



# Nature's wealth

## Manitoba's wetlands are a vibrant, valuable part of our shared environment

DR. PASCAL BADIOU

**W**etlands are incredible places.

As a research scientist, I have dedicated my life's work to understanding how these unique areas function, and the environmental and economic roles they play in our world.

A wetland is any area that holds water either temporarily or permanently. Some hold water year-round while others may only hold water for one or two months each spring. They may more commonly be known as sloughs, swamps, ponds or marshes.

More than just plants and animals, wetlands are tremendously productive ecosystems that provide a myriad of services to society worldwide. The annual value of the services provided by the planet's remaining wetlands is estimated at several billion dollars.

In terms of the plants and animals they support, wetlands are among the most highly diverse and productive environments. From the bogs of the boreal forest to deep marshes full of amphibian life to shallow, duck-filled potholes in our rolling farm country, they are home to hundreds of different plant and animal species – including more than one third of Canada's species at risk.

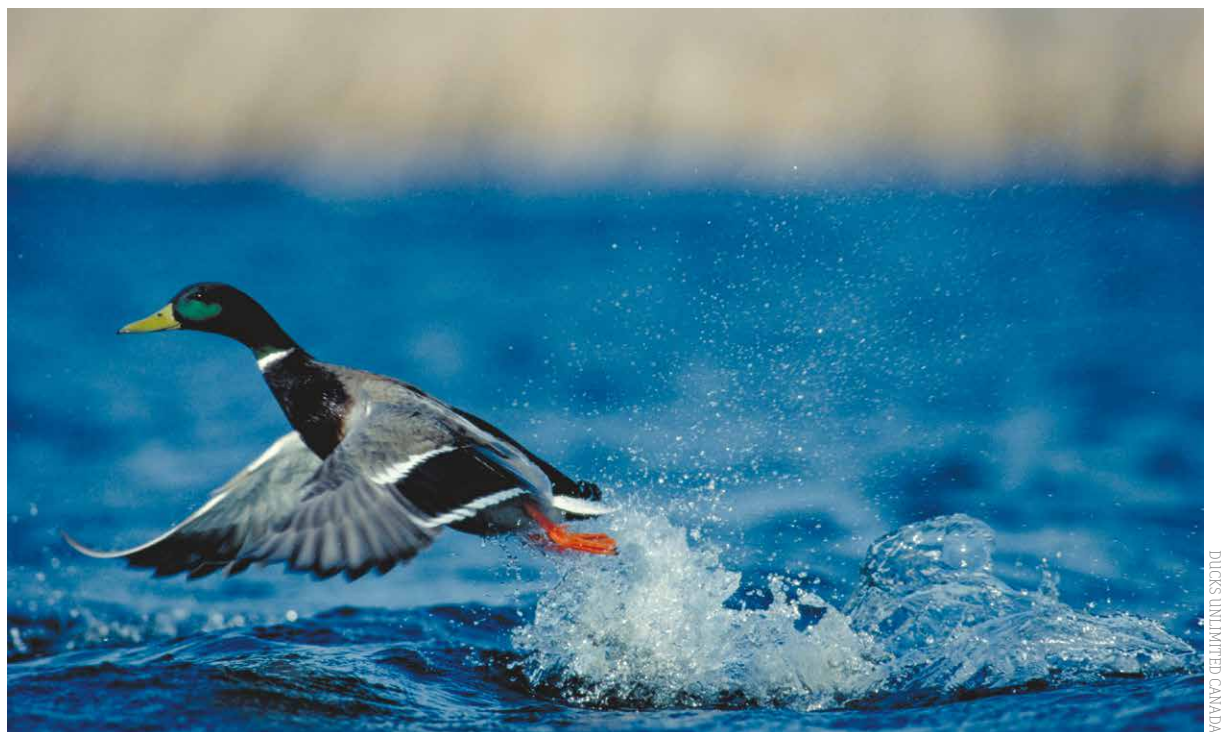
These areas are important nesting and summer destinations for migratory bird species like ducks, geese, cranes, shorebirds and herons, which return every spring to raise their broods. Wetlands also serve as year-round homes to animals such as insects, toads, turtles, frogs, snakes and rodents.

Wetlands bring balance to our natural environment. They are effective regulators of water, protecting the land in both drought and flood situations. During wet years, wetlands help reduce flooding by acting as sponges, capturing water and reducing flood peaks and vol-

umes. During dry periods, wetlands ease the effects of drought by slowly releasing the water they've stored back into surrounding areas.

Wetlands also stabilize the soil, holding it in place and preventing erosion. Within that soil, they trap sediments, which helps create a rich, fertile habitat for plants and animals.

Wetlands are often referred to as the kidneys of the landscape. This is because the plants, bacteria and animals in a wetland filter the water, capturing nutrients like phosphorus, which contributes to potentially harmful algae blooms in our lakes. Wetlands also act as carbon and greenhouse gas sinks, storing a portion of what would otherwise be released



Migratory birds such as mallards make their summer homes in wetlands.

Wetlands are home to hundreds of different plant and animal species – including more than one third of Canada's species at risk.



Dr. Pascal Badiou takes his research work to the field, studying the diverse characteristics and benefits of wetlands.

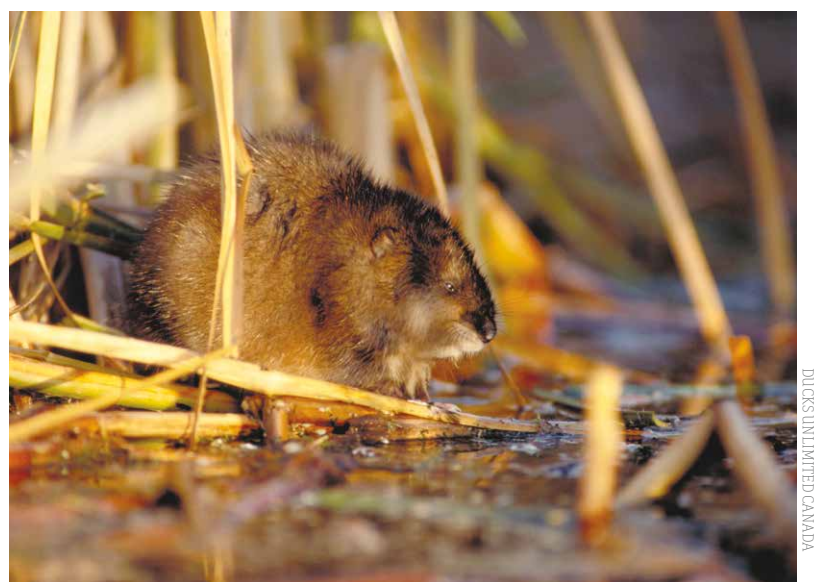
into the environment.

Finally, wetlands provide terrific learning experiences. From the muddy bottom to the skies above, they are teeming with an-

imal life and rich in vegetation, providing endless opportunities as "outdoor classrooms."

Despite the many benefits they offer, wetlands are one of the earth's most threatened ecosystems. In the last century, 50 per cent of the world's wetlands have disappeared. They have been drained because of industry, urbanization and agriculture. Losses have been particularly high in the Canadian Prairies and what's known as the Prairie Pothole Region. In some areas, such as the Manitoba portion of the Red River watershed, losses exceed 90 per cent.

Wetland destruction brings a multitude of consequences. In science-speak, it alters the hydrology of watersheds (hydrology is the study of the movement,



Wetlands serve as year-round homes for animals like muskrats.

distribution and quality of water) and increases the amount of runoff that is generated, thereby increasing total water flows as well as flood peaks.

Furthermore, Ducks Unlimited Canada's research has demonstrated that drained wetlands are hotspots for moving nutrients and other pollutants into the watershed. Lastly, when drained, the carbon that wetlands have accumulated over time is released back to the atmosphere. And of course, when plant life and important habitat is lost, all species that rely on

wetlands for food, breeding and shelter are affected.

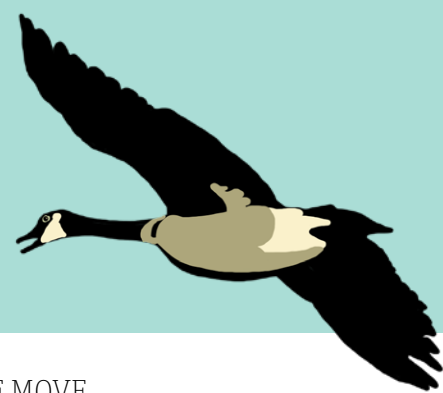
In Canada, we are fortunate to have about 25 per cent of the world's remaining wetlands. Thanks to research, we know enough now to understand that these important ecosystems need to be protected for the future health of the environment, the plants and animals that depend on them, and society as a whole.

*Dr. Pascal Badiou is a research scientist with the Institute for Wetland and Waterfowl Research at Ducks Unlimited Canada. ■*

Wetlands are rich with an abundance of diverse plants and animals. Here are a few examples of the hundreds of different species – and their unique characteristics – that you might encounter in a Manitoba wetland.

#### BUZZ OFF!

Although the standing water found in marshes and swamps is an ideal breeding ground for Manitoba's infamous insects, large and healthy wetlands actually have very small mosquito populations – mainly because they're full of other insects, amphibians, birds and fish that act as natural predators. To these species, mosquitoes aren't pests – they're lunch!



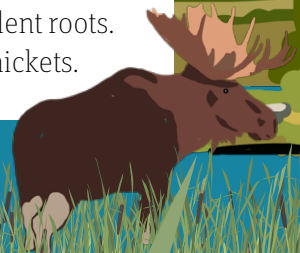
#### ON THE MOVE

Only some of Canada's birds are migratory. Those that commonly come and go each year include waterfowl (such as ducks and geese), raptors (such as hawks and eagles), wading birds (such as cranes, herons, gulls, terns and shorebirds) and songbirds (such as warblers, blackbirds and thrushes).

Many migratory birds fly thousands of kilometres before reaching their wintering grounds. It's a risky journey – poor weather, lack of food, exhaustion and predators are just some of the dangers along the way. As a result, migrating birds have evolved, both physically and strategically, to deal with these challenges en route.

#### MOOSE

The moose takes its name from an Algonquin word for "eater of twigs." A typical summer diet for these giant mammals includes grasses and aquatic plants. Moose frequent shorelines of shallow lakes and marshes, feeding morning and evening on pondweeds or water lilies. Strong swimmers, they've even been observed to dive in search of succulent roots. Midday is spent resting in willow thickets.



#### AMERICAN BITTERN

What's that sound? This large bird produces gurgles that sound like a cross between a frog and water bubbles. It also camouflages itself by standing straight and swaying like a reed.



#### MINK

Healthy wetlands often support eight or more mink per square kilometre. The best places to see them are in large marshlands or along lakeshores, rivers and streams. Mink are a semi-aquatic form of weasel that use waterways as travel paths, and as sources of food and shelter.



#### SNAPPING TURTLE

One of the world's largest freshwater turtles can be found right here in Manitoba. The snapping turtle's shell can reach 45 cm in length, as big as a large pizza. This mostly nocturnal wetland reptile lives up to its name; snapping turtles can be very aggressive, possibly because, unlike other turtles, they are unable to retreat inside their shells. The snapping turtle's strong jaws and sharp beak can easily crush a small branch – or a human finger.



#### WOOD DUCK

Considered by many to be the most beautiful of North American waterfowl, the wood duck is a perching duck that normally nests in cavities in trees. These birds typically pair up on their wintering grounds or on the return migration to their breeding grounds. Unlike most other ducks, wood ducks have sharp claws for perching in trees.



#### TOAD

Canadian and American toads breed and spend the summer in wet areas such as marshes. In the fall, they travel to dry, upland areas where they dig their own burrows or use existing tunnels or natural crevices to protect themselves from freezing during the winter. When the weather warms up in spring, they dig their way to the surface and move back toward their breeding ponds.



#### ZOOPLANKTON

Zooplankton are microscopic animals that thrive in the water in wetlands. Many are filter feeders, taking bacteria and algae from the water. They serve as an important food source for small insects and fish.



#### WHAT EXACTLY IS A WETLAND?

Depending on where you live, wetlands may be more commonly known as sloughs, ponds or marshes. The Canadian Wetland Inventory identifies five types of wetlands:

**BOGS:** peat-covered wetlands (peatlands) which include sphagnum mosses (peat mosses), shrubs and black spruce.

**FENS:** peatlands characterized by a higher water table and including plants like black spruce, tamarack, sedges, grasses and various mosses.

#### MARSHES:

nutrient-rich wetlands that are periodically inundated by standing or slowly moving water. Vegetation includes cattails, reeds, rushes and sedges.

**SWAMPS:** wetlands with standing or gently moving water, with dense coniferous or deciduous forest, or tall shrub thickets.

#### SHALLOW/OPEN WATER:

small water bodies, or portions of wetlands and water bodies. These areas can also include the transition stage between lakes and marshes.

# Cattails: The multi-purpose plant

Cattails are one of the most versatile – and valuable – wetland plants in Manitoba. Their natural benefits include water filtration, animal habitat and flood protection. They can be turned into fuel sources, woven into rope or baskets, and even used as food!

The next time you walk by or canoe through a marsh, take a moment to recognize how truly amazing its plant life really is.

## From the marsh to the dinner plate

MARLO CAMPBELL

Cattails are a common sight throughout Manitoba – but don't let the abundance of this ubiquitous species fool you into taking it for granted.

"It's a very useful plant and it deserves a lot of respect," says botanist Laura Reeves, the founder of Prairie Shore Botanicals. (She calls cattails "nature's supermarket," noting that "wherever you find cattails, you know you have shelter, water, fire and food.")

Based south of Winnipeg near Gardenton, Man., Reeves offers a variety of



HELEN/SHUTTERSTOCK

Cattails and other wild plants are part of botanist Laura Reeves' regular diet.

services and classes, including a one-day workshop dubbed "Laura's 'You can eat that?!' Wild Edible Adventure." Participants are taught how to identify multiple species of wild plants before being taken outside to gather as many as they can find. Collected plants are then turned into a full-course meal.

Cattails are often on the menu – and for good reason: almost every part of them is edible.

The roots, which Reeves says taste like sweet corn, are best harvested in fall or early

spring. They can be roasted or, once peeled, the inner starch can be rubbed out and used as a gluten-free flour substitute. The bottom, tender part of the shoot is best gathered in May or June; usually eaten raw, it tastes like spicy cucumber. Male cattail flowers can be picked from late June to early July. Located in a papery sheath just above the more recognizable sausage-shaped female flower, they can be harvested just after they form, when they are green, and steamed. The yellow, powdery pollen they produce once open can also be eaten; high in protein and beta carotene, it, too, can be used like flour.

When harvesting cattails, location matters. Cattails are filter plants and Reeves cautions against eating those found along busy roads or highways.

"You have to watch which kind of water you're pulling them out of," she says. "You don't want to be eating the filter out of a contaminated marsh."

### Curried chickpeas with cattail flowers

LAURA REEVES

½ - ¾ cup onions  
2 tbsp. oil  
1 - 2 cloves garlic, minced  
¼ cup black pepper  
1 - 2 tbsp. Trinidad curry powder  
1 cups cooked chickpeas (garbanzo beans)  
1 tsp. salt  
3 - 5 male cattail flower spikes

½ cup water or vegetable broth (optional)

In a medium frying pan, sauté onions in oil over medium heat until clear. Add garlic and continue to sauté until onions are lightly browned, being careful not to burn the garlic. Add black pepper and curry powder and stir for one to two minutes. Stir in chickpeas and salt. Remove cattail flowers from three flower spikes and stir in until evenly distributed. Add more flowers if you like but be careful – too many can make a dish slimy. For a saucier dish, add water or vegetable broth until you get the desired consistency. Serve with (wild) rice or quinoa.



CINDY BALKWILL/PHOTODISC/ARND BRONKHORST

For Reeves, gathering wetland edibles like cattails is more than just a job – it's a way to connect with nature.

"It's not only just the eating,

it's the whole being outside and feeling the sun on your back, and the wind, and hearing the birds and the frogs," she says. "It's rejuvenating." ■

## Nature's flood fighters

SHANE GABOR

Not all infrastructure is made of concrete. In Manitoba, wetlands are both ecologically and economically beneficial "green" infrastructure. With their ability to distribute the storage of water on the land, they play an important role in regulating water levels. Conversely, when wetlands are destroyed, the probability of flooding increases – as does the need to incur (or invest in) flood-related expenses.

A recently released report from the University of Saskatchewan demonstrates the significant impact of wetlands on peak water flows, the highest level that water reaches during a flood. "Improving and Testing the Prai-



DIKAS/SHUTTERSTOCK

Flooding can make life come to a halt. Wetlands can help reduce its effects by regulating water levels.

rie Hydrological Model at Smith Creek Research Basin" investigated several scenarios, including the changes that would occur if wetlands were restored to their historic levels, as well as if they were drained completely.

The study was led by Dr. John Pomeroy, director of the university's Centre for Hydrology. His analysis in the Smith Creek Watershed near Yorkton, Sask., showed that during the flood of 2011, previous wetland drainage

(1958 – 2008) increased peak flows by 32 per cent. His team also found that those same levels would be 78 per cent higher if today's existing wetlands were completely drained.

"One of the results that surprised me was that wetlands, even in a flood year, still had the capacity to hold more water," Pomeroy says. "When you don't store water in the watershed, it's going to come off the watershed – it's as simple as that."

Manitoba's remaining wetlands provide floodwater storage capacity that exceeds 11 times that of the 56-km long Shellmouth Reservoir, located in Western Manitoba on the Assiniboine River. That reservoir was built in 1972 at an approxi-

mate cost of \$10.8 million. When calculated in today's dollars, the flood storage capacity of provincial wetlands can be estimated at more than \$600 million.

Flooding has environmental, social and economic costs that affect us all. Those with farms, businesses and homes in flooded areas see their lives come to a halt and their property damaged. Others feel the impacts in tax dollars used for compensation and repairs, and the building of related infrastructure.

Pomeroy acknowledges that wetlands are not the only contributing factor in a flood event. They are, however, a critical component of water management and flood mitigation – one that we can influence. ■

## Fuelling innovation at Pelly's Lake

KARLA ZUBRYCKI

We often say that when life gives you lemons, you should make lemonade. Farmers in Manitoba aren't likely to find lemon trees growing on their land, but they probably will find cattails in low-lying areas, ditches and on pastureland. Since wetlands are sometimes seen as unproductive land that would be better used for crops, the cattail may well be the prairie version of the lemon. With that life lesson in mind, a group of Manitoba organizations and individuals have been working together to turn cattails into valuable bioenergy products.

Bioenergy is renewable energy from biological materials such as plants.

This concept has been put into action at Pelly's Lake, Man., a 627-acre site two hours southwest of Winnipeg that grows an estimated 3,800 tonnes of cattails each year. For the last three years, these wetland plants have been harvested with large-scale machinery and turned into a range of fuel products including pellets, cubes and synthetic gas.

As a solid fuel, cattails compare well to other forms of plants used for energy. For example, fuel pellets are often made of poplar or willow, as well as switchgrass and agricultural residues. Cat-



KARLA ZUBRYCKI

tails provide an equal or higher heating value than these materials and can be harvested after only 90 days, compared to seven to 10 years for the trees.

The International Institute for Sustainable Development (IISD) is also exploring how to turn cattails into liquid fuel such as bioethanol or biobutanol. In other words, cattails could eventually run everyday machinery such as cars and lawn mowers.

Dr. Richard Grosshans, senior research scientist at IISD, says the more he studies cattails, the more he learns about their versatility.

"The fantastic thing is that not only are we creating bioenergy and other high-value



KARLA ZUBRYCKI

A cattail bale is transported by tractor at Pelly's Lake.

bioproducts, but we are also generating other benefits by harvesting cattail, including capturing nutrients that could otherwise cause algae blooms, and restoring habitat. When we show that wetlands have so many benefits, people are more and more inclined to protect them." ■

## The purifying plant

KARLA ZUBRYCKI

Have you ever compared parts of nature to parts of the human body? Forests are nature's lungs, taking in carbon dioxide and providing oxygen. Rivers are its circulatory system, moving water long distances. Wetlands are vital organs, too – they are nature's kidneys.

Wetlands have a remarkable ability to filter contaminants from water. Cattails, which are found in many wetland ecosystems, are a perfect example of this plant purification in action.

The International Institute for Sustainable Development (IISD) has found that wetlands in Manitoba capture about 12 kg of phosphorus and 60 kg of nitrogen per acre of cattail. This filtering function is essential to protecting the health of Lake Winnipeg, where excess amounts of nutrients are contributing to the growth of harmful algae blooms. If more nutrients can be removed from water by wetlands before they reach the lake, we will all enjoy cleaner water.

"We think of wetlands as infrastructure, just as much as human-made treatment plants are. Both are important to keep our water clean," says Dimple Roy, director of the Water Program at IISD.

Small wonder, then, that

constructed wetlands designed specifically for wastewater treatment are becoming increasingly popular throughout Manitoba. In Winnipeg, you can see one in action at FortWhyte Alive – it provides habitat for wildlife and serenity for visitors, all while it treats water from the centre. Just outside of Winnipeg at Oak Hammock Marsh, a 1.1-acre constructed wetland (surrounded by a very large natural wetland) treats more than eight million litres of wastewater each year. Likewise, the Village of Dunnottar, located on the south shores of Lake Winnipeg, has begun using a constructed filtration system for its municipal lagoon to reduce nutrient and other wastewater pollutant loads to waterways and Lake Winnipeg.

Constructed wetlands have even found their way onto mining and other industrial sites, where they can be used to treat wastewater from mining activities, helping to remove heavy metals such as copper, nickel and zinc.

In Southern Manitoba, we are fortunate to live in a landscape dotted with wetlands. Whether natural or constructed, these areas are some of our best (and most affordable) defences against water pollution, complementing traditional human-made treatment facilities. ■

Interest in wetlands is growing across Manitoba. Here are just some of the initiatives currently underway across our local landscape.



## Turning back the clock in Netley-Libau Marsh

MARLO CAMPBELL

Netley-Libau Marsh is located at the southern end of Lake Winnipeg at the mouth of the Red River. Encompassing approximately 64,250 acres (more than seven times the size of Birds Hill Park), it's one of the largest freshwater coastal wetlands in Canada.

In addition to being a vital habitat for waterfowl and an important natural nursery for the small fish that serve as food for larger, commercial fish species such as walleye, sauger and whitefish, a healthy Netley-Libau Marsh can help control algae blooms in Lake Winnipeg by filtering nutrients from the water that flows through it.

Unfortunately, a 2004 study by researchers from Ducks Unlimited Canada and the University of Manitoba concluded Netley-Libau Marsh is no longer functioning as a healthy coastal wetland. From 1979 to 2001, open water on the

marsh increased by more than 20 per cent. Water now covers half the area, which means a reduction in nutrient-filtering marsh vegetation.

A new project initiated by the Lake Winnipeg Foundation (LWF) hopes to change this. In late September, LWF organized a two-day workshop to explore the feasibility of marsh restoration.

"Knowing that there were problems in the marsh, and understanding that marshes and wetlands are effective nutrient filters, sediment filters, for lakes everywhere, and knowing that Lake Winnipeg has an excess nutrient problem which is leading to increased blooms of algae, we felt it was important," says Alex Salki, a retired research biologist and the chair of LWF's Science Advisory Council.

Shoreline management and wetland conservation are two of the eight actions identified in LWF's Lake Winnipeg Health Plan, which aims to reduce nutrient loading to Lake Winnipeg.



Water twists and turns through the maze of Netley-Libau Marsh before reaching Lake Winnipeg.

LWF's workshop brought together representatives from local agencies and experts from as far away as Hungary to discuss the multiple reasons for Netley-Libau Marsh's decline and to learn about restoration projects in other marsh ecosystems facing similar challenges. The project's long-term goal is to begin rehabilitating portions of Netley-Libau Marsh to regain the area's ecological function. ■

## In his own backyard

CAROLYN KOSHELUK

Landowners play an important role in the future of wetlands on the Prairies. Norm Kerr knows all about it.

Kerr, a retired iron worker, is deeply connected to his property. He is committed to restoring and protecting natural areas. He says the land enriches his life. And his conservation efforts are ensuring the land's environmental integrity for future generations.

Kerr approached Ducks Unlimited Canada (DUC) while building his retirement home. He purchased a 160-acre property near Minnedosa to fulfill his dream of having a piece of land to call his own.

The land was pasture at the time of purchase. The wetlands had long since been drained.

DUC partnered with Kerr on a conservation agreement, which meant he received financial support for the resto-

ration and protection of wetlands. He, in turn, committed to conserving the natural integrity of the site by limiting the amount and type of future development.

Because Kerr is a hands-on kind of guy, he proudly handled much of the clean-up, including removal of old chemicals and barrels, and rebuilt the yard in 2012. He's taken a keen interest in the native plant life that has since returned to the wetland area. He has a special fondness for the mallards that began nesting there this summer.

The majority of his acreage is rented out for pasture. Kerr is fiercely proud of his commitment to balance wildlife conservation and agriculture. With the benefits this also affords the livestock that now graze on his land, he recognizes his contribution to conservation as a win-win for both nature and local producers. ■

## Protecting wetlands, protecting Lake Winnipeg

MARLO CAMPBELL

What happens on our land affects what happens in our water. Upwards of 70 per cent of Southern Manitoba's original wetlands have been drained since development began in the province, much of that on what is now agricultural land. While supporting regional economies and enabling producers to grow food for local, national and global markets, drainage has also significantly reduced the natural landscape's ability to store carbon, mitigate droughts, control floods and filter nutrients that contribute to algae growth in lakes such as Lake Winnipeg.

In June, the Manitoba government announced a new Surface Water Management Strategy, as well as *Towards Sustainable Drainage*, a set of proposed drainage regulations. The goal is to enhance wetland protection in order to help restore and protect Lake Winnipeg, and also to improve the efficiency of the existing provincial licencing system so that landowners can



New protection for provincial wetlands will help local landowners and Lake Winnipeg.

complete minor drainage projects without being slowed down by red tape.

Wetlands are differentiated from one another by physical characteristics such as the types of plants that grow in them and the amount of time they hold water. The proposed strategy and regulations would protect seasonal, semi-permanent and permanent wetlands from drainage. These types of wetlands typically hold water for longer periods of time, often include some open-water areas, and host a variety of vegetation that provides critical habitat for biodiversity

and other ecological services.

The new approach includes a commitment to the principle of "no-net-loss of wetland benefits," whereby if drainage must occur, compensatory action will be required to replace their valuable ecological functions. The aim is to provide transparent and consistent protocols that balance all interests of Manitobans, the environment and the economy.

Public consultation on the Surface Water Management Strategy and *Towards Sustainable Drainage* will continue until Dec. 31, 2014, with comments being accepted in writing or by email. ■

## An ecological gem

MARLO CAMPBELL

Brokenhead Wetland Ecological Reserve is a little-known ecological gem. Tucked beside Highway 59 on the way to Grand Beach, just north of Brokenhead Ojibway Nation (BON), the 1,391-acre fen wetland was established in 2004, and is home to numerous species of insects, birds and mammals, as well as 28 of Manitoba's 36 native orchid species, eight of its 10 carnivorous plant species, and 23 other rare plants and fungi.

It's also where, for generations, Indigenous communities have collected medicinal plants such as Seneca root, cedar and Labrador tea, says BON member Carl Smith.

Smith is the chair of Debwendon, a non-profit organization founded in 2007 through a partnership between BON, Native Orchid Conservation Inc. and the Manitoba Model Forest. It was created to help preserve the area's unique ecosystem and the cultural practices that depend on it. Plans are to develop and maintain an interpretive boardwalk trail that would allow people to visit the wetland without damaging it. "Debwendon" means trust in Ojibway.

Thanks to years of hard work, \$1 million in provincial funding and a \$600,000 donation from local naturalist Eugene Reimer, Debwendon's



Carl Smith examines one of the many unique plants found along the Brokenhead Wetland Boardwalk Trail.

vision is finally becoming a reality.

The Brokenhead Wetland Boardwalk Trail will officially open on June 26, 2015. Located next to the ecological reserve, it features one kilometre of raised cedar boardwalks that wind through forest and marshland environments. Several rest points with benches allow explorers to sit and reflect.

BON has been taking plant inventories and training guides for tours that will soon be available. Although signage has yet to be added, the trail is complete. Smith says it has already attracted plenty of curious nature-lovers.

"We're getting a lot of calls and a lot of people are interested," he says. "They really enjoy it. They never realized that it was back here; they drove by here for years and years." ■

## Pellet power at the Living Prairie Museum

KARLA ZUBRYCKI

In winter, Winnipeg residents can see cattails used as heating fuel when they visit the city-run Living Prairie Museum. Starting in 2013, the city partnered with the International Institute for Sustainable Development (IISD) to create biofuel pellets from cattails and prairie grasses, harvested from various locations throughout Winnipeg. These pellets are burned in a stove at the museum and are capable of heating the entire space.

Turning cattails and native grasses into biofuel pellets was a logical step for the city, as it harvests large amounts of these plants annually. In order to maintain water flow in ditches, the city must remove cattails from some locations. Similarly, tallgrass prairie restorations, like the one at the southeast



Pellets made from a mixture of cattails and prairie grasses help heat the Living Prairie Museum.

corner of Assiniboine Forest, are hayed periodically as part of their management. Haying mimics the natural service that used to be provided by the herds of bison that once roamed the plains, eating plants and grasses as they travelled, and is an im-

portant part of keeping the prairie healthy and diverse.

In the past, the city had little use for these plant materials. The pellet project is turning the by-product of the city's management plan into a useful, valuable product. The city-sourced pellets replace bags of wood pellets that would otherwise cost money.

"It is an incredible fit at the Living Prairie Museum, providing a sustainable heat source by burning a by-product of our maintenance activities and also showcasing the value and importance of our prairie grasses," says city naturalist Rodney Penner.

The project also traps nutrients in the harvested plants, which might otherwise contribute to algae growth in waterways.

To feel the heat produced by these pellets this winter, visit the Living Prairie Museum at 2795 Ness Ave. ■



**LWF** LAKE WINNIPEG FOUNDATION  
lakewinnipegfoundation.org

**Ducks Unlimited Canada**  
Conserving Canada's Wetlands  
ducks.ca

**iisd** International Institute for Sustainable Development / Institut international du développement durable  
iisd.org