.

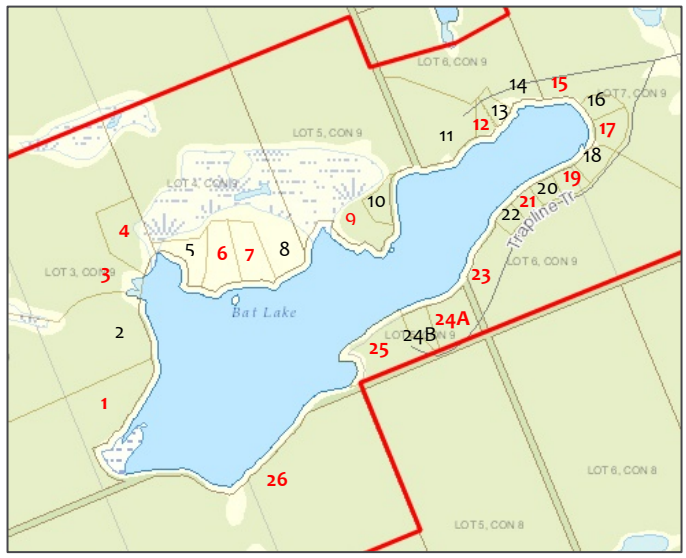



Figure 7.1
Growler Lake – Land Parcels

Parcels range in size from 0.4 to 64.0 hectares with shoreline frontages measuring between 53.1 and 364.6 meters. Growler Lake is only partially developed with fifteen seasonal dwellings constructed as of July 2015 (developed properties are indicated by bolded red parcel numbers in Figure 7.1). The development of Growler Lake is relatively recent in comparison to other lakes in the County where seasonal dwellings have existed for more than seventy–five years. Notwithstanding the original two hunt cabins erected in the 1940's, development of Growler Lake began in 2000 with the unpermitted construction of a hunt camp on Parcel #25. Detailed information on land use by parcel is provided below in Table 7.1.

With the exception of the original Shore Road Allowance and Municipal easements which are owned by the Municipality and the lake bed which is owned by the Crown and managed by the Ontario Ministry of Natural Resources, all land in the Growler Lake Community is privately owned. Additionally, the two private roads which provide vehicle access to the lake are privately owned. Although the private ownership of all roads accessing the lake restricts vehicle traffic to the lake to property owners and invited guests, Growler Lake may be accessible to the public by public portages as provided for in the Severance Agreement noted above. A similar provision for a public portage is included on the registered survey of Parcel #26. The approximate location of the public portages is shown in Figure 3.6.

## Table 7.1
## Land Use & Development Summary

| Parcel # | Area (ha)[1] | Lake Frontage (m) | Developed[2] | Outbuilding[3] | Dock[4] | Forest Management[5] | Streams[6] | Septic bed from lake (m)[7] | Out House[7] | Water Source | Maximum Altitude (m) | Steep Slopes[8] | Zoning[9] | | | | Water & Land Feature Inventory |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | WR4L | WR6L | RU1L | EP | |
| 1 | 37.8 | 348.6 | 2012 | ✓ | F | | | >30 | | W | 425 | ✓ | | | ✓ | | wetland |
| 2 | 22.6 | 186.0 | | | F | | | | | | 425 | ✓ | | | ✓ | | wetland |
| 3 | 49.7 | 57.0 | 2009 | ✓ | F | | inflow | >30 | ✓ | L | 405 | | ✓ | | ✓ | | wetland[10], beaver pond |
| 4 | 2.1 | 69.9 | 2004 | | F | | inflow | >20 | | W | 380 | | ✓ | | | ✓ | stream |
| 5 | 1.2 | 181.5 | | | | | | | | | 390 | | ✓ | | | ✓ | |
| 6 | 1.5 | 130.5 | 2011 | | F | | | >30 | | W | 390 | ✓ | ✓ | | | | island |
| 7 | 1.0 | 104.7 | 2004 | ✓ | F | | | >30 | | W | 390 | ✓ | ✓ | | | | |
| 8 | 19.8 | 119.4 | | | | | | | | | 390 | ✓ | ✓ | | ✓ | | wetland[10] |
| 9 | 22 | 384.6 | 2011 | | F | ✓ | inflow | >30 | ✓ | L | 415 | ✓ | ✓ | | ✓ | ✓ | wetland, fen, stream |
| 10 | 0.6 | 221.1 | | | F | | | | | | 275 | ✓ | ✓ | | | | |
| 11 | 4.1 | 178.2 | | | | | | | | | 415 | ✓ | | ✓ | | | granite rock face |
| 12 | 0.4 | 72.9 | 2010 | | F | | | >30 | | W | 370 | | ✓ | | | | |
| 13 | 0.4 | 76.5 | | | P | | inflow | | | | 370 | | ✓ | | | ✓ | stream |
| 14 | 12.1 | 113.1 | | ✓ | P | | | | ✓ | | 430 | | ✓ | | | ✓ | stream |
| 15 | 64.0 | 81.3 | 2009 | ✓ | F,C | | | >30 | | W | 375 | ✓ | ✓ | | ✓ | ✓ | wetland[10], beaver ponds, stream, heron rookery |
| 16 | 0.6 | 53.1 | | | | | | | | | 435 | | ✓ | | | | |
| 17 | 0.9 | 75.9 | 2004 | ✓ | F | | inflow | >20 | | W | 375 | | ✓ | | | ✓ | stream |
| 18 | 0.6 | 53.4 | | | | | | | | | 380 | ✓ | ✓ | | | | |
| 19 | 0.6 | 64.8 | 2012 | | F | | | >30 | | W | 385 | ✓ | ✓ | | | | |
| 20 | 0.4 | 78.6 | | | | | | | | | 385 | ✓ | ✓ | | | | |
| 21 | 0.4 | 70.5 | 2014 | | P | | | >30 | | | 385 | ✓ | ✓ | | | | |
| 22 | 0.4 | 69.0 | | | F | | | | | | 385 | ✓ | ✓ | | | | |
| 23 | 17.0 | 165.6 | 2010 | ✓ | F,C | ✓ | | >30 | | L | 430 | ✓ | | | ✓ | | |
| 24A | 1.5 | 154.5 | 2004 | ✓ | F | | inflow | >20 | | W | 385 | | ✓ | | | ✓ | stream |
| 24B | 0.6 | 68.4 | | | | | | | | | 385 | ✓ | ✓ | | | | |
| 25 | 2.1 | 288.0 | 2000 | ✓ | F | | | >20 | | W | 395 | | | ✓ | | | |
| 26 | 36.0 | 594.0 | 2008 | ✓ | F | ✓ | inflow outflow | >30 | ✓ | W | 405 | | | | ✓ | ✓ | heron rookery, beaver pond, waterfall, streams |
| | 300.0 | 4,061.1 | 14 | | | 3 | | | 4 | | | | | | | | |

Notes:
[1] Land area (ha) does **not** include area of original Shore Road Allowance, if purchased.
[2] Year construction of dwelling initiated
[3] Outbuilding may include an unattached garage, bunkie, private cabin, and/or shed
[4] Dock Types: F–floating; C–crib; P–piers
[5] Property registered in Private Land Forest Stewardship Program, Ontario Ministry of Natural Resources and Forestry
[6] Refer Section 5.5
[7] Refer Section 7.3
[8] Steep slopes are defined as slopes of 25% or more, measured over a horizontal distance inland of 45 metres from the high water mark, along a continuous shoreline frontage of 25 meters. An indicator or steep slopes may refer to the entire waterfront or part thereof. Refer Section 6.3
[9] Refer Section 7.4
[10] Significant Wildlife Habitats, Species of Conservation Concern. Source: *Dysart Official Plan, Natural Heritage Features*

## 7.2 Residential Occupancy

As noted above, a seasonal dwelling has been constructed on only about half of the land parcels abutting Growler Lake. The buildings tend to be larger than traditional cottages and generally contain three to six bedrooms, multiple bathrooms and appliances (washing machines, dishwashers, etc.). All dwellings are constructed for four–season use and road access is maintained year–round. It is estimated that the population on Growler Lake, not including guests, on any given day, ranges between ten in the off–season and as many as fifty in peak periods.

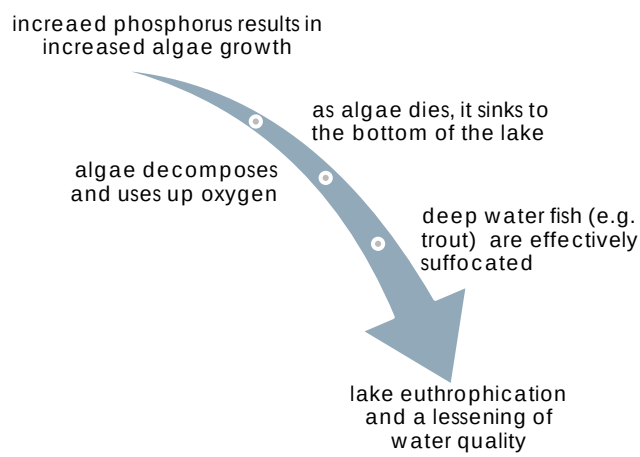
However, the inevitable development of currently vacant parcels combined with an increase in the frequency and duration of the use of existing seasonal residences, including an increase in intended future 'retirements to the cottage,' will definitely result in a significant increase in residential occupancy over the next few years.

## 7.3 Sewage Systems

The impact of untreated household waste on ground and lake water can be catastrophic for both humans and lake ecosystems. E–coli bacteria from untreated human waste can result in serious health issues, even death. Phosphorous reaching the lake through a sewage system (e.g. soap/detergent in wash water) accelerates lake eutrophication, threatening the lake ecosystem (Figure 7.2).

The Province establishes standards for on–site sewage systems in the *Ontario Building Code*. Standards and regulations are administered (permitted, inspected, etc.) by the local Municipality or Health Units.

**Impact of Phosphorus on Lake Ecosystems**




On–site (private) sewage systems process liquid and solid household and human waste so that it may be safely absorbed into the ground and released into the air. The *Ontario Building Code* establishes five classes of on–site sewage systems: outhouse or privy, grey–water system, cesspool system, septic system, and holding tank. Nearly all private sewage systems recently installed in Ontario are septic systems (Class 4). Basically, the septic system includes some type of treatment unit such as a septic tank and some type of absorption system such as a leaching bed. The septic tank is used to capture the floating scum and heavy sludge while allowing the fluid to pass through the tank and then into the drainage bed where it is broken down by bacteria before being absorbed into the ground and ultimately released into the air. A properly installed and well maintained septic system will ensure that harmful bacterium such as e–coli and some portion of the phosphorus entering the system is removed from the waste water before it is absorbed into the ground. In effect, septic refers to the process of flushing a toilet, waste putrefying or decaying and thereby becoming septic. Solids accumulate at the bottom of the septic tank and must be pumped out at regular intervals based on septic size and frequency of use.

Without exception, developed properties on Growler Lake have a Class 4 on–site sewage system (septic system) with sufficient capacity based on criteria set out in the *Ontario Building Code* to handle the anticipated load of each dwelling. The distance of the leaching bed from the lake, however, varies between properties (refer Table 7.1). Changes to the *Ontario Building Code* in 2007 increased the water setback for on–site septic systems leeching beds from twenty to thirty metres because the neutralization of harmful bacteria increases as the distance of the leaching beds from the water increases. All septic systems on Growler Lake were inspected

at prescribed stages of the installation; however, even properly placed and installed septic systems may be less effective or even fail as a result of faulty materials, use beyond intended capacity, crushing damage, and inadequate maintenance.

In addition to these primary septic systems, there are four outhouses or "earth pit" privies on the lake. These Class 1 sewage systems are also regulated by the *Ontario Building Code* and the Municipality of Dysart, et al; regulations stipulate a sixty metre setback from *any* water body. Although there are specific regulations concerning the construction of a Class 1 sewage system, a building permit is not required. Therefore, Class 1 sewage systems are not inspected for compliance to the *Code*.

## 7.4 Municipal Planning Regulations

The *Provincial Policy Statement*, issued in 2005 under the *Ontario Planning Act*, provides policy direction specific to the province's interest in land use and development throughout Ontario. The *Act* stipulates that all official plans be consistent with the *Provincial Policy Statement*. The *County of Haliburton Official Plan*, initially approved by the Minister of Municipal Affairs and Housing in March 2006 and most recently reviewed and updated in 2010, establishes a broad planning policy framework for the County and is intended to guide the *Official Plan* and development approvals of the local municipalities.

The *Dysart et al Official Plan*, initially approved by the Minister of Municipal Affairs and Housing in March 2004 and more recently reviewed and updated in accordance with the provisions of the *Ontario Planning Act*, provides "a detailed comprehensive document to guide and direct the use of the land in the Municipality." The stated objectives of the *Official Plan* include: protection and enhancement of the environment; conservation of cultural heritage resources; promotion of recreational development, recreational opportunities, commercial and industrial development, resource economy, and livable settlement; control of rural area development; minimization of servicing costs; and protection of public health and safety. The *Official Plan* documents the Municipality's broad policies (public service, general development, resource protection and general land use) and policies governing the use of lands and water specific to land use designations. It is not possible or even useful to summarize the *Municipality of Dysart et al Official Plan* and its associated bylaws in this document; the Plan and bylaws may be viewed at http://www.dysartetal.ca/portfolio-view/planning/.

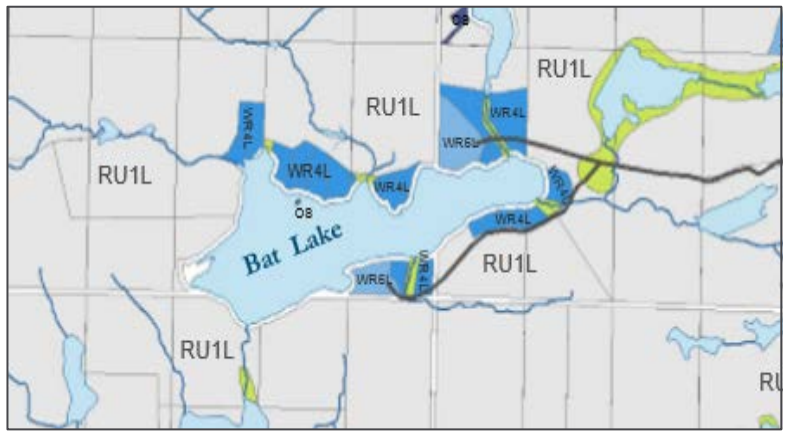



Figure 7.2
Grower Lake – Land Zoning

As shown in Figure 7–2 and Table 7–1, above, there are four land use designations in the Growler Lake Community: Waterfront Residential Type 4L, Waterfront Residential Type 6L, Rural 1L and Environmental Protection. Of the twenty–seven parcels, twenty–five are zoned as waterfront residential with limited services (not accessible by public road). Two parcels are zoned as rural residential with limited services.

Table 7–2 provides a brief synopsis of the parameters, permissions, and limitations of each of these land use designations.

Table 7.2
Municipal Zoning Summary

| Code | Land Use Designation | Characteristics |
|---|---|---|
| **WR4L** | Waterfront Residential Type 4L | ▪ 60 meter frontage<br>▪ 20 meter water setback on lots developed as of 2004; 30 meter setback on lots developed after 2004<br>▪ minimum shoreline vegetation buffer – 20 m<br>▪ limited service (no public road)<br>▪ permitted uses include a single seasonal dwelling, private cabin, home office<br>o minimum dwelling area of 55m²<br>o limited conversion to permanent occupancy may be permitted<br>o maximum of two accessory buildings<br>▪ areas of limited land use include steep slopes, extensive areas of minimal soil coverage, eroding or unstable slopes, high water tables (e.g. areas of organic soils and all wetlands) |
| **WR6L** | Waterfront Residential Type 4L | ▪ 150 meter frontage<br>▪ 30 meter water setback<br>▪ minimum shoreline vegetation buffer – 30 m<br>▪ limited service (no public road)<br>▪ permitted uses include a single seasonal dwelling, private cabin, home office<br>o minimum dwelling area of 55m²<br>o limited conversion to permanent occupancy may be permitted<br>o maximum of two accessory buildings<br>▪ areas of limited land use include steep slopes, extensive areas of minimal soil coverage, eroding or unstable slopes, high water tables (e.g. areas of organic soils and all wetlands) |
| **RU1L** | Rural Residential Type 1L | ▪ Minimum 20 acres<br>▪ 180 meter frontage<br>▪ 30 meter water setback<br>▪ Limited range of rural uses<br>▪ Limited services (no public road)<br>▪ permitted uses include a single seasonal dwelling, private cabin, home office<br>o minimum dwelling area of 74m²<br>o limited conversion to permanent occupancy may be permitted<br>o maximum of two accessory buildings |
| **EP** | Environmental Protection | ▪ Includes all wetlands and lands adjacent to lakes and rivers that have been or may be subject to a flooding hazard<br>▪ Private structures, except for minimal stairways, walkways, and docks, are prohibited in the EP zones |

As previously noted, Growler Lake property owners are subject to terms and conditions set out in the *Severance Agreement* (Ontario Land Registry Instrument Number H H212102). Among other things, the *Severance Agreement* provides:

- that access to all land parcels is via a private right of way in common, and that construction, maintenance and improvement of the private roadway will be solely the responsibility of the benefitting parties
- the establishment of an incorporated road association whose purpose shall include the ongoing maintenance of the private roadway, and that the owner, and on behalf of future owners of the lands, undertakes to maintain a valid membership in the road association
- permitted access and use of specified portions of the original road allowances for normal pedestrian and vehicular traffic
- continued existence of the public portage between Growler Lake and Klaxon Lake in accordance with the *Public Lands Act, R.S.O. 1990*
- preservation of the visual characteristics of the shoreline and maintain, as much as possible, the natural state of the shoreline, adhering to municipal setbacks, ensuring the vegetation within the setback area be disturbed as little as possible, and shoreline revisions are subject to written approval by the Ministry of Natural Resources
- registration of the *Severance Agreement* against the title of all subject land, by the Municipality and notification of such registration of this *Agreement* and all provisions therein to all prospective buyers and future owners, by the Owner

The terms set out in the *Severance Agreement* (Ontario Land Registry Instrument Number H H212102) are consistent with the provisions and principles of the *Municipality of Dysart et al Official Plan* and the terms specified in associated by–laws, including the *Comprehensive Zoning By–law, Municipality of Dysart et al* (By–law 2005–120).

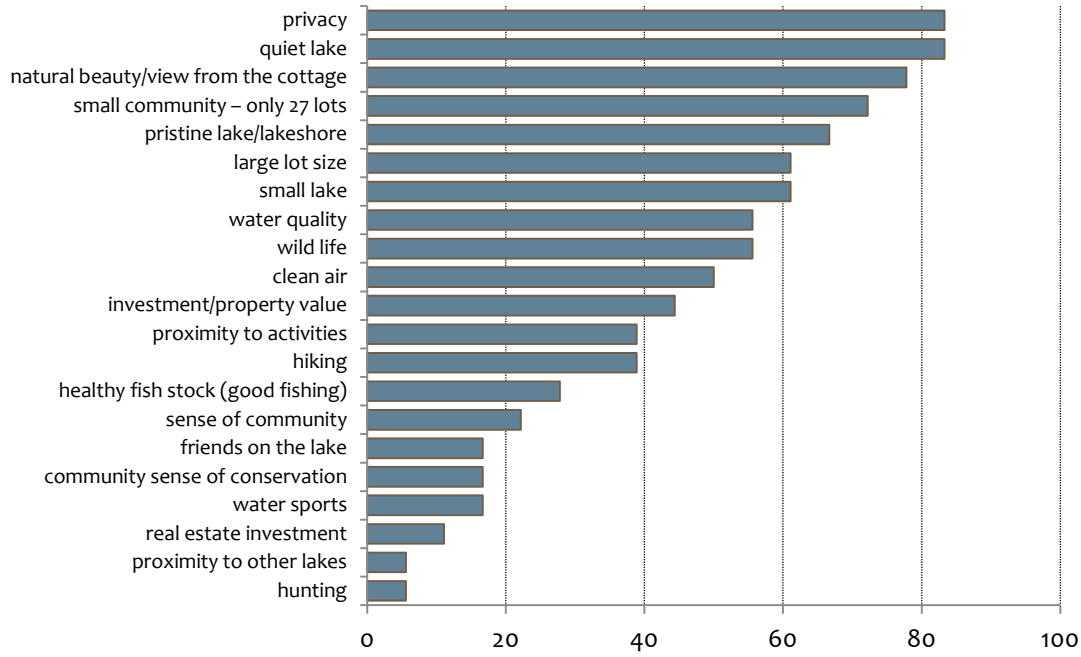

Stefan Kirsch

# 8.0 Lake Values

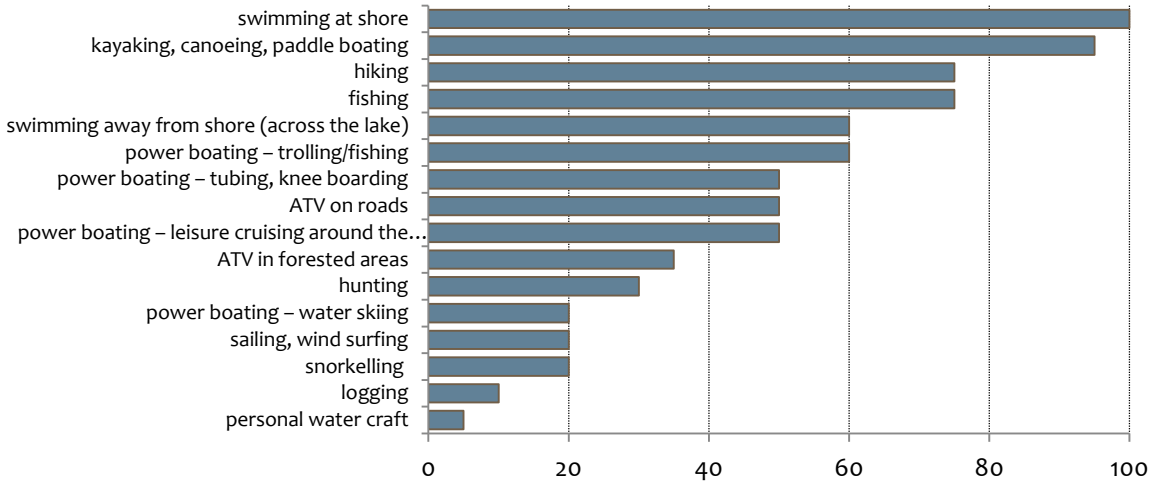
## 8.1 Survey Results – Growler Lake Property Owners

In the Spring of 2012, members of the Growler Lake Property Owners' Association were invited to participate in an on– line survey to determine what attracted them to Growler Lake, what activates they do or plan to do on and around the lake, what they thought about lake related concerns and activities, and what they might like further information about. Of the members representing the twenty–seven properties, twenty–one submitted a response. At the time of the survey, five properties were still owned by Windy Ridge Developments and responses were not received for these properties.

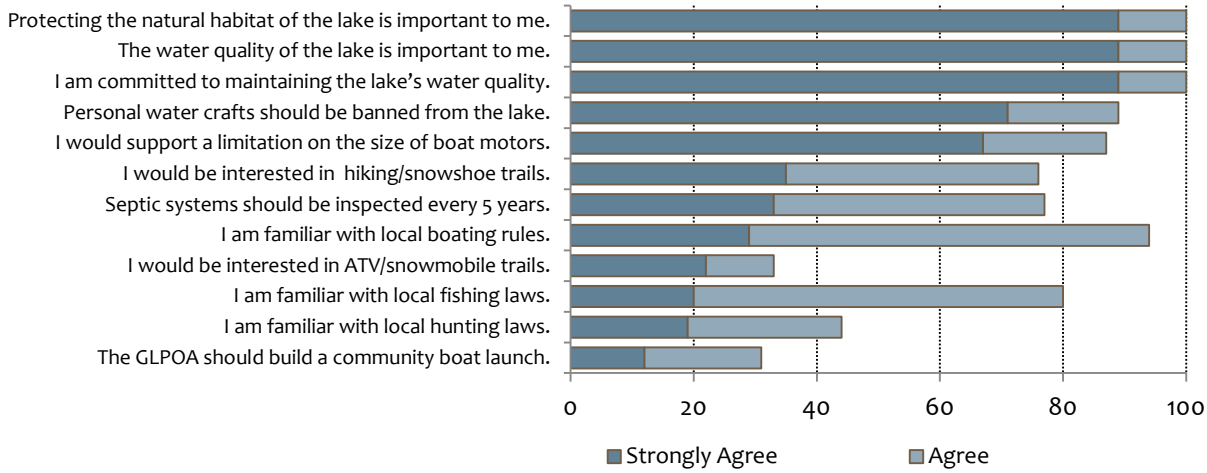
### WHY YOU CAME...



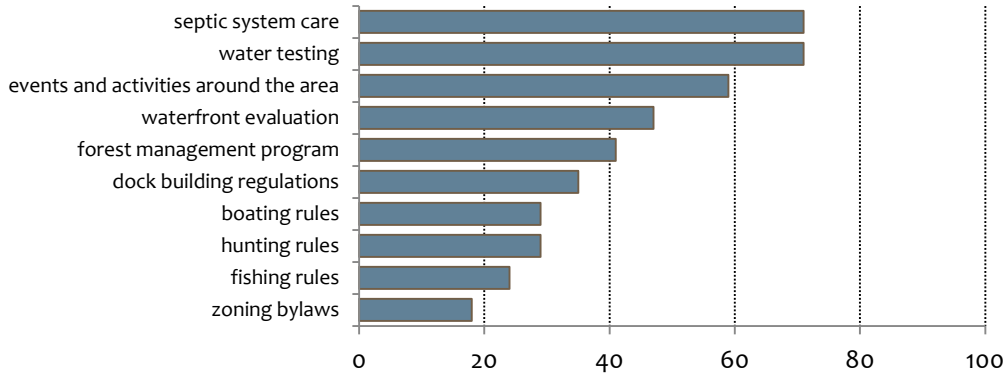

### WHY YOU STAY...



## WHAT YOU THINK...




## WHAT YOU WANT TO KNOW MORE ABOUT...




## WHAT YOU WANT IN A LAKE PLAN…

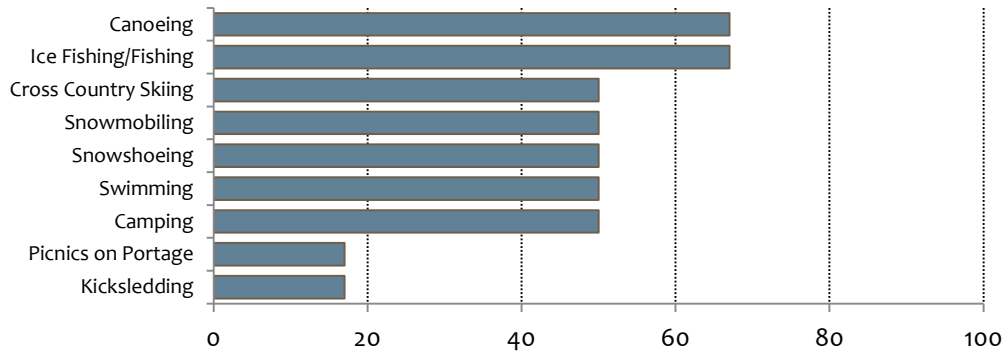
- sincere member agreement/commitment to the *Plan*
- benchmark values for water quality and on–going monitoring of water quality
- guidelines that reflect what members value about the lake specific to: water quality, shoreline protection, boating safety, launching boats particularly those coming from other lakes, garbage disposal/littering, fire bans, and protection of fish and wildlife
- input from external stakeholders (local residents, Lipsy Lake Owners Association, etc.)
- emphasis on on–going education on relevant issues (e.g. over–fishing, use of live bait, overloaded septic systems, appreciation for wetlands/marshland, wildlife, impacts of construction, shoreline revisions, etc.)
- restricted use of live bait
- adherence to/enforcement of boating, hunting, fishing, shoreline, zoning laws and bylaws
- restriction/ban on personal water craft
- appropriate motor/wake/speed restriction
- community security

When owners were asked what they wanted Growler Lake to look like/be like in five or ten years, the response was not surprising: owners overwhelmingly agreed that they wanted Growler Lake to look and be the same as it is today: clean, quiet, pristine, and beautiful!

## 8.2 Survey Results –West Guilford, Selected Areas

A survey was distributed in May 2014 to all of the homes along Barry Line Rd., the two cottage owners on Claypack Lake, one long term renter on Claypack, Medeba Camp, as well as the excavation company currently responsible for the maintenance of Growler Lake Drive/Trapline Trail. The purpose of the survey was to determine how people use Growler Lake and to solicit their input into the planning process. The survey led to three interviews with long term residents who contributed information for the history section of this report. Visitors to Growler Lake enjoy it for the same reason that the property owners enjoy it: the excellent quality of the lake water, the natural shoreline, the wildlife, the tranquility, the gorgeous scenery and night skies. Comments on the survey plus conversations revealed some concern that the presence of cottages on Growler Lake has the potential to damage the lake's health. Local residents appreciate that the GLPOA is attempting to protect Growler Lake and ensure its viability for future generations to enjoy.

### HOW OTHERS USE GROWLER LAKE...




One participant indicated that at times night noise from Growler Lake travels over to Claypack Lake. Further questioning indicated that this problem may have lessened with the adoption of our good neighbor policy (*Personal Code of Conduct for GLPOA Members, Families & Guests,* Appendix 3). Another participant indicated that a motor ban on Growler Lake would be appreciated. He has been advised that a ban on personal motorized water craft has been put in place but that it is not possible for a complete motor ban.

Five people have indicated an interest in participating in a social time and in cleaning up deadfall and garbage from the portage between Growler Lake and Claypack Lake. One problem that keeps cropping up with local residents is the restricted public access from Growler Lake to Klaxon Lake. This issue is a result of the actions of an owner on Klaxon Lake not the Growler Lake Property Owner's Association. Clearly marking the public access to Klaxon Lake is something that would be appreciated by many of the local residents.

All of the survey participants would like to receive a draft copy of the *Plan* and many of them would also like a final copy and a chance to attend the meeting when the *Plan* is presented to the membership. A contact list for this purpose has been created.

In conclusion, Growler Lake Property Owner's Association has made a very real effort to include all other potential stakeholders in the planning process as is recommended in the *FOCA Lake Planning Handbook*. We have solicited stakeholders' opinions and concerns. We plan to include all interested parties as the lake planning process continues. We recognize that a lake plan is only effective if the majority of stakeholders can agree with the *Plan* and its recommendations.


Sue Vorvis

# 9.0 Recommendations

Growler Lake is a vibrant and healthy lake and the Growler Lake community members are engaged and committed to keeping it so. The challenge for the future is to build and expand upon the strong base of community support and to engage additional participants such as renters and members of the broader community (who might use the lake for activities such as ice fishing) in the implementation of these recommendations. The majority of recommendations below relate to education, communication and stewardship; only a few anticipate the need for action by governmental regulatory bodies.

The recommendations have been organized to relate to the chapters of the *Growler Lake Plan*. Based on the information presented in the specific chapter, it is recommended that the members and/or the Conservation Committee of the Growler Lake Property Owners' Association:

## 1.0 Introduction

a. recognize that the *Plan* document is the initial step in a long–term and continuous process of consultation, assessment, evaluation, and education

## 2.0 Vision, Principles& Targets

a. commit to protect, as practical, the pristine nature of Growler Lake, such that Growler Lake will look and be the same in five, ten, twenty years, as it is today – clean quiet, pristine and beautiful

## 3.0 Lake Description

a. continue to research and document the history of Growler Lake and surrounding areas
b. publish the *Plan* in a photobook

## 4.0 Social Elements

a. increase awareness of and adherence to boating laws and regulations
b. continue to encourage respectful boating conduct in line with the *Personal Code of Conduct for GLPOA Members, Families & Guests*
c. increase awareness of the harmful effects of older 2–stroke motors and promote the use of newer environmentally friendly 2–stroke and 4–stroke motors and 2–stroke lubricant
d. increase awareness of the potentially harmful impact of development on the landscape and aesthetics of the lake, and provide best practices which highlight applicable zoning bylaws and building regulations
e. increase awareness of the potential harmful impact of artificial lighting on shoreline and aquatic ecosystems, and provide best practices regarding exterior lighting

## 5.0 Natural Heritage

a. increase awareness of the importance of preserving the natural shoreline, highlight potential harmful impacts on the ecosystem of Growler Lake, and provide best practices to preserve the natural shoreline as much as is practical
b. continue to monitor water quality (phosphorus levels and water clarity) through continued participation in the Lake Partner Program
c. continue to conduct phosphorus level tests in two additional locations in the lake until it is determined that additional testing is no longer necessary; this testing will be conducted at the expense of the Association
d. report the results of all water quality testing to the membership on an annual basis
e. increase awareness of the sources and harmful impact of phosphates entering into the lake and provide best practices to minimize the use of products containing phosphorus (e.g. detergents, pesticides, and herbicides)

f. increase awareness of the location and value to the biodiversity of fish and wildlife habitats and breeding grounds in the Growler Lake watershed area and provide best practices to protect these areas, particularly areas of preferred use by endangered species
g. increase awareness of and adherence to hunting and fishing laws and regulations
h. promote proper cleaning of hulls and live wells of all boats launched into Growler Lake, particularly boats that have been previously launched into other water bodies
i. discourage the use of live bait, or if used, encourage the appropriate disposal of unused bait
j. increase awareness of terrestrial and aquatic invasive species and provide best practices for reporting and removal of invasive species
k. increase awareness of the potentially harmful effects of the introduction of non–native plants
l. increase awareness of the potentially harmful effects of the use of firewood from non–local sources

## 6.0 Physical Elements

a. increase awareness of the significance of zoned areas of limited use, including steep slopes and eroding or unstable slopes

## 7.0 Land Use

a. request that the Municipality of Dysart et al identify the location of any legal public portages to Growler Lake. If legal portages are identified, GLPOA will consider posting signs and clearing walking trails along them.
b. increase awareness of and encourage participation in the Private Land Forest Stewardship Program
c. increase awareness of the capacity, limitations, and mechanics of all classes of on–site sewage systems and provide best practices for use, monitoring, maintenance, and repairs
d. ensure that Class 1 on–site sewage systems (outhouses) are constructed in accordance with the Ontario Building Code and meet Municipal minimum water set–back requirements
e. encourage the GLPOA Board to increase awareness of and compliance with the *Dysart et al Official Plan*, associated bylaws, and Severance Agreement (Ontario Land Registry Instrument H212102)
f. increase awareness of the significance of zoned areas of environmental protection and limited use, including steep slopes, extensive areas of minimal soil coverage, eroding or unstable slopes, and wetlands

## 8.0 Lake Values

a. establish and maintain partnerships with local and provincial organizations which further the environmental and stewardship goals of this *Plan* and that of the larger community
b. continue to promote a strong sense of community and social commitment through regular social events and participation in the larger community
c. increase awareness of our Lake Values (e.g. *Growler Lake Plan*, *Personal Code of Conduct for GLPOA Members, Families & Guests*, GLPOA Bylaws) to GLPOA members, local residents, and realtors through both the Growler Lake website and direct communication

The Growler Lake Property Owners Association is in the enviable position of creating a lake plan at a point in time when the lake is essentially pristine and all property owners agree that it is a priority to maintain this condition. Unlike many lake associations that face the daunting task of reversing or arresting the harmful effects of decades of more permissive zoning requirements, outdated sewage technology, and the lack of best practices to protect the lake and its natural inhabitants, this *Plan* seeks only to protect and preserve what currently exists. Although the *Plan* includes more than thirty recommendations, the majority call for education and providing best practice options. It is believed that these recommendations are neither onerous nor restrictive to the individual member's enjoyment of their cottage life, but will ensure that Growler Lake will continue to be enjoyed for generations to come.

Matt Bravman

# Appendixes

# Appendix 1 Information Sources

- Federation of Ontario Cottagers' Association (www.foca.on.ca)
  - *Lake Planning Handbook for Community Groups*
- Ontario Government (www.ontario.ca)
  - Ministry of Natural Resources
    - LIO mapping
  - Ontario Ministry of the Environment
- County of Haliburton (www.haliburtoncounty.ca)
  - Community GIS Mapping
- Municipality of Dysart, et al (www.dysartetal.ca)
- Glenside Ecological Services Limited
  - *Site Evaluation Report* (PRT Lot 5 Concession 9, Township of Guilford, Municipality of Dysart et al. County of Haliburton), May 2007
  - *Forest Management Plan* (PRT Lot 5 Concession 9, Township of Guilford, Municipality of Dysart et al. County of Haliburton), September 2012
  - *Forest Management Plan* (Concession 9 Pt Lots 6 & 7, Geographic Township of Guilford, Municipality of Dysart et al. County of Haliburton), May 2011
  - *County of Haliburton Natural Heritage Mapping: A Compilation and Preliminary Assessment* ( Prepared for Haliburton Highlands Land Trust), May, 2007
- Kennisis Lake Cottage Owner's Association, *Kennisis Watershed and Lake Plan, 2007* (http://klcoa.org/lakeplan/documents.html)
- Government of Canada (www.canada.gc.ca)
  - Parks Canada – Trent Severn Waterway
  - Fisheries and Oceans Canada
  - Ministry of Natural Resources
- Haliburton Forest & Wildlife Reserve Ltd., *Bird Checklist*
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- EDD MapS (www.eddmaps.org)

# Appendix 2 Glossary of Terms

| Term | Definition/Description |
|---|---|
| **Algae** | Simple single–celled (phytoplankton), colonial, or multi–celled, mostly aquatic plants, containing chlorophyll and lacking roots, stems and leaves. Aquatic algae are microscopic plants that grow in sunlit water that contains phosphates, nitrates, and other nutrients. Algae, like all aquatic plants, add oxygen to the water and are important in the fish food chain.<br><br>Algae is either suspended in water (plankton) or attached to rocks and other substrates (periphyton). Their abundance, as measured by the amount of chlorophyll *a* (green pigment) in an open water sample, is commonly used to classify the trophic status of a lake. Algae are an essential part of the lake ecosystem and provide the food base for most lake organisms, including fish. Phytoplankton populations vary widely from day to day, as life cycles are short. |
| **Algal Bloom** | Rapid growth of algae on the surface of lakes, streams, or ponds; stimulated by nutrient enrichment (or due to an increase in plant nutrients such as nitrates and phosphates). It is associated with Eutrophication and results in deterioration in water quality. |
| **Alkalinity** | The capacity of water for neutralizing an acid solution. |
| **Aquatic** | Consisting of, relating to, or being in water; living or growing in, on, or near the water. |
| **Bathymetry** | The measurement of the depth of large bodies of water (oceans, seas, ponds and lakes). |
| **Bedrock** | The solid rock beneath the soil and superficial rock. |
| **Biodiversity** | Refers to the degree of variation of life. This can refer to genetic variation, species variation, or ecosystem variation within an area, biome, or planet. |
| **Boreal** | A northern forest, as in the boreal forest Biome, characterized by evergreen conifers and long winters. Also referred to as Taiga |
| **Buffer** | Strips of grass or other erosion–resisting vegetation between or below cultivated strips or fields. |
| **Canadian Shield** | The extensive region making up much of northern and central Canada underlain by Precambrian rocks that have been eroded to produce a low shield like profile. |
| **Catchment Basin** | All lands enclosed by a continuous hydrologic drainage divide and lying upslope from a specified point on a stream. Also referred to as a Drainage Basin. |
| **Chlorophyll** | A green pigment, present in all green plants, responsible for the absorption of light to provide energy for photosynthesis |
| **Conductivity** | A measure of the ability of a solution to carry an electrical current and is directly related to the total dissolved inorganic chemicals in the water. Values are commonly two times the water hardness unless the water is receiving high concentrations of contaminants introduced by humans. |
| **Conifer** | A tree belonging to the order Coniferae with cones and leaves of needle shape or "scalelike." |
| **Conservation** | The careful and organized management and use of natural resource, for example, the controlled use and systematic protection of natural resources, such as forests, soil, and water systems in accordance with principles that assure their optimum long–term economic and social benefits. Also, preservation of such resources from loss, damage, or |

| Term | Definition/Description |
|---|---|
| | neglect. |
| **Crustacean** | Pertaining to an important division of animals, comprising of crabs, lobsters, crayfish, shrimp, etc having an external calcareous skeleton or shell in many pieces |
| **Deciduous** | Plants characterized by a specific growth and dormancy cycle, with certain parts falling at the end of the growing period, as leaves, fruits, etc. |
| **Ecosystem** | A community of animals, plants, and bacteria, and its interrelated physical and chemical environment. An ecosystem can be as small as a rotting log or a puddle of water, but current management efforts typically focus on larger landscape units, such as a mountain range, a river basin, or a watershed. |
| **Environmental** | All of the external factors, conditions, and influences which affect the growth, development, and survival of organisms or a community. The components of an environment include climate, physical, chemical, and biological factors, nutrients, and social and cultural conditions. These influences affect the form and survival of individuals and communities. |
| **Environmental Analysis** | An analysis of alternative actions and their predictable short and long–term environmental effects, which may include physical, biological, economic, social and environmental design factors and their interaction. |
| **Erosion** | The wearing away and removal of materials of the earth's crust by natural means. As usually employed, the term includes weathering, solution, corrosion, and transportation. |
| **Estuary** | The tidal mouth of a large river, where the tide meets the stream |
| **Eutrophic** | A term applied to freshwater lakes that are high in available nutrient (>20 µg/l) |
| **Fecal Coliform** | A group of bacteria normally present in large numbers in the intestinal tracts of humans and other warm–blooded animals. The presence of this type of bacteria in water, usually taken to indicate that the material is contaminated with solid human waste. |
| **Fen** | Low land covered wholly or partly with water; a Moor or Marsh. A type of Wetland that accumulates peat deposits. Fens are less acidic than Bogs, deriving most of their water from groundwater rich in calcium and magnesium. |
| **GIS** | Geographical information system (GIS) is a computer system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data. |
| **Gley Soil** | Sticky clay soil or soil layer formed under the surface of some waterlogged soils. Characteristic of poorly drained areas, gley soils contain reduced amounts of iron and other elements and are gray and mottled in colour |
| **Greywater** | Wastewater from clothes washing machines, showers, bathtubs, hand washing, lavatories and sinks that are not used for disposal of chemicals or chemical–biological ingredients and specifically excludes water from a toilet, kitchen sink, dishwasher, or water used for washing diapers. |
| **Groundwater** | 1. Water that flows or seeps downward and saturates soil or rock, supplying springs and wells. The upper level of the saturate zone is called the Water Table.<br>2. Water stored underground in rock crevices and in the pores of geologic materials that make up the earth's crust. Ground water lies under the surface in the ground's Zone of Saturation. |
| **Habitat** | The native environment or specific surroundings where a plant or animal naturally grows or lives. The surroundings include physical factors such as temperature, moisture, and light together with biological factors such as the presence of food or predator organisms. |

| Term | Definition/Description |
|---|---|
| **Humic** | An organic residue of decaying organic matter |
| **Invasive Species** | A plant or animal that moves in and takes over an ecosystem to the detriment of other species |
| **Lake** | A considerable body of inland water or an expanded part of a river. |
| **Literal Zone** | 1. The shallow area near the shore of a non–flowing body of water; that portion of a body of fresh water extending from the shoreline lakeward to the limit of occupancy of rooted plants.<br>2. A strip of land along the shoreline between the high and low water levels. |
| **Lot** | A piece of land within a defined grid, measuring approximately 1,000 metres by 400 metres or 40 hectares (100 acres). |
| **Marsh** | A term frequently associated with Wetlands. An area of soft, wet, low–lying land, characterized by grassy vegetation that does not accumulate appreciable peat deposits and often forming a transition zone between water and land. A tract of wet or periodically inundated treeless land, usually characterized by grasses, cattails, or other monocotyledons (sedges, lilies, irises, orchids, palms, etc.). Marshes may be fresh or saltwater, tidal or non–tidal. |
| **Mesotrophic** | A term applied to freshwater lakes that are moderate in available nutrients (10 – 20 µg/l) |
| **Microgram (µg)** | Is equal to one–millionth of a gram (i.e. 1/1,000,000) |
| **Motorized Personal Watercraft** | A motorized watercraft less than 13 feet in length designed to be operated by a person or persons sitting, standing or kneeling on the craft rather than within the confines of a hull. |
| **Native Species** | A species that is a part of an area's original fauna or flora. |
| **Nutrients** | Elements or compounds essential to life, including oxygen, carbon, nitrogen, phosphorus, etc. |
| **Oligotrophic** | A term applied to freshwater lakes that are low in available nutrients (<10 µg/l) |
| **Parcel** | A piece of land that represent a legal estate, with a separate title deed. |
| **Peat** | Any mass of semi–carbonized vegetable tissue formed by partial decomposition in water of various plants, especially mosses of the genus Sphagnum. Peat varies in consistency from turf to slime. As it decomposes its color deepens, old peat being dark brown or black, and keeping little of the plant texture. According to its formation, it is known as Bog Peat (mosses), Heath Peat or Meadow Peat (grasses and sedges), Forest Peat or Wood Peat (trees), and Sea Peat (seaweeds). |
| **Ph** | A convenient method of expressing the acidity or basicity of a solution. |
| **Phosphates** | General term used to describe phosphorus–containing derivatives of phosphoric acid. |
| **Phosphorus** | An element that is essential to plant life but contributes to an increased trophic level (Eutrophication) of water bodies |
| **Photosynthesis** | The process in green plants and certain other organisms by which carbohydrates are synthesized from carbon dioxide and water using light as an energy source. Most forms of photosynthesis release oxygen as a byproduct. Chlorophyll typically acts as the catalyst in this process. |
| **Plankton** | Minute floating forms of microscopic plants and animals in water which cannot get about to any extent under their own power. They form the important beginnings of food chains for larger animals. |
| **Pollution** | Any alteration in the character or quality of the environment which renders it unfit or less |

| Term | Definition/Description |
|---|---|
| | suited for certain uses. With respect to water, the alteration of the physical, chemical, or biological properties by the introduction of any substance that adversely affects any beneficial use. |
| **Pond** | A body of water smaller than a lake, often artificially formed. |
| **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. |
| **Precipitation** | Precipitation is the discharge of water, in liquid or solid state, from the atmosphere, generally onto a land or water surface. It is the common process by which atmospheric water becomes surface or subsurface water. Forms of precipitation include drizzle, rainfall, glaze, sleet, snow, graupel, small hail, and hail. |
| **Rookery** | A breeding colony of rooks, typically seen as a collection of nests high in a clump of trees. |
| **Runoff** | That part of the precipitation, snow melt, or irrigation water that appears in uncontrolled surface streams, rivers, drains or sewers. Runoff may be classified according to speed of appearance after rainfall or melting snow as direct runoff or base runoff, and according to source as surface runoff, storm interflow, or ground–water runoff. |
| **Seasonal Stream** | A stream that carries water only part of the time, generally in response to periods of heavy runoff either from snowmelt or storms. Flow generally occurs for several weeks or months in response to seasonal precipitation, due to ground water discharge. Also referred to as Intermittent Streams. |
| **Seep** | An area of minor groundwater outflow onto the land surface or into a stream channel or other waterbody. Flows are usually too small to be a spring. |
| **Septic System** | An on–site system designed to treat and dispose of domestic sewage. A typical septic system consists of a tank that receives waste from a residence or business and a system of tile lines or a pit for disposal of the liquid effluent (sludge) that remains after decomposition of the solids by bacteria in the tank. The remaining solids must be pumped out periodically. |
| **Septic Tank** | A tank used to detain domestic wastes to allow the settling of solids prior to distribution to a leach field for soil absorption. Septic tanks and their associated Leaching Fields are used when a sewer line is not available to carry them to a treatment plant. A settling tank in which settled sludge is in immediate contact with sewage flowing through the tank, and wherein solids are decomposed by anaerobic bacterial action. Usually part of a rural on–site sewage treatment system. Typically, septic tanks would have a volume of 1–3 times the daily sewage flow. Also see Septic System. |
| **Septic Tank Absorption Field** | A soil absorption system for sewage disposal, consisting of a subsurface tile system laid in such a way that effluent from the septic tank is distributed with reasonable uniformity into the natural soil. |
| **Setback** | The distance from a guilt structure to the regulated high water mark of a lake and/or a property line. |
| **Sewage Treatment** | The processing of wastewater for the removal or reduction of contained solids or other undesirable constituents. |
| **Spring** | A concentrated discharge of ground water coming out at the surface as flowing water; a place where the water table crops out at the surface of the ground and where water flows out more or less continuously |
| **Stewardship** | Administrative and/or custodial actions taken to preserve and protect the Natural Resources, particularly the plant (Flora) and animal (Fauna) life, of an area or Ecosystem. |

| Term | Definition/Description |
|---|---|
| **Stream** | A general term for a body of flowing water; natural water course containing water at least part of the year. |
| **Swamp** | A term frequently associated with Wetlands. Wet, spongy land; low saturated ground, and ground that is covered intermittently with standing water, sometimes inundated and characteristically dominated by trees or shrubs, but without appreciable peat deposits. Swamps may be fresh or salt water and tidal or non–tidal. It differs from a Bog in not having an acid substratum. |
| **Tarn** | A small steep–banked mountain lake or pool, generally formed by a glaciation process. |
| **Terrestrial** | Living or growing on land rather than in water or air. |
| **Topography** | The general configuration of the land surface including relief and position of natural and man–made features. |
| **Total Dissolved Solids** | A measure of the amount of material dissolved in water (mostly inorganic salts). Typically aggregates of carbonates, bicarbonates, chlorides, sulfates, phosphates, nitrates, etc. of calcium, magnesium, manganese, sodium, potassium, and other cations which form salts. An important use of the measure total dissolved solids involves the examination of the quality of drinking water. Water that has a high content of inorganic material frequently has taste problems and/or water hardness problems. |
| **Turbidy** | The term "turbid" is applied to waters containing suspended matter that interferes with the passage of light through the water or in which visual depth is restricted. The turbidity may be caused by a wide variety of suspended materials, such as clay, silt, finely divided organic and inorganic matter, soluble colored organic compounds, plankton and other microscopic organisms and similar substances. Turbidity in water has public health implications due to the possibilities of pathogenic bacteria encased in the particles and thus escaping disinfection processes. Turbidity interferes with water treatment (filtration), and affects aquatic life. Excessive amounts of turbidity also make water aesthetically objectionable. |
| **Viewscape** | The natural environment that is visible from one or more viewing points |
| **Vista** | A distant view through or along an avenue or opening |
| **Water Clarity** | The transparency of a water column, measured with a Secchi disc. |
| **Water Quality** | A term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular purpose. |
| **Watershed** | All lands enclosed by a continuous hydrologic drainage divide and lying upslope from a specified point on a stream. |
| **Wetlands** | Wetlands are those areas where water saturation is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the surrounding environment. |

Sources: North American Lake Management Society Glossary (http://www.nalms.org/home/lake–management/water–words–glossary/Water%20 Words%20 Glossary.cmsx ); en.m.wikipedia.org/wiki/Biodiversity; The New Webster Encyclopedic Dictionary of The English Language, 1980 edition, Avenel Books, New York; The American Heritage Science Dictionary Copyright 2005 by Houghton Mifflin Company.

## Appendix 3 GLPOA Code of Conduct

# PERSONAL CODE OF CONDUCT

### FOR GLPOA MEMBERS, FAMILIES, & GUESTS

1. Follow all federal, provincial (including OMNR – Ontario Ministry of Natural Resources), municipal, Dysart et al, and Growler Lake Property Owners Association regulations and by laws, including, but not limited to, noise, water, air pollution, land use as well as building guidelines. Note: The new shoreline tree removal by law as of Aug. 29, 2012.
2. Use biodegradable products for cleaning and personal hygiene whenever possible. Avoid all products such as those with phosphates, et cetera, and anti–bacterial products which will disrupt our lake's bacterial population.
3. Bathing of yourselves or your pets in the lake with shampoo or soap is strongly discouraged.
4. Clean all watercraft (motorized and non–motorized) with biodegradable products prior to entry and/or re–entry into Growler Lake ensuring that the resulting runoff water does not enter the lake. Make sure live wells are safely emptied prior to boat launching in Growler to avoid contamination with unwanted species.
5. Dispose of all waste correctly and safely, including waste from construction trailers on building sites. Construction materials (including stumps) should be dumped in appropriate facilities (not along the road or in either gravel pit).
6. As The Common (water and air) belongs to all of us, barring any emergency, anyone who wishes to alter said Common in any way should contact the Executive for direction.
7. Adopt safe fire pit construction, use, and maintenance practices. Follow local fire restrictions and bans. See www.foca.on.ca/firesmart–cottage–fact–sheet.
8. Familiarize yourself and adhere to boating laws and regulations, including speed limits (e.g. no more than 10km within 30 metres/98.5 ft of shoreline), wake restrictions, engine noise, right of way, etc. to ensure safety, enjoyment and minimal shoreline erosion.
9. Help to maintain the quiet, peace, comfort, and enjoyment that many of us chose Growler Lake for, by keeping noise to a minimum. Sound travels easily across the lake so especially between 11:00pm and 7 a.m., be considerate re :

    - loud music, especially amplified sound
    - persistent barking or whining of dogs
    - persistent loud yelling, shouting, or singing

    If you plan to set off fireworks, shoot guns or other firearms, or have a noisy party please make a reasonable effort to inform your neighbours on the lake – or invite us to the party!

# Appendix 4 BY–LAW NO. 11



**BY-LAW NO. 11**

A by-law to adopt a prohibition on the use of Motorized Personal Watercraft on Growler Lake.

**GROWLER LAKE PROPERTY OWNERS' ASSOCIATION**

**WHEREAS** it is known that Motorized Personal Watercraft have a significant negative environmental (noise, fuel vapor emission, shore erosion, etc.) and biological (phototoxicity, etc.) impact, and that the involvement of motorized personal watercraft in accidents resulting in injury and/or death is disproportionate to their use by the boating population:

**BE IT ENACTED** as a by-law of Growler Lake Property Owners' Association, as follows:

**Article 1 Definition of Motorized Personal Watercraft**

1.1 a motorized watercraft less than 13 feet in length designed to be operated by a person or persons sitting, standing, or kneeling on the craft rather than within the confines of a hull.

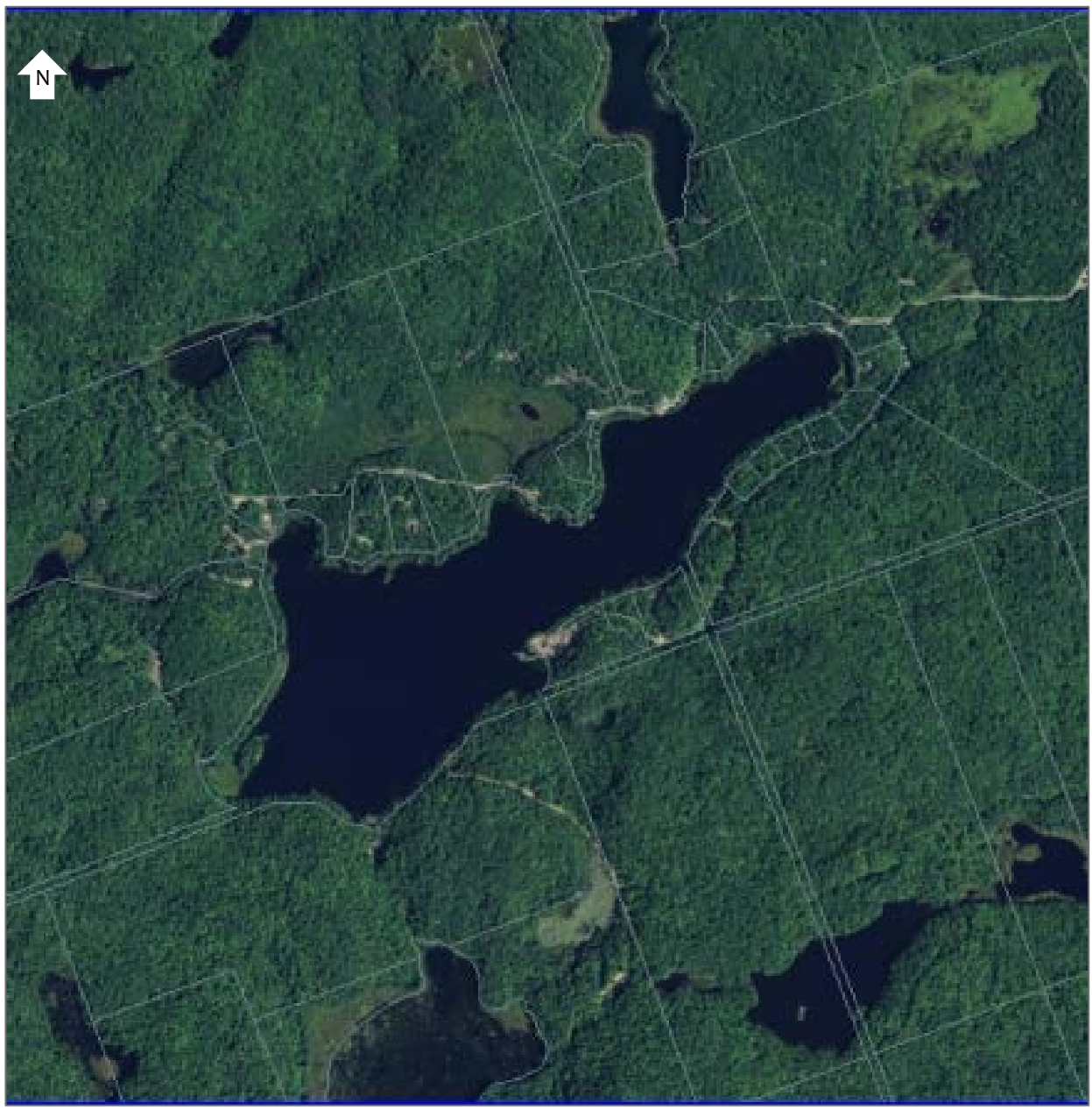
**Article 2 Prohibition on Motorized Personal Watercraft**

2.1 The use of motorized personal watercraft, as defined in section 1.1, is prohibited on Growler Lake.

2.2 Growler Lake Property Owners Association members are responsible to inform/advise their families, guests, and renters of the prohibition of motorized personal watercraft on Growler Lake.

Passed by the Members on October 19, 2013.

# Appendix 5 Growler Lake – Aerial with Parcel Outlines

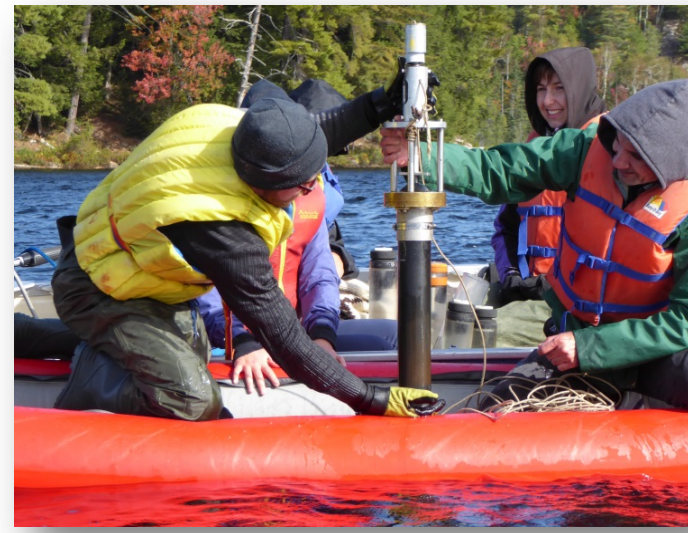


# Appendix 6 Growler Lake – Aerial of Growler Lake Drive

# Appendix 7 Paleolimnology Study of Growler Lake: A 270-Year Record of Environmental History Stored in the Sediments of Growler Lake

Paleolimnology is the multidisciplinary science that uses physical, chemical, and biological information preserved in lake sediments to reconstruct past environmental conditions. Sediments that accumulate in lakes provide records typically spanning years to millennia, and knowledge extracted from this natural archive can effectively dovetail with monitoring data that is of shorter duration.

A paleolimnological study of Growler Lake was conducted by Dr. Brent Wolfe (Wilfrid Laurier University), Dr. Roland Hall (University of Waterloo), and graduate students (Stephanie Francis, Eric McQuay, Nicole Meyers, Wathiq Mohammed, Janina Reis, Casey Remmer, Christine Ridenot, Stephanie Roy, James Telford, Emily Trendos, Nelson Zabel) enrolled in their 'Paleolimnology' course during Fall 2015. On cool, windy 2 October 2015, the paleolimnology research team obtained sediment cores from the lake using a gravity corer. Sediment cores were collected from the eastern and central parts of the lake at water depths of about 5 and 20 m, respectively. The sediment cores were approximately 40 cm in length. On shore, the lake sediment cores were then described and sectioned at 0.5-cm intervals.



Collecting a Sediment Core

Sediment samples underwent several analyses in laboratories at the University of Waterloo and Wilfrid Laurier University. To establish a timescale for the sediment core, radiometric analyses of 210Pb and 137Cs were performed using a gamma ray spectrometer. 210Pb results were used to model sedimentation rates and to generate the sediment core chronology. Measurement of 137Cs was used to identify the stratigraphic horizon that represents 1963, corresponding to the peak in above-ground nuclear weapons testing that released this radioactive isotope into the atmosphere. Loss-on-ignition analyses and measurement of organic carbon and nitrogen elemental and isotope composition were used to reconstruct past changes in the source of organic

Sectioning the Sediment Cores

matter (from soil and plants in the catchment versus from aquatic plants in the lake), nutrient balance, and aquatic productivity. Samples were analyzed for algal pigment concentrations using high performance liquid chromatography. Results were used to reconstruct the abundance of different algal groups, which can provide information about past nutrient conditions. Diatoms were identified – they are a diverse form of microscopic algae with cell walls made of silica that preserve well in lake sediments and inform us about changes in water chemistry (nutrients, pH), productivity, and habitat (e.g., growth of weed beds along the lake shore).

The research project was conducted to answer several questions, including: 1) How have environmental conditions in Growler Lake changed over time?; 2) Are there changes in lake conditions associated with the history of human activity in the watershed?; 3) How has watershed erosion changed over time and influenced the lake?; 4) Has recent climate change affected the lake?; and 5) Have environmental changes taken place since cottage development? As summarized below, findings contribute knowledge of the natural and human history of Growler Lake and assist with implementing the principles of lake management.

## Results

The figure shows key results from analysis of the sediment core that was obtained in the central part of the lake at 20 m depth. The 210Pb data indicated that the 38-cm core spanned approximately 270 years to 1745. Results are plotted versus time and include: sedimentation rate, organic matter content and carbon to nitrogen ratio, pigment chlorophyll a concentration and the chlorophyll a to pheophytin a ratio, and diatom species Tabellaria flocculosa strain IIIp, Aulacoseira distans, and Cyclotella stelligera.

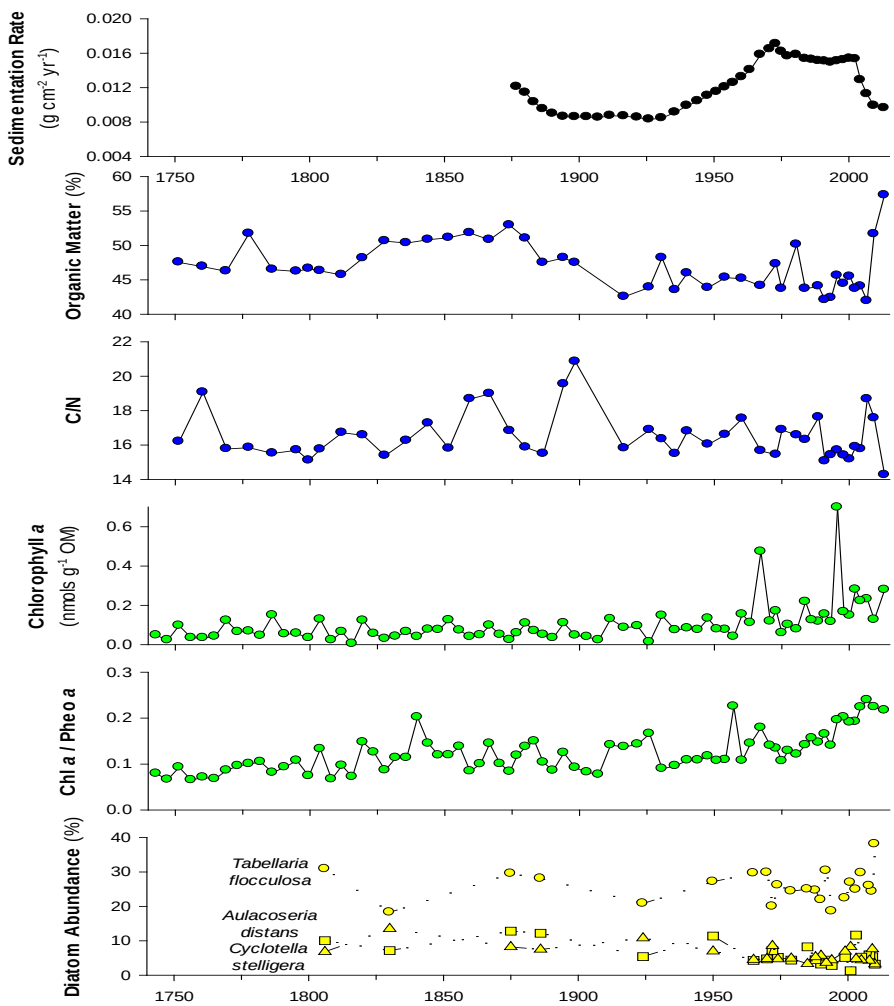



Figure A.1
Selected Sediment Core Analyses vs Time

Small changes in sedimentation rate, shown for the past 140 years, appear to closely correspond with changes in logging activity and erosional intensity in the watershed. The decline in sedimentation rate between 1875 and 1882 may reflect the decline of logging activity around Growler Lake. This marks the time when the local logging company, headed by W.H.L. Gordon and J.M. Irwin who owned lumber harvesting rights to the entire Haliburton region, began to decline after an economic boom in the 1870s. Consequently, little lumber was cut in the 1890s and Irwin eventually declared bankruptcy in 1895. Low sedimentation rates until 1930 correspond to a time when no logging activity occurred. After 1930, increased logging, initially in response to increased demand for lumber during World War II, corresponds with steadily increasing sedimentation rate to the early 1970s. After 1974, sedimentation rate declines slowly until the mid-1990s when logging activity ceased. From 2003 to the present there is a sharp decline in sedimentation rate to rates approaching earlier times when there was no logging activity in the watershed, suggesting that cottage development has not led to increased erosion.

The geochemical data (organic carbon content and carbon/nitrogen [C/N] ratios) indicate that the sediments contain a mixture of organic material derived from erosion of soils in the watershed and from aquatic plants in the lake. Generally, high C/N ratios indicate more terrestrially-derived organic matter and low C/N ratios indicate more aquatic-derived organic matter. For example, peaks in C/N ratios at 1760, 1860, and 1895 suggest times of increased supply of organic matter from the watershed. It is interesting that the largest C/N ratio peak at 1895 corresponds with a time of reduced logging activity suggesting a natural event (e.g., major storm) may have been the cause for increased erosion at this time. This may have also been the case for the high C/N ratio at 1760, whereas the high C/N ratio at 1860 may correspond with early logging activity. Note that changes in the organic matter content and the C/N ratio at the top of the core are likely due to incomplete degradation of freshly deposited organic matter.

The pigment results suggest that algal productivity has not varied substantially during the past 270 years. This is best captured by chlorophyll a, which is a photosynthetic pigment produced by all algae and widely used as a measure of algal growth in water quality studies. The chlorophyll a concentration has remained relatively constant throughout the core. A slight increase in chlorophyll a values during the past few decades is likely not related to an increase in aquatic productivity but rather is attributed to greater preservation of recently deposited organic matter. This interpretation is supported by the increase in the chlorophyll a to pheophytin a ratio, which can be used as a pigment preservation index. Overall, low chlorophyll a values indicate that Growler Lake has maintained an oligotrophic status, despite land use changes within the watershed.

Composition of diatom communities was consistent throughout the sediment core, as shown by the relative abundance of the three most common species (Tabellaria flocculosa strain IIIp, Aulacoseira distans, Cyclotella stelligera). The communities were diverse with no taxa dominating individual sediment samples, reflecting a healthy aquatic ecosystem. Most of the taxa are known to grow in the deep-water zone of slightly acidic, nutrient-poor lakes in the mixed deciduous-coniferous forest zone and with slightly brown waters resulting from carbon supplied by fringing wetlands and forest soils. Consistent with results of pigment analysis, the diatom data suggest Growler Lake has maintained excellent water quality throughout the past 270 years.

In summary, conditions in Growler Lake have, to a large extent, remained relatively constant during the past 270 years. Small changes in sedimentation rate correspond with logging activity but importantly, sedimentation rate appears to have returned to a rate similar to the latter part of the 19th century and early part of the 20th century when logging activity was reduced. This has occurred despite development of cottages suggesting recent land-use change has not increased erosion in the watershed. Likewise, cottage development does not appear to have altered algal production or water quality in Growler Lake. Continued stewardship and water quality monitoring to detect any future changes are recommended.

Note that these results were presented to the Growler Lake Property Owners Association by the University of Waterloo and Wilfrid Laurier University graduate students on 17 December 2015.