

The Impacts of Wetland Loss

**Canadians cannot afford to keep losing wetlands.
Yet wetlands continue to be drained and degraded across the country.**

Wetlands are among the Earth's most productive ecosystems. Unfortunately, wetlands are also one of the earth's most threatened ecosystems. Estimates on wetland loss indicate that up to 70 per cent of wetlands have been lost or degraded in settled areas of Canada.

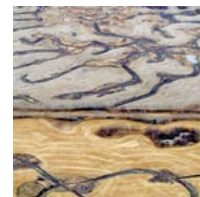
Wetland loss is negatively affecting Canada's environment. For instance, algae blooms are seriously harming many Canadian lakes, including Lake Winnipeg, the world's tenth largest freshwater lake. These algae blooms are a symptom of increased nutrients delivered from upstream watersheds. In many cases, these watersheds have endured significant wetland drainage, allowing nutrients to flow into major lakes and rivers without the benefit of the natural filtration of wetland systems.

On top of that, when wetlands are lost, significant amounts of greenhouse gases are released and the landscape's ability to store carbon is reduced. The ecological goods and services that

are critical to our health and economic well-being are continually being deteriorated — and Ducks Unlimited Canada (DUC) wants the loss of wetlands in Canada to stop.

A Manitoba Research Project

DUC recently completed Phase I of a multiphase research project to determine the impacts of wetland loss and associated drainage activity in the Broughton's Creek watershed located in southwestern Manitoba. The research paints a clear but startling picture. Although the study focused on Manitoba, the results demonstrate that wetland loss negatively affects water quality and carbon sequestration and that their continued loss impacts Canadians, now and in the future. Integrated wetland policies are needed now to protect and restore wetlands across Canada.



Ducks Unlimited Canada
Conserving Canada's Wetlands

Active by nature.

ducks.ca

DECEMBER 2008

Research Partners and Logistics

During the first phase of research, DUC partnered with the University of Guelph and Tarleton State University, a member of the Texas A&M University system. Lead funding for this innovative project was provided by the Murphy Foundation. The study was conducted in the Broughton's Creek watershed north of Brandon. The area was selected as a study watershed because the land use and wetland loss trends are representative of other agricultural watersheds across the Prairie Pothole Region of Canada. This region is a priority area for waterfowl and is critical to the continent's waterfowl populations. Additionally, impacts of wetland drainage on carbon sequestration were estimated using results from previous DUC studies that were funded by Environment Canada, Natural Resources Canada and Agriculture and Agri-Food Canada.

Research Results

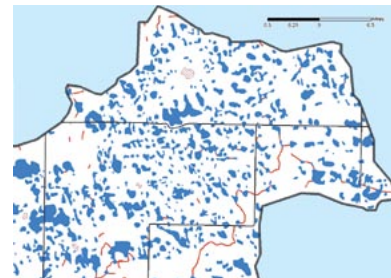
The first step of this project was to determine the amount of wetland loss and drainage activity that occurred in the watershed between 1968 and 2005. This project confirmed that 5,921 wetland basins, or 70 per cent of the total number of wetlands in the Broughton's Creek watershed, have been degraded or totally lost due to drainage. These numbers do not account for wetland loss before 1968 or after 2005. The second step of the project focused on the development of a hydrologic model to evaluate environmental impacts of this loss at a watershed scale. This research determined that wetland loss since 1968 in the Broughton's Creek watershed has resulted in:

- 31 per cent increase in area draining downstream (an additional 19 square kilometres)
- 18 per cent increase in peak flow within the creek following rainfall
- 30 per cent increase in stream flow
- 31 per cent increase in nitrogen and phosphorus load from the watershed
- 41 per cent increase in sediment loading
- release of approximately 34,000 tonnes of carbon, equivalent to 125,000 tonnes of CO₂ – the annual emissions from almost 23,200 cars
- estimated 28 per cent decrease in annual waterfowl production

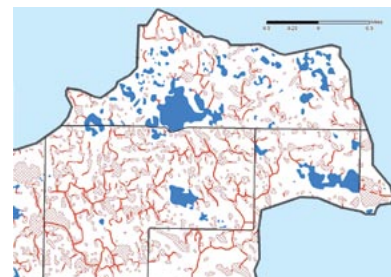
Why Does Wetland Loss Cause These Negative Impacts?

Wetlands collect and store water from the surrounding landscape during rain or snow-melt. Wetlands are able to filter sediments and nutrients before slowly returning water to the water cycle. When wetlands are drained, or even partly drained, the local drainage area is connected to downstream flows. Although this study focuses on Manitoba, the cumulative impacts of wetland drainage will have negative impacts anywhere in Canada.

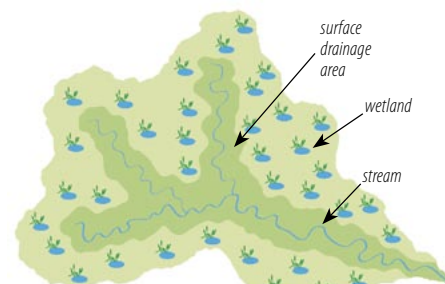
Portion of Broughton's Creek Watershed, 1968



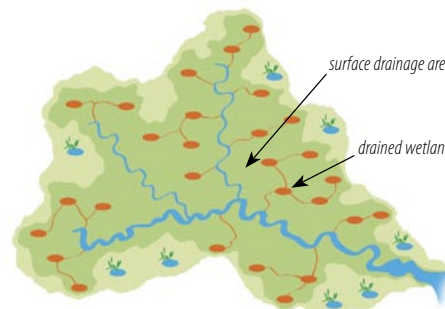
Portion of Broughton's Creek Watershed, 2005



blue = wetlands
red hatch = drained
red lines = drainage ditches



Watershed with intact wetlands



Watershed with drained wetlands



Ducks Unlimited Canada
Conserving Canada's Wetlands

Active by nature.

ducks.ca

DECEMBER 2008



What Does Wetland Loss Mean For Canadians?

Wetlands are an integral component of much of the Canadian landscape and play a significant role in watershed health. DUC extrapolated the research results to all of southwestern Manitoba, an area that has land use characteristics and wetland loss rates that are similar to the Broughton's Creek watershed. Scaling up research indicates that wetland drainage since 1968 has resulted in:

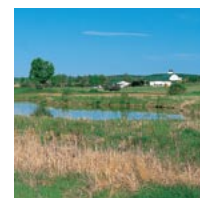
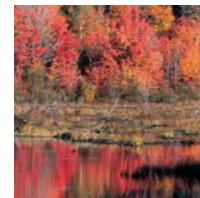
- an increase in total phosphorus loading by 114 tonnes per year to Lake Winnipeg. Every year the lake experiences massive algae blooms from increased nutrients resulting from wetland loss throughout the Lake Winnipeg watershed. This amount of phosphorus is the same as dumping 10 semi loads of commercial agricultural fertilizer or 544,000 bags (seven kilograms each) of lawn fertilizer directly into Lake Winnipeg every year.
- a release of 5.0 million tonnes of carbon stored in wetland sediments and plant material – equivalent to the emissions of 169,000 cars for 20 years.
- an increase in area contributing run-off to Lake Winnipeg of 4,518 square kilometres.

The estimated value of wetland ecosystem services associated with nutrient removal and carbon sequestration lost since 1968 is \$430 million. To replace the ecosystem services lost in Manitoba in 2005 alone would cost approximately \$15 million and this will increase to \$19 million by 2020 if wetland drainage is not halted. This extrapolation is to a small portion of the Canadian Prairies – but the results are substantial.

In this study, the estimates presented above are for southwestern Manitoba alone and do not account for wetland drainage across the rest of the Prairies. The numbers would be staggering if the impact of all wetland loss was determined. Additionally, the value of ecosystem services provided by wetlands is dramatically underestimated here as DUC focused only on benefits associated with nutrient removal and carbon sequestration. DUC did not consider the economic costs of downstream flooding, lost biodiversity, lost groundwater recharge, diminished ecotourism and many other ecological functions that are lost when wetlands are drained or degraded.

Wetland loss needs to be stopped immediately to prevent further deterioration of Canada's water resources. And, wetland restoration must begin if we hope to improve and maintain the quality of our water supplies for future generations.

Wetland loss needs to be stopped immediately to prevent further deterioration of Canada's water resources. Additionally, wetland restoration must begin if we hope to improve and maintain the quality of our water supplies for future generations.



Ducks Unlimited Canada
Conserving Canada's Wetlands

Active by nature.

ducks.ca

DECEMBER 2008

What Needs to Happen?

Society needs to realize that the root cause for this continued loss is that agricultural producers are faced with market forces, policy signals and economic incentives to drain wetlands rather than to conserve them. Despite being natural stewards of the land, producers are making decisions to improve their economic viability by increasing their land base and their production efficiency.

DUC's research has confirmed that society is the primary benefactor of wetlands. Yet, in the current system producers alone are burdened with costs to retain them. Wetlands need to be made a public policy issue with the objective of developing an integrated and comprehensive wetland policy that effectively stops wetland loss.

Ducks Unlimited Canada has 70 years of wetland expertise and experience to assist both government and stakeholders in the development of a wetland initiative that will benefit all Canadians. To do this we need proactive and comprehensive wetland policies across Canada that provide incentive-based programming for producers complimented by legislated protection, extension, tax credits, public outreach, removal of barriers to adoption and other tools. This will create the necessary paradigm shift to ensure that wetlands remain functioning on our landscapes.

DUC's research justifies the need for a comprehensive and integrated wetland policy. Wetland drainage and water quality should be of concern to all Canadians. Wetland loss impacts our quality of life and our economic well-being.

The time for action is now.



DUC's research justifies the need for a comprehensive and integrated wetland policy. Wetland drainage and water quality should be of concern to all Canadians.