WHITE LAKE Property Owners Association
Environment Volunteers

ENVIRONMENT BULLETIN

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White Lake: Myths and Maps

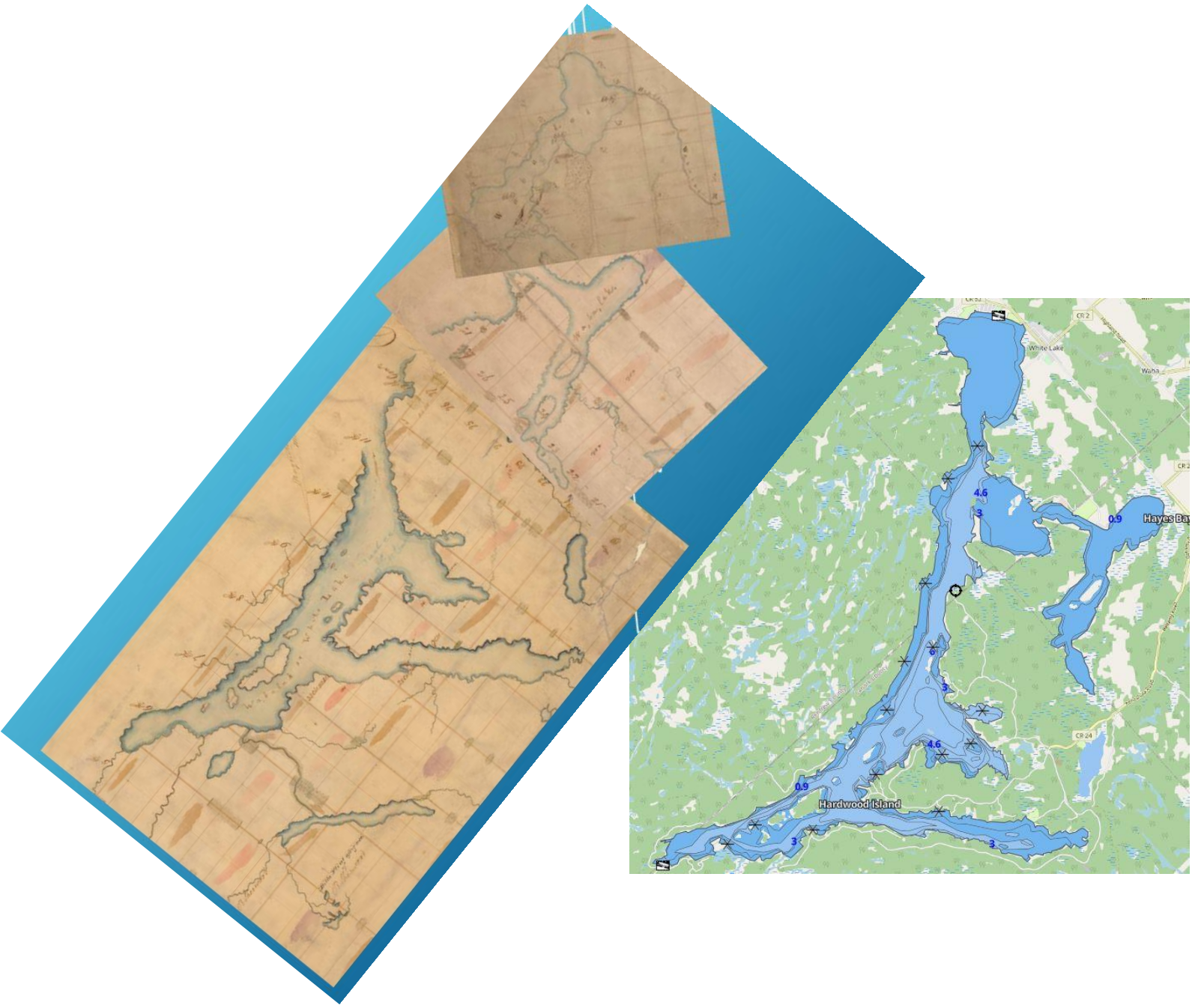
Over the years we have heard cottagers and residents of White Lake bristle at the suggestion that the lake is artificial, created when the first dam was built in 1845. In one publication[1], the author states that "*when a dam on Waba Creek was constructed it resulted in the water levels increasing in three previously small interconnected water bodies*", and thus forming the lake as we see it now.

We do not have a picture of the dam as it was in 1845, however the photo below shows the condition of the dam in 1919. This dam was rebuilt in 1948 and was changed to the present-day concrete structure in 1968.

[1] V.R. Brownell; *A Biological Inventory and Evaluation of the White Lake Study Area, Eastern Ontario;* Ontario Ministry of Natural Resources, Kemptville Ontario District Office; 2001

What if we had a map of the lake both before and after the first dam was built? Then we could compare the outlines of the lake, and see just how the dam affected its contours.

As it turns out, we can do just that. On the left is a composite of the hand-drawn maps of White Lake created in 1822 by surveyor Reuben Sherwood[2]. On the right is a present-day satellite map of the lake.



[2] Province of Ontario Archives

The two maps above clearly show that the contour and shorelines of the lake are essentially identical before and after the construction of the original and replacement dams at Waba Creek.

So, as the current dam raised water levels in the lake by about 1.5 metres, why are the lake contours on both maps essentially the same? If there were three interconnected ponds before the dam was built, why are they not evident on the 1822 map?

The answer to these questions lies in the fact White Lake is a wetlands lake. About 25% of the lake surface area is made up of marshes and very shallow (≈ 1.5 to 2 m) waters.

Lake Contours: When Reuben Sherwood surveyed the lake, he included the extent of wetlands as part of the natural contour of the lake. In his 1985 paper, Ferris[3] said that "*Although there are seasonal fluctuations, there has been very little change in water levels since 1823. Water levels have not increased by more than 20 cm vertical and 9.1 m horizontally".*

What Ferris is saying here is that the MAXIMUM level of the lake has not changed since pre-dam times. Before the construction of the dam, White Lake water levels rose during the spring melt and early summer and then slowly receded. Flooded wetland areas were drained with some areas drying up and others turning into shallow swamps.

What the dam achieved, however, was raising the MINIMUM level of the lake by about 1.5 metres. This explains why the contours of White Lake appear to be the same in the two maps above.

Three interconnected water bodies: How do we explain the assertion by some that the lake was a series of three interconnected ponds before the dam was built? Is there any basis in fact supporting this?

Using bathymetric (depth) data and figuratively 'draining' away 1.5 metres of water from the lake, could these three interconnected water bodies be revealed?

The map below shows in light blue the extent of White Lake at low-water prior to the construction of the dam. This is what the lake would have looked like in late August. The darker blue areas would have been flooded at high-water in the spring and early summer.

It appears from this map that there remained only a single water body and there were no other areas of open water at low-water in late summer.

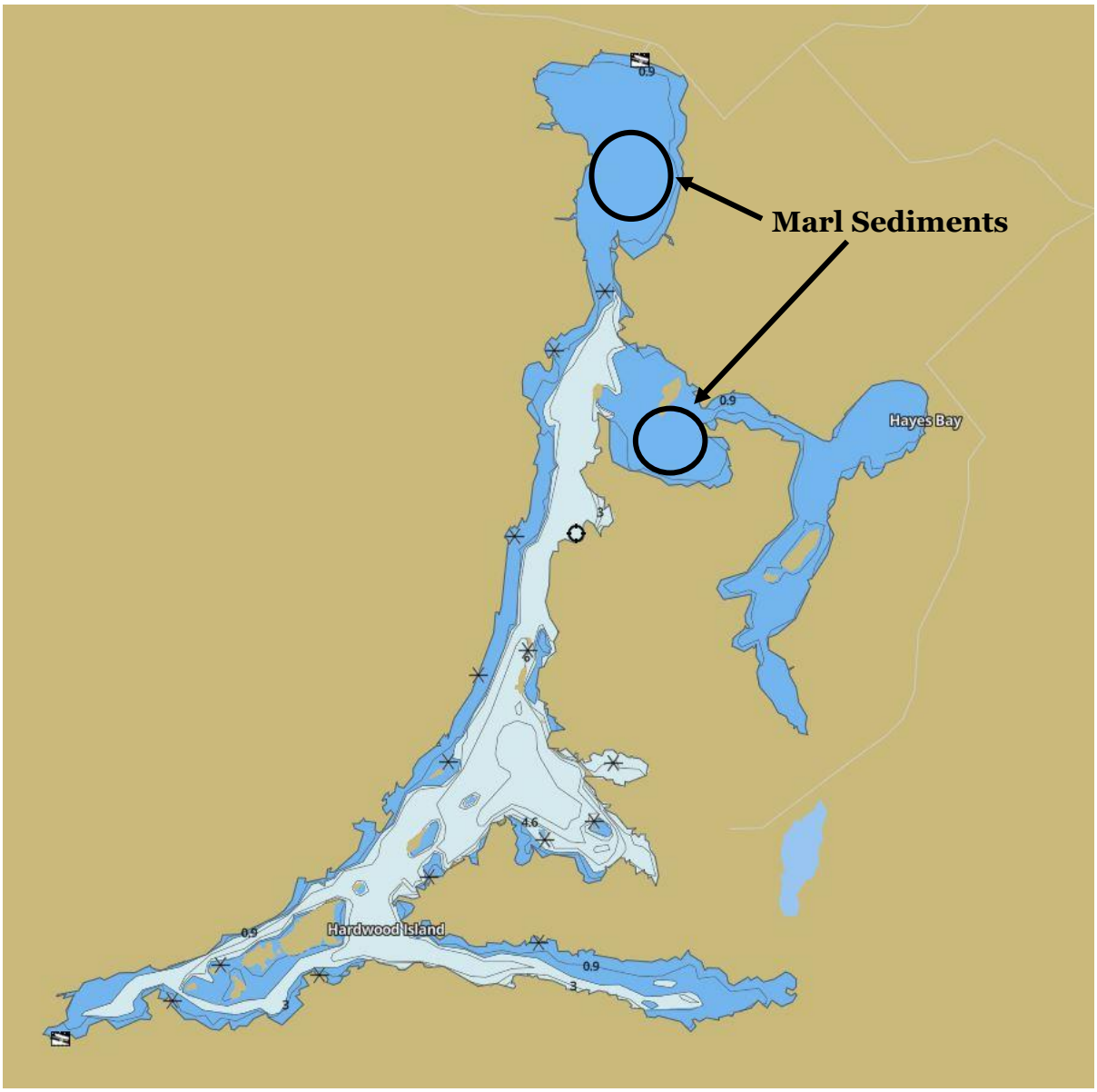
However, we know from present day observations that there are parts of the lake which do not support the growth of aquatic plants because the sediments there are composed of marl, a calcium mineral. These areas are shallow (≈2 m) and circled on the map below. It

[3] J.P. Ferris, White Lake Integrated Resources Management Plan, Part I, *Ministry of Natural Resources, Lanark and Renfrew Counties, December, 1985.*

is possible that at low water levels, prior to the construction of the dam, these parts of the lake appeared as open water perhaps only .5 metres deep.

In the end, all theories appear to be correct. We can have an unchanging lake contour at high water before and after dam construction as well as several interconnected open water bodies during seasonal low water conditions.

The secret to understanding all of this is that the dam <u>increased low water levels</u> while not substantially changing high water levels.



*Joan Gregoire is thanked for her sharp-eyed editing of this and all other Environment Bulletins.