

The Power of Small Wetlands for Clean Water

BUILDING THE CASE FOR LEVERAGING WETLANDS AS NATURAL INFRASTRUCTURE IN AGRICULTURAL LANDSCAPES

Not long ago, many of us believed that clean water was Canada's natural heritage.

That was before summers were tainted by fear of blue-green algae and its toxic discharges in rivers and lakes threatening the health of wildlife, pets and people. Warming temperatures are aggravating the impact of excess nutrients, particularly phosphorus, in agricultural watersheds with high rates of surface and subsurface drainage—like those in southwestern Ontario.

Recent research by Ducks Unlimited Canada (DUC) quantifies the role of restored wetlands in capturing phosphorus in agricultural watersheds. Excess phosphorus plays a key role in the increase in algae outbreaks, an alarming trend that highlights the need to better understand the value and benefits of wetlands for capturing phosphorus from surface-water runoff before it moves downstream.

As part of our large-scale conservation program in the Lake Erie watershed, researchers assessed eight recently restored wetlands for one year, regularly monitoring water inflows and outflows to measure their nutrient-capture capacity and efficiency. Like most restored wetlands in the region, these can be described as “edge-of-field” sites, set in a low-lying area that receives runoff from the agricultural landscape.

Research highlights

- ⊕ Results indicate the restored wetlands act as “phosphorus sinks,” with less phosphorus leaving the wetland basins than entering them.
- ⊕ Total mean wetland retention capacity for phosphorus was determined to be 7.2 kg per hectare per year with a 39% overall mean reduction efficiency.
- ⊕ All eight wetlands efficiently captured soluble reactive phosphorus (SRP), the form of phosphorus considered most problematic for water quality in Lake Erie, with a mean SRP retention capacity of 3.4 kg per hectare per year, and a 59% reduction efficiency.
- ⊕ Restored wetlands were found to function in a nutrient retention role in all four seasons, an indication that restored wetlands can be effective to reduce nonpoint source nutrients from entering Lake Erie.

This research is planned to continue for two additional years to build on our knowledge of the nutrient-retention capacity and efficiency of restored wetlands over multiple years.



Restored wetlands act as phosphorus sinks

Weekly monitoring in all four seasons showed that water tested as it exited the study site contained less phosphorus than water entering the site.

This research helps to ensure that communities have the information they need to understand the role of natural infrastructure conservation in resilient watersheds.



Ducks Unlimited Canada delivers wetland conservation that benefits every Canadian. Our vision is to ensure a landscape with healthy wetlands—a conservation mission that embraces the entire continent of North America. Working with many partners—including thousands of private landowners—we protect, construct and restore wetlands to support the natural infrastructure of Canada's landscapes.

Landowners helped with “citizen science”

Our thanks are due to the landowners who graciously allowed regular access to their wetland restoration projects. Some landowners helped collect rainfall data over a five-month period and provided valuable local information.

Focus on phosphorus in Lake Erie

Natural infrastructure—wetlands, grasslands and forests that support productive landscapes—can play a key role in watershed resilience.

Canada and the United States adopted phosphorus reduction targets in 2016 to protect the western and central basins of Lake Erie and DUC has been hard at work since 2017, with our partners, carrying out more than 150 wetland projects—which brings our historical total in the Lake Erie watershed to more than 500 wetland projects.

The Lake Erie wetland research was led by the Institute for Wetland and Waterfowl Research—DUC’s research arm—and funded in partnership with the Ontario Ministry of Natural Resources and Forestry and the U.S. Fish and Wildlife Service via the *North American Wetlands Conservation Act*.

DUC and its many conservation partners have made strong progress in driving a systemic change in approach toward watershed-scale wetland conservation—a natural solution that will be increasingly needed in the Great Lakes region and beyond.



▶▶ **A report, *Determining the Nutrient Retention Capacity of Newly Restored Wetlands in Southwestern Ontario*, is available online: www.ducks.ca/stories/policy/the-power-of-small-wetlands-for-clean-water**



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