

Watershed Management Plan Stobie Creek



December 2016



Who we are

The Central Algoma Freshwater Coalition (CAFC) is an incorporated not-for-profit organization dedicated to the protection, restoration, and improvement of watersheds throughout the Central Algoma Region, which stretches from the eastern boundaries of Sault Ste. Marie to the eastern boundaries of the Municipality of Huron Shores, including St Joseph Island. A vision of healthy sustainable watersheds guides our work.

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History of the Central Algoma Freshwater Coalition

The Central Algoma Freshwater Coalition (CAFC) was formed in 2007, to unite the voices of concerned landowners of the recurring blue-green algae blooms that were being experienced on multiple lakes in the region. These “trigger” events often create strong and growing public support for implementation of watershed management planning at the local watershed level.

The Approach

Watershed management is not so much about managing natural resources, but about managing human activities as it affects those resources. Because human activities include actions by governments, municipalities, industries and land owners, watershed management must be a cooperative effort.

The expense of undertaking watershed management is far less than the cost of future remediation.

This is a first generation watershed management plan for this area. Most of the research to date has centred on nonpoint source phosphorous nutrient loading.

Cover Photo – Stobie Creek South of Highway #17

Recognition

Ontario Trillium Foundation

Water Sampling Volunteers

Paul Perry – Bright Lake

Hugh Coverly – Desbarats Lake

Nancy Maltman – Caribou Lake

Consultants & Services

Gertrud Nurnberg

Testmark Laboratories

Support CAFC Become a Member

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Executive Summary

Central Algoma is a beautiful area in which to live work and play with a mix of agricultural, forested and lakeshore landscapes including Lake Huron. It is an important migratory bird stopover habitat and contributes to the biodiversity features of Lake Huron.

The Stobie Creek watershed is a small rural watershed that ultimately contributes to the water quality of Lake Huron. The watershed is two third natural and one third agricultural and has not significantly changed since at least the 1930s. The agriculture is a mix of cash cropping, beef operations and family farms. Old Order Mennonite are the main family farm owners working the land with work horses as did the earlier pioneers.

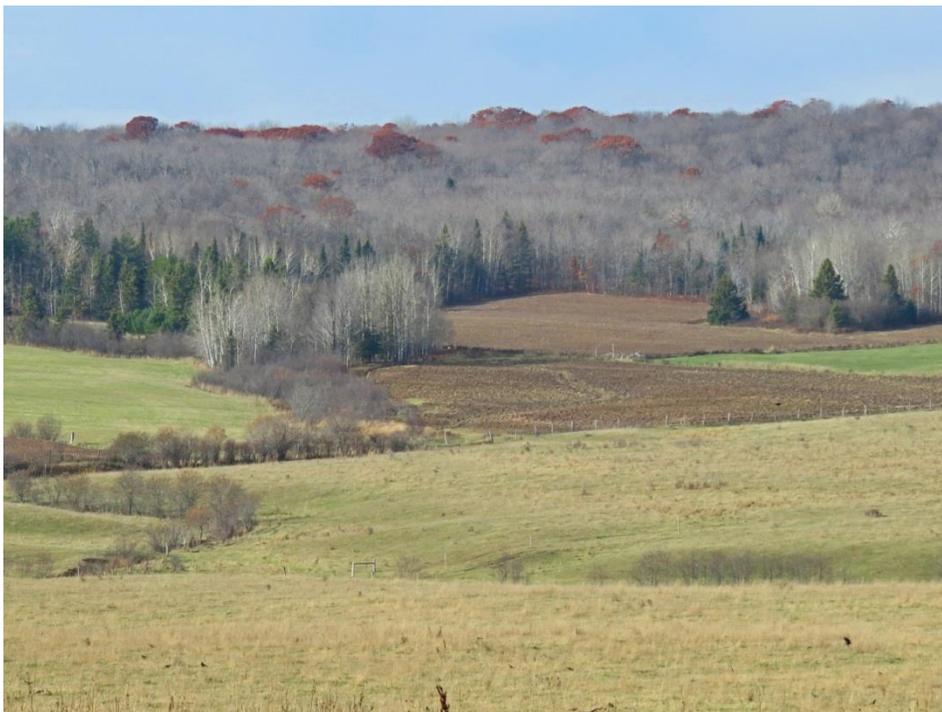
In the headwaters there are small scale cottage lot developments on Caribou and Round Lakes where residents have concerns about cyanobacteria blooms. There is an important central watershed wetland at Gibboney Lake (Marsh) that supports biodiversity and contributes to water quality. A provincially significant wetland is located at the Creek's mouth.

Owners and users of Portlock Harbour have raised concerns about sediments originating from the Creek.

Lakes naturally accumulate phosphorous over time in a process called eutrophication. This process can be accelerated by human activities.

This report recommends that the entire community work toward an improvement in water quality.

The plan places emphasis on improving water quality by encouraging increases in cottage and agricultural riparian buffer zones; and managing cottage sewage disposal and agricultural nutrients.

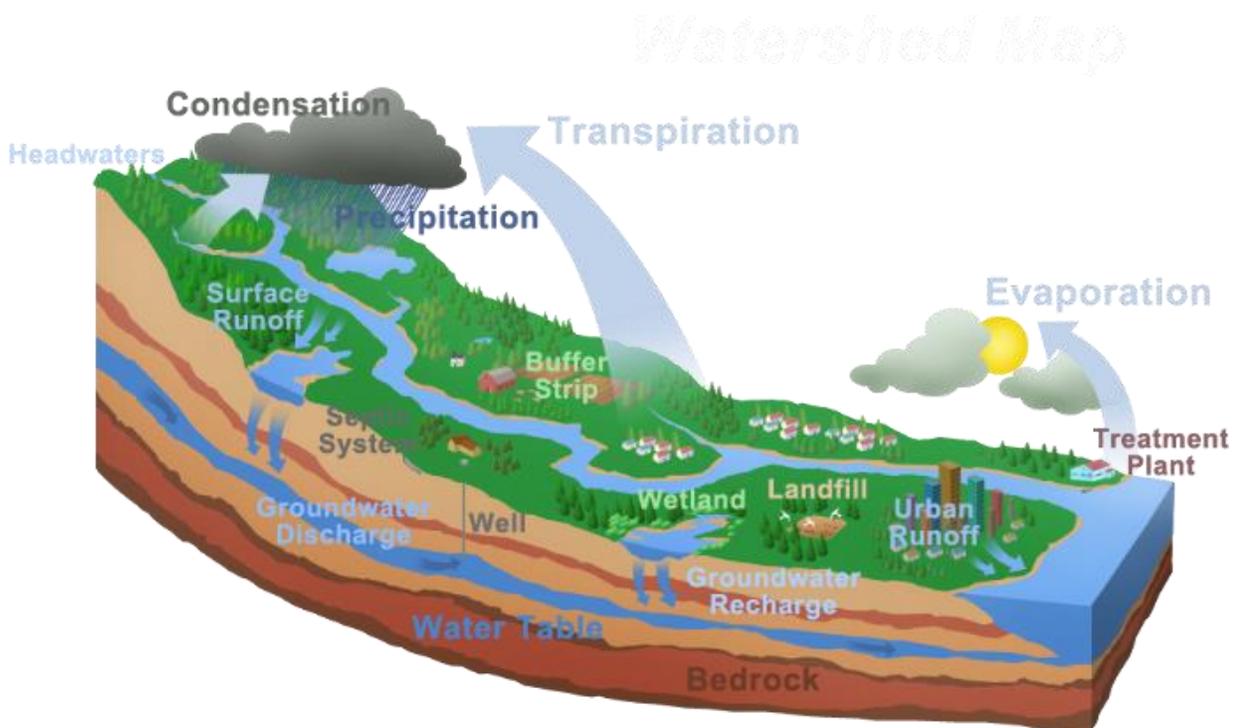


Stobie Watershed

1.0 What Is a Watershed

As water flows through an area, it comes into contact with many features of that environment – both natural and manmade. This area is referred to as a watershed. Specifically, “a watershed is an area of land that catches rain and snow and drains or seeps into a marsh, stream, river, lake or groundwater.”

The boundaries of a watershed are formed by the highest points in the landscape – they are like the edges of a bathtub or sink – any water that falls within it will drain downwards to the same outlet. Homes, farms, cottages, forests, small towns, industries and more can make up watersheds. Some cross municipal, provincial and even international borders. They come in all shapes and sizes and can vary from millions of square kilometers that drain into an ocean to only a few acres that drain into a pond.



Conservation Ontario (2013). What is a Watershed

Each watershed is made up of many smaller sub-watersheds. The Central Algoma watershed is part of the Lake Huron watershed which forms part of the larger Great Lakes-St. Lawrence Watershed which then flows into the Atlantic Ocean.

The first step in protecting water quality is to better understand your place in the watershed. We all live in a watershed and water knows no political borders. Our environment, economy, and communities depend on healthy watersheds. A Watershed Management Plan is a guide to help us achieve healthy and sustainable watersheds.

2.0 What is a Watershed Management Plan

A Watershed Management Plan is the process of managing human activities and natural resources in an area defined by watershed boundaries.

These plans can range one page memos to thousand - page engineering and environmental reports. These documents are meant to be an ongoing and evolving process to assist in sustainability of these valuable natural resource. Change occurs as research knowledge improves and needs of the area change. By protecting this natural resource, you are not only conserving our natural and cultural heritage but also protecting the legacy of clean water for future generations.

By protecting water quality, you are also protecting your investment as a property owner or resident in this landscape. You will notice that being a water quality steward and working with the environment will result in savings of time, money and frustration.

With funding provided by the Ontario Trillium Foundation, CAFC has built upon initial water quality data, scientific reports, municipal plans, and regional, provincial, and bi-national commitments to develop an initial Watershed Management Plan for Stobie Creek.

This plan is designed to be a preliminary guidance document to shed light on the health of our local watersheds.



Stobie Creek Watershed Gordon Lake Road Looking South

3.0 Stakeholder and Public Involvement

A public meeting was held in February of 2014 in Johnson Township. CAFC presented a brief overview of water quality discussions around the Central Algoma area and more specifically the Stobie Creek, regarding reoccurring cyanobacteria blooms; identification of the role phosphorus plays in the occurrences of these blooms; concerns for the rivers, creeks; streams and lakes; sedimentation; mechanical removal of beaver dams and the downstream effects; and invasive species.

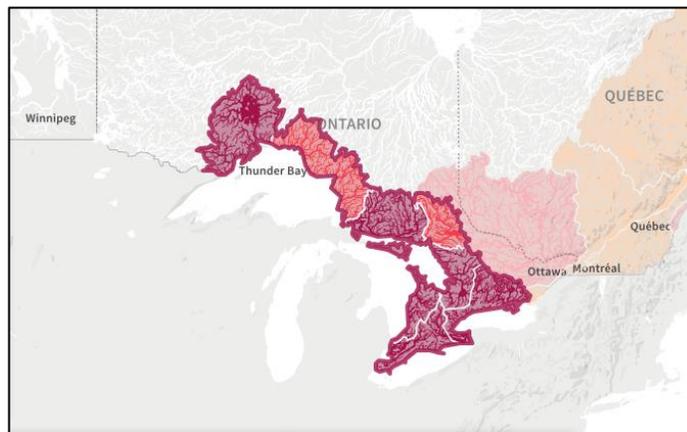
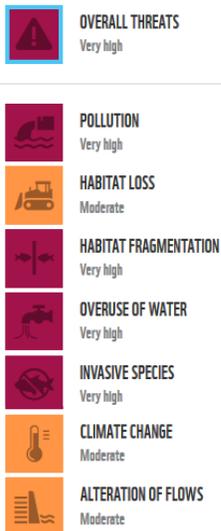
The major concerns identified related to flooding, maintaining traditional rural agriculture (including meeting water needs), cyanobacterial blooms on Caribou Lake and Round Lakes, stability of Gibboney Lake (Marsh) at a high water level, sedimentation of the Provincially Significant Wetland (PSW), sedimentation impacts on Portlock Harbour cottages, and maintaining Lake Huron water quality for future generations.

4.0 The Great Lakes Watershed

The Great Lakes Watershed spans an area that is 223,948 sq. km and includes thousands of tributaries and is the Earth's largest freshwater ecosystem. Lake Huron's surface area is 59,600 sq. km and has a drainage basin of 134,000 sq. km.

The overall threat to the Northern Lake Huron Watershed is rated as "very high" including pollution, habitat fragmentation, overuse of water and invasive species.

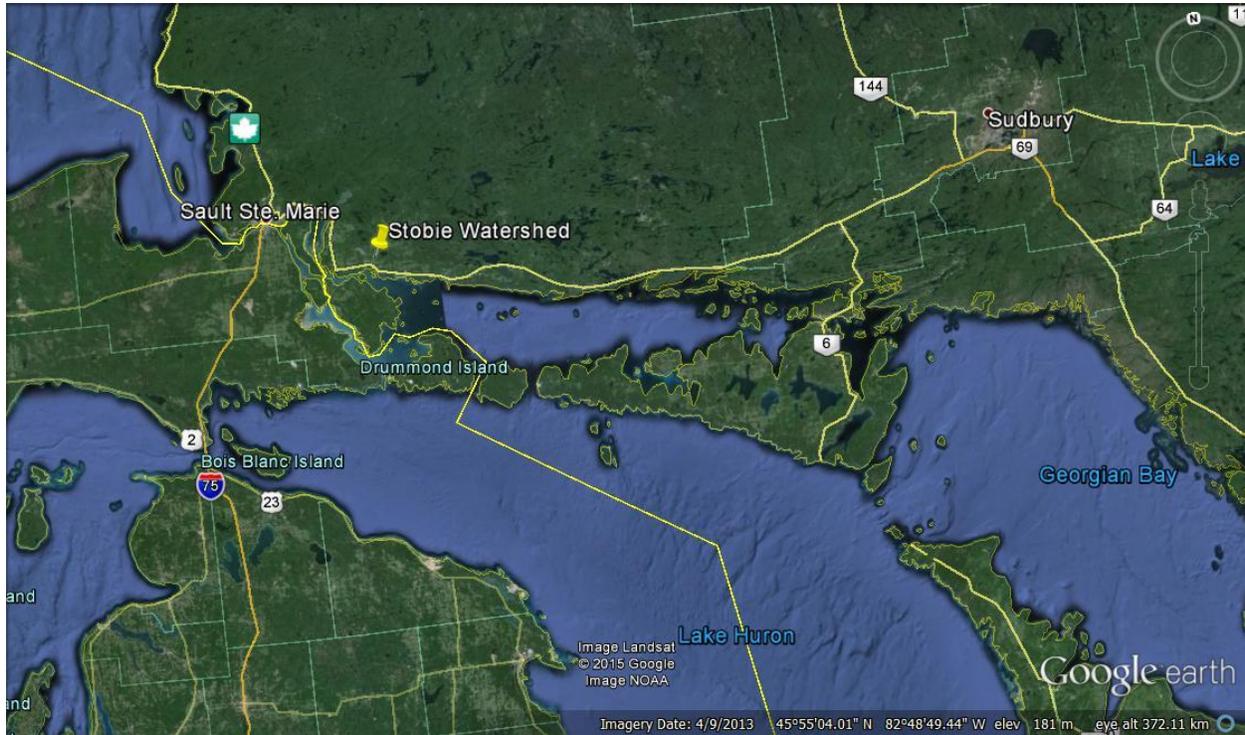
Scores by threat indicator



www.awsassets.wwf.ca/downloads/wwf_watershed_report_greatlakes_16072015.pdf

5.0 Northern Lake Huron - Central Algoma Region

The Central Algoma Region, for the purposes of the Central Algoma Freshwater Coalition, stretches from the eastern boundaries of the City of Sault Ste. Marie to the eastern boundaries of the Municipality of Huron Shores, including St Joseph Island.



This region includes 12 municipalities, First Nation Communities, and is home to 10,000 individuals year-round and grows substantially in the summer months when tourists and cottagers come to experience any of the 30+ lakes in the area.

Central Algoma has a rich and unique history, including being home to the first copper mine. Both the Trans-Canada highway and the Canadian Pacific Railway (operated by Huron Central Railway) cross the area in a general east to west direction. No matter the season, tourists, outdoorsmen, and families flock to the area to enjoy the fishing, beaches, hunting, culture, history, landscapes, farmers' markets and lakes.

The largest industries in the region are agriculture, tourism and quarry operations. The agriculture and tourism industries both rely heavily on healthy waters to survive and thrive.

The coastal wetlands of the St Mary's River and the lands of the North Channel are important migratory bird stopover habitats along Lake Huron. The region is important habitat because it has much natural land cover, some coastal wetlands and relatively little coastal development.

6.0 Stobie Creek Watershed – Surface Water

Terrestrial / Land Use

The watershed is rural with no towns or cities. There once was a train stop but now only a single building is left standing in Portlock. Most of the land in the watershed area is privately owned with the exception being the provincially owned lake and stream beds. The forested areas are mixed woods with some small scale timber harvest as well as maple syrup operations. In

agricultural areas lands are used for cash cropping, pasture, hay fields and the newly emerging market gardening. Some farms are tilled and harvested using the work horse.

Caribou Lake has year round homes and cottages – while downstream of the Stobie Creek confluence with the North Channel there is another grouping of cottages.

Transportation corridors in the area include the TransCanada Pipeline, the Huron Central Railroad, the TransCanada Highway #17 and municipal roads with hard and gravel surfacing.



Municipal ditches and agricultural field drains have been established in the watershed. These drainage systems may increase stream flow volumes but this has not been adequately investigated. Increased flow into watercourses can cause stream bank erosion.

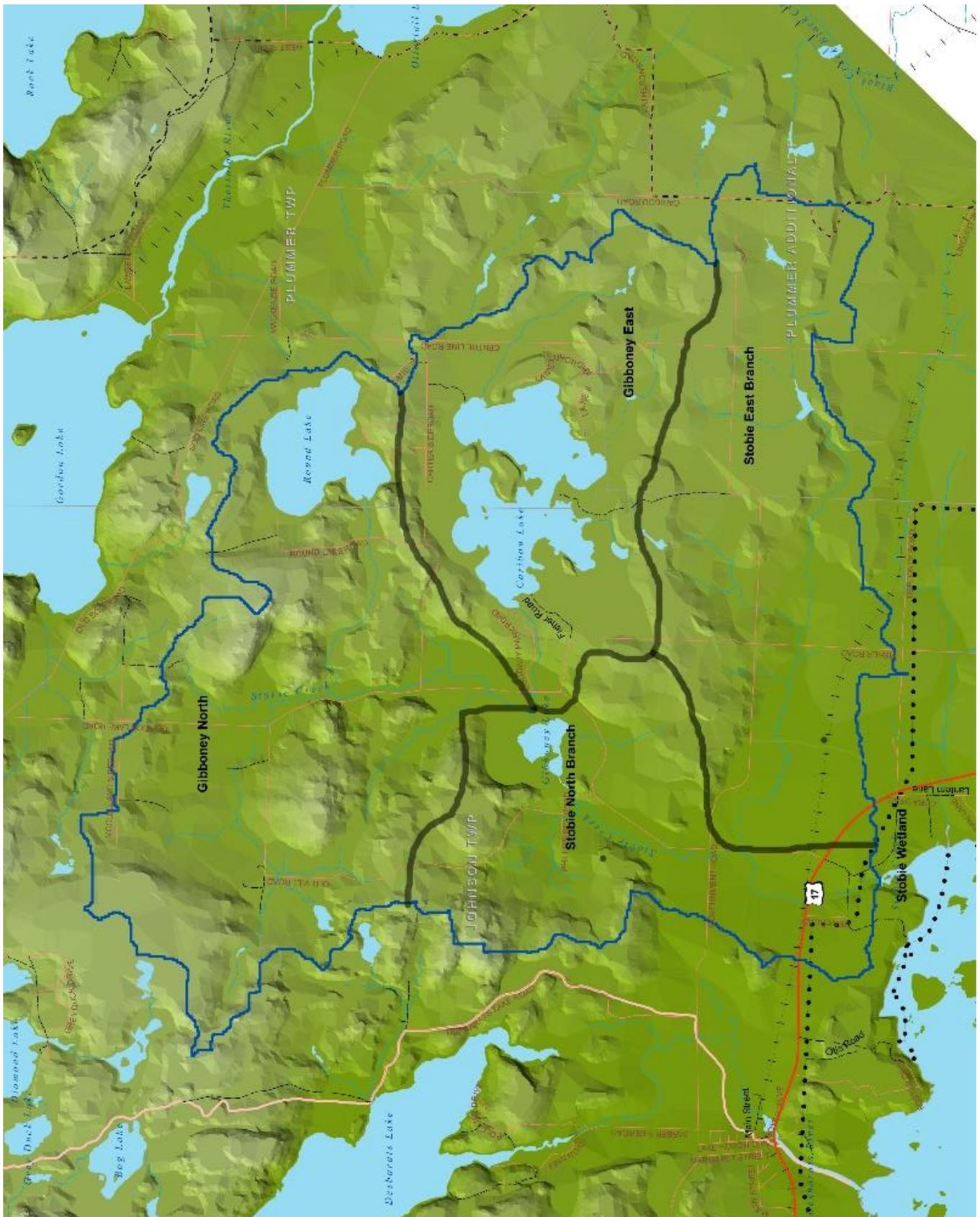
Erosion and sediment transport is a natural process of river systems and is observed in stable streams and rivers. Excessive erosion, sediment transport and sediment deposition however can be indicative of accelerated processes due to surrounding land use activities.

Aquatic

Stobie Creek is generally a slow moving creek with some sections of faster velocities at the downstream outflows of Caribou Lake and Gibboney Lake. It is a warm water creek system. In agricultural areas creek banks are generally vegetated with grasses. Based on aerial photography dating back to 1935 - fields have changed little in over the last 80 years and are typically established to the edge of the water course.

The Stobie Creek Watershed has a watershed of 54 sq. km. 11% of the watershed is covered with lakes and wetlands. There are 30 sq. km of mixed wood forest. Agriculture accounts for 16 sq. km and is centred primarily on the water courses. Tulloch Engineering has identified peak flow in the Stobie Creek watershed and the two Stobie Creek sub-watersheds in its report *Stobie Creek Rehabilitation and Enhancement Strategy (2015)*. Engineered structures should reflect these flows and reference can be made to the Tulloch study.

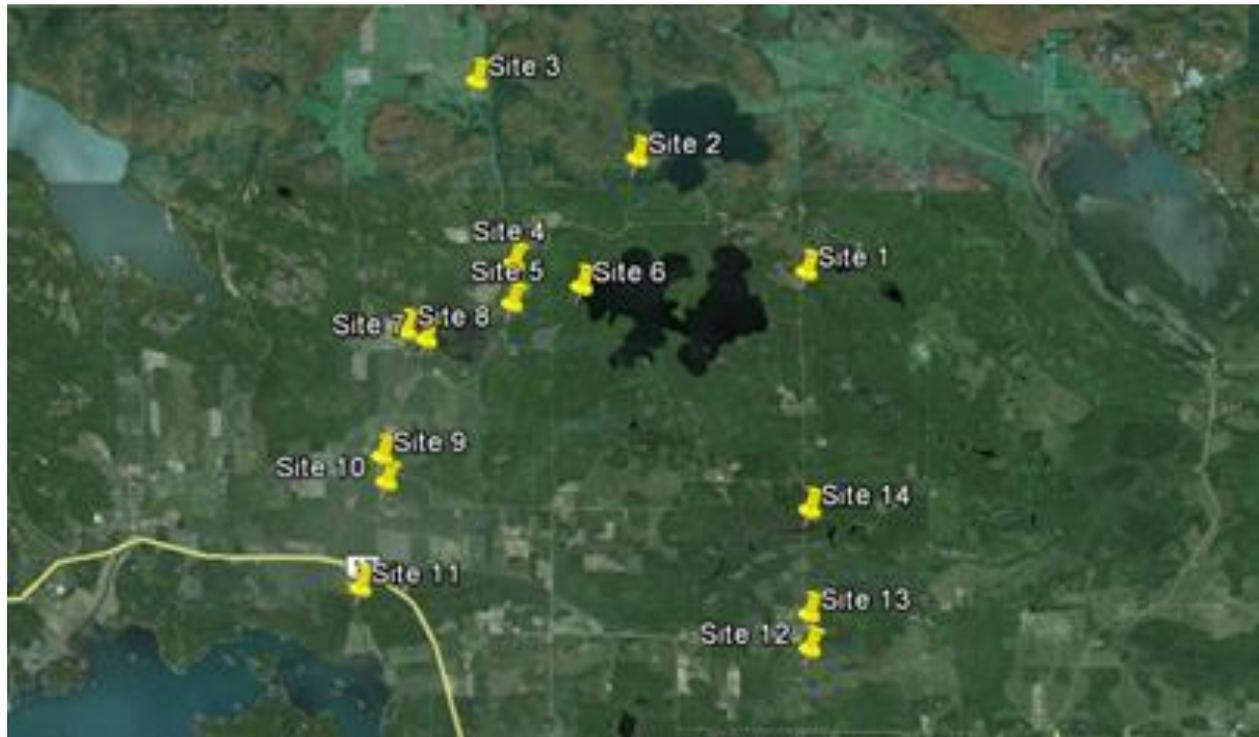
Tulloch Engineering also identified sub-watersheds features and named them, the Stobie North Branch, the Stobie East Branch, the Gibboney East Tributary and the Gibboney North Tributary and the Stobie Creek Wetland (North Channel - Provincially Significant Wetland – PSW)



Stobie Creek Sub-Watersheds - Ministry of Natural Resources and Forestry – NIRVIS Map - CAFC Sub Watersheds

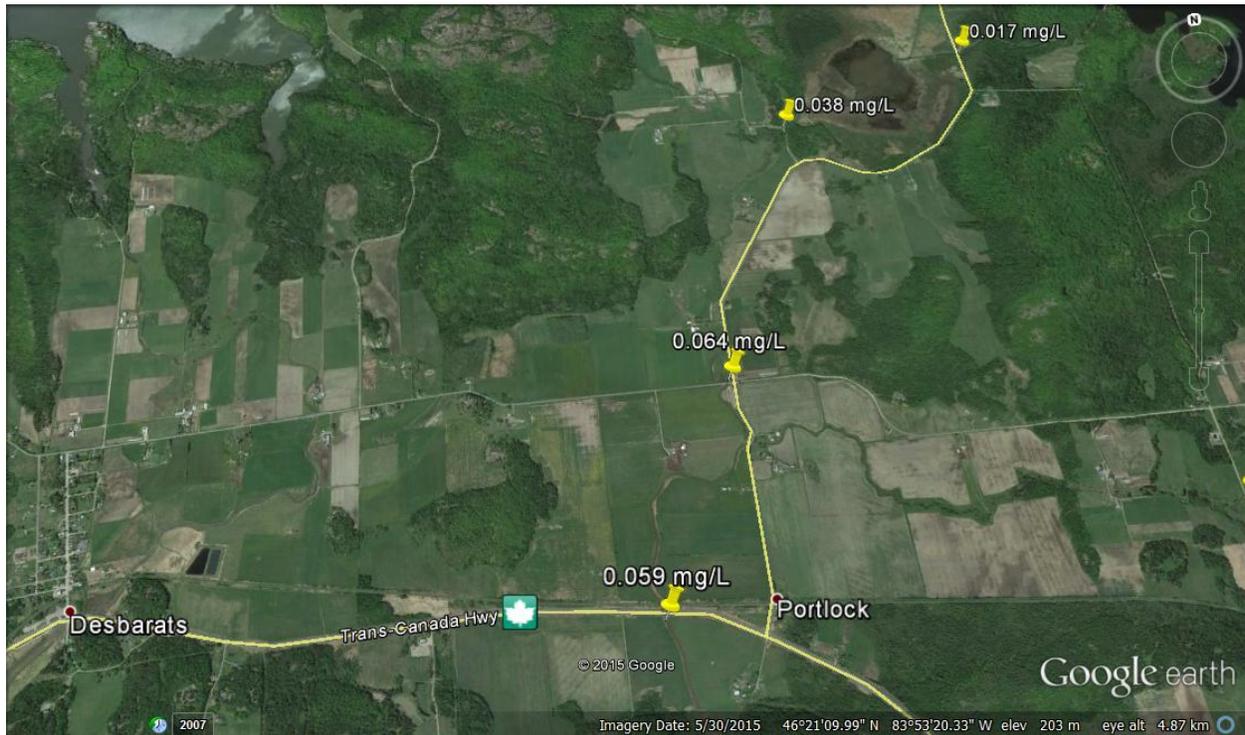
Water sample were taken monthly over a two year period during the open water season and TP recorded. The average TP values are in the table below.

Average Total Phosphorous (TP) - in (mg/L)		
Site Number	Site Name	Average TP
1	Centre Line Road (Caribou Lake, inflow)	0.022
2	Round Lake Road	0.021
3	Gordon Lake Rd @ McKinnon Rd (Stobie Cr)	0.049
4	Gordon Lake Rd below Carter Side Rd	0.058
5	Gordon Lake Rd (Black Cr, Gibboney Lk inflow)	0.017
6	Suddaby Park Rd (Caribou Lk to Black Cr)	0.012
7	Old Mill Rd @ Bridge (Stobie Cr)	0.038
8	Old Mill Rd @Phillips Rd (Stobie Cr)	0.062
9	Gordon Lake Rd @ Government Rd Bridge (Stobie Cr)	0.064
10	Gordon Lake Rd below Bridge	0.077
11	Below Hwy 17 (Portlock, Stobie Cr closest to Lk Huron)	0.059
12	Centre Line Rd below Tracks (Stobie Cr east)	0.054
13	Centre Line Rd above Tracks (Stobie Cr east)	0.051
14	Centre Line Rd below Government Rd (Stobie Cr east)	0.025
15	Government Rd @ Fisher Rd (Stobie Cr east)	0.085
Exceedances respective MOECC river quality objectives of 0.030 mg/L TP- shaded Exceedances respective MOECC lake quality objectives of 0.020 mg/L TP		



CAFC Water Sampling Sites

6.1 Stobie North Branch (including Gibboney Lake)



Stobie North Branch is 37 sq. km, with 5 sq. km of lakes and wetlands including Gibboney Lake. The land use is 50% forested and 50% agricultural. The Stobie Creek flows into the North Channel of Lake Huron at a provincially significant wet land.

Gibboney Lake is a wetland with no cottage development. The significance level of the wetland is unevaluated. The Sault Ste Marie Naturalists of Ontario and Michigan have classified the diverse area as a marsh because it is primarily made up of submergent vegetation, water lilies and pickerel weeds, with shallow open water areas.

Given its natural vegetation, the marsh is home to hundreds of species of plants, birds, amphibians, invertebrates, fish, and mammals. Rare, threatened, and species of concern have been identified including Barn Swallows, and Sedge Wren. There have been Black Tern's seen in the area, although no evidence was found during this study. A juvenile Black-Crowned Night Heron was observed feeding on two occasions in 2015.

Water levels vary in the wetland. Changing water levels may change the species that are present or their ability to nest, feed, and mate. More research is needed that spans multiple years as well as multiple seasons to get a better understanding of the species and habitats within the wetland. Having the wetland evaluated and determination reached regarding its significance may prove useful for future developments.

The outflow of Gibboney Lake flows west where multiple beaver dams have been established. The beaver dams are occasionally breached. Uncontrolled breaching the dams can release high energy flow that may entrain settled sediments and degrade downstream stream banks and affect water levels in the marsh.

The outflow of Gibboney Lake had a total phosphorous (TP) of .038 mg/l at Gordon Lake Road and Government Road TP was .064 mg/l and south of highway #17 .077 mg/l indicating increased nutrient loading as the creek passes through agricultural areas.

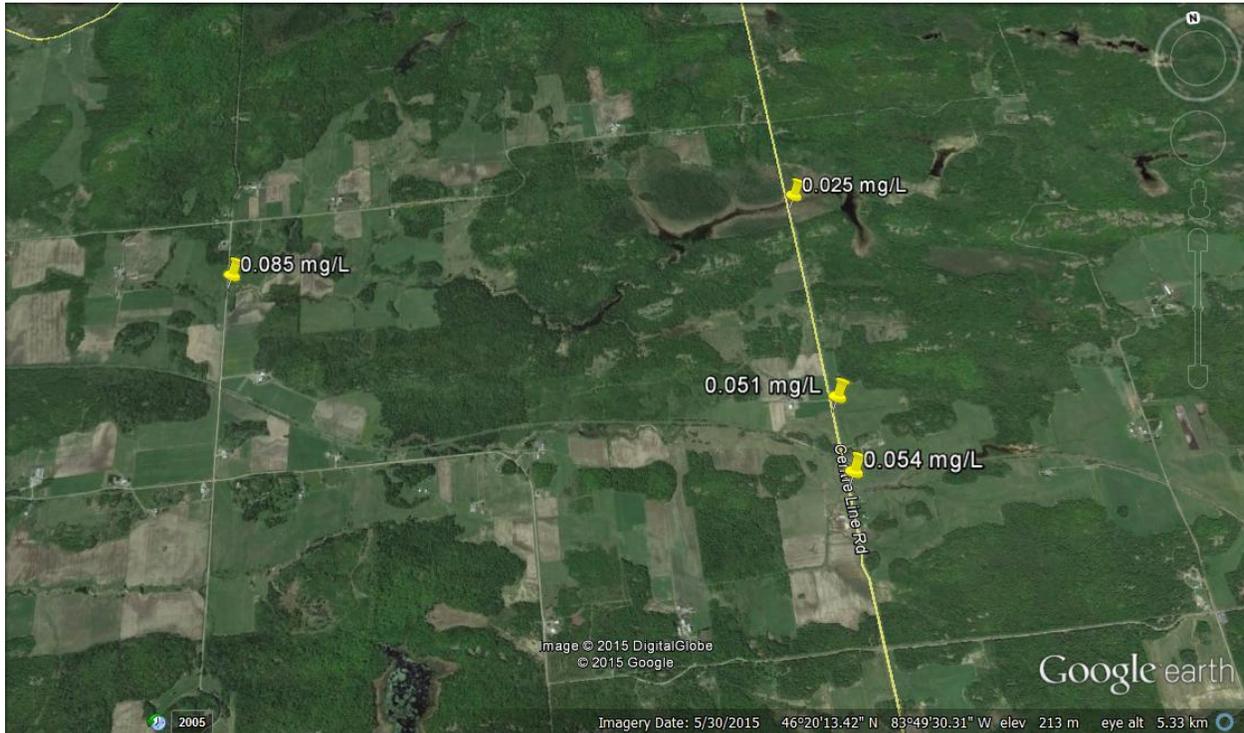
The Kensington Conservancy was concerned about sedimentation in the lower Stobie Creek and with Trillium funding retained Tulloch Engineering to review of the 2.4 km just above the entrance of the Creek into Lake Huron. The assessment included an evaluation of the main channel and adjacent lands to identify sediment sources and bank stability issues.

The report noted severe bank erosion, high turbidity and high levels of sediment transport and disposition. The report noted concerns regarding total suspended solids and sediment disposition downstream within a provincially significant wetland (PSW) at the North Channel of Lake Huron. The report outlined a multi-year “rehabilitation” strategy to recover the natural function and process of the Creek. The total estimated cost of the rehabilitation is estimated at \$3.2 million.



Beaver Dams at Outflow of Gibboney Lake

6.2 Stobie East Branch



Stobie East Branch is 13 sq. km, with 1 sq. km of lakes and wetlands, about 50% of the land is forested and 50% is agricultural.

The tributary at the Centre Line Road south of the tracks had a TP of .054 mg/l and north of the tracks .051 mg/l. This creek flow is down stream of agricultural land uses. The TP was 0.085 mg/l at the Fisher Road.



Beaver Dam at Fischer and Government Road – Stobie Creek East Branch

6.3 Gibboney East Tributary (including Caribou Lake)



Gibboney East Tributary is 11 sq. km, with 3 sq. km of lakes and wetlands including Caribou Lake. The land is mostly forested and there are cottages on Caribou Lake

Caribou Lake is a typical soft water; tea stained lake on the Canadian Shield and was probably oligotrophic with comparatively little nutrient concentration. In the last decade the water quality has apparently deteriorated. Nutrient concentrations still indicate low mesotrophic conditions – however cyanobacterial blooms are occurring in late summer and fall. Because dissolved oxygen concentrations are below saturation one explanation for the blooms is their fertilization from internal phosphorous from bottom sediments.

The lake is a headwater lake with a small undeveloped watershed catchment area. External phosphorous loading in Caribou Lake is likely from septic systems and shoreline development. There is a small dam at the outlet of Caribou Lake. The Lake is in the Township of Johnson and the Township of Plummer. There is a public access point at the west end of Caribou Lake near the outflow. Given the location of this access point near the outflow it likely contributes little total phosphorous loading to the lake.

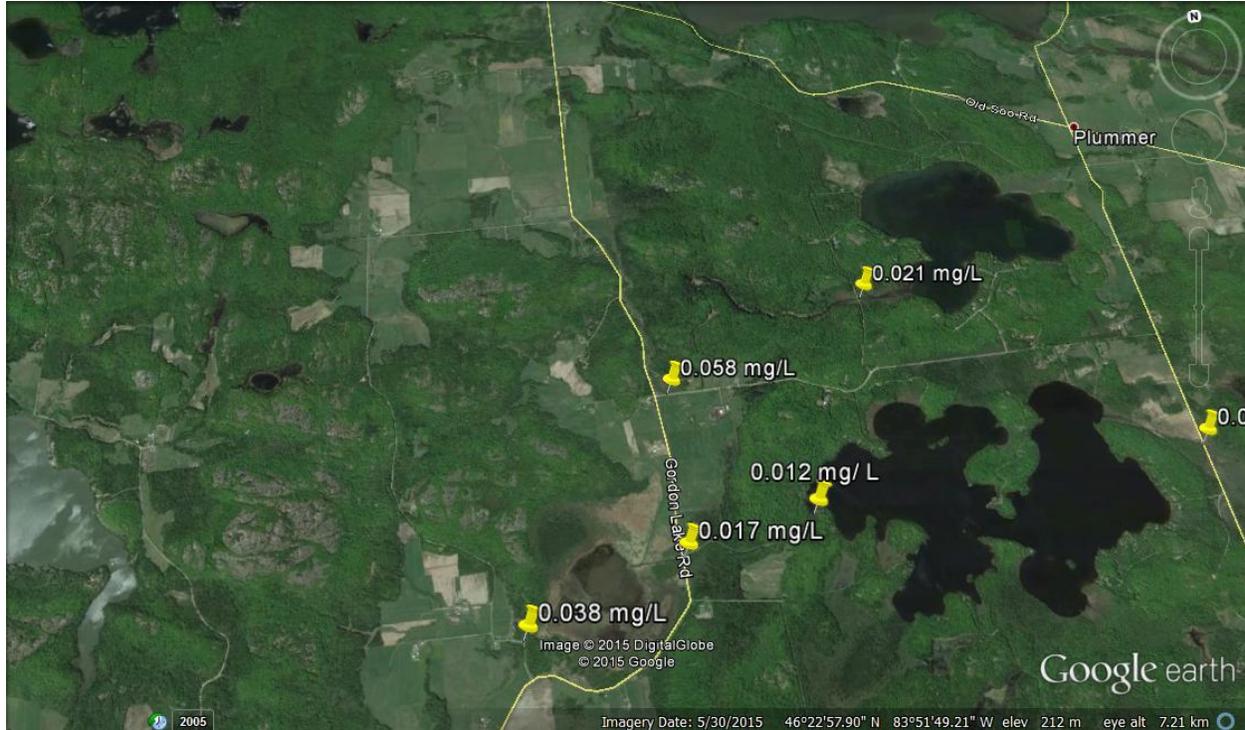
The water quality of Caribou Lake was assessed in a report by Freshwater Research – *Water Quality for Caribou Lake in the Stobie Watershed (2012)*. The lake is 2.1 sq. km in size. The lake has a Secchi disc transparency of 2.6 m and total phosphorous of 0.011 mg/l. The lake has experienced cyanobacterial blooms. Caribou Lake is a butterfly shaped lake with two basins – the eastern basin has a maximum depth of 6 m and the western basin has a maximum depth of 5 m. The mean lake depth is 4 m. Fish in the lake include Walleye, Northern Pike, Smallmouth Bass, Perch, Brown Bullhead, Pumpkinseed and Rock Bass. Walleye and Smallmouth Bass have been stocked.



Caribou Lake View from Public Access

Water sampling has been occurring on Caribou Lake since 2002 through the Ministry of Environment and Climate Change, Lake Partners' Program. The creek flowing out of Caribou is known as Black Creek. The creek had a TP of .012 mg/l – where it flows into Gibboney TP was .017 mg/l or low.

6.4 Gibboney North Tributary (including Round Lake)



Gibboney North Tributary is 18 sq. km, with 1.5 sq. km of lakes and wetlands including Round Lake. The area is about 50% forested and 50% in agricultural land use.

Round Lake drains into Gibboney Lake. Water from Round lakes seeps into the watershed through a marshy area situated east of Gordon Lake Road and North of Carter Side Road.



Round Lake

Round Lake has a mean depth of 1.8 m and maximum depth of 3 m – it is a clear unstained lake. Round Lake had a cyanobacterial bloom in July of 2007. Round Lake has a TP of 13.2 mg/l and Secchi disc reading of 3.5 m. The tributary between Round Lake and Gibboney Lake at Gordon Lake Road and McKinnon Road had a TP .049 mg/l and further south at Carter side Road .058 mg/l. This area is downstream of agricultural land uses.

A review of aerial photography by Tulloch Engineering show that two sections of the tributary adjacent to Government Road were straightened from a meandering channel to a straight channel following the road allowance. Straightening the channel will increase peak flow rates and peak flow velocity. The higher energy associated with this flow can cause increased erosion and sediment mobilization through this area. The removal of meanders also eliminates areas of lower velocity through the channel where mobilized sediments may have a chance to settle out.

6.5 Stobie Creek Wetland (North Channel - Provincially Significant Wetland - PSW)



Stobie Creek enters the North Channel of Lake Huron near Portlock and Dawson Islands in Portlock Harbour. There are cottages on islands and main land in the Harbour. Cottagers have reported water discoloured by sediment.

The Stobie Creek Wetland at the outlet of Stobie Creek is identified as a provincially significant wetland (PSW). It is a waterfowl staging and nesting habitat. Development in the wetland is not permitted. The Kensington Conservancy owns the 85 acre property that encompasses the PSW.

Fisheries and Oceans Canada has charted the Lake Huron water level at Thessalon since 1926 – the mean elevation of the lake was 176.5 m with a maximum elevation of 177.5 m in 1986. The elevation of the channel at Stobie Creek is 176 m – therefore the water level at Lake Huron can create a backwater flow within the Creek. The creek is a warm water creek with Brown Bullhead fish. Extensive fisheries surveys have not been done but habitat may be suitable for Northern Pike, Walleye and potentially Sturgeon. Chimney Swift, Boblink, Barn Swallow and a Snapping Turtle have been observed. These species are listed in the Endangered Species Regulations.

6.6 General Patterns and Trends

River systems are dynamic systems and some erosion is to be expected.

TP concentrations were lowest at the upstream headwater sites, including the lakes and out flows and increased at the downstream locations. Exceedances of MOECC river quality objectives of 0.030 mg/l increases in TP load along Stobie Creek eventually contribute to Lake Huron TP loading. There were spikes in some TP values possibly the result of immediate and intermittent sources, such as road runoff and agricultural fertilizer. Considering that the flow rate

and water volume increase with distance from the headwater, the increased TP concentrations downstream mean severe increases in TP load along Stobie Creek that eventually contribute to the TP loading of Lake Huron. Documented nutrient increases relate to nonpoint sources of TP.

Lack of over storey vegetation along streams in some areas contributes to elevated stream temperatures.

There was a severe rainstorm in the fall of 2013 that washed out roads and broke beaver dams that may also be a factor in TP concentrations in lakes.

7.0 Stobie Creek Watershed - Groundwater

Groundwater in the Stobie Creek watershed needs additional research and groundwater recharge areas have not been documented. Groundwater recharge areas are typically in areas of permeable sands and gravels. Typical threats to ground water include waste disposal sites, salt storage, snow storage, fuel storage, fertilizer, chemical, hazardous waste, and sewage hauling. Abandoned wells have not been inventoried – but anecdotal discussion suggest there are some abandoned wells in need of proper closure to restrict ground water contamination.

8.0 Recommendations

There needs to be a shift toward continuous community based improvement in water quality and environmental conditions. By using best practices to manage human activities within the watershed boundary the aim is to protect natural resources for future generations, while reflecting the social context, and economy of the community. The plan proposes a partnership approach, and adaptive management that aim for continuous improvement.



Stobie Creek at Centre Line Road – Headwater Wetlands

The goals of this plan are to maintain healthy water system including ground water (clean drinking water for rural watershed residents) and surface water (clean water that contributes to the health of Lake Huron – healthy terrestrial and aquatic ecosystems, sustainable human use of surface water for non-drinking water purposes), and protection of the public from flooding and erosion.

- The target for TP is less than .030 mg/l for streams and less than .020 mg/l for lakes or at a minimum a decreasing trend.
- That creeks in the area be continued to be monitored for elevated TP
- That stream flow volumes and downstream impacts be monitored.
- That all lakes be monitored with blooms including profiles of temperature and dissolved oxygen, Secchi disc readings and TP. This should occur at least once in Aug and once in September or if funds are not available as a minimum measure TP at the lake outflow
- That a groundwater and significant aquifer recharge area study be undertaken.
- That existing forests and wetlands are maintained at current percentages of land use by encouraging general tree planting across the watershed.
- That over storey vegetation along streams areas be increased by 75% where it is currently absent.
- Establish buffer strips along streams including fencing where cattle grazing occurs on adjacent land.
- Develop a centre for Love Your Lakes shoreline assessment and educational stewardship program.
- That the Kensington erosion control study rehabilitation plan be undertaken.
- That the Gibboney wetland be evaluated to determine its significance level.
- That best management practices be encouraged to be adopted by private land owners across the watershed.
- That an inventory be taken of abandoned wells and that a plan be established to properly close these abandoned wells

9.0 Best Practices

The implementation will involve partnerships with conservation organizations, the cottage associations and the agricultural sector.

We all share responsibility for the protection of natural resources particularly water.

Well planned, healthy buffers demonstrate a landowner's due diligence and civic mindedness.

Buffer Strips and Riparian Zones

A buffer strips is a strip of vegetation – usually a mix of trees, shrubs and grasses either planted or naturally occurring along watercourses and natural areas to protect them from surrounding land uses. Width is a key factor in buffer strip design. For bare soil conditions on adjacent land and 10 percent slope an effective buffer strips would be: 5 m for bank stability, 10-30 m for sediment and soil bound nutrient removal, and 10-300 m for nesting waterfowl.

A riparian zone has no definite boundaries, but is the larger transitional area between water surfaces and uplands. It includes the area immediately adjacent to water bodies; it includes streambanks, plant and animal communities, and the floodplain.

General

- Wetlands provide the best protection and play an important role in managing both water quality and quantity. Wetlands collect surface water; prevent flood, store water and release water into streams as well as shallow aquifers. The vegetation and soils in wetlands can use excessive crop nutrients and assimilate bacteria and organic pollutants from farm runoff. Wetlands support an incredible number of plants, animals and fish. Land use around wetlands can be important as the wetland itself as many species use this adjacent area including nesting birds, frogs and salamanders. Although any buffer around wetlands is beneficial consider just keeping it a wetland – don't dump fill or debris, avoid damaging soils, waterways and vegetation, seek all approvals before manipulating water levels.
- Beaver dams create wetlands that generally retain sediments and phosphorous. The dams are not permanent and when breached especially with high flow volumes it flushes sediment into downstream lakes. Care must be exercised to not destroy wetlands and should be done with some selection where there is a downstream lake. Consideration must also be given endangered species habitat, to pond hibernating habitats (e.g. turtles freezing), and breeding habitats. Seek all approvals before manipulating water levels. There is potentially significant legal liability to breaching beaver dams if you cause property damage to others.
- Have licenced trappers remove beavers and key dams only if necessary to protect human values and with proper planning and permits. Seek all approvals before manipulating water levels.

Waterfront Property / Recreation

- Maintain a minimum 30 m buffer along shorelines
- Surface runoff needs to be controlled to prevent erosion from roads and ditches
- Surface runoff needs to be controlled to prevent roads and ditches from discharging directly into the lakes
- Septic systems need to be properly maintained and installed.

- Waste water systems should be inspected and decommissioned if not working properly including trailers and accessory buildings such as saunas.
- On lakeshores as a general rule don't make hard surface shorelines soft and don't make soft shores hard.
- Prevent the removal of shoreline vegetation including trees, shrubs and wetland vegetation.
- Prevent the planting of invasive plant species.
- Fertilizer runoff from grassed areas of a lakeshore development can contribute significant amounts of nutrients especially if combined with irrigation. Reduce lawn cover and reintroduce natural vegetative cover.
- Restrict intensive recreational uses to appropriate areas (e.g. ATV's, boating). Keep ATV's from destroying vegetation, creating water crossings and causing excessive erosion.
- Encourage anglers to use access point toilet facilities.



Typical ATV Tracks and Soil Erosion

Municipal

- Municipal ditches are often in flat areas and are grassed – because maintenance is required – trees may be considered for planting on one side to allow continued access for maintenance.
- Municipal ditches are best with a minimum 5 m grassed buffer
- Where possible clean ditches in the early part of the growing season so that grasses can re-establish.



Typical Trees Shade Ditch on One Side



Typical Sediment Control

- Municipal ditches when cleaning occurs establish silt barriers to prevent erosion and prevent sedimentation.
- Where tile drain enters a ditch ensure the energy of the moving water is dissipated where it drops into the ditch with materials such as silt barrier and rocks.
- That municipalities respond when residents raise concerns about the effects of development on water quality by updating Official Plan based on lakeshore capacity assessment that is scientifically established.
- That municipalities enforce water-related regulations and by-laws.
- That municipalities use the Lakeshore Capacity Assessment Handbook prepared by the Ministry of Environment – while municipalities are not required to carry out lakeshore capacity assessment, this planning tool is strongly recommended by the Ontario government as an effective means of being consistent with the Planning Act, the Provincial Policy Statement (2005), the Ontario Water Resources Act and the federal Fisheries Act.
- That municipalities use the Lakeshore Capacity Assessment Handbook prepared by the Ministry of Environment as a basis for training resource managers in municipalities.
- That Official Plans specify a lake development policy – that development shall be determined by and be consistent with approved Lake Development Plans including capacity calculations using the Lakeshore Development Capacity Model or an alternative acceptable to the Ministry of Natural Resources and the Ministry of Environment
- That municipalities develop shoreline protection by-laws (see examples - appendix for Elliot Lake)
- That municipalities encourage cottage associations to join in the Ministry of Environment and Climate Change – Lake Partners Program to monitor lake phosphorous.

Agriculture

- The best management practice is to fence livestock out of stream beds and buffer zones.
- The best management practice for intensively pastured (feed imported) areas is to restrict access from riparian (seasonally flooded) areas. In most cases a permanent fence is best.
- Livestock holding areas with an increased density of deposited manure need to have runoff managed to reduce the risks to adjacent surface and ground water.



Typical Fenced Stream Buffer

- Soil management – healthy soils play an important role in water management. Healthy soils build resistance to erosive forces by adding organic matter, improving soil structure and increasing infiltration rates.
- Practice tillage conservation to control erosion by reducing the effects of slope and increasing the time period of soil cover. These can reduce wind and water erosion.
- Good knowledge of plant nutrient requirements and soil testing before fertilizing is effective in controlling nutrients in all areas but is of significant importance in areas with tile drainage
- Time of nutrient application to avoid to heavy rain events or placing nutrients on snow. If it is impossible to avoid winter nutrient spreading it should occur well away from water bodies and drainage areas on vegetated fields.
- Nutrient application at least 30 m from wells.
- Prevent application of nutrients on cropland adjacent to surface water unless there is a vegetated buffer strip with a minimum width of 3 m from the top of the bank.
- Prevent application of commercial fertilizer or agricultural source material (manure) within 13 m of surface water on bare soil unless it is incorporated into the soil within 24 hours.
- Prevent application of non-agricultural source materials (bio solids) within 20 m from the top of the nearest bank of surface water.
- Pesticide must be applied as directed. Prevent application within 15 m buffer strip between your treatment area and the top of the bank along a watercourse.



Typical Livestock – Wetland Damage

- Maintain greater than 150 m between nutrient (manure piles) and chemical storage and the nearest surface water.
- Wetland habitat drainage has resulted in habitat loss across Ontario. Any wetland drainage projects of a large wetland should undergo an environmental assessment.
- Buffers of 50 to 300 m at wetlands provide the best protection and play an important role in managing both water quality and quantity. Wetlands collect surface water; prevent flood, store water and release water into streams as well as shallow aquifers. The vegetation and soils in wetlands can use excessive crop nutrients and assimilate bacteria and organic pollutants from farm runoff. Wetlands support an incredible number of plants, animals and fish. Land use around wetlands can be important as the wetland itself as many species use this adjacent area including nesting birds, frogs and salamanders. Although any buffer around wetlands is beneficial consider just keeping it a wetland – don't dump fill or debris, avoid damaging soils, waterways and vegetation, seek all approvals before manipulating water levels.

10.0 CAFC's Role

Champion a Regional Approach for Continued Stewardship in Central Algoma

Short Term

- Become a forum where local stakeholders can come for support and guidance to carry out their stewardship initiatives.

Long Term

- Operate an office, meeting space and resource centre open to the public.
- Employ full time staff dedicated the Central Algoma Freshwater Coalitions Initiatives.

Develop Environmental Education and Public Awareness Campaigns

Short Term

- Maintain a website with quarterly newsletters, information resources, local environment scientific reports, and related links.
- Develop brochures on Septic Management, Agriculture, Nutrient loading, natural shoreline buffers and algae blooms – make the brochures available to community partners and at CAFC events.
- Develop videos on the Central Algoma Freshwater Coalition, Natural Shorelines, Agriculture Best Management Practices and Invasive Species Prevention.
- Develop four signs at access points to public lakes in Central Algoma – encouraging watershed stewardship.



CAFC – Healthy Habitats Sign – Caribou Lake Access Point

Long Term

- Provide 6 (bi-monthly) presentations reflecting the topic of environmental stewardship in the Central Algoma area.
- Develop a centre for Love Your Lakes shoreline assessment and educational stewardship program.

On-the-Ground Projects

- Provide a forum for groups to present their water quality concerns.
- Assist in developing project plans.
- Support and guide local stewardship initiatives

Administrative Role

- Assist partners in leveraging funds, resources and connections to allow partner projects to flourish.
- Provide coordination services for the project such as website maintenance, meeting facilitation, agenda and logistics development, tracking progress and supporting communications and networking.

Fundraising

- Work with a diversity of funding sources to secure funds for the start-up of the project.
- Work with partners to secure funds for local community projects.

11.0 Adaptive Management and Plan Review

Every 10 year review this plan to reflect management activities that have been implemented as well as changes in environmental conditions, scientific understanding or stakeholder priorities.

Evaluate new or changing threats

Celebrate successes.



Out Flow of Stobie Creek at Gibboney Lake

Photo, Map & Diagram Credits

Figure 2 - Conservation Ontario (2013). What Is A Watershed,

Figure 4 – www.awsassets.wwf.ca/downloads/wwf_watershed_report_greatlakes_16072015.pdf

Sub-Watershed Map - Ministry of Natural Resources and Forestry – NIRVIS Map - CAFC Sub Watersheds Added

All satellite Images - Google Earth – CAFC Water Sample Sites / Labels Added

All Photos Chuck Miller

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The Corporation of the City of Elliot Lake, Official Plan (2006) and Shoreline Protection By-laws Consolidated Excerpt from Zoning By-law, By-law No.03-8 being a by-law to amend Zoning By-law No. 87-40 Elliot lake, Ontario www.cityofelliottlake.com/en/cityservices/zoningbylaws.asp

THE CORPORATION OF THE CITY OF ELLIOT LAKE

Consolidated Excerpt from Zoning By-law

BY-LAW NO. 03-8

Being a by-law to amend the
Zoning By-law of the Municipality
No. 87-40.

(05-5; 05-63; 08-33)(09-81)(15-47, 15-59)

The Council of the Corporation of the City of Elliot Lake **ENACTS AS FOLLOWS :**

1. **THAT** By- law No. 87-40, as amended, is hereby further amended by adding to Section 4. **ZONES**, 4.1 Classification of Zones after Limited Services Residential “L” Zone, the following:

Shoreline Residential
Rural Estate

“RS” Zone
“RE” Zone.”

2. **THAT** By- law No. 87-40, as amended, is hereby further amended by adding to Section 5. **GENERAL REGULATIONS FOR ALL ZONES**, the following after 5.13:

“5.14 Water and Sewage Disposal Services-Municipal or on-site (private) services
No building permit shall be issued for any building or structure which requires municipal or on-site (private) sanitary sewage services unless the building permit application is accompanied by a Certificate of Approval issued under the Building Code Act or the lands are serviced with municipal water and sewer services, whichever is applicable for the proposed method of sewage disposal. The servicing of lands with municipal sewer and water services is intended to include lands for which the services have not been installed but which are subject to a valid subdivision or development agreement providing for such services. Wells (on-site water services) shall be constructed in accordance with the requirements of Ontario Regulation 903.

3. **THAT** By- law No. 87-40, as amended, is hereby further amended by adding to Section 20. **RURAL “A” ZONE**, Permitted Uses, after Horse stables and horse riding facilities the following:

“Public Boat Launch”

4. **THAT** By-law No. 87-40, as amended, is hereby further amended by adding thereto the following new section after section 21. **Rural “B” Zone:**

“Section 21.A **SHORELINE RESIDENTIAL “RS” ZONE**

Limited municipal service standards apply to this zone.

21A.1 **Permitted Uses**

No person shall use any land or erect or use any building or structure for any purpose except one (1) or more of the following uses:

- Single Family Dwelling
- Seasonal/Recreational Dwelling
- Structures accessory to the above uses

Shoreline residential uses are permitted on the following lakes:

McCarthy Lake, Pecors Lake, Depot Lake, Marshland Lake, Popeye Lake, Trout Lake, Rossmere Lake, Grandeur Lake, Dunlop Lake and Quirke Lake.

21A.2 **Requirements**

Each lot may contain not more than one single family dwelling or seasonal/recreational dwelling, but not both.

Lot area, minimum	0.4047 ha
Lot width, minimum	45 metres
Building line from the lot line adjoining a lake or river, minimum	20 metres from High Water Mark
Building line from street lot lines (non-waterfront properties)	12.0 metres
Building line from rear lot line	12.0 metres
Building line from another lot line, minimum	6 metres
Building height (main building), maximum	10.5 metres
Ground floor area of single family dwelling and Seasonal /Recreational dwelling on lots of .81 hectares or less, minimum	65 sq. metres,
Ground Floor Area of single family dwelling and Seasonal/Recreational dwelling on lots greater than .81 hectares, minimum	111.48 sq. metres

Despite the above, the minimum ground floor area dwelling size of 65 square metres applies to the following residential shoreline lots: Site 9, lot 7; Site 12, lot 13; Site 13, lots 1 and 12; Site 20, lot 13; Site 21, lot 34; Site 23, lots 2 and 10; Site 26, lots 17, 18, 19, 21, 23, and 30 and Lot 17, Plan 1M-581 on Popeye Lake.

(By-law No. 05-5; 06-63, 15-47)

Lot coverage, maximum	main building	10%
	accessory buildings	10%
	all buildings	15%

Balconies, canopies and unenclosed porches/decks may project beyond any building line adjoining a lake or river, a distance of not more than 5 metres including eaves, stairs or any part of the structure. For the purpose of allowable encroachments for accessory structures, lot coverage for the above structures shall not be included in the calculation.

The parking of not more than (1) one Commercial vehicle as defined under section 5.11.3 will be permitted.

Recreational vehicles used as seasonal dwellings on vacant lots are prohibited unless authorized by a Temporary Use By-law under section 39 of the Planning Act.

1) Requirements for Buffer Areas:

Each Lot shall have a buffer area in which:

- a) no trees shall be removed;
- b) no roots or root systems, herbs, grasses, or the duff layer shall be removed;
- c) no lawn shall be established or maintained.

A Buffer Area shall be maintained around the perimeter of each lot, and having the following minimum depth:

Buffer Area:	NB All lands lying on the opposing side of the High Water Mark (ie. seasonally inundated shorelands and beds of water bodies) shall not be altered without the authority of the Crown.
Shoreline Buffer: From the lot line adjoining a lake or river, minimum	15 metres measured horizontally inland from the High Water Mark
Perimeter Buffer: From the rear lot line, minimum	10 metres

Perimeter Buffer: From any other lot line, minimum	5 metres (15-59)
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2) EXCEPTIONS:

Prior to submission of a Lot Development Plan, exceptions (1) i) and ii) may be undertaken. The following exceptions are permitted within the required Buffer Area upon approval of a Lot Development Plan:

(1) Buffer Area Exception along the side or rear lot line	i) Up to a maximum of 9 metres width for driveway(s) may be permitted to cross or occupy the Buffer Area to provide vehicular and pedestrian access from the road onto the lot.
Water Access Only properties	ii) Up to a maximum of 4.5 metres width for access from the water may be permitted.
	iii) Encroachments may occur for an accessory building where the structure has a lesser setback than the required buffer.

(2) Shoreline Buffer Area Exception	The lands located in a shoreline buffer area shall be maintained in a natural state except for the following:
	i) Dead or decaying vegetation shall not be removed unless it poses a safety hazard. Dead or decaying standing trees that pose a risk to safety may be felled and left to decay on the forest floor on the subject property. Other dead or decaying vegetation may be relocated within the buffer area so that it no longer poses a safety risk.
	ii) maximum 2 metre wide pedestrian pathway from the dwelling to the shoreline
	iii) a maximum 4 metre wide utility access route including minimal removal of the duff layer for underground utility installations (may include hydro, cable, internet, natural gas, water). This area shall be restored immediately to original grade and native vegetation must be planted.
(3) In addition to the above exceptions:	Trees within the shoreline buffer area may be removed, as shown in a <i>Lot Development Plan</i> to alter the Buffer

	<p>area or to allow construction of an accessory structure or building that is otherwise permitted within the required front yard as follows:</p> <p>i) a maximum of 20% of the trees within the Buffer Area may be removed;</p> <p>ii) the maximum width of disturbance within the Shoreline Buffer shall be a maximum of 10 metres width in total for road-access lots and 12.5 metres in total for water-access lots.</p> <p>iii) outside of the areas described in 2(2)ii, 2(2)iii and 2(3)(ii) above, shrubs will not be removed from the shoreline buffer but may be selectively pruned.</p>
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(08-33)(15-59)

Accessory Buildings

Detached Private Garage

Notwithstanding any other provision in this By-Law, one(1) detached private garage only may be erected per lot as follows:

- Building line from street lot line: same as main bldg.
- Building line from side lot line and rear lot line: 3 metres
- Building height, maximum: 6 metres and may contain intermediate floors
- Ground floor area, maximum: 111.5 sq. metres and not to exceed ground floor area of main building.

Sleep Cabin – Not more than (1) one cabin will be permitted per lot

- Floor area , maximum 25 sq metres
- Location, minimum behind main bldg.
- Building line from other lot line 3 metres
- Height, maximum 5 metres

Land-based Boat House (storage only)

- Distance from high water mark, minimum 3 metres
- Floor Area, maximum 25 sq. metres
- Height, Maximum 1storey
- Building line from other lot line, minimum 3 metres

Water-based Boat House (storage only)

- Subject to approval by the Ministry of Natural Resources
- Projection from private lot benefitting from the structure 3 metres
- Height, Maximum 1.5 storeys

- Building line from other lot line, minimum	6 metres
Gazebos, Saunas, Decks on Waterfront properties only	
- Location	unrestricted
- Distance from high water mark	3 metres
- Building line from other lot line	6 metres
- Building height	1 storey
Other accessory buildings	
- Building line from street lot line	same as main bldg
- Building line from other lot line	3 metres
- Building height	1 storey

21. A.3 Definitions

For the purposes of Section 21A, the following definitions shall apply:

Boat House: means a building or structure or part thereof, used for the storage, shelter of private boats, personal watercraft or other forms of water transportation and equipment accessory to their use, but shall not be used for human habitation nor be equipped with pressurized potable water or sanitary facilities.

Buffer Area: means a portion of a lot around the perimeter of the lot where existing vegetation is maintained or re-established in its natural predevelopment state, or native vegetation is planted for the purpose of protecting natural vegetation and minimizing the visual impact of any buildings or structures on the lot.

Buffer Area, Shoreline: means the portion of the Buffer Area adjacent to the High Water Mark.

Disturbance: means removal, damage or destruction in any way of trees and/or the placement of accessory buildings within the Buffer Area.

Duff Layer: means forest floor cover including organic matter on the forest floor such as leaves, needles, and mosses.

Grasses: means many species of grass such as quack grass, timothy and sedge.

Herbs: includes many species of weeds and flowers such as trillium, lily, cattail, buttercup.

Dwelling- Seasonal/Recreational: means a single detached dwelling containing one (1) dwelling unit constructed as a secondary place of residence and is not the principal place of residence of the owner or occupier thereof.

High Water Mark: means the mark made by the action of water under natural conditions on the shore or bank of a body of water, which action has been so common and usual and so long continued that it has created a difference between the character of the vegetation or soil on one side of the mark and the character of the vegetation or soil on the other side of the mark and as established by an Ontario Land Surveyor.

Lawn: means an area of cultivated grass or any area of mowed grass.

Lot Development Plan: means a Plan submitted in accordance with the Municipality's Site Plan Control By-law.

Lot Line, Street: means any lot line or high water mark that divides a lot from the street.

Public Boat Launch: means public land designated by the appropriate authority and developed and maintained by the authority as a public access to a navigable water body.

Shrubs: immature trees and/or low vegetation or bushes including but not limited to Dogwood, Cranberry, Alder, Elder, Willow, Blueberry, Labrador-Tea.

Sleep Cabin: means an accessory building or structure located on the same lot as the principal building or structure, the accessory use being for sleeping accommodations in which neither cooking or sanitary facilities or pressurized water shall be provided.

Street: means a public highway, or a private thoroughfare of not less than 15.24 metres in width, which affords a principal means of vehicular access to the abutting lots, or in the case of a water frontage lot, only the lake or river frontage is to be considered the street.

Tree: means a self supporting woody plant with a diameter of 10.2 cm (4") measured by caliper or more measured from outside the bark 1.4 m (4'7") above existing grade of the ground adjoining its base or where there are multiple stems on a tree, means the total of the diameters of the three largest stems measured approximately 1.4 m above existing grade.

5. **THAT** By-law No. 87-40, as amended, is hereby further amended by adding thereto the following new section after section 21.A **SHORELINE RESIDENTIAL "RS" ZONE**:

"Section 21.B **RURAL ESTATE "RE" ZONE**

Permitted uses

Any use permitted in the 21.A Shoreline Residential Zone subject to the requirements of such zone except that the **minimum lot size shall be 1 hectare.**"

6. **THAT** Schedule “A” to By-law No. 87-40, as amended, is hereby further amended by deleting the Rural Zoning Map inset and replacing with the inset map showing the additional Residential Shoreline “RS” and “RE” Zone areas, attached hereto and forming part of this by-law.

7. **THAT** this by-law shall come into effect on the date it is passed by the Council of The Corporation of the City of Elliot Lake, subject to the applicable provisions of The Planning Act, 1994.

PASSED this 24th day of March, 2003.

Note: This document is a consolidation of the Shoreline Residential Zone requirements, an excerpt of the Municipality’s Zoning By-law. The full document and Official Plan consolidation are available at the Office of the City Clerk, City of Elliot Lake, 45 Hillside Drive North, Elliot Lake, Ontario P5A 1X5.