Big Bald Lake Plan

February 22, 2010

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Introduction

Context Map Kawarthas

Big Bald Lake is a jewel among the Kawartha Lakes. Nestled snugly to the west of Buckhorn, the lake is made up of a number of bays around the perimeter and random islands dotting the central portion, yielding a uniquely beautiful view from the shoreline of each property. Regardless of the season, the lake environment provides an amazing experience to all who live or visit.

Over the years the watershed surrounding Big Bald Lake has had many changes: highway improvements, property development, an increasing population and demand for recreational opportunities. The trend is away from small family cottage and boats with small horsepower, and towards more permanent homes, landscaping, larger cottages, high-speed boats and personal watercraft. However, the lake remains a highly desirable place to cottage and live and this is evident by the rising property values over the past decade.

The most significant trend in recent years is the growth in the number of year round residents on the lake. This in itself will likely have the most profound impact on the lake for both the short and the long term. Big Bald Lake does not lie within the boundaries of any Conservation Authority. As well, while a number of different government bodies have jurisdiction over various aspects of the lake, there is no single body or overall “champion” organization for the lake.

Therefore, the future of the Big Bald Lake watershed is to a large extent in the hands of its stakeholders.

Big Bald Lake is a jewel worth protecting. Our Lake Plan will help us do that.

Members of the Lake Plan Steering Committee:

Rob Arkell
Bruce Barnes
Duncan Brown
Keith Gardner
Earl Hughes
Susan Lewin
Dr. Eric Sager
Bonnie Ginter-Brown
Bev Mathews
Paul Ventresca

Purpose of the Lake Plan

The intent of the lake plan is to engage the Big Bald Lake community members to identify and protect the lakes’ special areas and features by improving the long-term sustainability of the lake system through community stewardship, and improved land use planning policies.

The Lake Plan will become the voice and advocate of the lake and represent the best interests of the lake environment and residents. Best practice policies will be clarified in the lake plan, with an action plan to ensure ongoing implementation. Education and communication of these best practices are key goals of the Lake Plan.

The development of the lake plan is a process which takes a pro-active rather than reactive approach to managing the future of the lake and its surrounding environment. The Lake Plan is intended to be a living document that will continue to evolve over time as new issues and circumstances occur and new information becomes available.

The Process

Lake Planning Process

STEP 1
Initial Preparation
Confirm the framework for the project and establish a Steering Committtee

STEP 2
Collect Background Info
Collect information on the Natural, Physical, and Social Elements, and Land use through Workshops, surveys, and research

STEP 3
Prepare Lake Plan
Develop the Lake Plan, and establish actions to be implemented, and confirm with steering committee, lake residents, and stakeholders.

STEP 4
Implementation
Create awareness about the Lake Plan and undertake Actions.

The Big Bald Lake Plan was created through the volunteer efforts of a Steering Committee which included members of the Big Bald Lake Cottagers Association, Councilor Bev Matthews (Galway-Harvey-Cavendish) and Dr. Eric Sager, of the Trent University/Fleming College Environmental Science program. At various points in the process, the committee also engaged the services of lake plan consultant Randy French, of French Planning Services, to help design a framework, facilitate meetings, gather and evaluate background information, and generally guide the process.

The Association approached all stakeholders who had vested interest in the lake to participate in the process. This included full time residents, cottage and property owners, local businesses, and local government. The intent of the process was to engage property owners in a discussion about the values that are important to their quality of life, and to identify the issues and concerns that impact these values, and to prepare an action plan to carry forward.

Information for the Lake Plan was gathered by a number of individuals and groups, as outlined below:

- Committee volunteers- general research
- French Planning Services- provided information regarding official plan policies and prepared maps
- By Trent Environmental Science students- provided research papers on Aggregates, Lake Capacity and Sensitive Lands

The process of preparing the plan was as important as the end product, and it was important that ample opportunity be given to all stakeholders of the Bald Lake watershed area to provide input. The main method of engaging stakeholders were surveys and workshops. As a result this process was conducted over a three year period.

Values Survey 2006

Surveys distributed via newsletter, email, and hard copy during summer of 2006. Approximately 200 surveys were distributed and 50 surveys (25%) were returned. The survey asked about what values had the most impact on their enjoyment of the lake, relating to categories including water quality, swimming, scenery, shorelines, noise, boating and fishing. The surveys served to highlight what was important to the waterfront residents as well as negative impacts. Overall, aspects of the natural environment were key areas of appreciation, and concerns related to changes and threats to the

natural environment were uppermost. Water Quality stood out as the number one concern, as it impacts all aspects of the experience on the lake.

Lake Values

Water Quality
Swimming
Scenery/View
Natural Shorelines
Peace and Quiet
Wildlife Viewing
Night Skies

Lake Issues

Aquatic Vegetation proliferation (weeds)
Boat traffic and safe boating
Noise and Light Pollution
Development
Taxes
Shorelines

The key values and issues identified are shown on the tables in the sidebar.

Stakeholders Workshop 2007

A resident and stakeholder workshop was held on July 7, 2007, at the Buckhorn Community Centre, and was facilitated by Mr. Randy French of French Planning Services. The purpose of the workshop was to promote discussion among waterfront property owners and others from the community to identify the important values and special features that support the current high quality of life in the area. Discussion was also promoted to identify the issues that impact these values, and the potential solutions. Approximately 25 people were in attendance.

The workshop was divided into two sessions. The first session dealt with identifying the general values and special places in the area that support the high quality of life of people who live, cottage, or visit the area. The second session was designed to identify the issues that impact these values and places, and to discuss potential solutions.

List of Information Collected

Natural Elements

- *Water Quality*
- *Aquatic Plants*
- *Streams*
- *Vegetation*
- *Wetlands*
- *Fish and Wildlife*
- *Invasive Species*
- *Endangered Species*

Physical Elements

- *Soils and Steep Slopes*
- *Narrow Waterbodies*
- *Minerals and Aggregates*

Land Use

- *Official Plans*
- *Zoning By-Laws*
- *Legislation*

Social

- *Community Values*
- *Viewscape*
- *Important Sites*
- *Recreation*
- *Noise and Light*
- *Historical Development*

Stakeholder Workshop 2009

A second resident and stakeholder workshop was held on May 17, 2009, at the Angelfire Resort, and was facilitated by Mr. Randy French of French Planning Services. Mr. French reviewed the purpose of the meeting, which was to obtain comments and advice on moving forward. He explained in detail the planning work done to date, the role of Lake Planning in promoting stewardship of the Lake, and lake planning work that other lake communities have done. He explained how the Lake Plan is organized around environmental and land use principles and targets. Susan Lewin presented a comprehensive outline of the Draft Lake Plan, concluding with a list of 10 action items that evolved from the plan.
A discussion ensued on the action items proposed. Suggestions were tabled in the meeting minutes, and the action items were revised to reflect consensus on priority items. Approximately 50 people were in attendance.

Background Information

The collection and analyses of background information was primarily completed by volunteers who live or cottage at Big Bald Lake. A list of tasks was compiled and the volunteers undertook specific components of the plan. The Steering Committee felt this was the best way to minimize costs as well as to promote and maintain local expertise on the lake. The Association's approach was to focus on the collection of existing water quality and natural heritage information.

French Planning Services provided guidance and direction to the Steering Committee, as well as compiling detailed maps on lake watershed, habitat, and land use. There were many agencies that were supportive of the process and involved in collecting background information: the Ministry of Natural Resources (MNR), Ministry of the Environment (MOE), as well as independent research provided by Dr. Eric Sager, Research Scientist at Trent University.

The Vision

The lake vision statement is intended to provide guidance for what the lake should be and look like in the future, and describes a common objective that is important for all community members. The following vision statement reflects the values that are shared by all Big Bald Lake stakeholders.

Our Vision is a place where water quality, wildlife habitat, natural beauty, recreational opportunities, and peace and tranquility is maintained for present and future generations to enjoy.

Following the workshops and the survey, the following principles and targets were defined. The principles apply to the preparation and implementation of the Lake Plan and the targets provide a focal point and a method for measuring efforts in the preparation and implementation of the plan.

Principles and Targets

INCLUSIVENESS
The development process used to create the Plan must be inclusive of all stakeholders and will solicit input and feedback wherever possible.

PROTECT LAKE CHARACTER
The natural, social and historic character of the lake must be protected, enhanced and rehabilitated.

FOCUS THE PLAN ON THE END RESULTS
The plan focuses on end results and a balanced approach, including means such as communication, education, and regulation.

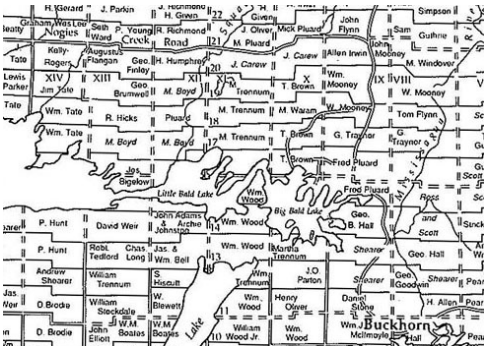
IMPLEMENTATION APPROACH
Implementation emphasizes education, communication, and voluntary compliance over legislative and regulatory constraints.

:

- WATER QUALITY
- FISH AND WILDLIFE
- SHORELINES
- TREES & VISTAS
- DEVELOPMENT
- CHARACTER
- SOCIAL LIFE

Lake Description

Historical Overview



1850 Survey

The first survey of Harvey Township was undertaken in 1818, which is when extensive logging activities commenced. Flooding of shorelines in the 1830's occurred, when the Buckhorn dam was created, to facilitate transportation of log booms. Further flooding, locks and dams occurred between 1875 and 1900, which connected Big Bald Lake to the Trent Severn waterway system. Buckhorn (formerly Halls Bridge until 1936), became an important historical centre, largely due to the road along the top of the dam which provided access to south Harvey.

The result of the flooding and dams that were created is that the water levels on Big Bald Lake are artificially controlled, and parts of the shallow bays are actually drowned land. Early maps reveal that the present Big and Little Bald Lakes were originally separate and a road to Lake Catchacoma crossed between them at the site of the present channel called 'The Elbow'.

Government Road (Hwy 36)
Looking South

A recent hypothesis put forward by the Kawartha Lakes Stewards Association, 2006 Report on Water Quality, states that the Mississagua River, which currently enters the main Kawartha Lake system just downstream of Buckhorn into Lower Buckhorn Lake, once split into two paths. One headed to Lower Buckhorn as it does today, while the other branched west to Big Bald Lake, into a nearby marsh beside County Road 36, and then into Catalina Bay. It is thought that loggers created a blind dam 1 km north of the old Scott's Mill dam to ensure that logs floating down the river did not end up diverted into Big Bald Lake.

A map of pioneer settlers around 1850 shows that early owners around the lake were Pluard, Hall, Shearer, Wood, Trennum, and Brown, most of which owned vast tracts of land, and typically did not settle directly on Bald Lake, although there were some exceptions. One of the early settlers, Tom Trennum, built a frame house on the west side of the 'Elbow'. A pioneer home was located just east of this, built by Matthew Wharam, which ultimately burned down. The Catalina Bay area was settled in 1880 by Thomas Traynor, who worked at the nearby Scott's Mill on the Mississauga River. A lumber camp cook shack remained at Catalina Bay until 1926.

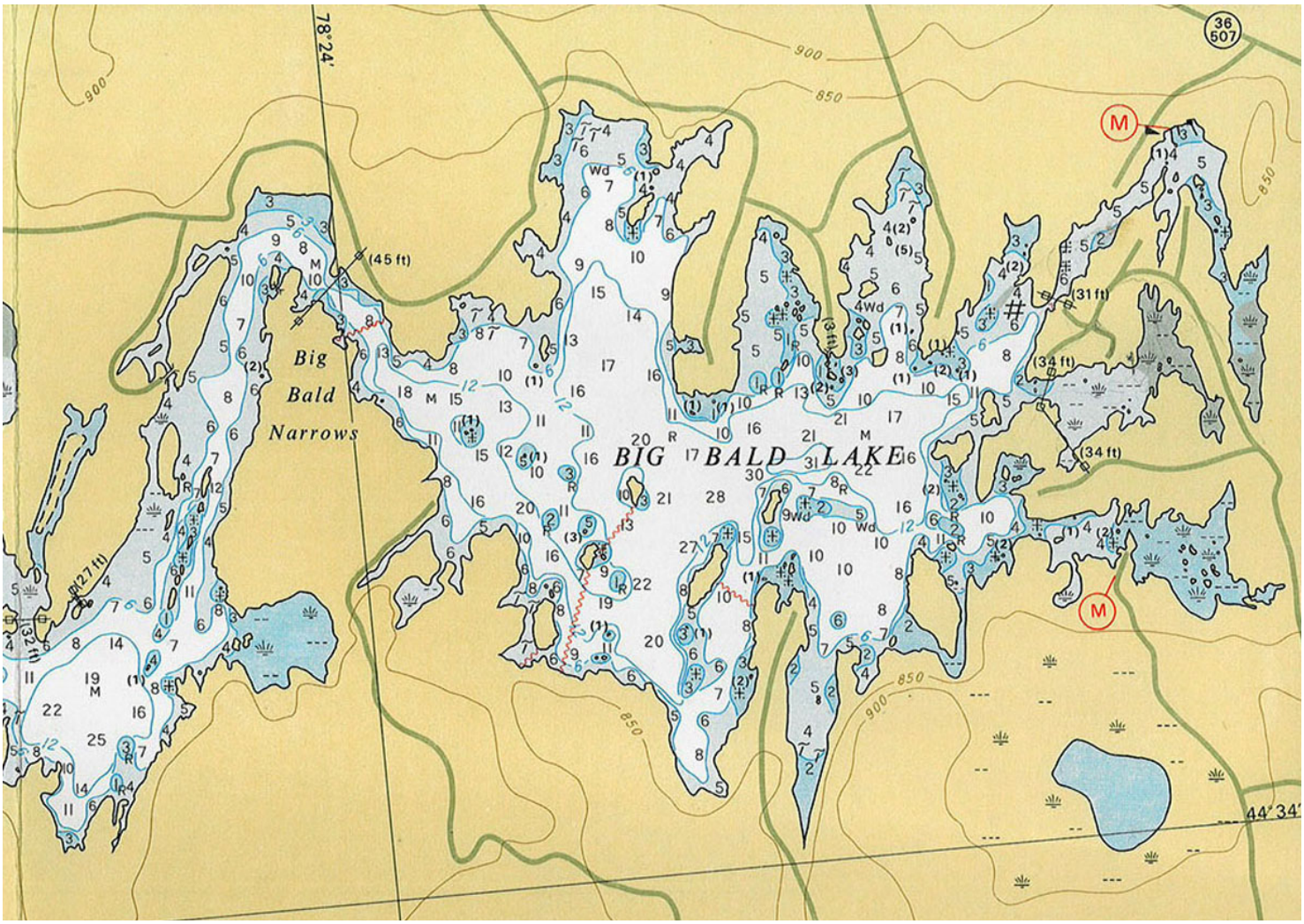
Scott's Mill, built in 1858, had a connection to Big Bald Lake, as it had a railway connected from the mill to Pluard's Landing. Train cars moved to the Lake under gravity, and returned to the Mill by horsepower. Scows towed by steamboat then took the lumber to market via Bobcaygeon. The dock extended 800 feet on pilings to a large crib in deeper water. Evidence of this 'underwater' railway still exists and the log ties are clearly visible. It is interesting to note that large log booms were still seen on the lake as late as the mid 1920's.

After the 1950's, cottaging boomed and retirement resettlement increased, the population increased dramatically, and waterfront farm lots were sold off. The economy in the area transformed to accommodate tourist, recreational, and service employment.

Location Description

Big Bald Lake is located within the Kawartha Lakes region, within the Township of Galway Harvey Cavendish, formerly Harvey Township. It is a small secluded lake at the head of the north-eastern reaches of Pigeon Lake. The Kawartha Lakes are a unique chain of lakes occupying a broad, shallow valley running across the central part of Southern Ontario (Trent Valley). The name Kawartha is derived from an Ojibwa name meaning "bright waters and happy lands". The lakes lie approximately along the boundary between the Precambrian Shield to the north and the overlying Paleozoic sedimentary rock of the south. The waters feeding the Kawartha Lakes vary in composition as a result of the diverse geology. Fluctuations in flow and their effects on navigation historically were addressed by the creation of reservoirs on the upstream lakes, first by damming by the logging industry and later as part of the creation of the Trent Canal.

The Trent-Severn Waterway connects the Kawartha Lakes to both Georgian Bay and Lake Ontario via several water systems including the Trent, Indian, Otonabee, Ouse, Crowe and Severn rivers. These lakes receive their water from headwater lakes originating in the Haliburton Highlands via Gull and Burn-Irondale River watersheds, which drain into Balsam and Cameron Lakes respectively, and from Cameron Lake drain southeast towards Lake Ontario.



Lake Depths in feet

Big Bald Lake lies at a latitude of 44°34' north and longitude of 78°23' west. The lake covers an area of 201.2 hectares with a shoreline length of 21.4 kilometres and an island shoreline length of 2.9 kilometres. The maximum depth of BBL is 9.4 metres.

Water Levels

The water levels in Big Bald Lake are subjected to fluctuations by Trent Severn Waterway management for navigational purposes, as well as for the benefit of inhabitants downstream. The stability of Big Bald Lake water levels are considered by the authorities when determining water level adjustments. Water inflow takes place at the Bobcaygeon lock, and water outflow at the Buckhorn lock. The lake is gradually lowered 1.2 to 1.5 metres, starting in the late fall, in preparation for the spring runoff.

Factors that influence the water level targets are, in order of priority, flood mitigation and public safety, navigation, fisheries, and lastly water quality.

There is some concern among Big Bald Lake property owners that water levels are getting too low at certain times of the year, rending water intake systems useless.

Watershed

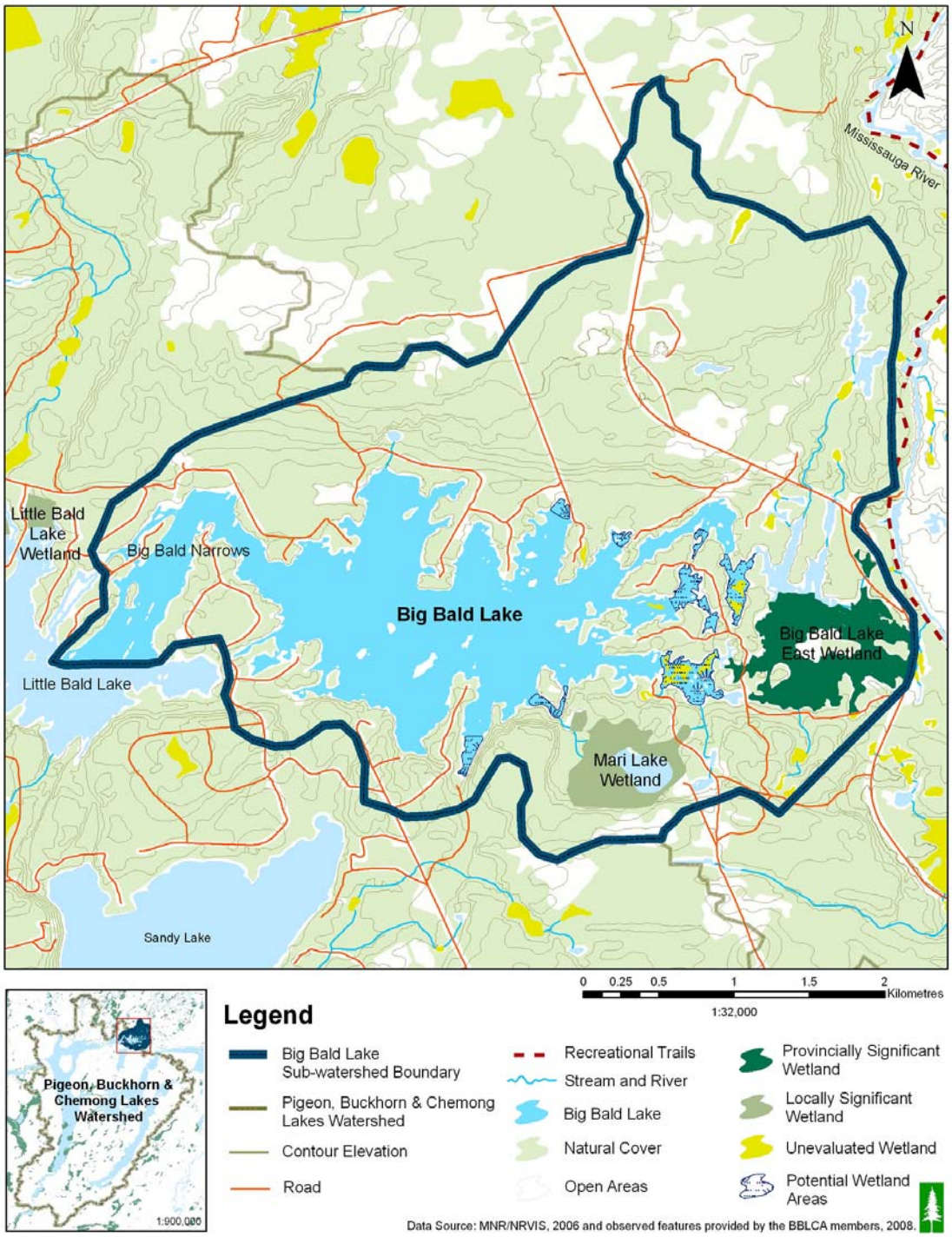
A watershed is the area of land from which water drains and is, eventually, stored into a reservoir or basins of water, such as a lake. The Big Bald Lake watershed follows closely the south and west shore of the lake. At the east, the watershed extends beyond the immediate shoreline to take in the Marl Lake Wetland and the Big Bald Lake East wetland. To the north the watershed extends as far as 3 km from the north shore.

The lake watershed contains several streams and wetlands which drain into Big Bald Lake, which then in turn drains through Little Bald Lake and into the much larger Pigeon Lake. This means that Big Bald Lake itself is a net outflow lake. A key reason for the outflow is that Big Bald Lake is largely spring fed, meaning the lake is flushed on a regular basis. In the context of all Ontario watersheds, BBL watershed is very small and therefore would not cause frequent flushing, because the source streams are very small.

Big Bald Lake is in the fortunate position versus other Kawartha Lakes, in that we have only one contributing watershed. Pigeon Lake for example has 23 contributing watersheds. This

translates into the ability for the Big Bald Lake property owners, with proper planning, stewardship, and enforcement, to largely control the quality of our own waters, irrespective of the water quality of surrounding lakes

Map 1 - Big Bald Lake's Natural Features



Natural Features

Natural heritage areas and features, such as wetlands and fish and wildlife habitat, provide ecological functions that are critical to the survival of all species, including humans. The biodiversity of plants and animals and their habitat is a valuable resource which should be a legacy left for future generations. Biodiversity is non renewable or, at best, extremely difficult to restore once lost.

The topic of water quality is subject to a great deal of attention in our plan, as it has been identified as having the greatest impact on our lake experience. Other key areas include wildlife and fish habitat, wetlands, shoreline vegetation, invasive species, and endangered species

The Big Bald Lake stakeholders have indicated that the lake experience is special because of its largely natural shorelines, water quality, and abundance of wildlife and vegetation indigenous to the area. It is the desire of the community that, through a stewardship approach, the lake remain as close to its current state as possible.

Water Quality

Water Quality is a primary issue
Water is our keystone resource and most survey respondents indicated that quality of water is a value that must be preserved for future generations. Research, along with results from our surveys and workshop results indicate a variety of concerns with our water

quality both currently and for the future. With a decline in water quality comes a decline in the quality of lake life.

Lakes are dynamic and fragile systems, responding not only to artificial stimulus but also to natural fluctuation events. Basin size, volume, soil, bedrock and climate are instrumental in lake buffering capacity. All surface waters are subject to nutrient, sediment and toxic contamination, some of which may come from the lake's own substrate or runoff from the landscape, and others which come from human activity. Artificial manipulation of water levels, shoreline development and land use changes, acid rain and climate change have negatively impacted the quality of lake water across southern Ontario.

Recommendations
Water Quality

Continue to monitor water quality through the Kawartha Lake Stewards Association and Ministry of the Environment Programs

Encourage residents to implement best management practices:
1. Maintain septic systems
2. Minimize phosphate loading into the lake
3. Promote natural shorelines to capture runoff

A number of survey respondents noted concern about water quality deterioration due to the increased presence of bacteria and weeds as well as clarity. Geese and faulty or inadequate septic systems were also mentioned as contributing to worsening water quality.

The factors leading to changes in water quality are numerous, connected, and complicated. In general, there is a lack of consistent data available to make accurate assessments of exactly how water quality is changing over time. However, Big Bald Lake has been involved in a water quality sampling program that is establishing excellent baseline data for future research.

How do we measure water quality? The Ministry of the Environment is responsible for monitoring, regulating, and enforcing the protection and management of water quality and quantity in the province. The Ministry has also established thresholds for water pollutants, with two important pollutants in inland lakes being phosphorus and E. coli bacteria.

Our cottage association measures both of these key indicators through our participation in the Kawartha Lake Stewards Association (KLSA) – Lake Partner program. Since 2002 we have sampled our water approximately six times each year between May and September at various locations around the lake. At the same time, our water clarity is tested.

A special note of thanks to all of our lake stewards over the years who have gathered our samples and delivered them for testing on a volunteer basis!

Phosphorus

Increased nutrient loading can cause negative impacts on watersheds by speeding up the eutrophication process. Many nutrients contribute to this process including carbon, hydrogen, oxygen, nitrogen, phosphorus and sulphur. But the most detrimental nutrient is considered to be phosphorus.

Phosphorus concentrations should not exceed 20 parts per billion (ppb). Levels above these amounts can result in foul smelling algae blooms and deterioration of recreational and aesthetic values. Research shows that a shift towards a turbid, algae dominated lake system is extremely difficult to remediate.

There are two sources of phosphorus in the environment: natural and human-induced. Natural sources are found in a variety of forms from dead plants and animals to geologic make up of the area. Human-induced sources include fertilizer, septic systems, runoff (lawns and storm water), and agriculture.

Big Bald is unique in that its northern shoreline and portions of the eastern and southern shorelines are underlain by large and small pockets of limestone based bedrock. Streams and groundwater flowing through this bedrock may introduce natural sources of nutrients into the system.

However, because Big Bald Lake lies in the Precambrian region, dominated by granite rock, nutrient loading from natural sources is reduced. The granite also limits the potential for agricultural use in the area. Therefore, it is conceivable to conclude that the greatest threat of nutrient loading comes from human-induced sources, including faulty septic systems and shoreline runoff.

E.coli

The presence of E.coli indicates fecal contamination from warm-blooded animals such as birds or mammals, including humans. Sources of E. Coli include septic system discharge into the lake, discharge of boat holding tanks, and wildlife and domestic animal excrement.

Although most strains of E.coli are harmless, some strains cause serious disease, such as in the Walkerton tragedy, or occasionally in ground beef “scares.”

The basic analysis done by KLSA cannot distinguish the difference between the harmless and the deadly, so we always treat E.coli as if we were dealing with a harmful strain.

Water Clarity

Water Clarity is measured by lowering a secchi disk into the water to measure how deep a person can see into the water. The larger the secchi depth, the clearer the water is. Water clarity may be affected by three different factors - algae, sediment disturbances, and/or water colour. The 2004 KLSA report quotes a study that found property values began to decrease as Secchi measurements fell below 4 metres.

How is our lake doing?

Based upon the available information, water quality seems to be in good condition and is fairly stable. Overall results continue to track favourably in comparison to many of the Kawartha lakes.

Phosphorus is measured in “parts per billion” (ppb). The Ontario Ministry of the Environment has established a threshold of 20 ppb to avoid nuisance concentrations of algae in lakes. The KLSA places lakes in 3 categories according to their Phosphorus content. Big Bald Lake lies in the “Low Phosphorus” category, as measured recently, with levels averaging 15 ppb or lower.

E.coli is measured in “E.coli per 100 millimetres of water (E.coli/100 mL)”. E-coli measurements are best known for their use by public health officials, who will post beaches as unsafe to use when counts exceed 100 E.coli/100 mL. KLSA considers counts at 20 E.coli/100 mL and below, with occasional counts between 20 and 50 as normal for the Kawarthas. Counts on Big Bald Lake are generally in this category. Our occasional counts above 50 are often attributed to large populations of Canada geese in the area.

If we are to try and maintain our E.coli and phosphate results it is important that lake residents properly maintain septic systems and minimize contributing phosphate loading to the lake.

According the KLSA Lake Partner Program data, the lake is moderately transparent based on a ten-year average of 3.85 m.

Aquatic Plants

Recommendation
Aquatic Plants

Participate in the Kawartha Lakes Stewards Association aquatic plant project
Promote the use of the KLSA Aquatic Plant Management Manual to be distributed in 2009.

While a certain amount of aquatic plant life is normal, there comes a point when the abundance of aquatic plants in a lake is excessive. Typically we begin to call them "weeds" when they impede our ability to enjoy the lake experience. For many of our survey respondents, Big Bald Lake is now at that point, and getting worse.

In contrast to many northern lakes of the Canadian Shield, the Kawarthas are naturally more productive ecosystems, meaning they are full of life, and can support a greater number of organisms, including aquatic vegetation. A certain amount of aquatic weeds are natural and play a positive role in the lakes ecosystem. Fish utilize weeds for shade, protection, food and a place to lay eggs. Weeds also help clarify lake water and slow the action of waves that erode shorelines. Healthy weeds make it less likely that algae will take over a lake, which can result in smelly surface scum that can even be toxic.

There is no single reason as to why the aquatic vegetation in our lake has proliferated beyond its natural level. Instead there appears to be a variety of contributing factors, including the following:

Excessive Nutrients – when levels of nutrients like phosphorus and nitrogen increase to higher than natural levels in the lakes, they become a strong fertilizer for excessive plant growth. These extra nutrients can come from local agriculture, inadequate controls of effluent at sewage treatment plants, atmospheric deposition of airborne dust from cities & towns, urban storm water runoff, and also from the shoreline itself through fertilizer applied too close to shore and "leaky" septic systems.

Invasive Species – invasives are non-native species that grow rapidly in new regions. Eurasion milfoil and curly-leaved pondweed are two such species that can be found in Big Bald Lake.

Zebra Mussels – these small, freshwater mollusks grow attached to hard surfaces and phytoplankton in the water. They increase water clarity, which allows sunlight to travel deeper into the lake, and stimulating plant growth. As well, zebra mussels deposit nutrient rich feces on the sediment, which promotes weed growth.

A variety of methods are being used to control aquatic plant growth in the Kawarthas. Some of the more popular include

- Benthic Mats
- Herbicides
- Cutters
- Mechanical Harvesters
- Raking or Pulling
- Kernals of Corn – used to attract carp

The KLSA has produced a guide on aquatic plants, which includes a review of the above control methods. A proposed action of this lake plan is to distribute this guide to the membership.

Streams

Streams are a significant feature of the landscape and are an integral source of water to the lake, including freshwater from ground sources. Streams also provide for specific habitat for fish and wildlife. There are approximately fourteen streams that flow into Big Bald Lake. Based on the FPSI map and MNR digital data, the 14 streams represent all inflowing streams to Big and Little Bald lakes, including, those entering Big Bald via Big Bald Lake east PSW (provincially significant wetland).

All of these streams occur on privately owned land. These streams have not been surveyed or inventoried to date.

Inappropriate development and human activity may threaten stream habitats through sedimentation, nutrient impacts, channelization, herbicides, pesticides, infilling, dredging, and changes in flow.

Vegetation

Natural vegetation helps to stabilize soil from erosion and reduce runoff into the lakes, as well as providing a good food source and habitat for wildlife.

Big Bald Lake`s watershed is comprised of mixed and coniferous forests, and the shorelines are dominated by forest mixed with rocky granitic outcrops, and numerous pockets of wetland vegetation in the bays and inlets. Historically the watershed was covered with old growth Eastern White Pine and Eastern Hemlock.

Intensive logging in the late 1800`s and early 1900`s removed these stands, replacing them with younger mixed forest, dominated by white pine, maple, and red oak trees. The landscape is predominantly forested and non-agricultural, owing to the rough, rocky topography.

Wetlands

Recommendation
Wetlands

Work to locate, verify, evaluate and map all remaining wetlands via municipal and provincial policy.

Promote public education about importance and conservation of all natural habitats including wetlands.

Wetlands are nature's filters, purifying water sources from the surrounding landscape. In addition, they provide habitat for fish and wildlife, flood and erosion control, shoreline stabilization and sediment retention for the protection of water quality, recharge for groundwater. Wetlands also represent opportunities for tourism, recreational and education. Unfortunately wetlands are seriously threatened natural features within the Trent Severn waterway system. Further loss of wetlands will result in the decline of biological diversity, water quality, manageable water flows, recreational and educational values, and fishing/wildlife viewing. As lake stewards, we must provide protection against disturbance and loss of wetland habitat.

Provincially significant wetlands
Within the Big Bald Lake watershed there are a number of wetland areas contained in the many shallow bays and inlets. There are two major wetlands which have been evaluated by the ministry of Natural Resources as being significant: Big Bald Lake East wetland is assessed as being a 'provincially significant' wetland and Marl Lake wetland is assessed as being a 'locally significant' wetland.

There are many other wetlands within the lake which may be sensitive areas but to date have not been evaluated. Specifically, there are bays along the eastern side of the lake, as well as one bay on the west side and one bay on the channel between Big Bald Lake and Little Bald Lake which could be categorized as wetland areas (swamps, marshes).

Although these areas have not been classified as sensitive lands, likely due to their small size, they may play a critical role in the water quality of the lake, provide critical habitat for mammals, birds and/or reptile, and therefore be sensitive lands for the overall quality of Big Bald Lake.

The last ministry review of Big Bald Lake wetlands was completed in 1985, and a new review is needed to locate all unevaluated wetlands. The action that is recommended is to work to locate, verify, evaluate and map all remaining wetlands via municipal and provincial policy.

Area Mammals

White tailed deer
Moose
Raccoon
Black Bear
Lynx*
Mink
Bobcat*
Northern River Otter*
American Marten*
Fisher
Beaver
Muskrat
Porcupine
Striped Skunk
Bats
Weasel Species*
Eastern Chipmunk
Red Fox
Coyote
Grey Wolf
Woodchuck
Mice
Moles
Shrews
Snowshoe Hare
Eastern Cottontail
Voles
Red and Grey Squirrels
Northern and Southern* Grey Squirrels

*denotes species are rare or at risk

Fish and Wildlife

Big Bald Lake supports wild, self sustaining populations of Muskie, Smallmouth Bass, Largemouth Bass, Pickerel, Panfish, and some very large Carp. Fishing is a popular activity on the lake.

Wildlife viewing is an integral component that contributes to the high quality of life on the lakes, according to the survey results. A wide variety of mammals listed for the area have been confirmed. In addition, our region is home to many reptile, amphibian and bird species, including the Great Blue Heron and Loons, all of which breed in the area.

Shoreline development, lead sinkers and jigs, water level fluctuations, watercraft and nest predators, put loons, other waterfowl, reptiles, and shoreline wildlife at risk of population declines. Fish and wildlife ranked very high in terms of importance the enjoyment of our lake environment. As such, an action of this lake plan is to promote the conservation of our fish and wildlife populations.

Invasive Species

Exotic or invasive species are non-native species that have been introduced into local habitats and can have devastating effects on the overall health of an aquatic ecosystem. Most often, aquatic invasive species have been introduced during fish stocking or have migrated via the Trent Severn waterway. The connectivity of the lakes facilitate the spread of these species through such practices as bait bucket dumping, ballast water dumping, and failure to clean boats prior to launch.

In 2006, BBLCA participated in an invasive species study. The results confirmed the presence of zebra mussels and rusty crayfish, which have become widespread. Zebra mussels increase water clarity and phosphorus, which promote algae and other growth. There was no confirmed presence of the spiny water flea. The aquatic plant Eurasian water milfoil is confirmed, as well as purple loosestrife which grows around the lake.

Species at Risk

The long term existence and rehabilitation of these species depends on the protection and maintenance of their breeding habitats, including foraging and migration corridors. There are currently six bird and six reptile species listed at risk in our area, and at least 10 more listed species that may be inhabiting areas within the watershed. Locating and identifying rare species helps to protect their habitat, local biodiversity, and the lakes' natural heritage.

Current Species at Risk

Bald Eagle
Golden Eagle
Peregrine Falcon
Red Shouldered Hawk
Short eared owl
Black Tern
Blanding's Turtle
Stinkpot Turtle
Northern Map Turtle
Eastern Hog Nosed Snake
Eastern Milksnake

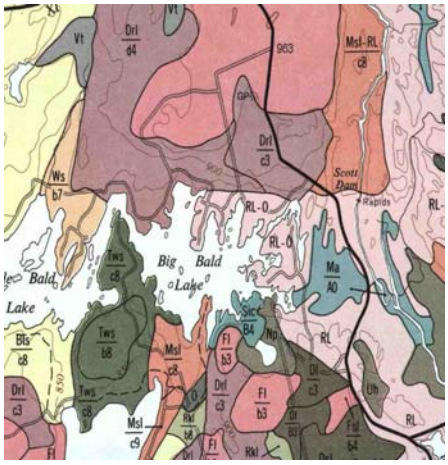
Potential Rare Species

Great Grey Owl
Red headed Woodpecker
Louisiana Waterthrush
Southern Flying Squirrel
Eastern Wolf

Physical Elements

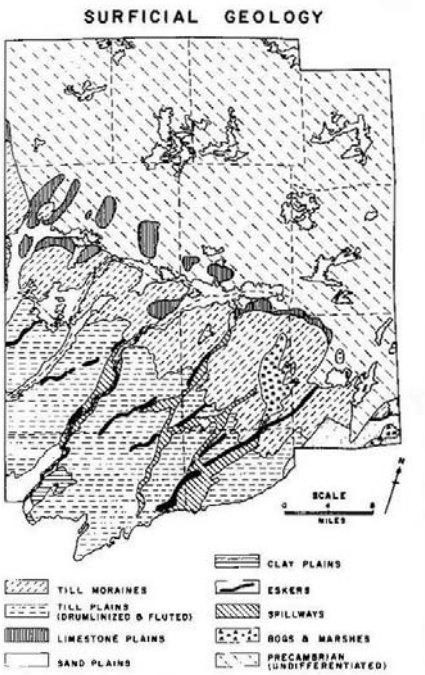
Physical Facts

The Kawartha Lakes area straddles the Canadian Shield boundary. The mix of Pre-Cambrian granite and limestone bedrock create a mix of unique and rare ecological communities including alvars and old growth white pine forests. The topography of the area is defined by till moraines and drumlins, rocky outcrops, and numerous wetlands: landscape features reminiscent of past glacial activity.



Soil Map

Big Bald Lake occupies a rough granitic landscape, which emerges from the level limestone to the immediate south, and bears a distinctive vegetation of juniper, pine, birch, oak, and poplar. In shallow moist pockets, mosses flourish and in wider low lying areas a boggy, bushy cover occurs. The topography of Big Bald Lake itself paints two distinctly different pictures when looking at north shore versus south shore. Big Bald Lake has a geologic bedrock of Black River Ordovician (limestone) along the north and eastern shoreline and Precambrian granite and gneiss bedrock along the southern shoreline. Surficial geology (surface bedrock) is predominantly surficial till deposits of Precambrian origin along the northern shoreline and limestone along the southern shoreline. The bedrock geology of limestone makes Big Bald unique.



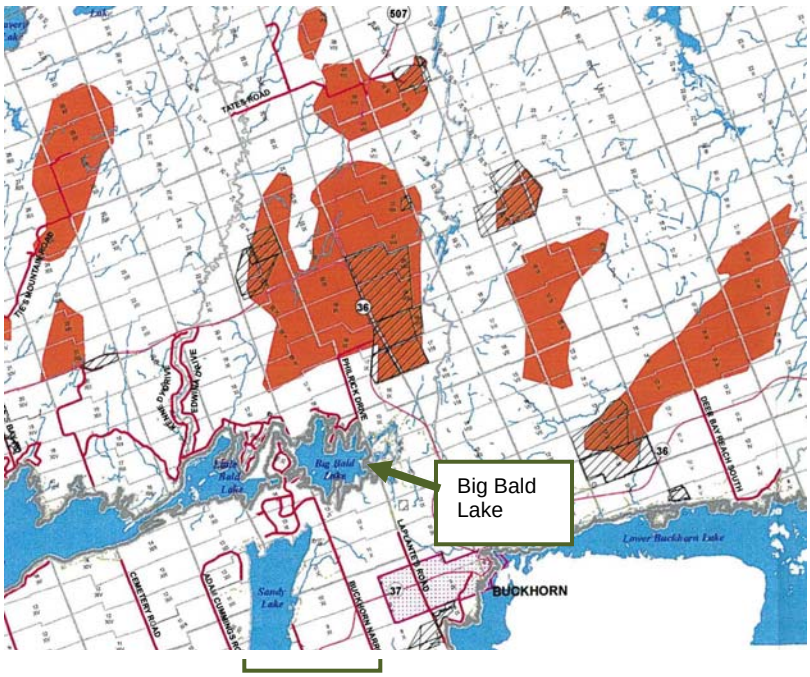
The shoreline vegetation is based on the Conservation Blueprint data which are radio-telemetry and satellite imagery interpretation, not on-the-ground field investigation. The data does indicate pockets of coniferous dominated forest along the shorelines, in particular the wetland areas. Water-loving coniferous species like black spruce, balsam fir, eastern white cedar and even hemlock will often be found along the shorelines and wetland areas. Red pine tends to grow in plantation type forests and on sandy soils. White pine may also be found along the upland slopes of shorelines, also on sandy or rocky soils.

The Big Bald Lake shoreline is irregular, with large pockets of wetland vegetation in the shallow portions. These wetlands support considerable amounts of aquatic vegetation, as well as emergent stumps and boulders.

The soils in the area are shallow, stony, sandy and acidic, with low fertility and frequent bedrock outcrops. The surface deposits are primarily ice deposited materials that range from well drained sandy loam tills to well drained medium to fine sands. The overall thin soil cover of rock, silt, and fine sands on Precambrian bedrock, makes many areas susceptible to erosion if disturbed and are difficult for septic system installation.

Minerals and Aggregates

Aggregates such as sand, gravel, and rock, used for construction, industrial, manufacturing, and maintenance purposes, are plentiful in the local area and several quarry pits are in operation to the north of Big Bald Lake. The map below shows the potential aggregate and landscape stone mining areas (in orange), that the Township has designated as potentially suitable for mining. Only a small portion of this is presently being used for mining (hatched area), although the future potential is for a much bigger area and more intensive operations.



Galway-Cavendish-Harvey Official Plan – Schedule C – high aggregate potential areas shown in orange

There is a small, abandoned limestone quarry adjacent to the Lake on the south shore (on the road to the old marina, now Angelfire Resort).

Locating quarry operations a reasonable distance from residents and environmentally sensitive areas is important due to ensuing negative impacts from blasting, dust, silt runoff, noise, truck traffic and truck noise, and groundwater seepage.

Historically, quarries were typically abandoned once the water table had been reached. More recent legislation has placed greater demands on quarry owners for rehabilitation and restoration of the quarry once operations have ceased.

The demand for aggregate in our province is high and the use of aggregate is widespread ranging from road construction, to shoreline stabilization, to even toothpaste. As a result, the Provincial Policy Statement, the Aggregate Resources Act, and our own municipal Official Plan all contain measures to protect current and future aggregate extraction activities.

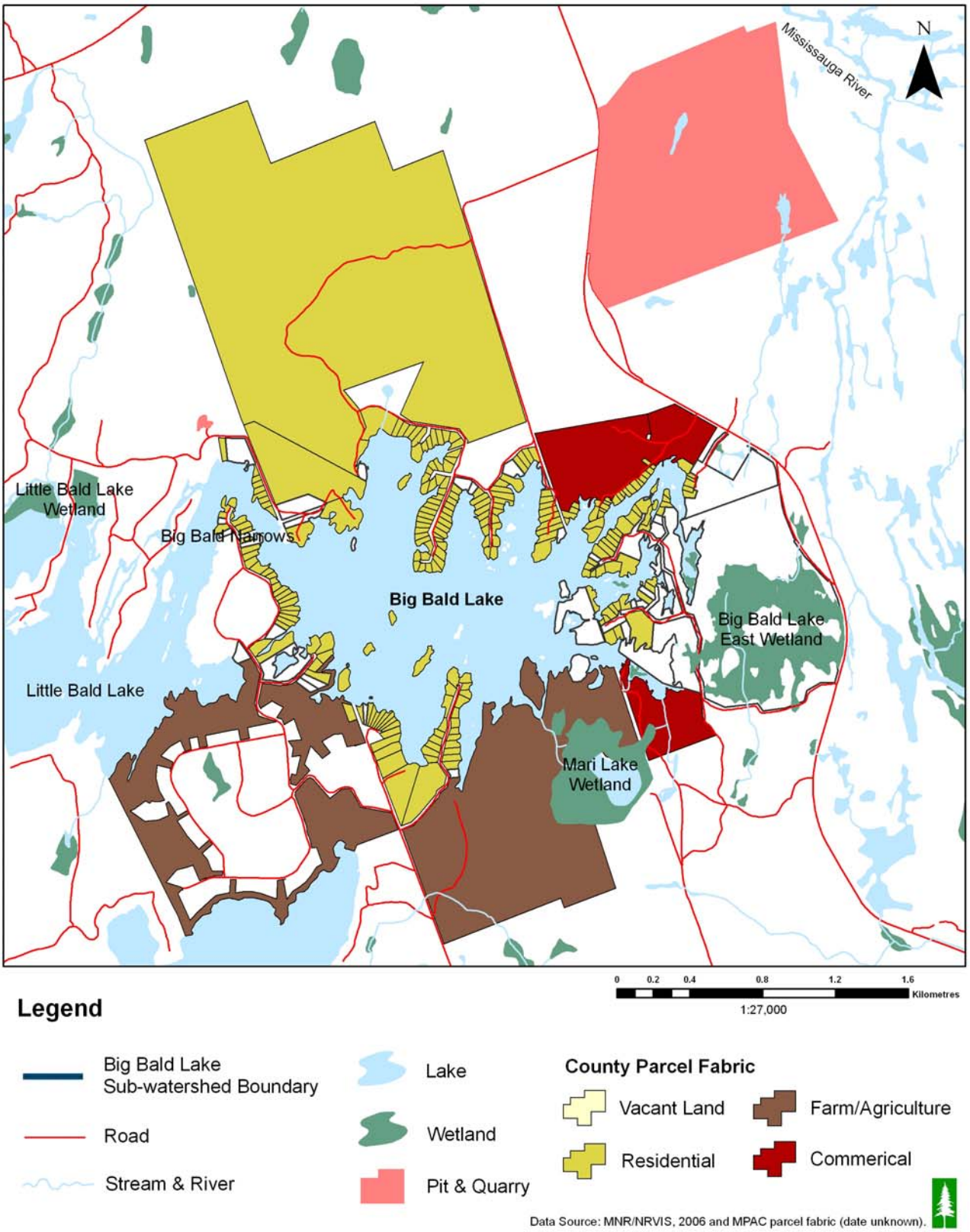
Limestone deposits are widespread in the area and unabated growth in extraction activities may pose a threat to those natural features held high in importance in our lake experience.

Physical Landform Constraints

Narrow water bodies, steep slopes, and floodplains pose constraints to development, due to hazards of human safety, conservation of local character, or protection of significant features. Narrow water bodies are defined as aquatic areas with less than a 150 metre width from shore to shore. The confined nature of these areas results in the perception of increased density and less private recreational space for boating and swimming.

The viewscape in the area surrounding the lakes is that which can be seen form any point along the shoreline. These areas typically encompass a buffer from the lake's shoreline or the highest point of land surrounding the lake. Identifying and protecting our lake's viewscape is important for long term maintenance of the natural beauty surrounding our lake.

Map 2 - Land Use in Big Bald Lake's Watershed



Land Use

Current Status and Trends

The Flow of Legislation

The Big Bald Lake watershed area is within the Township of Galway, Cavendish & Harvey. Most of the shoreline is privately owned and primarily zoned residential. Two commercial properties exist around Big Bald Lake: Catalina Bay Resort on the northeast and Angelfire Resort on the southeast. A large tract of area along the southern shore, including some undeveloped shoreline, is designated Farm/Agriculture, although no agricultural usage occurs today. There are scattered municipal land parcels primarily resulting from old concession road allowance grids that randomly overlaid the lake, many of which have become informal public recreation space.

Some background facts and trends relevant to land use planning on our watershed:

- Big Bald Lake has 260 developed waterfront lots including 5 developed island properties.
- Potential for additional waterfront lots exists in the large undeveloped property in the southeast quadrant of the lake.
- Other potential additional shoreline development would be in the form of conversions, infilling, redevelopment and clusters involving several small lots.
- An increasing number of retiring baby boomers are making their permanent homes on waterfront property
- Important waterfront economic and social activities, such as tourism, depend on maintaining our natural characteristics.
- 8% of urban (Greater Toronto Area - GTA) households own leisure property. An increase in this percentage and the GTA's forecast growth will bring more people to our lake country

Official Plan

The 2005 Provincial Policy Statement was followed by the Peterborough County Official Plan Amendment in 2006, and most recently by the Official Plan Amendment process currently underway for our township. The plans are intended to guide the future growth and development of the townships while respecting preservation of water quality and the natural environment along the lakes and watercourses.

These plans, although prepared for a 20-year time period, are to be reviewed by Council at five year intervals.

The County of Peterborough Official Plan has taken a watershed-based strategic approach to land use planning and water management. Development decisions that enhance natural shorelines (open space buffers and no tree cutting) and other qualities that contribute to the area's character as well as promoting property stewardship, are key principles. The Plan is meant to be a guide to the townships. Therefore, the lower-tier Plans and development decisions must conform to the intent of the County of Peterborough Official Plan. All plans must also be consistent with the Provincial Policy Statement (2005), which provides full and partial protection to natural heritage and water quality from development in the watershed.

Recommendation
Land Use

Develop a system to monitor township decisions and foster engagement of residents in local decisions affecting the lakes and watershed.

Lobby for inclusion in the jurisdiction of a conservation authority

Develop closer relationship with Township, promote exchange of information.

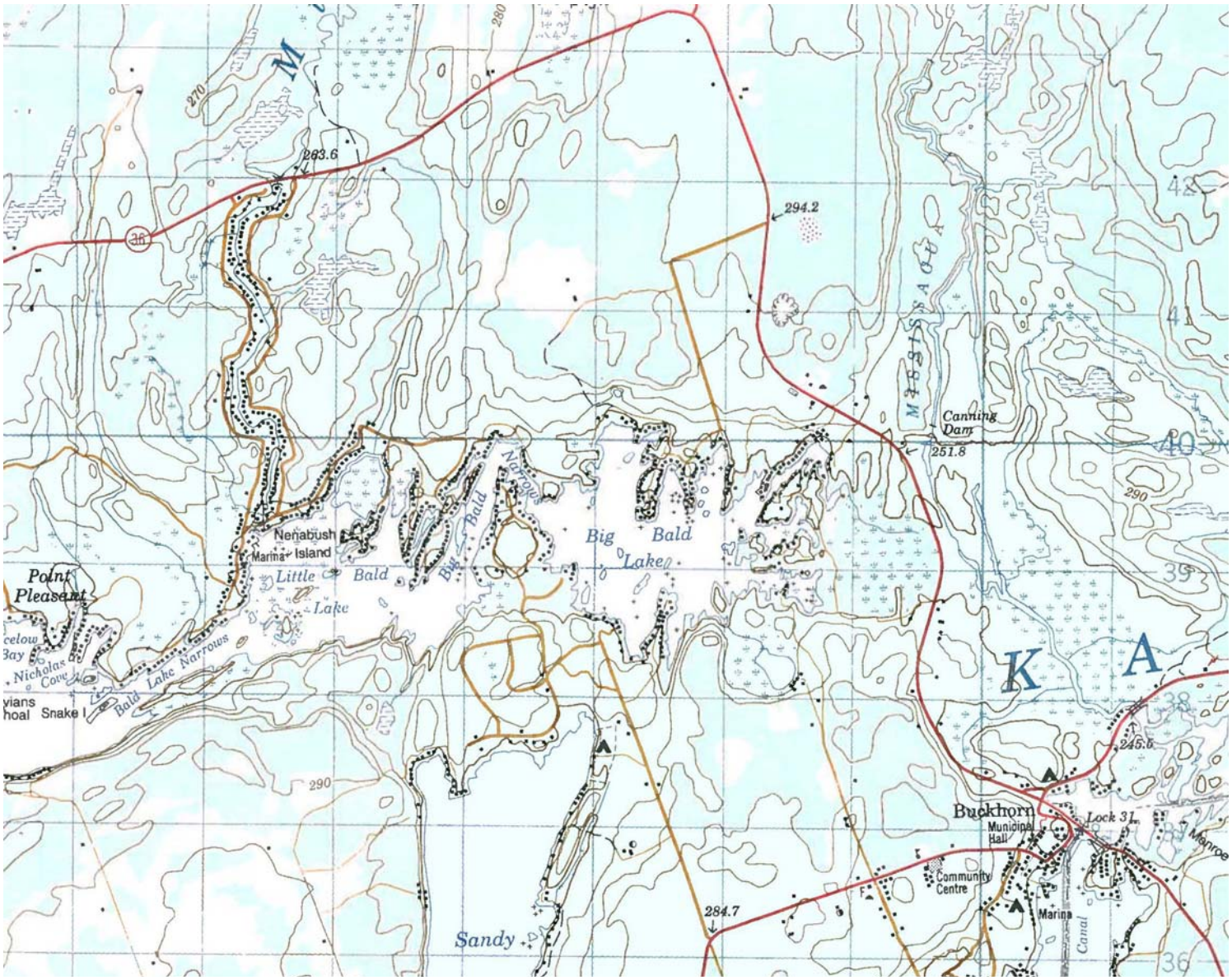
Once our township's new Official Plan is complete, the zoning bylaws will be amended to reflect the new policies and better reflect today's issues. Public input is part of this process, towards creating a comprehensive plan and allowing for resident participation to support the Plan's intent. Big Bald Lake residents have the opportunity to become involved in the process and help guide the outcome.

The Big Bald Lake watershed is located between the Otonabee and Kawartha Lakes Conservation Authorities, and southwest of the Kawartha Highlands Signature Site. Since the Big Bald Lake watershed is not included in either of the Conservation Authorities, or Provincial Park boundaries, it is the responsibility of the municipalities to govern over the lake and its features.

Minor Variance Application

The developed shorelines of Big Bald Lake lend themselves to requests for cottage conversions and additions. While the updated Official Plan (OP) moves to strengthen environmental protection with increased setbacks and minimal lot sizes, property owners may utilize the Minor Variance Application process to circumvent the OP. The Variance Committee is also faced with issues of grandfathering rights and re-building on existing footprints. As such, today's approvals may not be environmentally appropriate, may not meet the intent of the new OP, and may not be inline with our waterfront stakeholders values. Potential impacts to the shoreline buffer zone include tree cutting, rock blasting, excessive filling and grading, and the construction of oversized cottages on small lots.

Development Density:
Each black dot represents a developed property



Topographic Map

Lake Capacity

Recommendation
Carrying Capacity

Investigate the usefulness of lake capacity modeling in the evaluation of future waterfront development applications.

Work with stakeholders to develop a lake capacity definition that forms part of planning and zoning decisions

All lakes have a maximum "capacity", the threshold above which the lake experience begins to deteriorate. While lake capacity is referred to loosely in the *GHC* Official Plan, the municipality currently has no official definition of lake carrying capacity. With no capacity definition in place, our lake experience is potentially at risk.

The definitions of lake carrying capacity to date are varied. The concept of lake capacity is currently being re-evaluated, moving away from the notion that a universal model can be applied to calculate the number of dwellings that can exist without detriment to the lake. Each lake and watershed is different from the next, and therefore each has a number of variables or "exceptions" to consider. More recent models consider the incorporation of a variety of social, natural, and physical factors along with the views of all lake stakeholders.

The importance of developing a lake capacity model for Big Bald Lake cannot be underestimated and should be an action item resulting from this lake plan. Another approach to deal with over capacity and limit density is to increase the minimum lot frontage requirements.

Currently, it is the municipality's view that the Ministry of the Environment determines whether or not a lake is at capacity. The Ministry of the Environment is in the process of completing a Lakeshore Capacity Assessment Handbook to serve as a planning tool by providing guidance on evaluating the impacts of shoreline development on the water quality of inland lakes on the Precambrian Shield. The Lake Plan will encourage our township to participate in this consultative process with the intent of adopting this potential new planning tool.

Social Elements

Recommendation
Social Elements

Promote communication and social interaction among our stakeholders.

Strengthen the Cottage Association

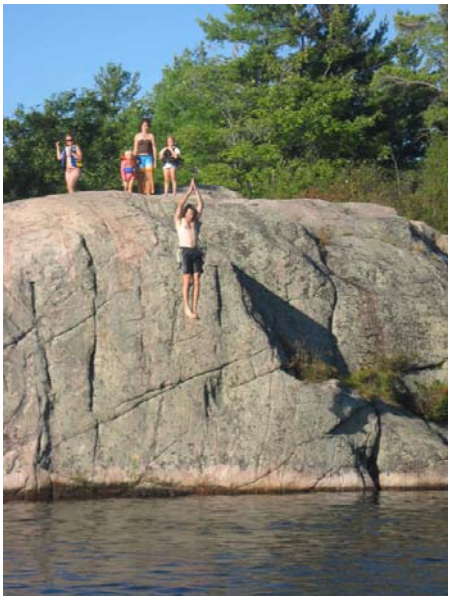
Involve the community network of residents in the lake planning process and establish a pool of volunteers for implementation of the Lake Plan recommendations.

Community Values

Residents of Big Bald Lake have clearly indicated their support for maintaining the special nature of the lakes. Residents and resort operators value the peace and quiet that exists as well as other social amenities such as recreational activities and social events. Social elements enhance the quality of life on the lakes and it is recognized that a collective community effort is required to ensure protection and enhancement of the natural, social and historical character that are precious for future generations to enjoy.

Landscape and Aesthetics

Participants at the stakeholder workshop indicted that the most valued attributes of the lake are its diverse and beautiful natural shorelines, fish and wildlife and the tranquil serenity. Significant portions of the shorelines and backlands remain undeveloped, and these vegetated shorelines, bays and inlets, islands, wetlands and tree line contribute to the natural beauty of this area. High profile and high density development and resource management activities such as aggregate extraction or clear-cut forestry practices could seriously impact these values.



Places of Interest

There are many local natural, historical and cultural sites that help to connect us to the land and the history of the area. It is important to continue to develop an awareness and appreciation of these unique features. Some of these sites include Jump Rock, Blueberry Island, and Government Island, all of which are publicly used recreational areas. Jump Rock and Government Island are located on municipal road allowances. Another place of interest is the cribbing and pier remains of the historical Pluard's landing, which is visible underwater near the mouth to Catalina Bay.

Recreational Activities

As Big Bald Lake is part of the Trent Severn Waterway, many cottagers on the lake own a variety of watercraft due to the opportunities provided for recreational activities on the lake. Most common are the small runabouts, but there are many larger touring boats, personal water craft, canoes, paddle boats, and kayaks, and some sailboats.

Recommendation
Boating and Snowmobiling

Promote safe and appropriate use of all recreational vehicles.

Encourage new technology in using and maintaining vehicles, including 2 stroke and 4 stroke marine engines.

Recommendation
Noise and Light Pollution

Encourage property owners to minimize noise and light pollution.

Improved conduct and use of personal watercraft (PWCs) and other recreational boats, would reduce concerns about congestion, water and air pollution, noise, safe operation of boats and wave action harming the delicate nesting grounds of the loons and other wildlife. During the winter, residents cross country ski on the lake, ice skate, ice fish, and snowmobile.

Noise and Lighting

The quiet and darkness of the shorelines is an important social component of the enjoyment of cottagers on Big Bald Lake. Excessive and unnecessary lighting detracts from the natural ambiance of the lake and results in reduced visibility of the stars: Unnatural lighting also affects sensitive lake biological systems, such as disrupting feeding and breeding behaviours.

Big Bald Lake Action Plan

The following recommendations/action items have been developed through consultation with residents, commercial operators, and municipal governments. The recommendations serve as a basis for long term implementation of the Lake Plan by stewardship/action committees.

This list below is a detailed list of recommendations found throughout the BBL Lake Plan.

- Action 1- **Continue to monitor water quality through the Kawartha Lake Stewards Association and Ministry of the Environment Programs** – consider additional monitoring programs for fish and wildlife, and invasive species.

- Action 2 - **Focus on preservation of existing fish and wildlife habitat**- provide education information to lake community on ways to value and preserve habitat, investigate best practices on fishing practices, monitor fish populations. A wetland and stream survey should be prepared.

- Action 3 – **Pursue stewardship activities that educate waterfront property owners on activities that are detrimental to the water quality** – initiate septic work partnerships with the municipalities through their Septic Re-Inspection Program to inspect, enforce, and ensure tanks are pumped on a regular basis.

- Action 4 – **Promote the preservation of natural shorelines** – encourage the restoration of degraded shorelines and discourage the use of fertilizers and pesticides within a 50 m buffer of the Lake.

- Action 5 – **Advocate that mining and aggregate extraction is limited within the viewscape and soundscape of the lake** – Big Bald Lake watershed includes area deemed as excellent sources of aggregates – Provincial Policy Statements deem that all such areas must be protected for aggregate extraction – the potential is for quarries to proliferate and negatively impact the Big Bald Lake experience.

- Action 6 – **Investigate and potentially lobby for inclusion in the jurisdiction of a conservation authority -** Big Bald Lake does not fall into the jurisdiction of any conservation authority – Otonabee Region Conservation Authority covers lakes to the east and Kawartha Conservation covers lakes to the west – therefore monitoring and protection limited.

- Action 7 – **Develop a closer working relationship with Municipal Council and staff –** develop more of a partnership to enhance two-way communication and potentially develop a 'memorandum of understanding' - provide input to the local municipalities regarding new development – to ensure proposed development is in character (density, scale, and massing) with its surroundings.

- Action 8 – **Develop and implement stewardship activities which educate and promote boating safety** – safety and noise issues expressed by stakeholders- encourage the use of 4 stroke motors and high efficiency 2 stroke motors, as well as alternatives to motorized boating such as canoes and kayaks.

- Action 9 – **Work together with the Trent Severn Waterway-** to provide input and to learn about TSW practices in relation to control of water levels.

- Action 10 – **Improve communications and strengthen the Big Bald Lake Cottage Association –** increase membership and community involvement, use the association newsletter, workshops, lake programs, and social events to educate and promote stewardship, and build a sense of community

Whose Plan is It, Anyway?

The future health of Big Bald Lake depends on the participation and commitment of everyone in our community. We encourage you to read the Lake Plan and get involved in the action plan.
The Lake Plan belongs to all of us- both residents, commercial operators, and visitors

For more information please contact:

Big Bald Lake Cottager's Association
R.R. #1 Buckhorn, Ontario K0L 1J0

2009 Executive:

Rob Arkell	President
Gerry Wood	Secretary/Treasurer
Ian Fraser	Communications
Susan Lewin	Lake Plan
Bruce Barnes	Area Reps
Ron Brown	Environment
Dave Fowler	Quarries

www.bblca.ca
E-mail: webmaster@bblca.ca

Special Thanks To :

French Planning Services
1016 Holiday Park Drive
Bracebridge, Ontario P1L 1W9

www.frenchplanning.com
Email: randy@lakeplan.com

The Township of Galway-Harvey-Cavendish:
For their assistance and monetary contribution to the development of this lake plan.