

EXECUTIVE SUMMARY

The report card takes an ecosystem approach to the analysis of [watershed](#) health. An [ecosystem](#) is a unit of the living part of the world (Biosphere) e.g. pond, lake, forest, meadow, biome region e.g. great lakes forest. These units can be very small or very large. They all have living (e.g. ferns and frog) and non-living (e.g. water, soil, air) parts and they all have the sun as their source of energy. Energy moves through the ecosystem through food chains from plants (producers) to animals (consumers) to decomposers in a one-way flow. However, ecosystems all cycle or recycle nutrients e.g. phosphorus, nitrogen and carbon etc. All of this goes on in a kind of fluctuating balance (dynamic equilibrium).

An ecosystem is a unit of the living part of the world e.g. pond, lake, forest, meadow

In the report card, the Muskoka and Black/Severn River watersheds are large ecosystems. Inside these large ecosystem are a number of smaller ecosystems: ponds, wetlands, softwood forests, hardwood forests, meadows, lakes, streams, barrens, edge habitats between forest and field each merging into the next. This report card reflects the health and balance that exists in our watershed ecosystems.

Water

As people live and work around lakes, rivers and streams, they impact and change those ecosystems. Some changes may be beneficial and others may degrade the natural systems upon which both humans and other species rely. This report uses a variety of indicators to identify present and potential stresses on lake systems and evaluates the health of both water used for recreation and the water we drink.

Maintain natural watersheds

Our waterbodies are generally in good to very good condition for recreational use. However, our lakes are changing and scientists do not completely understand the processes that are currently occurring. Natural events and behaviours are becoming less predictable and long-term trends are not as well understood as they were previously. It appears that some indices suggest improvement while others indicate deterioration. It is generally agreed that climate change is affecting natural processes, and that intact natural systems will be critical in adapting to projected changes in climate.

Prepare and implement [remedial action plans](#) for all lakes considered Over Threshold

Phosphorus is the nutrient that controls the growth of algae in most Ontario lakes. For this reason, a change in phosphorus [concentration](#) in a lake impacts the types of algae that live in the lake and the potential for algae blooms. Algae blooms detract from recreational water quality and in some cases affect the habitat of coldwater fish species such as lake trout.

The long-term objective is to maintain natural levels of phosphorus. Although there has been a gradual increase in long-term phosphorus over the undeveloped standard, improvement is occurring and over the last twenty years, phosphorus in over 60% of the lakes in Muskoka has remained constant or has decreased.

Protect natural vegetation along shorelines.

Shorelines vegetation protects waterbodies from nutrients and toxic chemicals that can be carried into the lake and contribute to water quality issues. Native vegetation is an important component of a lake system and provides habitat, stormwater management, water purification and visual beauty. Naturally vegetated yard-areas between the residence and the water strengthen nature's capacity to resist stress, as do increased setbacks for both buildings and septic systems.

Protect sources of drinking water

The protection of both private and municipal sources of water is essential to maintaining good drinking water supplies. In order to have a drinking water problem, there must be a source of contamination. With few exceptions, neither public nor private drinking water sources within our watersheds are subject to significant threats or possible sources of contamination.

EXECUTIVE SUMMARY

Air

*Poor Air Quality
Smog (NOx + VOC)
and
PM_{2.5}*

The watersheds of interest to the Muskoka Watershed Council are located on the eastern shores of Georgian Bay of Lake Huron. This geographic position is critical to our air quality as much of the air pollution that affects Ontario comes from the United States. This portion of Central Ontario is in the flow path of the [air mass](#) that originates in the heavily industrialized Ohio Valley, which brings with it high concentrations of particulate matter, nitrous oxide and [volatile organic compounds](#) that cause [smog](#) and ozone.

The recreational area of Muskoka/Georgian Bay/Parry Sound has always been considered to be pristine, healthy and a good place to escape the dirty air of many of the urban areas to the south. In the early 1900's people were sent to the Sanatorium in Gravenhurst to enjoy the fresh air and recover from tuberculosis. However, since the industrialization of southern Ontario and the Ohio Valley in the States this has been a myth. Locally, with steam trains and steam boats, excessive lumbering and industrial development in the early 1900's, not to mention the pollutants that would have been carried into the watershed from more distant sources, our air quality has not been pristine for decades.

*Reduce energy
consumption in homes
and businesses, and
for recreation and
transportation*

Components of air pollution come from various sources including point sources such as industry and coal fire electricity generation plants, mobile sources such as most forms of transportation, and natural sources such as forest fires. Much air pollution impacting Muskoka comes from the United States but a significant portion of that source is generated to fuel local manufacturing, transportation of consumer goods and power generation. Therefore, local actions to reduce electricity use and consumption of goods will reduce the demand for and the need to produce these goods and services.

Muskoka's air quality has been measured for several years, and the record shows that its quality is below a healthy standard one day out of three or four during May through September. If our air quality is to improve, a greater concerted effort will be required from federal, provincial, and municipal governments along with behaviour and lifestyle changes from individuals and businesses

*Advocate for
meaningful
legislation,
mandatory
regulations and hard
targets for carbon
emissions, and
programs and
services that ensure
cleaner air*

Further improvements in Ontario's air quality depend on the ability of the provincial and federal governments to negotiate stricter emission controls on Canadian and U.S. industries. A fundamental approach to our American neighbours is to set a good example with strong political leadership and demonstrated emission reductions that are monitored and reported to the public.

The province has taken a leadership role but their plan will only be successful if it is implemented at the local level by businesses, municipalities, school boards, individuals and all possible organizations. The province needs to set guidelines and provide expertise to help the reduction of air pollutants as well as to educate the public about the importance of dealing with the problem.

Land

*Forests provide food,
clean water, flood
control, clean air and
a place to relax.*

Land ecosystems play several key roles in a healthy watershed. They provide resources such as food, clean water, medicine, clothes, furniture and heat. They regulate water levels and control flooding, moderate our climate, improve the quality of the air we breathe and limit the spread of disease. They serve as a base for much of our recreational activities allowing for spiritual rejuvenation and the expression of cultural values. They provide essential supporting services to nutrient cycling by producing oxygen binding carbon and fixing nitrogen.

Forests sequester carbon and support birdlife that controls pests. They contribute directly to the economy through the ongoing production of forest products and indirectly by providing a setting for our tourism industry.

EXECUTIVE SUMMARY

Maintain large natural areas

Although much of the watershed remains naturally vegetated, the recently completed Watershed Inventory Project makes clear that there are some serious threats on the horizon. Maintaining ecological function is critical if we are to benefit from natural areas, but this is dependent to a significant degree on maintaining large undisturbed natural areas and also maintaining a [representative sample](#) of all ecosystems within a connected and self-sustaining system.

Reduce fragmentation by preserving, connecting and enhancing natural areas

The Watershed Inventory indicates that much of the forested area in our watersheds is fragmented through development and vulnerable to other forms of degradation. The ever-increasing network of roads and other transportation and communications corridors are resulting in a sharp reduction in undisturbed wilderness. In a very real sense, much of Muskoka and the surrounding areas are experiencing a form of urban sprawl that threatens our natural areas and the health of our watersheds. Remediation efforts through land acquisition or habitat improvement are vital in order to enhance the important ecological values that contribute to watershed health.

Stormwater carries pollutants, nutrients, sediment, oil and toxic chemicals to our lakes and rivers.

Stormwater runoff from built up areas is generated from a number of sources including residential areas, commercial and industrial areas, roads, highways and bridges. Essentially, any surface which does not have the capability to pond and infiltrate water will produce runoff during storm events. When a land area is altered from a natural forested ecosystem to rooftops, streets and parking lots, the hydrology of the system is significantly altered. Water that previously ponded on the forest floor, infiltrated into the soil and converted to groundwater, used by plants and evaporated or transpired into the atmosphere is now converted directly into surface runoff. As the amount of hardened surfaces increase in a watershed, more rainfall is converted to runoff and not available to the watershed processes that depend on it.

Reduce hardened surfaces in built-up areas

stormwater from built-up areas usually carries a witches' brew of pollutants, nutrients, sediment, oil and toxic chemicals that enter streams, rivers and lakes diminishing water clarity, reducing oxygen levels, contributing to undesirable algae blooms, and damaging fish habitat.

In order to protect the ecosystems supported by the lakes and rivers that flow through our communities, urban areas should strive to reduce hardened surfaces to a level where water is still available for plants and animals and groundwater is replenished.

Preserve and protect natural vegetation along shorelines

The shoreline zone is the last line of defence against the forces that damage otherwise healthy lakes and rivers. A naturally vegetated shoreline filters run-off removing harmful chemicals and nutrients. It prevents erosion and provides critical aquatic habitat.

Wetlands provide continuous, sustainable, environmental, economic and social benefits that contribute to healthy watersheds. They maintain and improve water quality, aid in flood control and protect from shoreline erosion. They support complex food chains that are essential for a broad range of living organisms, provide habitat for a wide variety of plants, animal and aquatic species, control and store water, and allow for the recharge and discharge of groundwater.

Identify and protect significant wetlands that are essential to watershed health

The identification and protection of significant wetlands within our watersheds has not received the attention it deserves. If water quality and watershed health are to be sustained, this must become a high priority item.

EXECUTIVE SUMMARY

Climate

Climate is the sum of the prevailing weather conditions of a place over a period of time and is comprised of all the features associated with weather, such as temperature, wind patterns, precipitation, and storms. Since the agricultural revolution, the human influence on the natural world including climate has accelerated.

In 1997, the average home created approximately 13 tons of Green House Gas emissions.

- 33.9% space heating.
- 13.7% water heating
- 8.2% lighting

A clear majority of respected and responsible scientists and community leaders agree that climate change is occurring and that humans are responsible for warming the planet at a rate that has never been experienced in human history. Since the Industrial Revolution, [concentrations](#) of carbon dioxide have increased by 30 per cent, methane by 145 per cent, and nitrous oxide by 15 per cent. As a result, within the past century the average global temperature has increased by 0.8^o Celsius. However, only very recently has it been possible to detect even minute shifts in either temperature or biological response to the warming trend. Even then, natural variation and evolutionary change make it very difficult to state with absolute certainty that any particular local trend is a result of global climate change.

The cause of these increases has been human activities related to our increasingly sophisticated and mechanized lifestyle, in particular the burning of fossil fuels such as coal, oil, and natural gas to generate electricity and to fuel our factories and cars. As well, we have cleared more land for human use in the past 100 years than in all of prior human history. This has resulted in the loss of forests and wetlands, which absorb and store greenhouse gases and naturally regulate the atmosphere.

Climate change will have ecological, social and economic impacts on the local watersheds. Scientists do not understand all the possible implications but some changes and stresses are already being documented not only across Canada and the world but also in Muskoka. Some data that may be interesting to track over time that will be influenced by global warming include: data for freeze up and break up of local lakes and rivers; first and last days for golfing; severe weather events such as wind storms, hail and tornados, flooding and freezing rain; the return date of migratory birds, and sighting of birds and animals that usually live farther south.

Impacts on regional watersheds

Global climate models and scenarios of greenhouse gas emissions indicate a warming of our watersheds by 2.2°C to 4°C, accompanied by an increase of precipitation of 1% to 16%. The net results could include the following:

- Decreasing lake levels on Georgian Bay of 0.08 m to 1.18 m.
- Increased temperature of inland lakes and reduced dissolved oxygen leading to changes in the freshwater fishery with resulting impacts on the recreational fishery industry.
- Increased forest fire hazard and insect infestations.
- Increased severe weather damage resulting in higher costs to address storm damage.
- Increased health costs due to increase in air pollution.
- Changes in outdoor recreation activities including hunting due to habitat loss, and in snowmobiling and X-country skiing due to warmer winters.
- Loss of many traditional native species as ecosystems change in response to climate variation.

*Temperature may increase by 2.2 to 4^oC.
Precipitation may increase from 1% to 16%.*