

2.4 Rapid River, Sandcherry Creek and Nelson River Subwatersheds



General Description

- **Total Area:** 408.4 km² (Sandcherry Creek – 146.0 km², Nelson Creek - 182.1 km², Rapid River - 80.3 km²).
- **Drainage:** All three of these subwatersheds are tributaries to the Vermilion River.
 - Rapid River Creek subwatershed has a main channel length measuring 36.4 km long draining an area of 80.3 km². It has a maximum elevation of 444.8 m.a.s.l. and a slope of 4.2 m/km.
 - Nelson River subwatershed has a main channel length measuring 48.4 km long and draining an area of 182.1 km². It has a maximum channel elevation of 454.5 m.a.s.l. and slope of 3.6 m/km.
 - Sandcherry Creek subwatershed has a main channel length measuring 29.7 km long draining an area of 146.00 km². It has a maximum channel elevation of 462.34 m.a.s.l. and a slope of 6.2 m/km.
- **Topography:**
 - Rapid River has a mean elevation of 395.3 m.a.s.l. and a maximum elevation of 478.6 m.a.s.l., with a mean slope of 9.2%.
 - Nelson River has a mean elevation of 407.9 m.a.s.l. and a maximum elevation of 500.1 m.a.s.l., with a mean slope of 8.8%.
 - Sandcherry Creek has a mean elevation of 400.1 m.a.s.l. and a maximum elevation of 483.9 m.a.s.l., with a mean slope of 10.3%.
- **Geology:**
 - **Bedrock Geology:** Mainly Precambrian bedrock of the Superior Province. The southern portion of all three subwatersheds are underlain by rock of the Sudbury Igneous Complex
 - **Quaternary Geology:** Most of this area is underlain with undifferentiated igneous and metamorphic rock, exposed at surface or covered by a discontinuous, thin layer of drift. Patches of glaciofluvial outwash deposits can also be found throughout.
- **Soils:** The southern extent is mainly covered by stable bedrock. Soil surface texture data from the northern extent of all three subwatersheds is absent, but bedrock is commonly found throughout the landscape in this area.
- **Groundwater:** In the Sudbury Source Protection Plan, a few Highly Vulnerable Aquifers were identified within these watersheds, mainly towards their northern extents. Sandcherry Creek also has a Significant Groundwater Recharge Area in the southern portion of the watershed, in the northern half of Morgan Twp.

- **Land Cover:**
 - Forest covers an area of 347.3km², 85.0 % of the subwatersheds.
 - Wetlands cover an area of 33.4km², 8.2 % of the subwatersheds.
 - Lakes cover an area of 31.1km², 7.6 % of the subwatersheds.
- **Land Use Type :**
 - **Zoning:** 179.5 km² (43.9%) of these subwatersheds fall within the City of Greater Sudbury's zoned areas and are subject to the Zoning By-law. Of that area, 93.8 km² (52.3%) is zoned rural, 85.3 km² (47.5%) is industrial and the remaining 0.28 km² is institutional.

Indigenous Communities and Traditional Territories

- These subwatersheds falls within the Robinson-Huron Treaty Area #61, of 1850. It also lies within the traditional territory of both the Wahnapiatae First Nation and the Atikameksheng Anishnawbek First Nation.

Development Pressure

Overall: Low – The majority of these subwatersheds are undeveloped with a moderate amount of forestry and mineral potential within the Sandcherry Creek and Nelson Creek subwatersheds.

- **Settlement Area:** These subwatersheds have no areas identified as 'Settlement Areas' based on the City of Greater Sudbury Official Plan.
- **Municipal Wastewater Facilities:** There are no municipal wastewater facilities within these subwatersheds.
- **Forestry:** The northern portions of all three subwatersheds fall within the Spanish Forest, while the southern extent falls within the Sudbury Forest. These subwatersheds have moderate forestry activities, with some areas identified for harvest in both the 2020-2030 Spanish Forest Management Plan and few areas identified in the Sudbury Forest Management Plan.
- **Aggregates:** There are currently 7 active and 2 inactive aggregate operations, covering an area of 4.18 km².
- **Mining**
 - No active exploration reported within the last year (February 2023-January 2024)
 - There are currently 103 active Mining Plans and Permits registered to these subwatersheds, 74 of which are in the Sandcherry Creek subwatershed, and 26 which are in the Nelson Creek subwatershed.
 - Historically, there were three producing mines:
 - Nickel Offset Mine, an underground mine in operation from 1943-1957, mined primarily Copper, Gold, Nickel, Palladium and Platinum.
 - Longvack Mine and Lower Coleman Mine are both located near the border of Sandcherry Creek and Lower Onaping subwatersheds. Longvack mine produced mainly copper and nickel, from 1954-1961, while Lower Coleman Mine operated from 2012-2014 extracting mainly nickel and platinum metals.

Recreational Use

- The rivers and lakes in these subwatersheds have a wide variety of uses including boating, canoeing and kayaking, swimming, and recreational fishing.
- The area is also used for Crown-land camping, hiking, hunting, berry picking and general nature appreciation.
- Trails are plentiful for off-road vehicle use, in part because of forestry roads which have increased access opportunities.
- There are no official snowmobile trails, though unofficial trails are present.

Water use

- No current Permits to Take Water.

Notable Waterbodies

- **Nelson Lake** is located within the Nelson River subwatershed. It is a medium deep lake measuring 308.8 ha with a maximum depth of 51 m. There are no permanent residents and 35 seasonal residents on this lake.
- **Joe Lake**, located in the Rapid River subwatershed, has an area of 216.2 ha and a maximum depth of 34 m. There are 30 permanent residents and 45 seasonal residents.
- Other lakes include Sans Chambre Lake and Dixon Lake.

Previously Identified Management Issues

- Rapids River and Sandcherry Creek are both minor tributaries that flow into the Vermilion River and have exhibited moderate to extreme erosion characteristics. (NDCA Watershed Inventory, 1980).

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:** Currently, there is no floodplain mapping for this area and no anticipated floodplain mapping work.
 - 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 elevation 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

- **Strathcona Creek Dam**, part of Glencore Sudbury INO's operation in the Levack area, falls within the Sandcherry Creek subwatershed.
- An unnamed private dam is present at the end of Strathcona Mine Rd, on an unnamed waterbody that eventually flows into Island Lake.

Drinking Water Source Protection

- There are no municipal drinking water sources within these subwatersheds.
- They are located within the headwaters of the Vermilion River Water intake, a municipal drinking water source. As such, all watercourses within these subwatersheds and the lands immediately around them are classified as Intake Protection Zone 3 as the water ultimately drains towards the Vermilion River drinking water intake.

Water Quality Indicators

- The City of Greater Sudbury's Lake water quality sampling has identified Nelson Lake and Joe Lake as oligotrophic.
- The Ministry of Environment, Conservation and Parks 'Lake Partner Program' samples from Nelson Lake, similarly, found it to be oligotrophic.

Significant Features

- A small portion of the Kitchener Township (Morton Lake) Conservation Reserve is located within the Rapid River subwatershed, covering an area of 0.67 km².
- Wildlife Values:
 - There are 332 moose related wildlife value areas, covering a total area of 108.3 km².
- There are no ANSI ecological or geological areas of interest.

Management and Stewardship

- **Wahnapiatae First Nation** and **Atikameksheng Anishnawbek First Nation**: Their traditional territories include the area within these subwatersheds. They are land holders of the area and, as such, are stewards of the land.
- **Four Lakes Community Association** (Frenchman, Hanmer, Joe, Dixon Lake).

Data available

- **Co-operative Freshwater Ecology Unit**: Sans Chambre Lake was sampled as a Reference Lake in the CFEUs long term monitoring of lakes recovering from Sudbury's mining legacy.
- **City of Greater Sudbury**: Lake Water Quality Program collects spring total phosphorus data on Nelson Lake (Nelson River subwatershed) and Joe Lake (Rapid River subwatershed).

Supporting Documents

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








Conservation Sudbury, **Vermilion River Watershed: Surface Water Quality Report on Current Conditions**, March 2017.

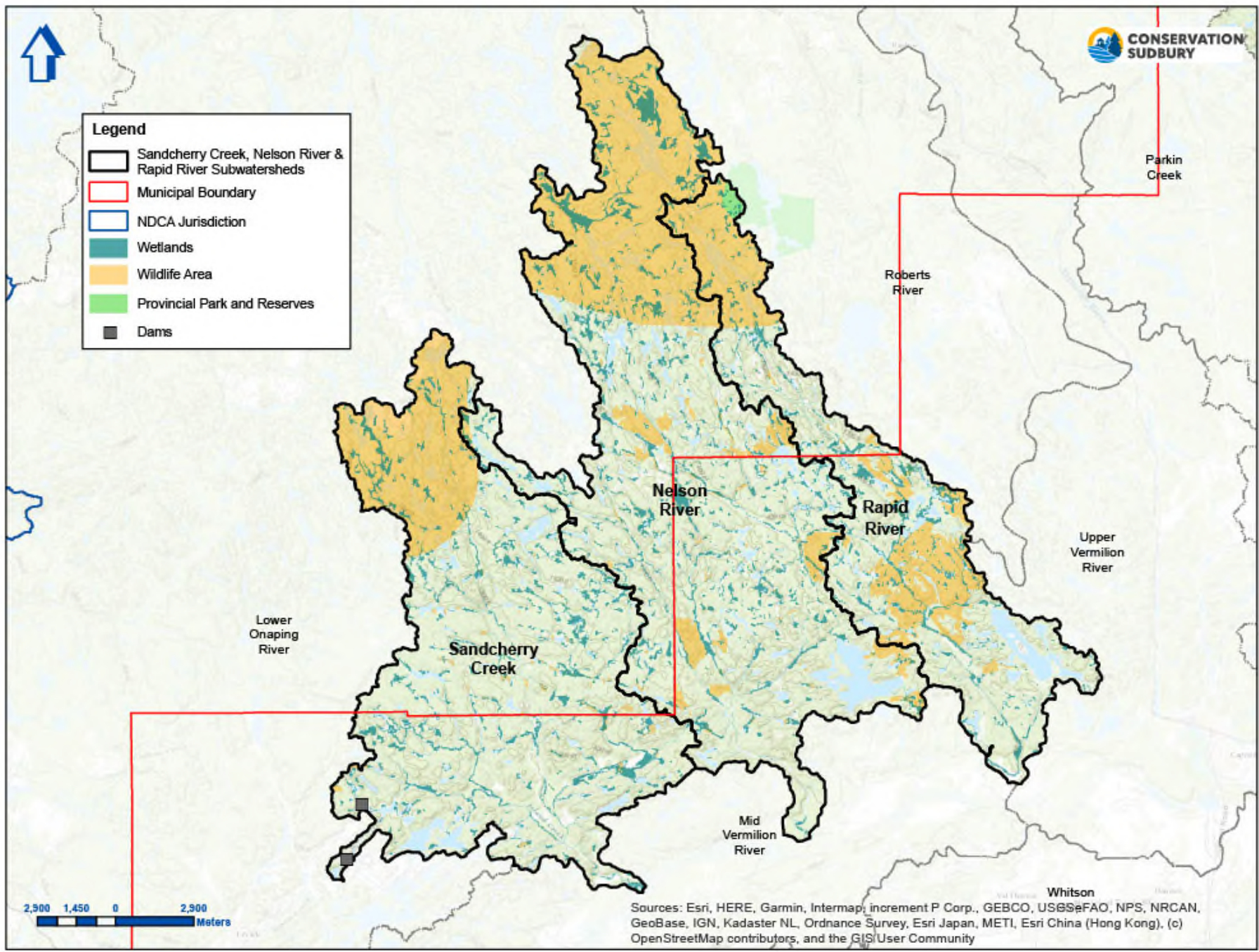
Nickel District Conservation Authority, **Watershed Management Planning Study - Summary Report**, January 1981.

Nickel District Conservation Authority, **NDCA Watershed Inventory**, September 1980.



Legend

-  Sandcherry Creek, Nelson River & Rapid River Subwatersheds
-  Municipal Boundary
-  NDCA Jurisdiction
-  Wetlands
-  Wildlife Area
-  Provincial Park and Reserves
-  Dams



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