



LAKE OVERLOAD



UNTREATED RUN-OFF KILLING CANADA'S GREATEST LAKES

ACTION NEEDED TO CLEAN UP OUR WATERWAYS



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Spending time at the lake is a treasured part of living in this country. My own water stories centre around paddling down idyllic boreal rivers flowing into Lake Winnipeg, fishing for pickerel while watching nighthawks, great blue herons and a myriad of birds thriving along the shores.

For birdwatchers, observing the spring migration of songbirds through sandy Long Point Provincial Park or Point Pelee National Park on Lake Erie is a must-do adventure. Whether we recall windy waves crashing ashore in a storm or basking on the beach in the blazing sun, most of us have water tales to tell. After all, water is the basis of life and there are more lakes in Canada than all other countries combined.¹

Two of our biggest lakes, Lake Erie and Lake Winnipeg — although not connected to each other — are remarkably similar. Physically, the lakes are the same size and both

are quite shallow. They both supply drinking water to surrounding communities and support important Indigenous, commercial and recreational fisheries.

Unfortunately, these two lakes also suffer a similar ecological ailment: **massive and disruptive algal blooms caused by too much phosphorus flowing into these lakes.**² Where does the excess phosphorus come from? It's from human and animal waste and fertilizer that is not managed properly.³

A lake's health is a byproduct of its watershed because almost everything that goes into a lake enters via the watershed. The land Lake Winnipeg drains is one of the largest on Earth, yet the shores are sparsely populated. The seven million people living in this watershed are spread from the continental divide in the Rocky Mountains down into Montana, the Dakotas, and Minnesota and all the way east to Ontario.⁴ On the other hand, Lake Erie has a small but populous watershed of 10 million people and includes the major

urban cities of Detroit, Cleveland and Buffalo.⁵ Yet even with these

differences, the similar depth of Lake Erie and Lake Winnipeg sets the ecological conditions for algal blooms.⁶

Due to the international reach of both the Lake Winnipeg and Lake Erie watersheds, there are overwhelming numbers of decision makers and reports about the lake overload of phosphorus and the plans for recovery.⁷ Throughout all jurisdictions the conclusion is the same: **runoff from agricultural lands with too much phosphorus is flooding our waterways.**^{8,9}

Studies of lake health are ongoing and more reports are being

planned, but we already know many simple solutions to fix these great lakes. Better still, there is an overriding concept that will have benefits far outside the individual lake's health: **we need to put nature back into these troubled watersheds.**

Slowing down the flow of nutrient-laden water into lakes is the natural strategy for reducing phosphorus. Preserving wetlands, ensuring runoff travels through vegetation and shoreline protection for waterways are all parts of the solution for healthy waterways. These solutions also provide innumerable side benefits, from increasing biological diversity and flooding mitigation to bettering our health and well-being through exposure to nature.¹⁰

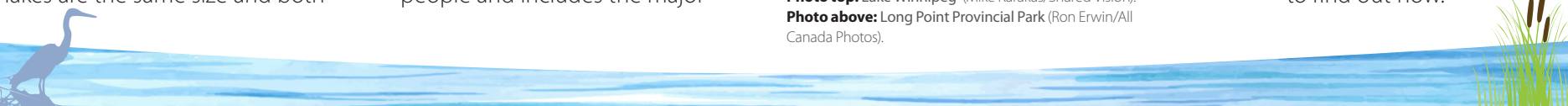
Algal blooms in our lakes are the symptom, not the problem. What we need to do is get the lakes back into natural balance, so lakes and their interconnected web of life can keep themselves healthy. Let's look upstream and put nature solutions in place. Read on to find out how.

"Run-off from rural, agricultural and urban land has become the largest contribution to phosphorus loads."

— Environmental Commissioner of Ontario, 2017



Photo top: Lake Winnipeg (Mike Karakas/Shared Vision).
Photo above: Long Point Provincial Park (Ron Erwin/All Canada Photos).



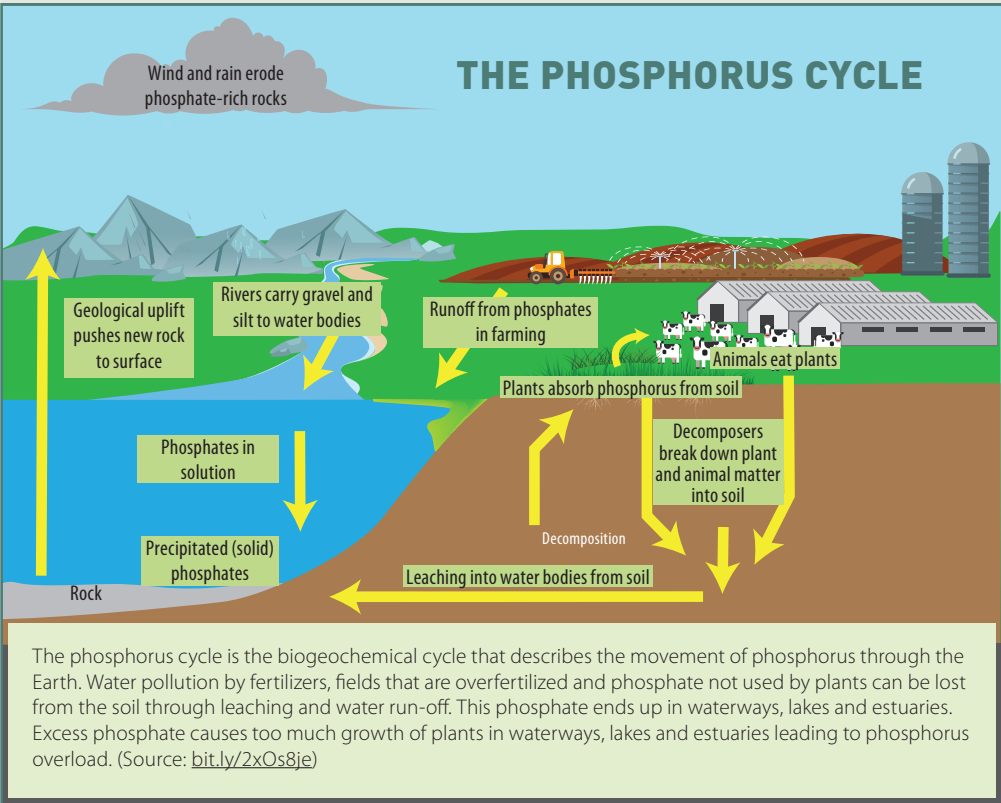
PHOSPHORUS: POINT TO THE SOURCE

When the algal blooms in Lake Erie first caused concern in the 1960s, we quickly learned that phosphorus — an essential element for life — was also the nutrient responsible for algal blooms. Excess phosphorus flowing into Lake Erie needed to be curbed. Research pointed to wastewater treatment plants as the **point source**: the identifiable source of the problem. Actions to control phosphorus coming from wastewater treatment plants precipitated an improvement

in Lake Erie in the 1970s and 80s. Now 40 years later algal blooms are appearing again. This time we can't point to a specific point source — instead, we are seeing gradual increases in phosphorus along the lengths of rivers flowing into our lakes. These **non-point source** phosphorus loads need to be addressed now, throughout the entire watershed.¹¹



Algal blooms can suffocate aquatic life, are a nuisance and can be toxic.



HOW MUCH IS TOO MUCH

The explosion of intensive livestock operations such as industrial hog barns since the 1970s has driven land use changes. Pasture and hay fields have been cultivated with corn and soybean crops needed to feed the animals in their enclosed barns.¹⁴ Waste produced from industrial livestock operations is often greater than the land can absorb.



Photo: Solid manure spreading (Eric Reder).

and winter rains.^{17 18} Too much manure applied to bare cropland in the fall and winter cannot all be taken up by the plants, leaving the excess to be washed downstream. Changes that eliminate late fall spreading would reduce phosphorus transporting down to our lakes.¹⁹ Manitoba already has a ban on winter spreading of manure, but Ontario needs to implement this

As far back as 1979, the Manitoba Clean Environment Commission cautioned, **“Intensive livestock operations are out of balance with nature because of the very large amounts of waste being produced on restricted areas of land.”**¹⁵ Despite such warnings, the Manitoba government has just removed protections in *The Environment Act*, which mandated that new intensive livestock operations have strict wastewater treatment systems. Intensive livestock operations are expanding once again.¹⁶

same control measure.²⁰ Overfertilized fields are another path to downstream phosphorus pollution.²¹ Although there are regulations in place for fertilizer application, both Manitoba and Ontario only have a three per cent inspection rate. The Environmental Commissioner of Ontario has stated the province has very little follow-up for noncompliance, while Manitoba’s published audit results are so uninspiring they wouldn’t pass for an elementary school science assignment.^{22 23} Furthermore, there’s no available data to show manure management plans have changed the output of phosphorus.²⁴

Research in both Lake Winnipeg and Lake Erie watersheds have shown over 80 per cent of the phosphorus coming from the land is transferred downstream during spring snowmelt

DOWN THE DRAIN

Water that flushes from household sinks and toilets usually flows to municipal wastewater treatment systems for processing and then is released downstream. While insufficient treatment and phosphorus removal from city sewers was the major contributor to algae blooms in Lake Erie in the 1970s, modernized sewage plants have substantially lowered phosphorus output from these point sources.¹²



Photo: Winnipeg North End Sewage Treatment Plant (City of Winnipeg).

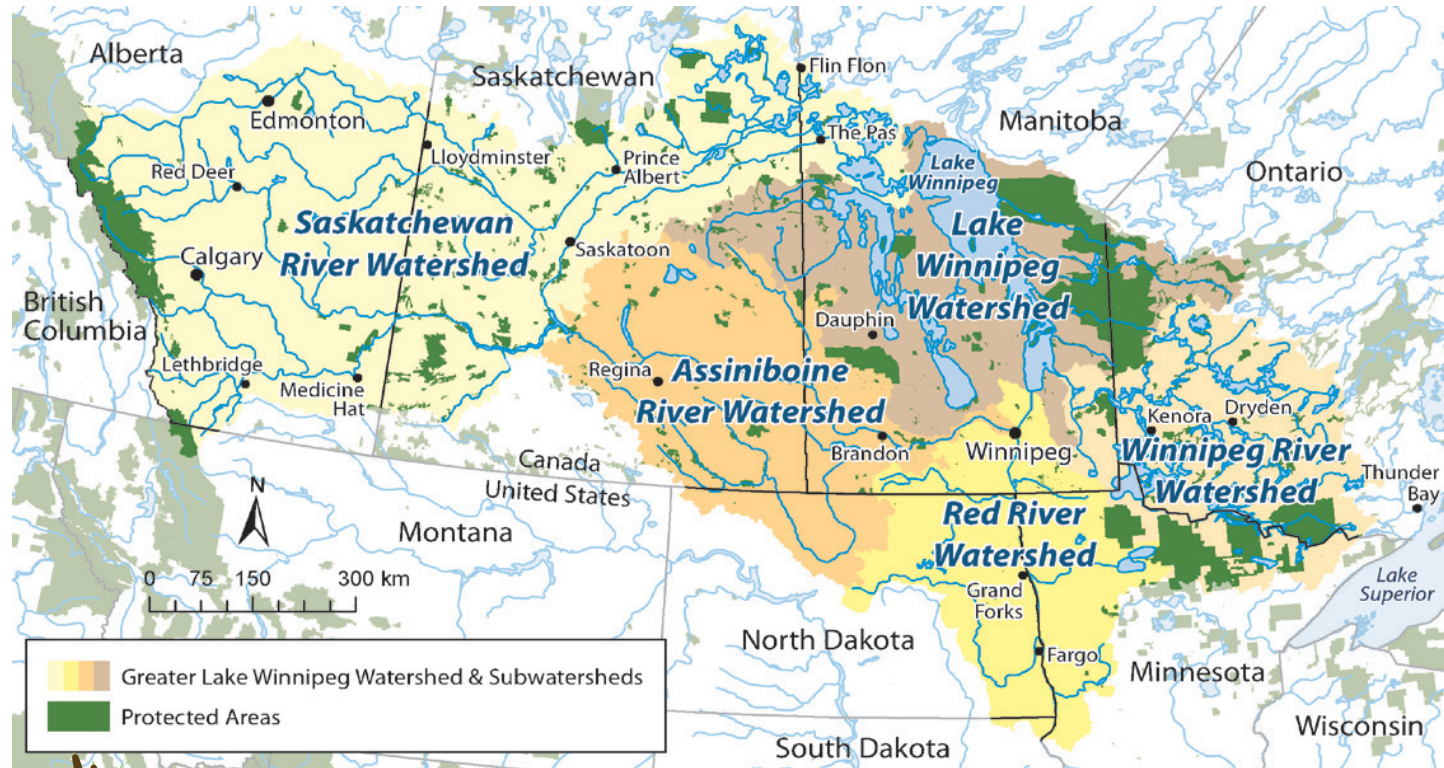
An exception to these improved plants is the City of Winnipeg’s North End Sewage Treatment Plant, built in 1937. In 2005 the provincial government, under the authority of *The Environment Act*, told Winnipeg to upgrade and meet a phosphorus reduction target by 2014. Unfortunately, 13 years later neither the city nor the province have found the political will to fix the problem. Lake Winnipeg continues to suffer as a result.¹³

DOWN STREAM

Draining water sitting on the land in temporary wetlands pumps phosphorus downstream — exactly the opposite of what our waterways need. Slowing water down upstream prevents phosphorus release, lessens erosion and helps mitigate expensive flooding and drought.²⁵

The introduction of tile drainage, which involves installing porous pipes under a field much like weeping tile along a house foundation, is messing with water flows. Without proper controls, tile drainage can accelerate both water moving downstream and the release of phosphorus.²⁶ Tile drainage is already rampant in North Dakota in the Red River watershed and a third of the phosphorus getting to Lake Winnipeg comes from the Red River in the U.S.^{27 28}

Governments in Ontario and Manitoba have also been negligent in their monitoring and control of tile drainage.



Photos: Patricia Beach, Lake Winnipeg (Mike Karakas/Shared Vision), algae stained rocks (Eric Reder).

THE SOLUTION IS MORE NATURE

Keeping it natural is a powerful tool we can use to save our waters and lakes from overload. An example of this are windrows: strips of trees planted along fields to slow the wind and improve soil health. They used to be prevalent in farmland, but are often being cut down and the field plowed under in order to seed more crop. Similarly, buffer strips of vegetation along fields are narrower and often nonexistent, as cropland is plowed right into roadside drainage ditches.²⁹ Re-establishing buffer strips and windrows can help our phosphorus problem. During heavy rain events, these natural areas lessen above-ground runoff and the transfer of phosphorus.³⁰



Photo: Prairie fringed-orchid (Roberta Olenick).

There is already some good news



Photo: A field with windrows (Creative Commons).

from the agricultural sector in Saskatchewan. 250 farmers make up the Saskatchewan Farm Stewardship Association and over 15 per cent of their lands are protected nature held in conservation agreements. This protection ratio is better than any other territorial or provincial government in Canada.³¹

The amount of work needed to restore nature and protect

water on agricultural lands is not happening voluntarily. Both the International Joint Commission — the body that handles transboundary water issues — and the Environmental Commissioner of Ontario have called on governments to institute mandatory regulations to control phosphorus and protect water on agricultural lands.³²

WETLANDS WILL DO THE HEAVY WORK

Wetlands are nature's superheroes of healthy water. Recovering Lake Erie and Lake Winnipeg can't be done without them. Slowing down water, retaining it upstream, and removing nutrients and other pollutants can all be accomplished in wetlands.

Unfortunately, more than 70 per cent of wetlands in both the Lake Erie and Lake Winnipeg watersheds have disappeared. It is no wonder why our water quality has deteriorated.^{33,34}

Draining a wetland to increase "productive land" has been standard practice in farm country for generations, but that process must end and all remaining wetlands protected. A majority of land in these watersheds is privately owned, so it will be necessary to mandate landowners into protecting these remaining ecological gems.

The Ontario and Manitoba government have recently introduced wetlands policies.^{35,36} In Ontario, it won't stop the loss of wetlands for another seven years and Manitoba has confirmed no details yet after two years of work. This simply isn't good enough.

The Environmental Commissioner of Ontario is recommending phosphorus reduction in farmlands — such as preserving wetlands — be incentivised, based upon measurable outcomes of phosphorus reduction.³⁷ The Manitoba government is promising to bring in a program, called



Photo: Point Pelee National Park marsh (Robert McCaw).

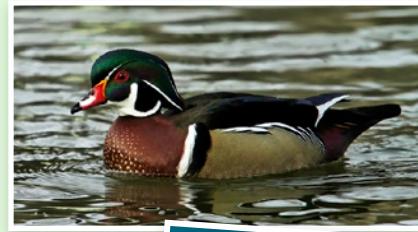
GROW, to put nature back in farmland. But again, it's been two years and no firm details are forthcoming. Substantial funding is needed to ensure incentive programs are effective in improving water health.³⁸



Photo: Blanding's turtle (Don Johnston).

A MODEL WATERSHED: LAKE SIMCOE PROTECTION

In 2008 Lake Simcoe became the first watershed in Canada to have its own protection legislation. Work done here can be modelled in other watersheds. From hundreds of farm improvement projects, to tallying remaining natural areas in the watershed, to counting private septic fields that need inspecting, the Lake Simcoe Protection Act attends to necessary details which will bring healthy nature back to the watershed. The language and action items in the most recent Lake Simcoe report shows that a committed citizenry has pushed the government to confront the ecological health of the watershed.³⁹



Photos: Wood duck (Mike Karakas/Shared Vision), Lake Simcoe Act report (MB government).



INDIVIDUAL ACTIONS

What we individually send down the drain can have a major impact on the health of our waterways. Wastewater treatment plants break down raw sewage, but they are not capable of removing other chemicals such as medications, cleaners or personal care products. Proper disposal of expired medications and chemicals and choosing non-toxic products in our lives will make a difference for our lakes.⁴⁰

New research shows microplastic fibre particles are accumulating in our waterways at an incredible rate, getting into the food chain as well. Microplastic beads in personal care products were recently banned in Canada, but microplastic fibres from synthetic clothing like fleece are being released during washing. Choosing clothes from natural fibres and using a microplastics filter while washing will help our lakes.⁴¹

Finally, using less water in general in our lives means less stress on our water infrastructure and in turn, our lakes.



Photo: Microplastic particles/beads (Creative Commons).

SHORELINES FOR WATER QUALITY

Shorelines connect our land to our water. How we treat the land along shores reflects how healthy our water will be. Natural vegetation on land and in the water along shorelines prevents erosion, slows down water, absorbs nutrients and provides habitat for aquatic creatures to thrive.⁴²

They also offer exceptional recreation opportunities, as the riparian areas — land along water bodies — have the greatest density of animals.

The Lake Simcoe Protection Plan is a good example of what is needed across the country, as it aims to preserve nature on riverbanks and shorelines.⁴³ This simple and sensible solution should be required on all waterways across the entire country.



Photo: Piping plover (Robert McCaw).



GET PEOPLE TO WATER

We have an inescapable attachment to water. It is the essence of our very existence and underpins all of life, yet collectively we're often detached from what it means to care for water. Luckily that is changing, as people are growing aware of the need to protect water quality and their ability to affect positive change.

The Lake Erie and Lake Winnipeg watersheds are under the jurisdiction of more than 100 Indigenous nations, two federal governments, four provinces, eight states and countless municipalities.⁴⁴ It seems a daunting task to protect water with this many lines in it, yet **forward-thinking laws are already being put in place to protect water here.** Looking at actions across different

jurisdictions is a tremendous tool for seeing a progressive path towards proper water protection, and also to offer hope.

Water we can swim in, drink from and fish in is the simplest explanation of our goal. In much of this country water is still that healthy, and not many years ago that was the case everywhere. Putting nature back into lands and waterways across this country is an essential piece of creating a livable world for us and future generations.

The benefits of putting nature back in place to protect our water are vast and cross so many areas of our lives. There is so much to gain: health benefits from cleaner air, improvements to water quality that boosts recreation and tourism, more biological diversity to make



Photo: Wilderness Committee Manitoba volunteers (WC files).

our world more resilient to changing weather patterns and increasing population, and better mental health simply from being exposed to more nature.⁴⁵

One of the simplest acts we can individually accomplish is to go to water. Figure out a waterway to visit and learn about it. Find out what cool critters make the area home and find out what the threats are to this waterway. Most importantly, tell people about your experience: your water story. We need to re-attach ourselves and society to healthy water.

Phosphorus loading is a catalyst for algal blooms, but these algal blooms in Lake Winnipeg and Lake Erie are a catalyst for an evolution to proper water laws across this land. We have more lakes here than the rest of the world combined. We can and will lead the world in protecting such a sacred gift.



Photo: Paddling on Lake Erie (Ontario Parks).

TAKE ACTION

Put nature back to care for healthy waterways. Contact the:

- ▶ Federal government, responsible for healthier waterways, and tell them to introduce a nationwide mandatory shoreline protection strategy.
- ▶ Manitoba and Ontario provincial governments and tell them to enact immediate wetlands protection for all wetlands. Each province should also introduce two enforceable regulations for agricultural land: one should mandate the establishment of windrows and buffer strips on field edges; the second should require fertilizer management plans.

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Photo: Canada warbler (Robert McCaw).

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Wilderness Committee, Vol. 37, No. 4, 2018.
 Canadian Mail Product Sales Agreement No. 0900567.
 Posted in Vancouver for free distribution. Printed in Canada on recycled newsprint with vegetable-based inks.
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 Published by
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