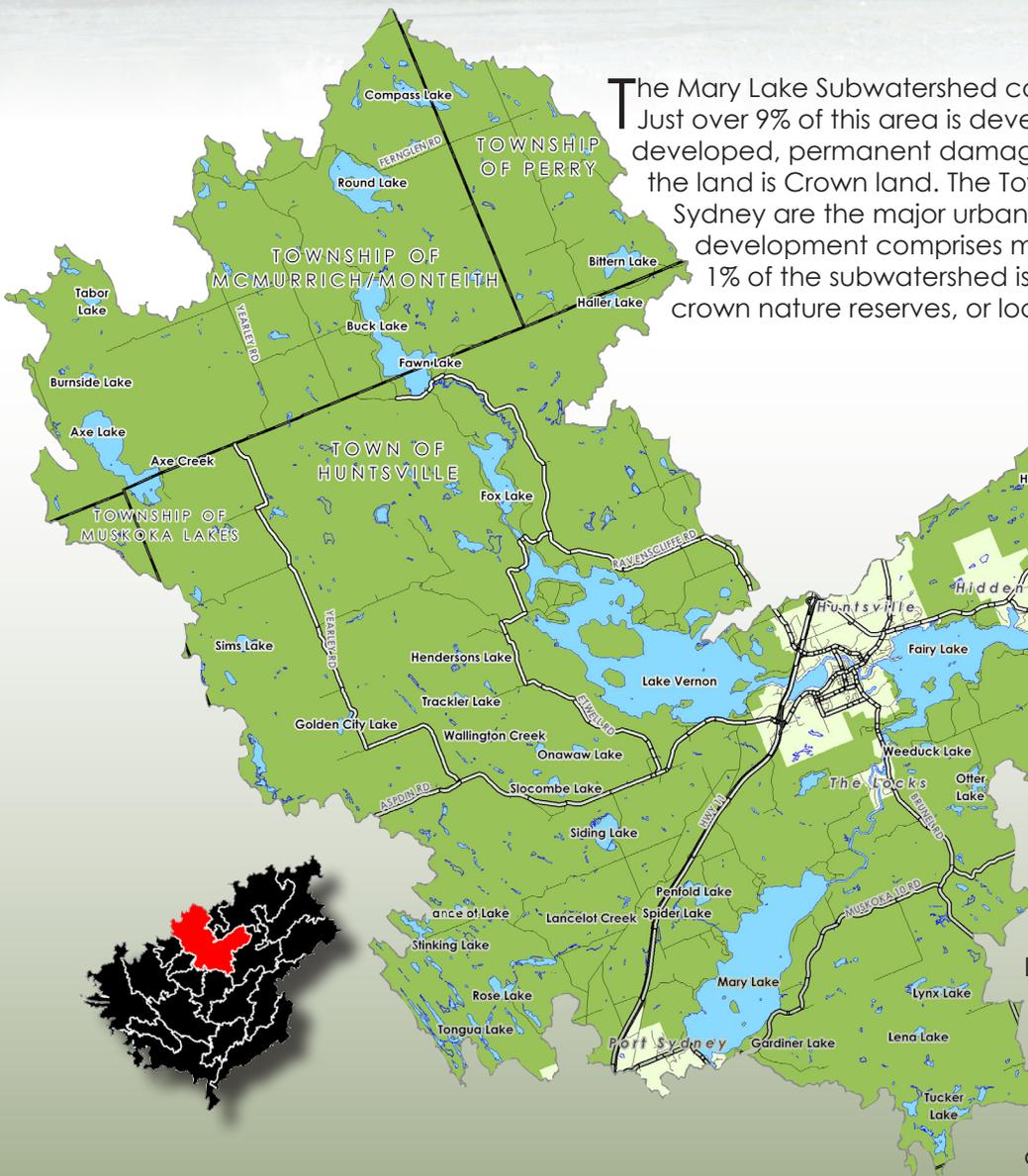


2014 MUSKOKA WATERSHED

REPORT CARD

MARY LAKE SUBWATERSHED

GRADES	
Land	Vulnerable
Water	Vulnerable
Wetlands	Vulnerable
Biodiversity	Vulnerable



The Mary Lake Subwatershed covers an area 66,344 hectares in size. Just over 9% of this area is developed. When 10% of a watershed is developed, permanent damage to water courses may occur. 5% of the land is Crown land. The Town of Huntsville and the village of Port Sydney are the major urban areas. Rural and shoreline residential development comprises most of the remaining land ownership. 1% of the subwatershed is protected through provincial parks, crown nature reserves, or local land trusts.

The headwaters for the Mary Lake Subwatershed start in Algonquin Park and flow down the Big East River into Lake Vernon (see the Big East River Subwatershed for more information). From the north, water flows out of the big Axe Lake wetland into the north part of Lake Vernon. There is a dam on Axe Lake and two on Buck Lake with a final control structure on Fox Lake before the water flows into the north part of Lake Vernon. Flowing out of Fairy Lake into the Muskoka River is a dam and set of locks just south of Huntsville. The final dam is in Port Sydney at the outflow of Mary Lake to the North Branch of the Muskoka River. There are four automatic water level gauges and two flow gauges on the system.

This report card describes the health of the land, water, wetlands and biodiversity of the Mary Lake Subwatershed and is part of the **2014 Muskoka Watershed Report Card** available at www.muskokawatershed.org.

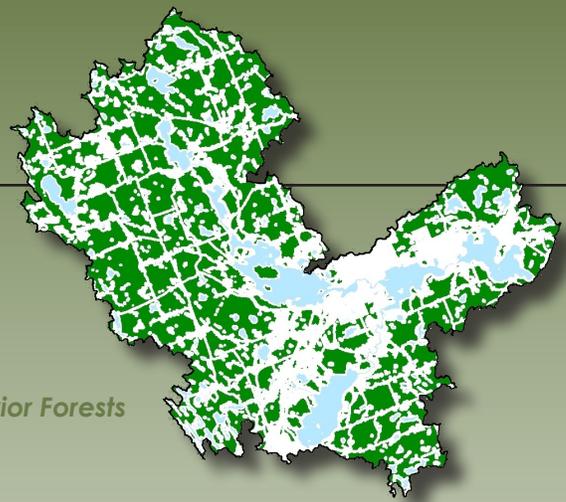
Stewardship Works!



Muskoka
WATERSHED COUNCIL

Land:

- Not Stressed
- ✓ Vulnerable
- Stressed



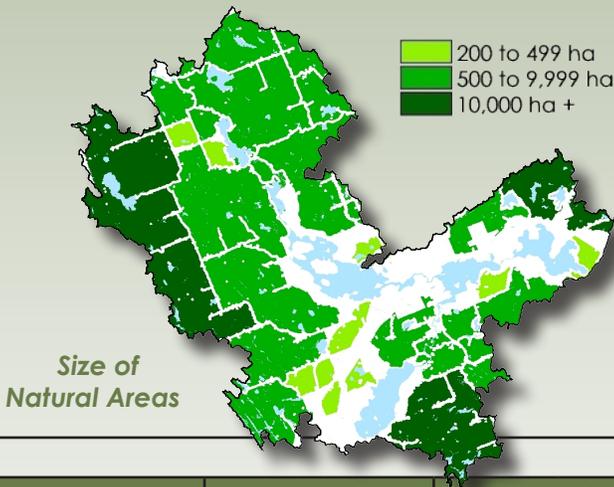
Interior Forests

Muskoka, such as bear and moose. These natural areas are also important to help purify the air, maintain good water quality and provide a carbon sink.

95% of the subwatershed is privately owned and it will be important to maintain a strong private land stewardship program to ensure that the long-term health of the subwatershed is maintained as development occurs. Although only 10% of the land is currently under active private land stewardship, there has been an increase in participation in MFTIP and CLTIP and donations to land trusts.

Both healthy riparian areas and interior forests are important to support local wildlife and maintain good water quality. Planting native species and renaturalizing shorelines are important stewardship activities in the subwatershed.

71% of the Mary Lake Subwatershed is in large undeveloped natural areas, with smaller patches of natural areas closer to developed areas. The subwatershed is relatively large and is dominated by the large lakes of Fairy, Mary, Peninsula and Vernon. In all, there are 88 small and medium sized lakes in the subwatershed. The subwatershed is centred on the urban area of Huntsville and stretches north into the southern portion of the District of Parry Sound. The lakes are surrounded by mixed forest vegetation with scattered development in the rural areas outside the town of Huntsville. The development pattern has resulted in a large undisturbed area that supports many of the large mammals native to



Size of Natural Areas

- 200 to 499 ha
- 500 to 9,999 ha
- 10,000 ha +

Indicator	Mary Lake Subwatershed		Muskoka Watershed		Description
	Value	Grade	Value	Grade	
Size of Natural Areas	71%	Vulnerable	79%	Vulnerable	Areas of natural cover that are 200 ha or greater. Natural cover includes forest, lakes, rock barrens and wetlands.
200 - 499 ha	5%		7%		
500 - 9,999 ha	44%		52%		
10,000 ha +	22%		20%		
Interior Forest	50%	Vulnerable	58%	Not Stressed	Interior forest is a forested area with a 100-metre forested buffer surrounding it.
Road Density	0.78 km/km ²	Vulnerable	0.51 km/km ²	Vulnerable	Road density is a measure of the degree of fragmentation of the landscape. Roads are a primary cause of death of many species, especially turtles and snakes.
Level of Development	9%	Vulnerable	5.4%	Vulnerable	Level of development is the percent of the watershed in urban or rural development. When more than 10% of a watershed is developed, lake and stream health may be impacted.
Shoreline Density	<13 lots/km	Not Stressed	N/A	N/A	Shoreline density is an indicator of the human stress on a water body. This stress includes nutrient loading, crowding, aesthetic appeal, and habitat impacts.
Shoreline Buffer	75-85%	Vulnerable	75%	Vulnerable	Shoreline buffer is the percent of unaltered lot area from the water's edge 20 metres inland. The shoreline buffer is the last line of defense against the forces that may otherwise damage a healthy lake.

Water:

- Not Stressed
- Vulnerable
- Stressed

Indicator	Mary Lake Subwatershed		Muskoka Watershed		Description
	# Lakes	Grade	# Lakes	Grade	
Total Phosphorus Concentration	16	Not Stressed	129	Vulnerable	The amount of total phosphorus in a lake is a measure of recreational water quality as phosphorus is generally the limiting nutrient in algae production.
< BG + 30%	12		73		
BG + 30% to BG + 50%	3		27		
> BG + 50%	1		29		
Algae		Not Stressed		Not Stressed	The propensity for algal blooms is the percentage of lakes with TP greater than 15 µg/L and are over threshold.
Fish Habitat (% Unaltered)	75-90%	Vulnerable	91	Not Stressed	This is a measure of fish habitat. Many fish species require the overhanging vegetation, rock shoals, and aquatic vegetation generally found in undisturbed sites.
Calcium Levels	37	Vulnerable	377	Vulnerable	Calcium is an important nutrient for the development of bones and exoskeletons. As a result of acid precipitation, calcium has been leached out of the forest soils and is now also in decline in many of the lakes in the watershed threatening the continued presence of important lake species.
< 1.5 mg/L	11		161		
1.5 - 2.0 mg/L	12		138		
> 2.0 mg/L	14		78		

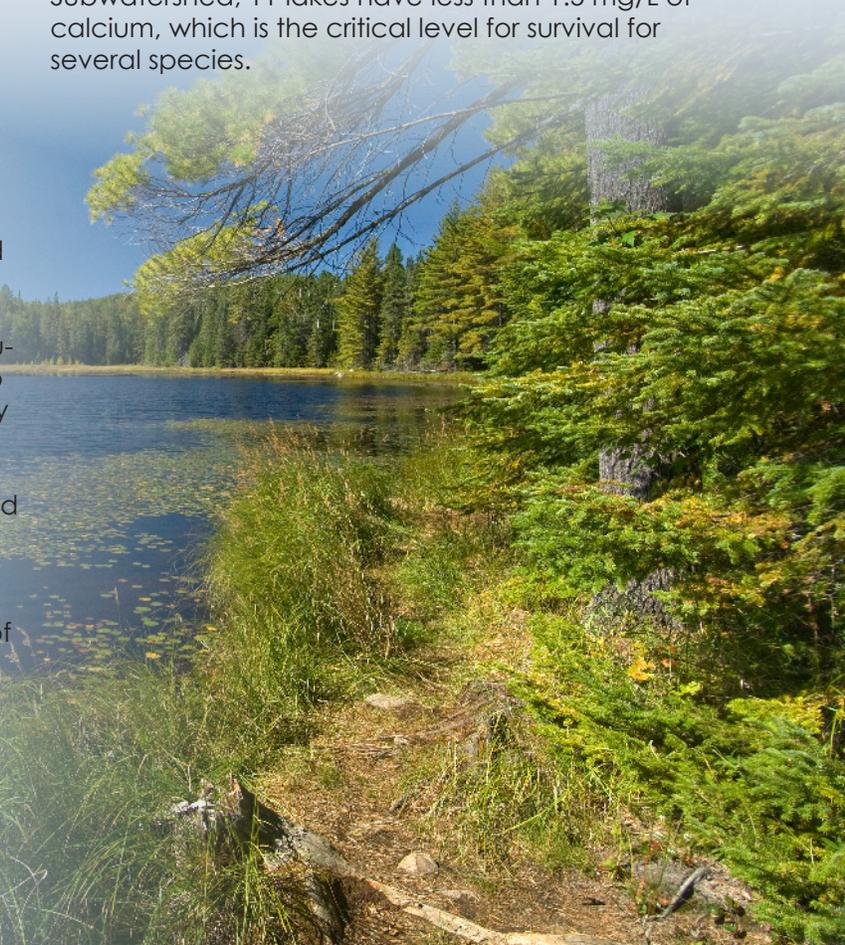
The Mary Lake Subwatershed flows from the north southward through a series of lakes and the Muskoka River to Lake Muskoka.

Total phosphorus concentration is an indicator of the amount of nutrient in a water body. A background or undeveloped level of total phosphorus has been determined for each lake. Where the phosphorus level has increased by more than 50% above the background level the lake may show signs of stress. There is one lake in the subwatershed (Walker Lake) that is Over Threshold.

Shoreline vegetation protects water bodies from nutrients and toxic chemicals that can be carried into the lake and contribute to water quality issues. They also protect the lake edge from erosion caused by waves and ice. The shoreline zone provides critical habitat for aquatic insects, microorganisms, fish, and other animals, thereby helping to maintain a balance in sensitive aquatic ecosystems.

Municipalities recommend that no more than 25% of a shoreline be developed. On average, between 15% and 25% of the shoreline on lakes in the Mary Lake Subwatershed has been altered.

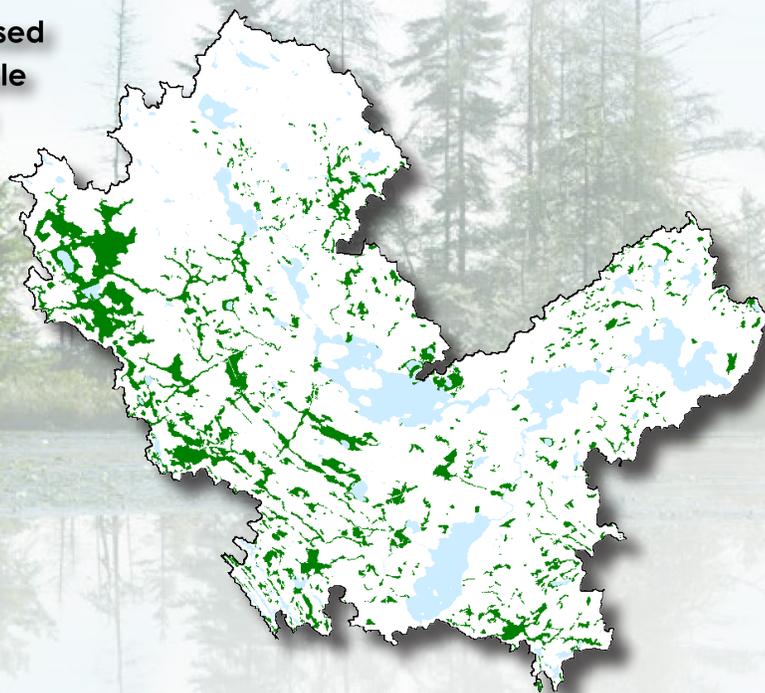
As a result of acid deposition, calcium has leached out of many lakes across Muskoka. In the Mary Lake Subwatershed, 11 lakes have less than 1.5 mg/L of calcium, which is the critical level for survival for several species.



Wetlands:

- Not Stressed
- Vulnerable
- Stressed

The Mary Lake Subwatershed is comprised of almost 11% wetland area. Wetlands are recognized by all levels of government as important components of a healthy environment. Wetlands and the area that surrounds them provide continuous, sustainable environmental, economic and social benefits that contribute to the high quality of life in Muskoka. Most species at risk native to Muskoka rely on wetlands for all or a portion of their life cycles.



Wetland Values

- Control and storage of surface water and recharge groundwater;
- Maintain and improve water quality, aid in flood control, and protect shorelines from erosion;
- Trap sediments which would otherwise fill water-courses;
- Support and initiate complex food chains;
- Provide important habitat;
- Support species at risk;
- Provide fish populations; and
- Provide active and passive recreational opportunities, including canoeing, bird watching, hunting and fishing

Subwatershed Name	% Wetlands	Comment	Grade
Mary Lake	10.82	<p>The Mary Lake Subwatershed is a large watershed with significant areas of development, including the urban area of Huntsville, Port Sydney, Deerhurst and the Highway 11 corridor. Although wetlands in the large rural area do not appear to be under significant development pressure, wetlands in areas adjacent to roads and in the urban areas are vulnerable to filling.</p> <p>In the Big East delta of Lake Vernon, the Town of Huntsville has taken some steps to protect the vast and provincially significant wetland. However, a review of current and past air photos indicates that several residential structures have been allowed in the margins of the wetland.</p> <p>As Hidden Valley developed, large areas of wetlands were filled or significantly manipulated. The original golf course south of Highway 60 was built primarily in a wetland. Today, only remnant wetland pockets remain. It is encouraging, however, that when the Champion golf course was built on the north side of the highway, most wetlands were preserved and designed into the course.</p> <p>More recently, along Highway 60 toward Dwight, filling has occurred on the north side of the highway. The air landing strip was once a wetland and several properties have filled in small portions of wetlands to have a developable lot.</p> <p>The wetland east of Grandview Drive at Brook Lane has also been filled as development has occurred.</p> <p>Wetlands in this subwatershed are in fair condition.</p>	Vulnerable

Biodiversity:

- Not Stressed
- Vulnerable
- Stressed



Biodiversity refers to the richness of life in the environment – the number of different species, their genetic variability, and the extent to which different groups of species occur from one place to another within the region.

Muskoka is blessed with a rich biodiversity primarily because of the extensiveness of its natural ecosystems. This biodiversity provides the resilience necessary to withstand environmental change and to continue to function

normally and provide the environmental goods and services on which we and other species depend.

Indicator	Mary Lake Subwatershed		Muskoka Watershed		Description
	# Species	Grade	# Species	Grade	
Species at Risk Habitat	11	Vulnerable	22	Vulnerable	The number of different types of species at risk habitat in the subwatershed. Subwatersheds with habitat for more types of species at risk are more vulnerable to development or other stressors.
<i>Endangered</i>	4		5		
<i>Threatened</i>	6		7		
<i>Species Concern</i>	10		10		
Alien Invasive Species*	4	Stressed	10	Stressed	Maintaining the diversity of native species is important to a healthy watershed. Invasive species often out-compete native species and significantly reduce the biodiversity of an area.

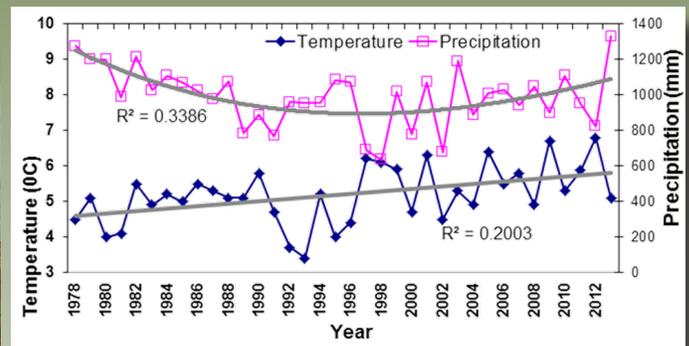
* Includes the Spiny Water Flea in the large recreational lakes. Spiny Water Flea will collapse the biodiversity of a lake.



Changing climate: temperatures continue to rise

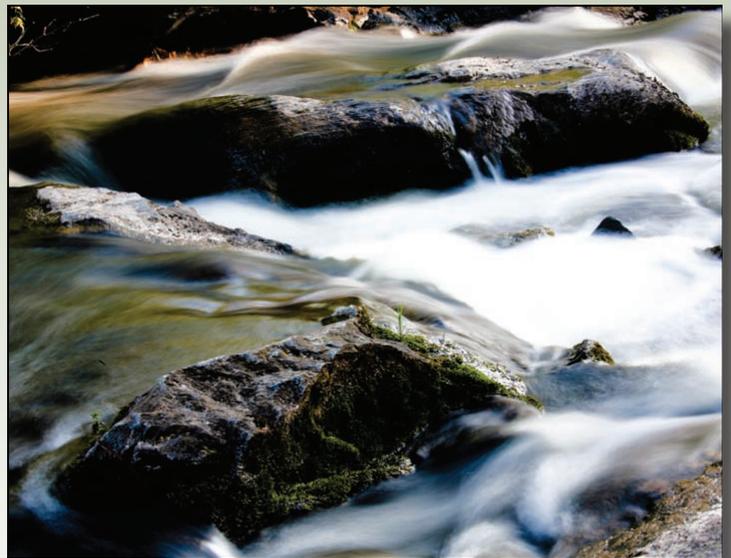
The mean temperature showed a clear and moderate increase or warming over 1978 to 2013, about 0.35 degree increase per 10 years, or a warming of 1 degree within 30 years. The annual precipitation had a significant decrease during 1978-1998 and then a weak increase during 1999-2013.

(Dorset Environmental Science Centre)



Stewardship Works: help protect the watershed

When all is said and done, the fate of sustainable management of Muskoka's watersheds lies in large part in the hands of local residents as they go about their day-to-day lives. It is the citizens of Muskoka who must generate the interest and enthusiasm to create, continue and expand local projects which lead to positive actions and results.



Stop the spread of invasive species

- Purchase non-invasive or native plants from a reputable dealer.
- Never dispose of domestic plants or animals into the wild.
- Inspect and wash your boat, ATV and other equipment and let dry for at least 6 hours before moving to a new lake or area.
- Do not move species from one area to another.

Retain buffers and leave shorelines in a natural state

- Maintain a wide buffer of native plants and trees around shorelines of lakes and rivers.
- Minimize boat speed (eliminate wake) in all near-shore areas and particularly in areas with known loon nests.
- Avoid grassed lawns in the waterfront area and minimize use of fertilizers.

Protect wetlands

- Leave wetlands alone.
- Keep recreational vehicles out of wetlands. Explore by kayak or canoe instead.

Maintain natural areas

- Limit cleared areas in the rural and waterfront area.
- Do not create new roads.

Reduce your personal impact

- Reduce your use of electricity and fossil fuels.
- Maintain your septic system.
- Improve the energy efficiency of your home and vehicle. Treat electricity as a luxury.
- Reduce waste by reusing, reducing, composting and refusing to buy items with excess packaging.