Looking upstream for solutions to Muskrat Lake's algae problem
by Ole Hendrickson

It is no secret that each summer, ugly, smelly, and potentially harmful algal blooms cover significant portions of Muskrat Lake near Cobden. A February 2012 article by Lucy Hass in the Renfrew Mercury quotes MNR Pembroke District issues and information officer Doug Skeggs as saying "It is, without a doubt, the biggest environmental challenge that we face in Renfrew County today."

On March 19, 2012 Whitewater Region council members met with provincial officials (natural resources, agriculture, environment), county health officials, and consultants to discuss this challenge. The meeting report says that 40 years of testing by the Ministry of Environment (MOE) has pinpointed the cause of the problem: elevated levels of the plant nutrient element phosphorus.

According to a MOE website, "Phosphorus is the element that controls the growth of algae in most Ontario lakes." By stimulating algal growth, elevated phosphorus decreases water clarity, and in extreme cases leads to algal blooms that "affect the aesthetics of the lake and/or cause taste and odour problems in the water."
Lakes fall into three broad categories with respect to phosphorus: 0-10, 10-20, and more than 20 micrograms per liter (20 µg/L). The MOE website says "Lakes over 20 µg/L… may exhibit persistent, nuisance algal blooms". The MOE provides phosphorus data for Muskrat Lake and nearby lakes in the Muskrat and Snake River watersheds that drain into Muskrat Lake.

Phosphorus in Muskrat Lake generally exceeds 20 µg/L throughout the ice-free period and has gone as high as 65ug/L. Nearby lakes (Jeffrey Lake upstream on the Muskrat River; Mink Lake and Lake Dore in the Snake River watershed) have phosphorus in the 5-20 ug/L range: enough to stimulate fish production without triggering algal blooms.
Where does the excess phosphorus in Muskrat Lake come from? The March 2012 meeting report says that two MOE studies (2005 and 2009) agree "a majority of phosphorus comes down the Snake River with smaller proportions from the Cobden Sewage Treatment Plan or adjacent landowners."

Upstream from Osceola the Snake River and Mink Creek have been ditched and straightened, draining the former Upper Osceola Marsh. A boat trip down these ditched waterways allows viewing of the intensive agricultural cultivation in the organic matter-rich soils of the drained marsh. Much of the area was planted in corn last year, reflecting high corn prices. Long stretches of these ditched portions of the Snake River and Mink Creek have essentially no permanent vegetation on their banks. During spring flooding, corn stubble in the lowest row of the fields is only inches from the water's edge. Banks are eroding in a few spots.

Downstream from Osceola one enters the Snake River Marsh. The MNR purchased portions of the marsh and designated them as a conservation reserve. Here, cattails and reeds grow in the river, the banks are lined with red osier dogwood, and waterfowl fill the skies. An MNR report on the Snake River Marsh says that the marsh "provides a filtering function for the watershed, catching and holding onto nutrients and chemicals in the runoff from agricultural lands upriver."

But does it catch and hold onto all the phosphorus? Algae in Muskrat Lake say "No".

I called Sid Vanderveen, technical expert for the Drainage Act in the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) about the Muskrat Lake/Snake River situation.

Vanderveen said that the Drainage Act has been around for 100 years. For most of that time the concern was getting water off the land as fast as possible. No doubt this was the main concern 50 years ago when the Snake River channel was dynamited upstream from Osceola, lowering the river level and draining over 1000 acres of the Upper Osceola Marsh for agriculture.

According to Vanderveen, there are few new drainage proposals these days. Now, the Drainage Act is increasingly used for broader environmental purposes such as restoring wetlands, in light of their ability to filter nutrients and maintain downstream water quality. In the case of the Snake River, Vanderveen suggested using the Drainage Act as a tool to create buffer strips to take up excess phosphorus running off farm fields into the Snake River. This would involve preparing an engineer's report, passing a municipal bylaw, and assessing the costs of buffers on property owners in the watershed: both establishment costs and lost revenue from reduced farm acreages. This would be a "community approach" rather than one driven by provincial regulation.

Vanderveen noted that farmers wouldn't like losing some of their lands to buffer strips - no surprise there – but OMAFRA pays 1/3 of the costs to farmers of the improvements through a grant. Community discussions about how to pay for the buffer strips could include Muskrat Lake landowners, including cottagers, who stand to benefit from greatly improved water quality, in addition to municipal officials and farmers. Sharing costs and benefits of re-establishing natural mechanisms for cleaning up the Snake River would be a "cutting edge" initiative. The issue of algae in Muskrat Lake cannot be addressed by a single municipality acting alone. It is a watershed-scale problem. Municipal officials, farmers and community members from Whitewater Region need to join with upstream municipalities and communities to solve Renfrew County's biggest environmental challenge.

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