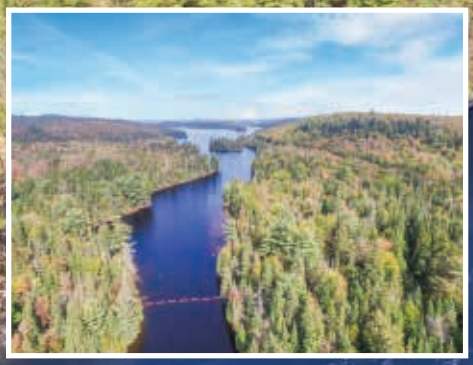
WE ALL BELONG TO A WATERSHED

There is much more to keeping it healthy than managing flood risk



Two ends of the Muskoka watershed: Downstream from Bala, Moon River Chute is one of close to two dozen rapids between Bala and Georgian Bay. Inset, near the watershed's source at Tea Lake, Algonquin Park, some 120 kilometres from Georgian Bay as the crow flies.

Tamsen Tillson

Much ink has been spent on issues relating to the Muskoka watershed through the decades, with the spectre and the reality of flooding increasingly taking centre stage. Yet many people don't really understand what the Muskoka watershed is and how it is managed. In the past that didn't matter, because the system appeared to just work, allowing us all to go about our business, most of the time. That's not the case anymore. In the last decade alone there have been a handful of "hundred-year floods," and experts predict that with climate change, there will be more.

Beyond that, the watershed faces additional pressures, increased development, rising levels of contaminants, invasive species, a decline in biodiversity, and shoreline erosion among them. It is more important than ever that stakeholders understand the inter-relationships and special dynamics around the Muskoka watershed, because in an era of climate change, it is only through working together that we will be able to manage and adapt.

The first thing to remember about watersheds is, whether you're in a Toronto mall or on a dock on a lake, you are on one. The world is comprised of watersheds, but typically we only describe them as such in the less-than-scintillating context of water flow, ecology or governance.

But simply put, a watershed is the parcel of land through which water flows on its way down to a common destination. In addition to lakes, rivers and streams, a watershed also includes the rocks and trees, the soil and the animals, as well as the dams, docks, buildings, sewers, streets, and parking lots within its boundaries. Ontario has three major watersheds, 28 secondary watersheds, and 144 tertiary watersheds, one of which is the Muskoka River watershed.

The Muskoka watershed is about 120 kilometres long and 62 kilometres wide, an area of about 5,100 square kilometres — about the same size as the island of Trinidad — beginning at the west end of Algonquin Park and running west to Georgian Bay. Geographically, the Muskoka watershed falls mostly in the District of Muskoka and its six area municipalities, Wahta Mohawk and Moose Deer Point First Nations, as well as smaller parts of Algonquin Highlands, Haliburton County and slivers of other municipalities. It includes more than 2,000 lakes, the largest of which are Lake Muskoka, Lake of Bays, and Lakes Rosseau and Joseph. All the water that falls on this area eventually makes its way into Lake Muskoka, down the Moon and Musquash Rivers from Bala, and eventually discharges into Georgian Bay on Lake Huron.

Aerial photographs courtesy of John Wright - North45 Communications Inc.

The geography is challenging from a water level management perspective because Nature designed the waterflow of the entire Muskoka watershed to bottleneck at three narrow channels at Lake Muskoka's Bala Bay. In terms of volume, it means that one inch of rain that falls on the 5,100-square-kilometre watershed can, over the course of about a week and depending on the time of year and other conditions, end up adding more than 20 inches to Lake Muskoka's water level. So, with a heavy rainfall or a rapid spring freshet (snowpack melt) the Muskoka watershed is like a bathtub with the tap turned on full and the stopper removed. The outlet is simply not big enough to keep up with the inflow, so the level rises.

Historically, the way we have managed the watershed also adds to the problem. Waterflow management in Muskoka began with the building of the first dams in the 1860s to facilitate the logging industry and to make safe passage for steamships. In the 1870s and '80s, locks and dams were built to connect the lakes adjacent to Huntsville and the Muskoka lakes. In 1894 power generation came into the picture with Bracebridge becoming the first municipality in Canada to own and operate a water-powered electricity generating station. Additional dams have gone in, some to generate hydroelectric power and, in more recent years, flow levels have been adapted for socio/recreational, environmental and economic interests. But to this point the thinking has been that they cannot be converted for flood control because the region doesn't have enough storage capacity to contain a heavy spring flood such as those in 2013 and 2019 (see sidebar). Additionally, officials with the Ministry of Natural Resources and Forestry (MNRF) have noted that the extent of development along the shoreline creates real challenges for any redesign of dams for flood control.

Today there are 42 dams in the Muskoka Watershed, 29 of which are managed by the MNRF. Eleven are operated by power facilities, one is owned and operated by the District of Muskoka and one is privately owned and operated. All of them worked together to develop a joint water management plan, the Muskoka River Water Management Plan, which was last amended in December 2019 (a small change that added Swift River Energy Limited as an operator in Bala).

There is a large and vocal contingency of those whose primary concern is flooding, led by Muskoka Lakes Mayor Phil Harding, who has repeatedly called for significant updates and protocol changes to the Muskoka River Water Management Plan. "Lowering water levels earlier during the winter months and infrastructure changes to allow water to pass through the watershed faster would help mitigate if not eliminate spring flooding completely," Mayor Harding says.

This thinking, in the opinion of Kevin Trimble, chair of the Muskoka Watershed Council, represents a crucial misconception. "There is a belief that the Muskoka River Water Management Plan can solve the flooding problems, but it can't," he says. "Tweaking it may help slightly, but that's the best we can do. Unfortunately, there is no magic bullet." He also suggested that manipulating water levels and flows without consideration of the other working parts of our environment will have consequences for our economy and communities.

This is not to say that nothing can be done. The region's woes have caught the attention of Ontario's Ministry of the Environment, Conservation and Parks, which in 2018 announced a $5 million Muskoka Watershed Conservation and Management Initiative (with the potential to raise up to another $10 million) to protect the watershed. In the summer of 2019, after the worst spring flooding yet, the ministry announced the appointment of nine people with a cross-section of environmental, financial and social interests to the Muskoka Watershed Advisory Group to identify issues and make recommendations to help protect and conserve the Muskoka

After every flood year, the finger pointing begins: they should have held the water back; they didn't draw down enough. To try to settle the case, Muskoka Watershed Council used Muskoka River Water Management Plan data and did some rough estimates. They found:

- All Muskoka's lakes and reservoirs together can hold about 0.6 cubic kilometres of water (about 240,000 Olympic pools).
- Between April 15 and May 10, 2019, the total flow of water in the system was 1.0 cubic kilometres.

"If all controllable volume had been available on 15 April (all lakes drawn down to the maximum), the spring thaw would have filled all storage capacity and still pushed 0.4 km^3 water through as a flood." For those who like the analogy, that's 160,000 Olympic pools flowing through the system.

The spring melt of 2019 flooded wetlands by Stoneleigh Lake, well removed from the main rivers and lakes of the watershed.

Boiling flow at Bracebridge Falls upstream of a hydo dam indicates how difficult the flooding was to control.

Photos by Neil Hutchinson

Watershed and support the economic growth of the region. Their preliminary report and recommendations were scheduled to arrive with Minister Jeff Yurek in Spring 2020.

It's important to note that the advisory group's mandate, and the solutions they are exploring, are far broader than flooding, says chairperson Mardi Witzel. "Even if you are only interested in water levels and water level management, it still makes sense to focus on the watershed as a whole," she says. "We want the public to better understand the interconnectedness of the many elements of the Muskoka Watershed; including water quantity, water quality, the forests, wetlands, soil, and the climate. Too frequently we talk about water levels and flows in isolation but that isn't helpful. We want to capture the best approaches to managing the watershed as a whole, including but not limited to water management."

The northermost of three narrows that funnel all the water from Lake Muskoka through Bala. Beyond here, River Street received significant flooding in spring 2019.

Photo by John Challis

Looking for ways to clear water from the system as quickly as possible is not necessarily best practice, notes Chris Cragg, a representative on the Muskoka Watershed Council, Muskoka Lakes Association and is also a member of the Muskoka Watershed Advisory Group. Climate is altering precipitation patterns over the course of the year, with more storms and precipitation in the cooler seasons, including more snow in the winter and a faster spring thaw, and hotter, dryer conditions in the summer. "If we find ways to employ wetland areas [and] backwater areas for temporary flood storage — instead of filling them in or paving them over or other bad things — they can help us," notes Cragg. "If we look longer term, with climate change we are going to want to hang onto the water to keep those levels up in the summer, so storing it upstream is a good idea."

Forests as water control tools

The healthier the forests and lands are, the higher the percentage of precipitation that is evaporated and transferred back into the atmosphere. Friends of the Muskoka Watershed Chair Norm Yan, who is also a senior research scholar, professor emeritus at York University and member of the Muskoka Watershed Advisory Group, has found that a widespread decline in calcium levels has negatively impacted forest health in Muskoka, and consequently, the watershed's ability to hang onto water upstream. Currently, about half of the precipitation that falls on the Muskoka watershed goes back into atmosphere through evaporation or transpiration. That's 10 per cent or 20 per cent lower than forests to the south, Yan calculates.

"Improving the health of forests is more than just good for the maple syrup industry," notes Cragg. "It's good for the overall water balance."

A holistic approach is particularly challenging in the Muskoka watershed because different agencies control different aspects of it. While 95 per cent of Ontario's population lives in watersheds managed by a Conservation Authority, we in Muskoka do not. Instead, water quality is handled by the Ministry of the Environment, Conservation and Parks; water levels and the Muskoka River Water Management Plan fall under the purview of the Ministry of Natural Resources and Forestry, while land use is governed by the municipalities. All are represented at the table by the Muskoka Watershed Council (MWC), a volunteer-based, non-profit advisory body. But the MWC has no legislative clout, and the interests of the governing agencies can be siloed and are at times even in conflict with one another.

This was also flagged by special advisor Douglas McNeil, appointed last fall by The Ontario Ministry of Natural Resources and Forestry to look at the flooding in Muskoka and across the province last year. In addition to finding no evidence of human error exacerbating the flooding, McNeil predicted that in an era of climate change, in the Muskoka Watershed in particular, flooding is likely to continue to occur at an increased frequency. "It is not a question of if these lakes and river systems will flood again," McNeil reports, "it is only a question of when."

This reality puts at risk thousands of homes and cottages, and more than 5,300 boathouses, 6,500 docks, and 41 marinas on the Muskoka watershed floodplain; a lot of valuable development that is typically not insurable for flooding or ice damage. And yet, McNeil noted that permits and approvals are continuing to be issued "without regard for the potential damage from flood and ice heaving." Between 2013 and 2016, permits for 267 new boathouses with a construction value of more than $46 million were issued in the Township of Muskoka Lakes alone.

McNeil's assessment goes on to state: "Designs presented to Council include first floor plans with utility rooms, games rooms, elevators and washrooms, which are much more than a basic boathouse, and there appears to be no direction or regard for incorporating floodproofing measures into the construction plans. As these structures continue to be built in harm's way, flooding and ice damage will only increase as will costs associated with the inevitable damage from these natural phenomena. It is unreasonable to expect that water levels can be controlled within a finite range and be kept below the damage level of docks and boathouses, or other structures, when dealing with a large river system with limited means to mitigate the magnitude and extent of flooding."

However complex and divided the current situation appears, Trimble, who sits on both the Muskoka Watershed Council and the Muskoka Watershed Advisory Group, sees this as an opportunity to dismantle these silos and bring competing interests into alignment. His vision is the creation of an independent new oversight body or agency, one that has teeth. This is something that the Muskoka Lakes Association has also called for. If they do not work together, Trimble warns, the danger is we're going to see more of the same: storms, floods, and with the dryer, hot weather in summer, droughts and fires.

Witzel also sees this as a glass-half-full moment, "There is an opportunity for the public to be part of an effective and collaborative process that will ensure a healthy and sustainable Muskoka Watershed for generations to come."

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