

## 3.0 Whitefish River Subwatershed



### General Description

- **Total area :** 198.53 km<sup>2</sup>
- **Drainage:** The Whitefish River subwatershed is made up of a chain of lakes connected by short channel reaches. Its headwaters originate at Daisy Lake, flowing southwest through Richard Lake, McFarlane Lake, Long Lake and finally Round Lake. From here, the river leaves the Conservation Sudbury jurisdiction, where it eventually makes its way into the North Channel of Lake Huron.
- **Topography:** Characteristic of Northern Ontario, much of the subwatershed is made up of rocky highlands interspersed with lower, flatter areas made up mostly of river valleys and lakes.
- **Geology:**
  - **Bedrock Geology:** Precambrian bedrock of the Huronian Province underlays most of this subwatershed, with intrusions of the Superior Province. Along the south-central border, Killarney granitic rocks are also present.
  - **Quaternary Geology:** Exposed or thinly covered bedrock is the main formation, with long pockets of glaciofluvial gravels and sands in the southwest and glaciolacustrine silts and clays in the northeast.
- **Soils:** Stable bedrock is the main surface substrate, with sandy loams playing a secondary role, followed by silty loams, particularly in the area between and to the north of Richard Lake and McFarlane Lake.
- **Groundwater:**
  - Many areas have been identified as 'highly vulnerable aquifers,' mainly found in the low-lying areas associated with the various lakes, watercourses, and wetlands in the subwatershed.
  - Significant Groundwater Recharge Areas have been identified mainly in the sandy area between McFarlane Lake and Richard Lake, as well as in several pockets along Long Lake.
- **Land cover :**
  - Forest covers an area of 125.8 km<sup>2</sup>, 63.4 % of the subwatershed.
  - Lakes cover an area of 29.2 km<sup>2</sup>, 14.7 % of the subwatershed.
  - Exposed bedrock covers an area of 26.5 km<sup>2</sup>, 13.8 % of the subwatershed.
  - Wetlands cover an area of 19.9 km<sup>2</sup>, 10.0 % of the subwatershed.
  - Community/Infrastructure covers 5.1 km<sup>2</sup>, 2.7 % of the subwatershed.
- **Land Use Type:**
  - **Zoning:** 70.8 km<sup>2</sup> (35.7 %) of this subwatershed is subject to the City of Greater Sudbury's zoning bylaws. Of that area, 44.6 km<sup>2</sup> (62.9 %) is rural, 10.7 km<sup>2</sup> (15.1 %) is park, 6.41 km<sup>2</sup> (9.0 %) is residential and 6.01 km<sup>2</sup> (8.5%) is open space. The remainder are small areas designated as industrial, institutional, seasonal, future development and commercial lands.

## Indigenous Communities and Traditional Territories

- The entirety of this subwatershed also falls within the traditional territory of the Atikameksheng Anishnawbek First Nation.
- The community of Atikameksheng Anishnawbek First Nation (AAFN) falls partially within this subwatershed. It has a land base of approximately 117 km<sup>2</sup>, occupying the western half of the subwatershed, to the west of Long Lake. It is located approximately 15km southwest of Greater Sudbury and is a part of the Robinson-Huron Treaty Area #61, of 1850 as well as a member of the North Shore Tribal Council. The community is made up of approximately 840 band members, with approximately 336 living within the land base and 504 residing elsewhere.
- It also falls within the Mattawa/Lake Nipissing Métis traditional territory, Region 5.

## Development Pressure

**Overall:** Low. While much of the subwatershed falls within the city's limits, most of the area remains undeveloped.

- **Settlement Area:** 7.36 km<sup>2</sup> (3.7%) of the subwatershed is designated as settlement area under the City of Greater Sudbury's Official Plan. This includes the south end of Sudbury (3.55 km<sup>2</sup>) and the neighborhoods around McFarlane Lake (2.25 km<sup>2</sup>) and Long Lake (1.56 km<sup>2</sup>).
- **Wastewater Facilities:** There are no municipal wastewater facilities within this subwatershed.
- **Forestry:** Located within the Sudbury Forest, this subwatershed contains no areas identified for harvest in the 2020-2030 Sudbury Forest Management Plan.
- **Aggregates:** There are 6 active aggregate operations identified within this subwatershed, occupying an area of 1.31 km<sup>2</sup>.
- **Mining:**
  - Currently, there are no producing mines. Historically, there was 1 mine, Long Lake Mine, a gold mine that operated from 1909-1916.
  - Within the last year, there has been no active exploration.
  - There is currently 1 active Mining Plan or Permit registered to this subwatershed.

## Recreational Use

- Many of the lakes within this subwatershed and their shorelines are used for recreational purposes, including boating, canoeing, kayaking, swimming, camping and recreational fishing.
- The area is also commonly used for crownland camping, hiking, hunting, berry picking and general nature appreciation. Trails are plentiful for snowmobiling and off-road vehicle use.
- Kivi Park is a 194 ha, 4-season, green space offering 55.7 km of trails for a variety of activities including hiking, cross-country skiing, canoeing, kayaking, cycling, and skating.
- Areas within the AAFN territory are used by members for traditional purposes, including hunting, fishing, berry and plant harvesting, maple syrup harvesting and nature appreciation.

## Water use

- There is currently 1 active Permit to Take Water within this subwatershed, held by a golf facility.

## Notable Waterbodies

- **Daisy Lake** has an area of 36.6 ha, and a maximum depth of 14 m. Daisy Lake has no permanent or seasonal residents. It is located within a provincial park and nature reserve established to monitor natural recovery of the mine-disturbed Sudbury landscape.
- **Richard Lake** is a small urban lake with an area of 83.6 ha and a maximum depth of 9 m. The lake has 106 permanent and 15 seasonal residents.
- **McFarlane Lake** is a medium-sized urban lake with an area of 166.1 ha in size and maximum depth of 18 m. The lake has 230 permanent and 53 seasonal residents.
- **Silver Lake** is a small urban lake with an area of 21.8 ha and a maximum depth of 10m. The lake has 22 permanent and 9 seasonal residents.
- **Long Lake** is a medium urban lake with an area of 861.3 ha and a maximum depth of 36.5 m. Because of its nature as a widening of the Whitefish River, it measures 14.5 km in length but less than 1 km in width over much of its length. A popular lake for waterfront development, Long Lake has 866 permanent and 217 seasonal residents.
- **Lohi Lake** is a small rural lake with an area of 41.6 ha and a maximum dept of 19m. The lake has 50 permanent and 15 seasonal residents.
- **Clearwater Lake** is a small rural lake with an area of 76.0 ha and a maximum depth of 21.5 m. The lake has 106 permanent and 22 seasonal residents.
- **Makada Lake** (AKA Black Lake) is a medium rural lake with an area of 353.8 ha. The lake has 87 permanent and 50 seasonal residents. Most of the lake is located within the Atikameksheng Anishnawbek First Nation community.
- **Round Lake** is a medium sized rural lake with an approximate area of 647 ha. It is located entirely within the Atikameksheng Anishnawbek First Nation community and has only a few known residents.
- **Other Lakes:** Grant Lake, Forest Lake, Tilton Lake, and Blackwater Lake.

## Previously Identified Management Issues

- In 2004, the City of Greater Sudbury completed a stormwater management study of the Algonquin Road subwatershed to identify option for controlling the quantity and quality of stormwater generated within the area, and to prevent water quality degradation, flooding, and erosion.
- **McFarlane Lake** and **Long Lake** have experienced water quality concerns over the years. See 'Water Quality Indicators' section for more details.

## Natural Hazard Identification and Regulation

Hazards and features regulated by Conservation Sudbury include flood and erosion hazards, wetlands, unstable soils, rivers, streams, creeks, and small inland lakes. More on these regulations can be found in the Conservation Authorities Act, O. Reg. 686/21 that addresses the risks of natural hazards.

### Floodplain mapping:

- Floodplain mapping of a section of the Whitefish River subwatershed was completed in 1983 identifying flood lines for both the Timmins storm and the 100-year flood. The study area included the chain of lakes from Daisy Lake, through Richard Lake, McFarlane Lake and ending at the outflow of Long Lake, as well as Silver Lake and the Algonquin neighborhood of the City of Greater Sudbury.
- As part of an Environmental Assessment, floodmapping within the Algonquin area was completed in 2005 and adopted as Regulatory mapping. An update to the Algonquin floodplain mapping from Silver Lake to McFarlane Lake is currently underway and expected to be adopted early 2025.
- In the absence of floodplain mapping, flood hazards are estimated based on site conditions. Typically, the extent of the flood hazard is estimated at 1.2 m above the bankfull or high-water elevation.

### Erosion hazard mapping:

- Currently, erosion hazards are evaluated based on the general guidance from the MNRF for confined and unconfined systems.

## Water Control Structure

- There are no water control structures identified within this subwatershed.

## Drinking Water Source Protection

- There are no municipal drinking water sources within this subwatershed.

## Water Quality Indicators

- The City of Greater Sudbury's Lake Water Quality Program has classified the following lakes as oligotrophic – having low nutrient enrichment: Daisy Lake, Richard Lake, Silver Lake, Long Lake, Makada Lake, Lohi Lake, Forest Lake, Clearwater Lake, and Tilton Lake. McFarlane Lake is also classified as oligotrophic, though its average spring phosphorus reading is slightly over the threshold value of 10 ug/L, suggesting it may be verging on mesotrophic and experiencing more urban impact to the water quality.
- **McFarlane Lake** has garnered some attention due to decreasing water quality through the years. It is an important urban lake used extensively for recreational purposes such as swimming, boating, and fishing, with several cottages and private homes along the shores, some drawing drinking water directly from the lake. Historically, the Ontario Government Complex at McFarlane Lake also utilized the lake as a potable water supply. The sewage treatment plant which served the complex also emptied into the northwest portion of the lake. (City of Sudbury McFarlane Lake and Whitefish River Preliminary Pollution Study, 1973).

- In 1973, samples taken along the Whitefish River from various locations upstream of McFarlane Lake revealed high coliform counts, suggesting pollution originating from sewage waste, ultimately making their way into the lake.
- In the early 1980's the MOE classified McFarlane Lake as an 'at capacity' lake and that future new developments would not be approved. McFarlane Lake has higher nutrient levels than many Sudbury area lakes and is affected by intensive housing development in its watershed including the Algonquin secondary watershed. It was one of the first lakes in northern Ontario to be invaded by the invasive Eurasian milfoil and it suffered from blue green algae blooms in 2008.
- Sampling in 2003 revealed that as water moves from Silver Lake, downstream through the Algonquin Road watershed toward McFarlane Lake, there was a trend towards increasing concentrations of nutrients, metals, and dissolved solids, attributable to urban runoff. (Algonquin Rd Watershed Stormwater Management Class Environmental Assessment Study, 2004).
- **Long Lake** has suffered from tailings runoff and seepage originating from Long Lake Gold Mine, which operated from 1908 to 1939. In 2012, it was found that elevated arsenic levels are present in the lake, exceeding the Ontario Drinking Water Standards and Health Canada's guidelines. A rehabilitation project is expected to begin in 2025 (Ministry of Mines, 2024).

### Significant Features

- Daisy Lake Uplands Provincial Park is a 600-ha nature reserve that has historically been disturbed by decades of mining activity in the area. This reserve is intended to be left untouched as to observe natural recovery, unlike the surrounding areas that have been subject to various restoration initiatives.
- The Eden Township Forest Conservation Reserve occupies an area of 145 ha. The area is of interest due to the presence of red pine and cedar dominated forests on a landscape of low hills as well as a provincially significant representation of sparse coniferous forest on prehistoric lake sediments.
- The Tilton Forest Conservation Reserve is a 745-ha hardwood forest, consisting of red maple, red oak, and red pine on low rolling hills, as well as a provincially significant earth science representation of the Killarney Magmatic Belt.
- There are not ANSI ecological or geological areas of interest identified.
- Wildlife Values:
  - There are 13 moose related wildlife value areas, covering a total area of 2.3 km<sup>2</sup>.

## Management and Stewardship

- **Atikameksheng Anishnawbek First Nation:** Their traditional territory includes the entire Whitefish River subwatershed. They are land holders within this subwatershed and, as such, are significant stewards of the land.
- **City of Greater Sudbury Regreening Program and VETAC:** The CGS's regreening program has completed regreening work on 11.0 km<sup>2</sup> (5.5 %) of this subwatershed.
- There are several lake stewardship groups within this subwatershed, including:
  - Forest Lake Stewardship Committee
  - Grant Lake Stewardship
  - Long Lake Stewardship
  - Friends of McFarlane Lake
  - Richard Lake Stewardship
  - Silver Lake Committee
  - Tilton Lake Stewardship

## Data available

- **Climate Station** – MNRF station CLIM-MTO-NR07 monitoring air temperature, humidity, precipitation, and wind.
- **City of Greater Sudbury:** Lake Water Quality Program collects spring total phosphorus data on Daisy Lake, Richard Lake, McFarlane Lake, Silver Lake, Long Lake, Lohi Lake, Pine Lake, Clearwater Lake, Tilton Lake, and Makada Lake.
- **Co-operative Freshwater Ecology Unit (CFEU):** Several lakes within this subwatershed have been sampled as part of the CFEUs various long term monitoring programs. Sampled lakes include Daisy Lake, Richard Lake, McFarlane Lake, Grant Lake, Hazen Lake, Silver Lake, Forest Lake, Lohi Lake, Long Lake, Hidden Lake, Pine Lake, Clearwater Lake, Swan Lake, and Tilton Lake.
- **Lake Partner Program:** Daisy Lake, Richard Lake, McFarlane Lake, Grant Lake, Silver Lake, Long Lake, Lohi Lake, Forest Lake, Pine Lake, Clearwater Lake, Tilton Lake, and Makada Lake have all been sampled for total phosphorus and sometimes secchi depth as part of this provincially run, volunteer-based program.

## Supporting Documents

Ministry of Mines, **Long Lake Gold Mine Rehabilitation Project**, March 2024.

Conservation Sudbury, **Greater Sudbury Source Protection Area - Assessment Report**, September 2, 2014.

Ministry of Natural Resources and Forestry, **Daisy Lake Uplands Provincial Park Management Statement**, February 2007.

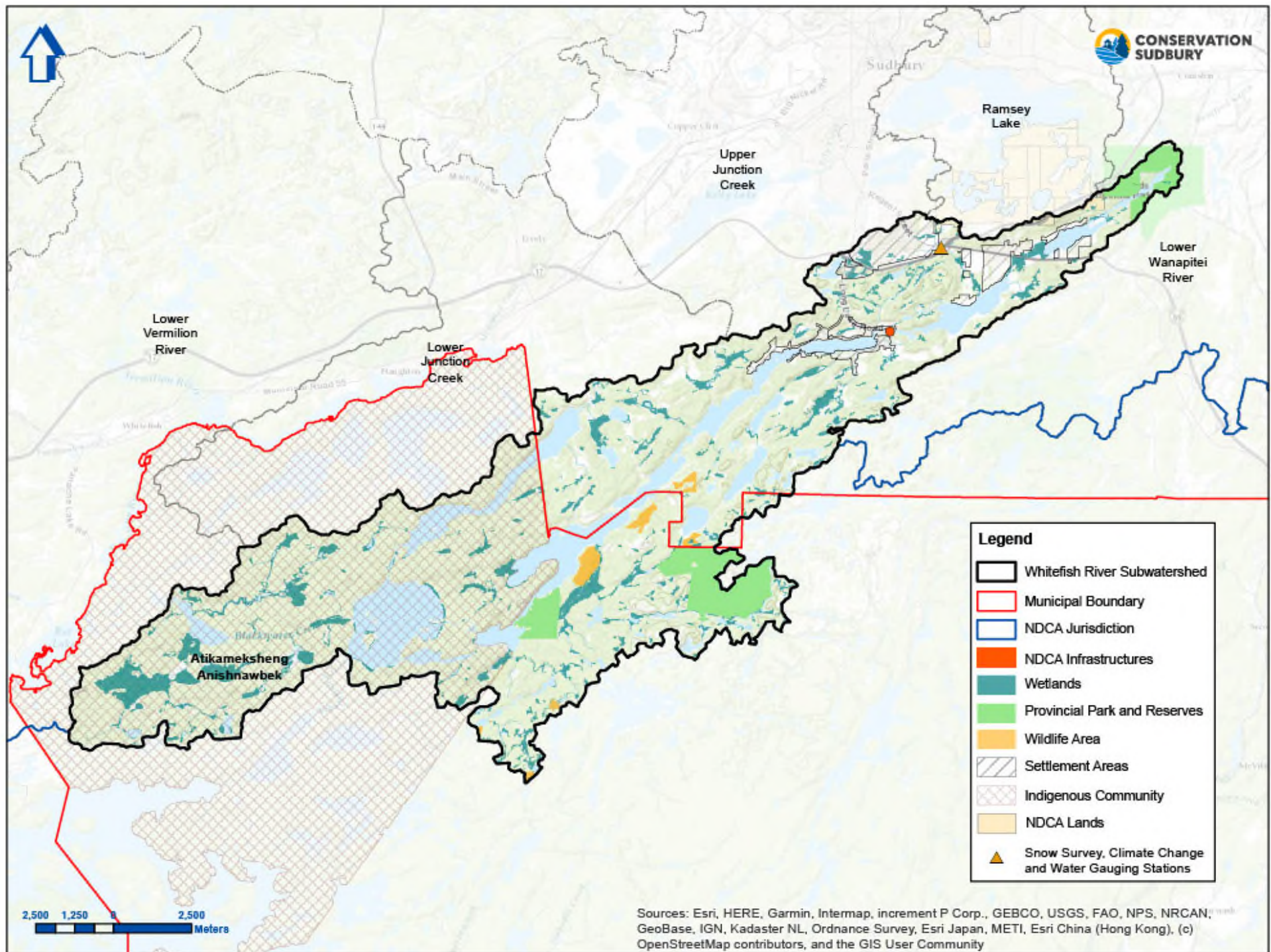
Earth Tech Canada Inc. for the City of Greater Sudbury. **Algonquin Road Watershed Stormwater Management Class Environmental Assessment Study**, 2004.

Ministry of Natural Resources and Forestry, **Tilton Forest Conservation Reserve Management Statement**, 2004.

Ministry of Natural Resources and Forestry, **Eden Township Forest Conservation Reserve Management Statement**, 2004.

Dillon Consulting Engineering and Planners. **Whitefish River Flood Plain Mapping – Technical Report**, 1983.

Ministry of the Environment, **City of Sudbury McFarlane, and Whitefish River Preliminary Pollution Study**, 1973



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community