

Losing GROUND

By DOROTHY PEDERSEN

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Urban sprawl. Industrial pollution.
farm runoff. Canada's precious wetlands
are feeling the squeeze. Can our fish
and game withstand the assault?



DURING the cold winter months of 2007, developers dumped tonnes of earth into a pond in Orangeville, Ontario, despite the protests of the local angler and hunter association. In warm weather, the pond had been a hive of activity, teeming with insects, frogs, waterfowl, baitfish and brook trout. The developer, it was rumoured, at least had the trout caught and released "up north" as an act of environmental friendliness before the dumping began. Other species, however, did not fare so well. Leopard frogs and turtles,

VITAL STAT: Wetlands currently cover roughly 14 per cent of Canada's land mass



for example, would have been trapped beneath the fill as they hibernated in the pond's mud bottom. More worrisome now, though, is the overall potential impact on the area's already besieged watershed.

Before it was filled in, the pond seeped underground into the Lower Minora Creek, which, a few blocks away, runs through a wooded site on the east side of a field slated for townhouse construction. Several years ago, a concrete "enhancement" was built to help dry up the area faster and reduce the amount of swampy land. It's not hard to imagine that the combination of filling in the pond and the impending construction of townhouses will all but destroy the creek, which eventually enters the Credit River via Island Lake.

Nor is it tough to fathom how this development, along with other construction sites along the Lower Minora, will result in anglers getting fewer nibbles 30 kilometres downstream in the Credit River. Even the most informed outdoor enthusiast may not make the immediate connection to distant, small environmental assaults and why fish aren't

biting, or why so few ducks are observed. But accumulated environmental damage can, and does, show up elsewhere, sometimes even thousands of kilometres away.

Many birds, mammals, amphibians and reptiles are dependant, either wholly or partially, on wetlands. Some fish species also inhabit wetlands, while others may live downstream in the same interconnected watersheds. Certain species of duck, such as mallards, are also highly dependant on wetlands, where they live part of their lives; other waterfowl rely on them as staging areas and stopovers during their migrations.

And the wetlands themselves serve as buffers, protecting surrounding streams, rivers and lakes by collecting runoff and filtering out sediment and nutrients. They also serve as carbon sinks, and vast amounts of greenhouse gases are released when they are destroyed, adding more fuel to global climate change.

"On average, about 75 per cent of the wetlands in southern Ontario that were here when settlers arrived have been drained or lost," says biologist Angus Norman, a wetlands specialist with the province's Ministry of Natural Resources. "Humans have been living on those landscapes for hundreds of years, when you think about the aboriginals. But many of the changes that our society has made over the last several decades have been very hard on wetlands."

Much of the problem stems from man encroaching too closely on these biologically diverse and important wild places. "If you change adjacent land use and put in a lot of residential, industrial or institutional development of any kind, and you don't put in an adequate buffer, you're going to lose wetland functions," says Kevin Rich, head of Ducks Unlimited Canada's municipal extension

HELPING HANDS

Armed with research predicting dire consequences for Canada's wetlands, Ducks Unlimited Canada is taking a multi-pronged approach to try to turn the tide. Along with encouraging landowners to restore and preserve wetlands, the group is also striving to get the message out to the public, as well as convince politicians to develop effective wetland policies. In the meantime, what can anglers and hunters do to help? Here are some suggestions.

- 1. INSIST LOCAL** politicians include wording in your area's municipal official plan to protect wetlands. Such an amendment can be made at any time. It could also include a review of local natural heritage policies.
- 2. ENCOURAGE LOCAL** politicians to invite developers to donate sensitive lands to your municipality.
- 3. IF YOU'RE** in the market for a new house, ask yourself if buying one on, or near, sensitive wetland

habitat is really the right thing to do.

- 4. GET YOUR** hands dirty. If you don't already belong to a conservation organization or a fish and game club, now's the time to join.
- 5. EDUCATE YOURSELF** about the issues and spread the word. Groups such as DUC (www.ducks.ca), as well as local conservation authorities, provide mountains of information on their Web sites. And it's free.

program in Ontario. And that includes the loss of wildlife.

In particular, Norman blames inadequate buffers between development and wetlands for southern Ontario's serious decline in amphibians and waterfowl. "Fifteen or 20 metres of adjacent land aren't adequate to protect, or provide, habitat requirements for amphibians or reptiles or nesting waterfowl," he says. "The minimum width we should be providing is somewhere around 50 metres, but they really need a few hundred metres."

NOT that the problem of declining wetlands is limited to population-rich southern Ontario. Throughout Canada's settled areas, it's estimated that as much as 70 per cent of wetlands have been lost or degraded. In B.C., for example, there are several hot spots when it comes to development encroaching on wetlands. "The East Kootenays and Okanagan are prime recreation areas," says biologist Brad Arner, DUC's manager of conservation programs in the province. "The Lower Mainland is a busy economy. We're looking at all kinds of development pressures."

Such pressures become even greater as people with money to spend flock from other provinces and countries to build recreation or retirement homes on B.C.'s lakeshore and oceanfront properties. "The Fraser Valley has gone from a large, natural lake and forest to urban and agricultural channels," observes Arner.

This, in turn, has resulted in more silt and nutrients in the local watershed, along with altered flows. "In the last few years it's really intensified," says Arner. "We've lost 85 per



cent of the historical wetlands, leading to lower water quality and loss of habitat from a wildlife perspective." Reduced populations of native species such as salmon and trout suggest they're taking the worst hit from the changes.

On the Lower Mainland, meanwhile, overwintering waterfowl such as trumpeter swans and northern pintails must now depend on agricultural crops for food because there are no longer enough native plant species to sustain them. "We think, 'This is nice agricultural land,' but overlook that it used to be a forest," says Arner.

Indeed, Canadians have become somewhat inured to the slow, incremental changes to the country's landscape. And over time, adding one more golf course, one more parking lot, one more farmer's field and one more something else has largely contributed to the current crisis.

Then there's industrial pollution, the critical effects of which don't simply reach just two kilometres, or even 200 kilometres, away. "Since the 1800s, the long-range transport of pollutants from southern Ontario and the

VITAL STAT:
Ontario,
Manitoba and
the N.W.T.
are home to
the most
wetlands in
the country

COMPETING INTERESTS

If rampant development is harming Canada's important wetlands, why not just stop it? A large part of the problem is that multiple levels of government, as well as various stakeholders, are involved in the decision-making process—and they don't all operate from the same handbook.

Take Ontario's Dufferin County, for example, where myriad agencies are assigned to conserve the area's natural resources. For starters, there's the Nottawasaga Conservation Authority, the Niagara Escarpment Commission, the Grand River Conservation Authority and Credit Valley Conservation. Then there are the various levels

of municipal, provincial and federal governments weighing in, each tasked with different aspects of wetland protection.

To further complicate matters, each conservation authority and government body has its own action plan, and each group must contend with overarching provincial statutes, such as the Green Belt Plan, the Clean Water Act and the Drainage Act, to name a few. How can this quagmire of bureaucracy get any worse? Consider: just one sloppy environmental impact study by just one agency can produce inaccuracies that can weaken the significance of studies by everyone else.



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American Midwest has decreased the water quality in Nova Scotia," says Randy Milton, a wildlife resources manager with Nova Scotia's Department of Natural Resources. "All our wetlands are affected now."

In particular, smoke containing hydrogen sulfides has spewed for years from chimney stacks belonging to steel, coal and other industries. Once airborne, the pollutants are transported thousands of kilometres away, eventually dropping acid rain in places such as Nova Scotia.

The southwest of the province has been especially affected. There, the freshwater has been acidified, its pH level reduced. "The water is of poor quality and can't support trout or breeding salmon anymore," says Milton. Trout may still live in the water, but they have limited success reproducing, resulting in lower populations.

In addition, acid rain creates a chemical reaction that leaches nutrients from the soil throughout the province. And while it's believed waterfowl habitat may still be adequate, it remains unclear whether egg development has been affected by the poor water quality.

WHILE wetlands may be facing similar threats across the country, it's in Manitoba that research is revealing exactly how land use has contributed to the overall problem. Assisted by Ontario's University of Guelph and Texas A&M University, DUC has been studying the 25,000-hectare Broughton's Creek watershed just north of Brandon. Extremely important from the standpoint of waterfowl and habitat management, the area is representative of watersheds and landscapes across the entire southwest of the province.

The researchers found that 5,921 wetland basins—or 70 per cent of the total wetlands in the watershed—had either been degraded or destroyed by farmland drainage between 1968 and 2005. This translates into a 31 per cent increase, or another 31 square kilometres, in the area now draining directly downstream.

"That's an extremely significant number because it changes dramatically the amount of water, and therefore the amount of nitrogen, phosphorus and sediment coming off the landscape and not being collected in wetlands any longer," says DUC research biologist Shane Gabor. "It's going into



VITAL STAT:
Agriculture is
the main
cause of
85 per cent
of Canada's
wetland loss

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VITAL STAT:
More than 20 million hectares of wetlands have been converted to farmland since the arrival of the first European settlers

river systems and our major lakes, such as Lake Winnipeg."

Those are sobering findings, considering they don't include losses prior to 1968 or after 2005. Extrapolate the numbers to all of southwestern Manitoba, however, and they're even more worrisome. The researchers estimate that, in addition to releasing five million tonnes of stored carbon, wetland loss since 1968 has added 4,518 square kilometres to the area contributing runoff to Lake Winnipeg.

Along with an increase in sediment, the increased runoff means an extra 114 tonnes of phosphorus is flowing into the lake each year, the equivalent to directly dumping in 3.8 million kilograms of lawn fertilizer. And if wetland loss continues apace in southwestern Manitoba, an additional 46 tonnes of phosphorus will be entering the lake each year by 2020.

One of the major side effects of such phosphorous loading is the presence of toxic blue-green algae, which is becoming increasingly common on Lake Winnipeg. It's so bad in some areas, it appears as though someone has dumped cans of green paint on top of the water.

"These massive algae blooms die and sink to the bottom and decompose," Gabor explains. "As they decompose, they suck up all the oxygen in the bottom water, usually killing off anything but the most resistant insects that live in the sediment."

The algae are also detrimental to fish, which are not only deprived of a substantial source of sediment food, but also of the oxygenated water they need to survive. Whitefish are one species, in particular, that researchers have identified as having declined dramatically in numbers.

Ironically, walleye appear to be doing well despite the algae blooms, but there is a caveat. "There have been invasions of rainbow smelt, and the walleye are enjoying a smorgasbord of this new aquatic invader," says Gabor. "That's why their populations are doing well."

And in lakes around the world where increased eutrophication has taken place,





fish harvests often go up and up until the bottom suddenly falls out. Warns Gabor: "It absolutely crashes."

IF fish are in such danger, can ducks and geese be any better off? More than 50 per cent of North America's waterfowl settle in the Prairie Pothole Region of the three Prairie provinces and North and South Dakota.

It's the continent's most productive breeding area—for now. In the Broughton's Creek study, for example, the researchers estimate there's been a 28 per cent drop in local waterfowl production since 1968.

Healthy waterfowl populations rely on healthy habitats, and when you remove wetlands from the Prairies, you reduce the number of birds that can settle there—they just can't crowd onto the remaining wetlands. After all, waterfowl exhibit spacing behaviour, and mating pairs set up territories; other birds are prevented from settling in close by.

"Typically, the smallest wetlands are most prone to drainage, and they are also the ones ducks like the most because they can get secluded pair space," says DUC research biologist James Devries. "These wetlands are also the most productive in terms of the number of invertebrates to feed on, or to build up body conditions to lay eggs."

So, when wetlands have been lost, fewer ducks are able to settle after enduring the rigours of migration. "As a result, the number of birds produced through breeding is reduced," adds Devries. "Continent-wide, duck populations begin to decline, and we've seen that a lot."

A 30 per cent loss of wetland generally translates into about a 40 per cent decrease in the number of ducks that can settle in an area. Some species are affected to an even greater degree. Devries and other biologists suspect that wetland loss has played a significant role in the dramatic decline in pintail populations, for example.

As for the overall, long-term environmental impact of wetland loss, scientists still don't know—despite all the research and numbers—where the point of no return is, when entire wetland ecosystems, without further warning, will simply crash. The fact there's still a chance to prevent a complete collapse, however, may be in large part due to the work of sportsmen-based groups such as DUC, Delta Waterfowl and Trout Unlimited Canada, not to mention numerous fish and game organizations across the country.

As DUC research scientist Pascal Badiou points out, his organization was founded 70 years ago by waterfowlers, and today they are its most ardent supporters. Says Badiou: "Their commitment to us is the reason this kind of research is coming out." ♦

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