A BIOLOGICAL INVENTORY AND EVALUATION OF THE WHITE LAKE STUDY AREA, EASTERN ONTARIO

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from 2001-2021 identifies two areas within the White Lake study area that will be actively managed (OMNR 2001). These are located south of Three Mile Bay. One involves replanting of the area formerly planted with pine and the other involves a harvest. A large peninsular area on the north side of Three Mile Bay was initially identified by OMNR for harvesting, however it has been temporarily withdrawn due to public protest.

(3) Physical and Historical Background

a. Bedrock

Bedrock in the White Lake study area is of the Early and Middle Precambrian age and includes metasediments, Archean metavolcanics, and plutonic rocks (Peach, 1956; Ontario Geological Survey Map 2462, 1982) (Figure 3). The plutonic rocks are low base compared to the more basic amphibolite and marble. The majority of the site is underlain by greyish metasedimentary crystalline limestone (marble) or dolomite. The marble is very fine grained and dense with bands of light or dark grey. North of Pickerel Bay on lot 26, concession XI, small deposits of hematite have been formed in the dolomitic limestone closely associated with pegmatite or quartz dikes. The Fahey or Bell Mine was created in the early 1900s to access these deposits and consists of a shaft about 7 m deep and a few trenches. Samples from an ore pile show 35% iron.

Plutonic rocks (primarily migmatite) of the granite, granite gneiss and pegmatite group are found along the eastern border of the study area where they begin to form the Pakenham Mountains. A narrow east-west trending band of Darling type granite occurs south of Three Mile Bay where it is flanked by a relatively uncommon plutonic body of diorite and gabbro. Metavolcanics of the amphibolite group form a narrow strip between the plutonic rocks and areas of metasedimentary crystalline limestone just east of Lowney Lake and along the south shore of Three Mile Bay. The amphibolite is composed of hornblende-plagioclase schist and biotite schist. A small area of amphibolite also occurs at the north end of the study area on the peninsula beside The Canal and the islands of Hayes Bay.

The majority of the marble is overlain with glacial drift, however a small outcrop can be seen on the south side of Cove Road as it slopes down to Lowney Lake (Figure 4). It is also obvious in numerous test pits which have been dug along the east side of Lowney Lake and along the hydroline west of Lowney Lake. A large plutonic outcrop is found in the southeastern portion of the site on the south shore of Willis Lake.

b. Surface Geology

The unconsolidated surface deposits in Darling and Pakenham townships are of glacial origin and are the parent material from which the soils have developed. Surficial materials cover the bedrock in much of the White Lake study area; they are generally shallow on the hills and more deep in the valleys. This material consists of glacial till and ice-contact deposits such as eskers (Hoffman *et al.* 1967), deposited in conjunction with the Late Wisconsinan ice advance. The ice retreated from the area approximately 10,000 years ago. The White Lake study area is part of a ground moraine landform (Noble 1988).

The bottom substrates of White Lake are predominantly mud. Based on sediment core sampling conducted in 1973, much of the lake was found to have deposits of thick marl (deposits of calcium from biological and sedimentary processes) (Mathers and Kerr 1998). The pH of the lake water ranges from 7.0-8.5. There is no geological information available for the fens found in the study area, however the White Lake fen which is also located within the White Lake ANSI, has a pH of 6.9 and a peat depth of 3.4 m (Riley 1988).

Figure 3: Geology of the White Lake Study Area (Peach 1956)