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4 VIEWS ON THE NATIONAL BIRD

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The important work of **wildlife rehab centres**

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COVER: © JOHN E. MARRIOTT/WILDERNESSPRINTS.COM. THIS PAGE: MIKE BEEDELL/CANADIAN GEOGRAPHIC

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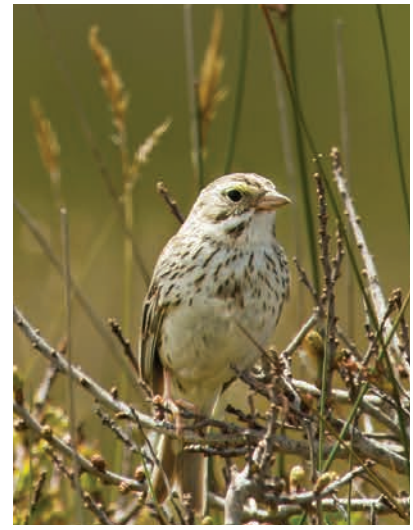
A WHALE'S TALE
See more astonishing images of the mighty humpback whale as it journeys north from its Caribbean calving grounds.

mag.cangeo.ca/jf15/sable



ONE FOR THE BIRDS
Sable Island is known for wild horses, but it's also a birdwatcher's paradise. Find out more about the birds that visit the island and how they get there.

mag.cangeo.ca/jf15/throwback

CELEBRATING 85 YEARS
Canadian Geographic is turning 85! Reminisce with us as we look back weekly at some of the best of the magazine.

mag.cangeo.ca/jf15/rehab

BEAR NECESSITIES
Watch videos of the black bear rehabilitation program at British Columbia's North Island Wildlife Recovery Association.

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EDITOR'S NOTEBOOK

ROY HANCLIFF

Bird is the word

Birthdays are a big deal, right? Especially those that celebrate a milestone such as 150 years as a nation. So as Canada approaches its sesquicentennial in 2017, *Canadian Geographic* decided it should help give the country an appropriate (and long overdue) gift — a national bird.

No, the country does *not* have one. We have a national arboreal emblem (the maple tree), a national horse (the Canadian), two national sports (lacrosse and hockey) and an animal (the beaver) that is a national symbol. With that in mind, *Canadian Geographic* is launching the National Bird Project, with the goal of helping proclaim an official bird for the country. We're kicking the initiative off in this issue with four essays by prominent Canadian writers — Will Ferguson, Charlotte Gray, Noah Richler and Alissa York — on what the national bird should be (see "The National Bird Project," page 41).

The intent of these essays is to inspire your participation, so to that end we've created a tournament at nationalbird.cangeo.ca, where Canadians can vote for their favourite species and submit their own 300-word essays on which bird should represent the nation. *Canadian Geographic* will proclaim the winner based on the public's vote in the magazine's 2016 wildlife issue. Then we'll promote it to be recognized as Canada's official bird in time for the big 150th bash on July 1, 2017. After all, better late than never, right?

—*Aaron Kylie*

To comment, visit mag.cangeo.ca or email editor@canadiangeographic.ca.

For inside details on the magazine and other news, follow senior editor Aaron Kylie on Twitter (@aaronkylie).

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PHOTO BY PETER MATHER

A black bear cub emerges for the first time from its den near Dawson, Yukon. When they're born (usually in January or February), cubs are not much larger than a squirrel, and don't see daylight until April or May, by which point they weigh about nine kilograms. Cubs usually stay with their mothers for about two years.

Want a chance to win a trip to Manitoba worth up to $14,000? Enter your best shots in the Click Here Manitoba Photo Contest until January 29. Find out more at manitoba.canadiangeographic.ca.

big picture

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exposure

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PHOTO BY KRIS TYNSKI

A bald eagle tears at a fish on the frozen surface of a tidal pool near Balls Creek, Cape Breton, N.S. Bald eagles are plentiful on the island, particularly around the Bras d'Or lakes, where several hundred of the raptors can be seen feeding throughout the year, or nesting from spring to fall.

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in a snap

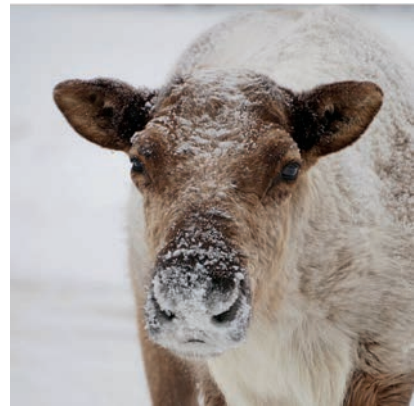
SHARING CANGEO VIA INSTAGRAM

@deladoobz Josh Floyd
Grizzly bears, Kananaskis, Alta.

@short__ Courtney Cheverie
Red squirrel, Kejimkujik National Park, N.S.

@_wespitts_ Wesley Pitts
Grey jay, Cape Breton Highlands National Park, N.S.

@leebarlow Lee Barlow
Elk, Banff National Park, Alta.

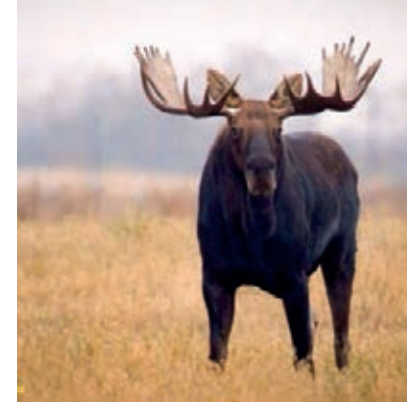


@k_girl883 Karine Scott
Caribou, Parc Omega, Montebello, Que.

@jcorke Jarrett Corke
Red fox, near Stratford, P.E.I.

@nantrax Martin Provost
Lynx, Ecomuseum Zoo, Montreal

@winterhawk_ig Ryan Dickie
Black bear, Fort Nelson, B.C.



@prairielifesk Dianne Mursell
Moose, near Regina

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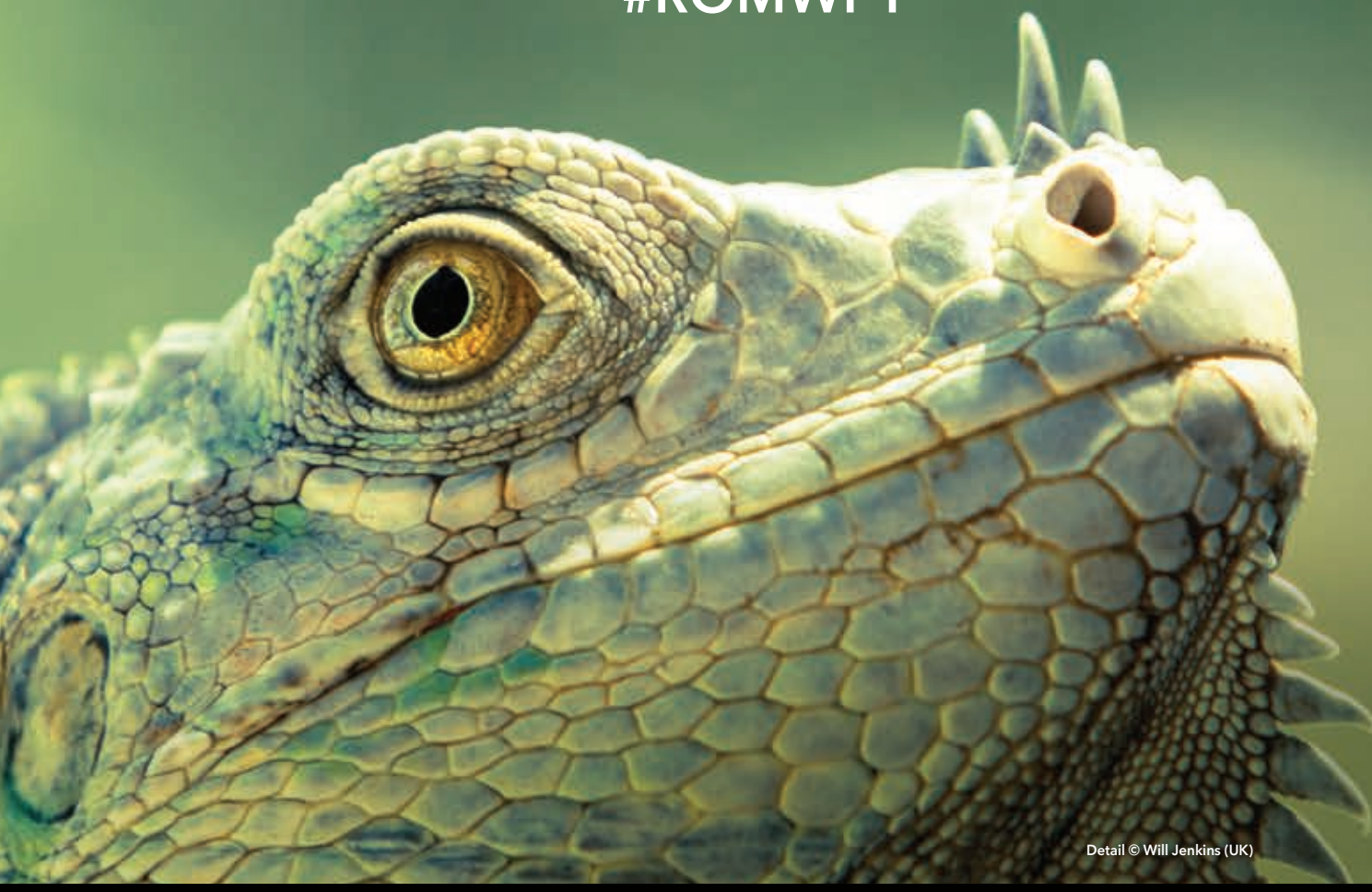

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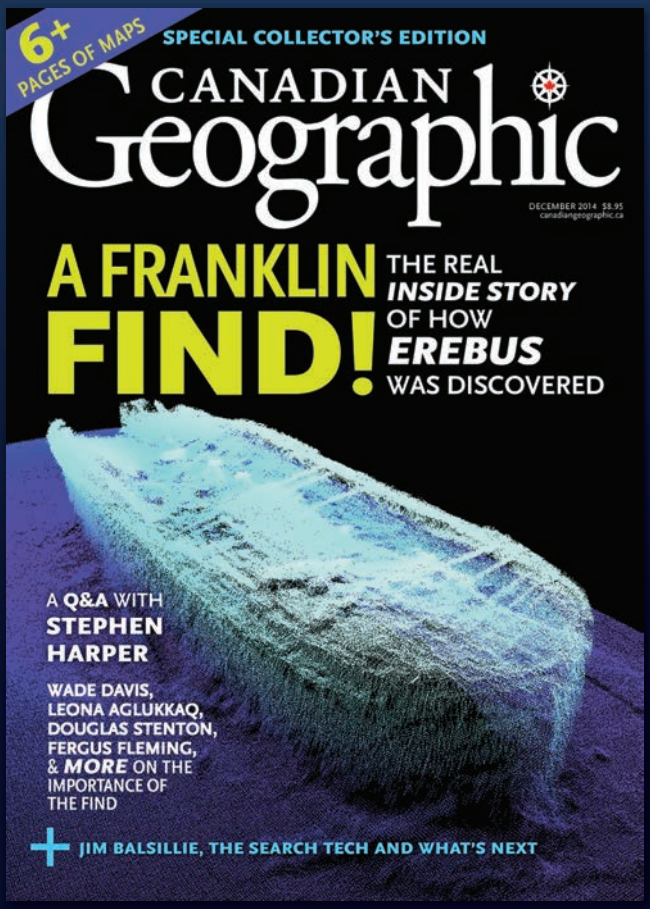

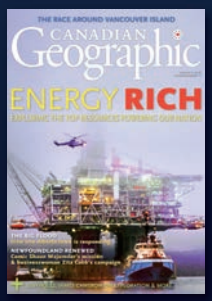

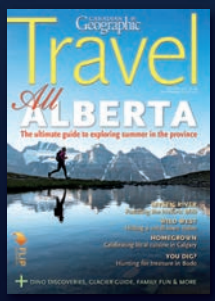

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Explore. Discover. Learn. Celebrate.

David Suzuki

The man who has been called Canada's 'environmental conscience' talks about his recent tour, why it's important and his campaign to change the constitution

David Suzuki believes his latest tour could be the start of a much larger movement that could one day reshape Canada.

INTERVIEW BY SABRINA DOYLE

Never let it be said that David Suzuki sets his sights too low. Already renowned for his work as a scientist, environmentalist and broadcaster, the outspoken bespectacled septuagenarian is tackling what could be his biggest challenge yet — amending the Canadian Charter of Rights and Freedoms. Suzuki wants the charter to enshrine the right to a healthy environment — clean water, fresh air and healthy food — and his recent national Blue Dot Tour, part of a long-term grassroots campaign to do so, rallied tens of thousands of Canadians to his cause.

On where the idea for the tour came from
In many ways, from the Canadian public. Wherever I go, people ask me what they can do, and all the polling indicates that people are concerned about the Earth and what we're doing to it. I've learned that tours can produce a lot of excitement, but you need something to feed people after you leave.

On why the tour is the most important thing he's ever done
I think the tour changes the nature of the conversation. It's no longer the economy versus the environment. It's now about what makes us healthy, and how we can keep that, which changes the game completely.

On rewriting the charter
I feel very strongly that things seem insurmountable until someone goes and changes them. The fact that it's a daunting idea shouldn't be an excuse for not trying. Think of the changes that have occurred in this country in the past 100 years. Our highest priority now should be healthy air. If you don't breathe, you die. If we can't agree on that, then we are really sunk as a species.

On where the tour goes next
The idea is to start at municipal levels, then two provinces that will take the lead at the provincial level, and then those two provinces will influence the other provinces, until we have seven on board. [*A change to the charter requires the agreement of Parliament, plus that of seven provinces representing at least 50 per cent of Canada's population — Ed.*] It's going to be autocatalytic. I think Canadians are ready for it.

Find out how David Suzuki repurposed a Barack Obama campaign strategy to create the Blue Dot Tour grassroots movement at mag.cangeo.ca/jf15/suzuki.

COURTESY DAVID SUZUKI FOUNDATION

11

The number of tribes from Canada and the United States that signed a treaty establishing an alliance to restore bison to parts of the Rocky Mountains and Great Plains. According to an Associated Press report, the long-term aim of the treaty is to "allow the free flow of the animals across the international border and restore the bison's central role in the food, spirituality and economies of many American Indian tribes and First Nations."

"This could be fatal for them. People are very concerned."

Michel Bélanger, the president of Nature Québec, tells *The Globe and Mail* that TransCanada Corp.'s Energy East pipeline poses a serious threat to beluga whales in the St. Lawrence River. TransCanada is awaiting government approval to continue work on its planned export terminal at Cacouna, which is on the river's south shore and close to an important calving ground for the endangered mammal.

Bye-bye birdies?

That could be the gloomy refrain come 2050, the year by which 126 bird species classified as "climate endangered" in the recent Audubon's Birds and Climate Change Report are projected to lose more than 50 per cent of their current climatic range. The report says another 188 species, classified as "climate threatened," are expected to lose the same amount of range by 2080. The study predicts how climate change could affect the ranges of 588 North American birds.

2,000+

The length in kilometres of active logging roads in Ontario's Algonquin Provincial Park, a number cited in the provincial environmental commissioner's 2013-2014 annual report, which recommended the government commit to ending logging in its "flagship provincial park."

"It's **growing**, it's **spreading**, it's **persisting** and it's **evolving** — evolving both to and through new species."

Darrel Rowledge, director of the Alliance for Public Wildlife, tells the CBC that chronic wasting disease should be considered an epidemic. David Swann, an Alberta Liberal Party MLA, recently called the disease a potential threat to the Canadian agriculture industry, akin to the mad cow disease outbreak that hit that province in 2003. Chronic wasting disease, which affects elk, mule deer and white-tailed deer, could be spread through the contamination of water and feed by infected saliva or feces.

THE ESTROGEN EFFECT

It's been hailed (and reviled) for everything from launching a sexual and social revolution to helping boost beef cattle production. When synthetic estrogen of the kind that's found in the birth control pill or growth implants gets into aquatic ecosystems, however, the result can lead to the near extinction of a population, a recent study shows. Scientists from the International Institute of Sustainable Development Experimental Lakes Area and the University of New Brunswick Saint John who introduced low concentrations of the hormone into a lake found that it interfered with the fathead minnow's ability to reproduce. "We were surprised when the population collapsed shortly after the whole lake study started," said Karen Kidd, the study's lead author.

Read more about each of these stories at mag.cangeo.ca/jf15/wildlife.

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Gain fan Nicole says:

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—

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INFOGRAPHIC

Sink, then swim

HMCS *Annapolis* will soon be Canada's newest artificial reef

By Thomas Hall

What would you do with a decommissioned Royal Canadian Navy destroyer such as HMCS *Annapolis*? If you're the Artificial Reef Society of British Columbia, you clean it and sink it, making it not only a lure for scuba divers, but a haven for marine life, including threatened species that will thrive in its nooks and crannies.

"Our mandate is to create sustainable man-made reefs," says Howard Robins, president of the ARSBC, adding that the non-profit has also sunk a Second World War victory ship, destroyer escorts and a Boeing 737, and consults on the creation of other man-made reefs.

Scheduled for sinking in early 2015, the *Annapolis* is the society's most ambitious project to date. Built in Halifax and launched in 1964, it served off Canada's East and West Coasts before it was decommissioned in 1996. This graphic details how the warship will be sunk, some of the species that will call it home and more.

PREPARATION

Robins says the *Annapolis* is their cleanest ship yet. After the government removes anything potentially toxic, ARSBC volunteers spend days scouring the vessels so they meet the highest environmental standards. Machinery, pipes, gaskets and anything else that may have oil or other pollutants on it are removed, and potentially valuable metals such as copper and aluminum are recycled.

SINKING

The *Annapolis* will be towed to its resting place in Halkett Bay Marine Provincial Park, where linear charges will be placed along its hull. Their placement ensures that the vessel will come to rest in an upright position. The charges don't explode so much as cut like explosive scalpels. In seconds, they slice a precise, metre-square hole in the hull and the ship sinks in about two minutes. Explosives experts and diving experts go down to check for risks, and within about two days the wreck is open to the public.

Mooring floats

Safety stop stations (aluminum-frame decompression points)

Concrete anchor

33 metres

265

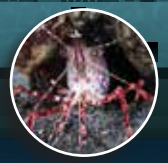
HMCS *ANNAPOLIS*

Length: 111.55 metres
Weight: 2,900 tonnes
Width: 12.8 metres
Height: 21 metres (to stack)

WILDLIFE

The reef will be home to many species, but Jeffrey Marliave, vice president of marine sciences at the Vancouver Aquarium, says it will provide a perfect "highly complex habitat" for two endangered species of rockfish in particular. Thought to be among the longest-lived fish in the ocean (more than 100 years), rockfish thrive in marine features such as rock slides and sunken ships. Marliave adds that yelloweye and quillback rockfish — respectively listed as special concern and threatened by the Committee on the Status of Endangered Wildlife in Canada — will be safer around the reef than elsewhere, because places that attract divers see less poaching.

Plumose anemones


Coon-striped shrimp

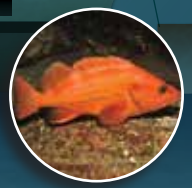
Ling cod

Quillback rockfish

DIVING

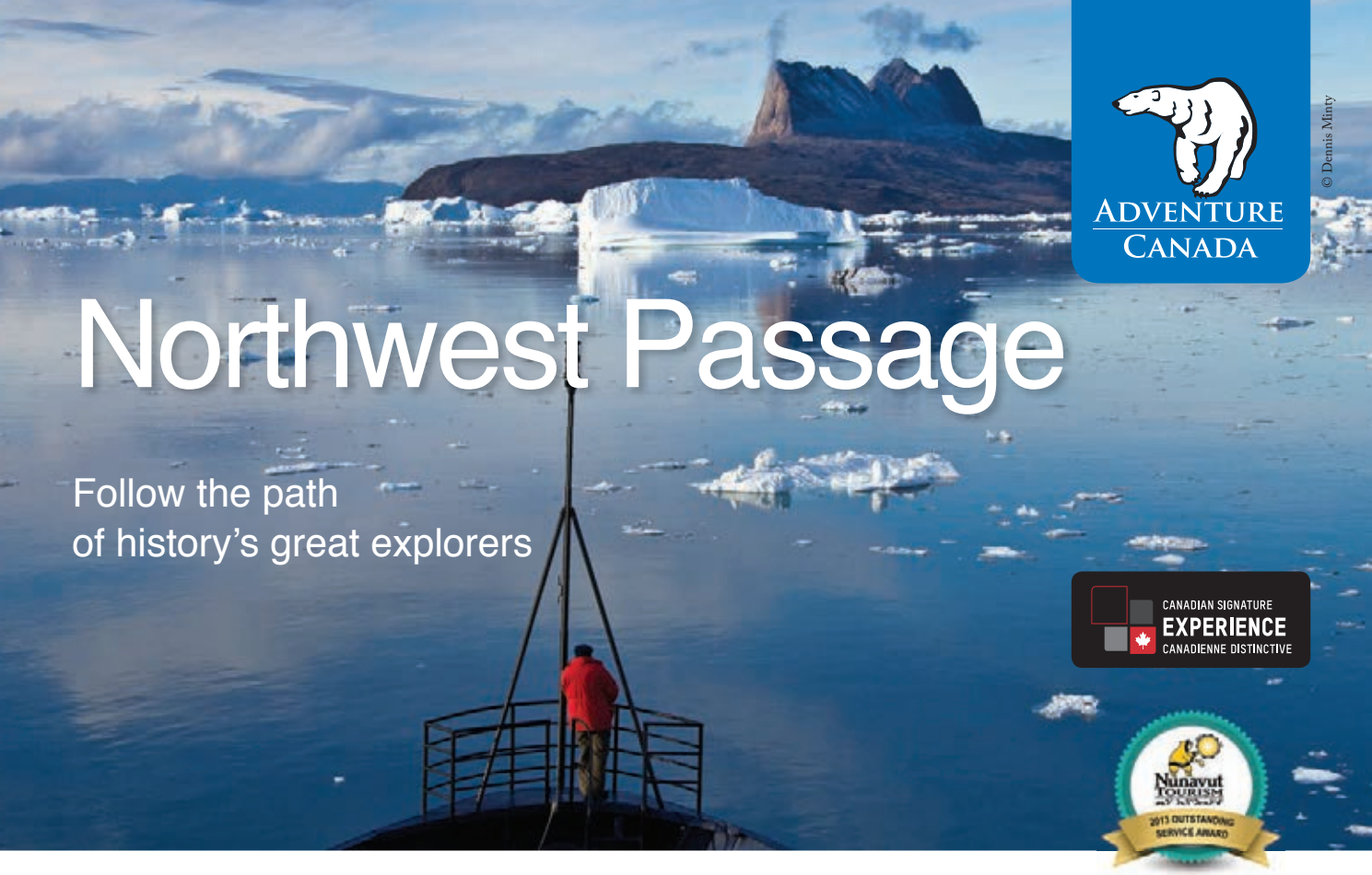
With its cut-away sides and shallow resting area, the entire ship will be accessible to divers of all skill levels. Additional holes will be cut in the hull so expert divers can enter the wreck and explore, while novices can peer in and see the areas of most interest, such as the engine and boiler rooms.

Cabezon (sculpin)


Yelloweye rockfish

Read about British Columbia's six other artificial reefs at mag.cangeo.ca/jf15/reef. For more information about the *Annapolis* project, go to artificialreef.bc.ca.

INFOGRAPHIC: CICADA CREATIVE INC.; PHOTOS, LEFT TO RIGHT: FIRST, SECOND & FIFTH, COURTESY ARSBC; THIRD, © THEDIVER123/DREAMSTIME.COM; FOURTH & SIXTH, KATHLEENREED/CREATIVE COMMONS/FLICKR; MAP: CHRIS BRACKLEY/CANADIAN GEOGRAPHIC



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A map's enticing image

How one cartographer used a defining Canadian symbol and place to attract settlers to the New World

*By Harry Wilson**

FOR ALL THE REMARKABLE detail contained in Herman Moll's 1715 *A New and Exact Map of the Dominions of the King of Great Britain on ye Continent of North America* — the neatly shaded mountain ranges, the thickets of place names, the tendrils of rivers — it is nothing purely cartographic that immediately draws the eye. Leave that to the beavers.

Yes, those are beavers (if it wasn't for that distinctive tail, some could be mistaken for bears or wolverines). And yes, they're at the base of Niagara Falls, "making dams to stop ye course of a rivulet, in order to form a great lake, about which they build their habitations," as the caption explains — although they're shown in far greater numbers than would ever appear in real life, bustling about in a way vaguely reminiscent of people. And therein lies the reason for showing the animal.

Moll's so-called beaver map was "among the first and most important cartographic documents relating to the ongoing dispute between France and Great Britain over boundaries separating their respective American colonies" (the map supports the British position), as Margaret Beck Pritchard and Henry Taliaferro write in *Degrees of Latitude: Mapping Colonial America*. But it was also meant to entice prospective British colonists, many of whom would likely have been familiar with the beaver because of its importance to the economic powerhouse that was the fur trade. "Since industry was known to produce wealth," the book continues, "the beaver represented what could be achieved with," as the caption notes, "great order and wonderfull dexterity."

Whether the map succeeded in luring would-be settlers to North America with the promise of fur-trade riches and mighty, untamed landscapes the likes of Niagara Falls is moot. What is certain, however, is that Moll managed to distil the perception of Canada at the time into an image that is still captivating today, even if it is now a cliché.

**with files from Sara Viinalass-Smith, early cartographic archivist, Library and Archives Canada*

Find out more about Herman Moll and see a larger version of this map at mag.cangeo.ca/jf15/moll.

THE FLAG AT 50

How Canada's most recognized emblem, which celebrates five decades in 2015, came to be

Canada, said Prime Minister Lester Pearson in 1964, needed a distinctly *Canadian* flag — not one with clear-cut ties to the country's often polarizing English and French roots.

William Lyon Mackenzie King had started the search for an official replacement for the Royal Union Jack in 1925, and had tried again in 1946, but Parliament never voted on a design. Finally, after months of fiery debate in the House of Commons, Pearson's 15-member all-party flag committee (ABOVE) tasked with recommending a design did so on Oct. 29, 1964. By a vote of 10-4 (the chairman did not vote), they selected the flag we have today, choosing it over a three-leaved, red, white and blue flag and one that merged the country's unofficial flag, the British-colonial-looking Red Ensign, with three fleur-de-lis.

The committee's choice had been styled by George Stanley, dean of arts at Kingston's Royal Military College. He had drawn on the school's commandant's flag, which features an armour-clad fist clutching maple leaves.

After a two-week filibuster spearheaded by Tory opposition leader John Diefenbaker, about 250 speeches and a final vote that ended after 2 a.m. on Dec. 15, 1964, the House of Commons took the flag committee's recommendation, and the Senate followed suit two days later.

Queen Elizabeth II proclaimed Canada's official flag on Feb. 15, 1965, defining the start of a new era for the country. As the *Toronto Daily Star* reported at the time, "A flag cannot make a nation. But it can help people to feel more like a nation."

—Nick Walker

If this story piqued your vexillological curiosity, then read more about Canada's historic flags at mag.cangeo.ca/jf15/flag.

QUEEN'S UNIVERSITY ARCHIVES, JOHN MATHESON FONDS, LOCATOR # 2131; MAP: HERMAN MOLL, A NEW AND EXACT MAP OF THE DOMINIONS OF THE KING OF GREAT BRITAIN ON YE CONTINENT OF NORTH AMERICA: CONTAINING NEWFOUNDLAND, NEW SCOTLAND, NEW ENGLAND, NEW YORK, NEW JERSEY, PENSILVANIA, MARYLAND, VIRGINIA AND CAROLINA, 1715, LIBRARY AND ARCHIVES CANADA, R11981-433-4-E

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Shifting sands

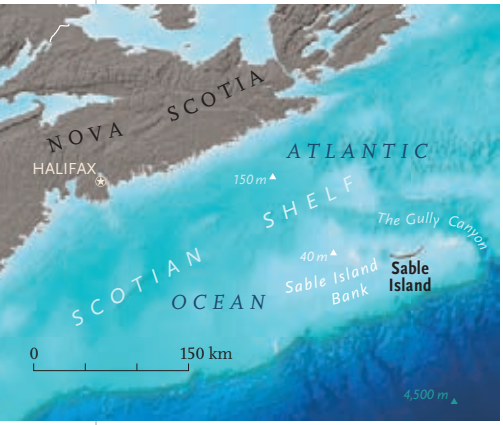
On its first anniversary, Sable Island National Park Reserve breathes new life into the 'Graveyard of the Atlantic'

By Aaron Kylie

Signs of wildlife are everywhere on Sable Island, whether it's the remains of a grey seal (ABOVE) or one of the island's renowned wild horses (LEFT).

"DEATH IS A REALITY. Here it's all around you," says Daryll Mooney to one of the first big groups of visitors to Sable Island National Park Reserve, Canada's newest national park. While his words might seem dire, Mooney, a Parks Canada operations coordinator, doesn't mean it that way. For death to be all around, life has to be ever-present, too.

Examples of the interplay between life and death aren't difficult to spy on the island, located about 290 kilometres southeast of Halifax. It's not uncommon, for instance, to see one of the preserve's famed woolly-haired horses digging in windswept sand the colour of brown sugar, next to the half-covered decaying remains of one of its relatives.



Nature here takes a truly unimpeded course. And having received formal protection as a national park just one year ago, on Dec. 1, 2013, the skinny (it's 1.3 kilometres at its widest), 42-kilometre-long, crescent-shaped series of sand dunes that emerges from the Atlantic may long remain a relatively untouched ecosystem. Other than the shipwreck-rescue crews of the past — which lent the place its "Graveyard of the Atlantic" nickname — and a handful of government researchers, there's been little human presence on the island.

While the island's population of about 400 horses — introduced in 1738 by Europeans settling in North America and eventually becoming Canada's first federally protected animals in 1962 — get the most attention, the island is teeming with life.

The visitors Mooney is addressing are part of a tour of the park organized by cruise company Adventure Canada, and they would go on to encounter hundreds of grey seals (part of the world's largest breeding colony of the species) and tern colonies, among many other critters. The island is also home to some 350 bird species, including the threatened Ipswich sparrow (the island is its only known breeding ground), more than 190 plant species, moths and insects found nowhere else on Earth, and at least six unique invertebrates that live in its freshwater ponds. Offshore, meanwhile, 18 species of sharks prowl the water.

Sable Island was once also home to a breeding population of the now-extinct Atlantic walrus, and its shifting sands sometimes unveil a tusk from the animal — further evidence of how death is never far away, even amid the park's vibrant life.

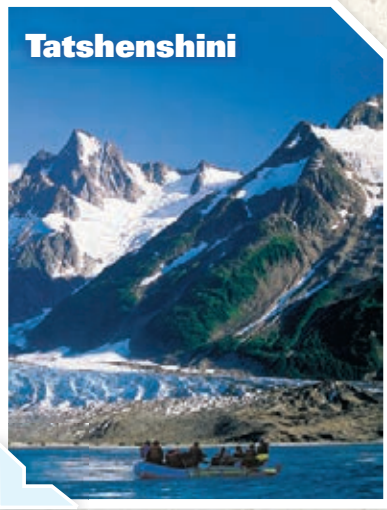
Sable Island is known for wild horses, but it's also a birdwatcher's paradise. Learn about the birds that visit the island and how they get there at mag.cangeo.ca/jf15/sable.

TOP LEFT: MICHELLE VALBERG; TOP RIGHT: NEIL EVER OSBORNE/CANADIAN GEOGRAPHIC; MAP: CHRIS BRACKLEY/CANADIAN GEOGRAPHIC

Wildlife!

Worlds largest non-polar glaciers

Virginia Falls



Glaciers, Bald Eagles

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THE FIGHT TO KEEP INVASIVE SPECIES OUT OF OUR COUNTRY'S ARCTIC WATERS

BY JOHN BENNETT

A diver inspects the hull of HMCS *St. John's* for growth of sea life after the ship's return to Halifax from a military exercise in Resolute Bay, Nunavut, in 2011.

MASTER CPL. PETER REED/FORMATION IMAGING SERVICES, CFB HALIFAX, NOVA SCOTIA/DEPARTMENT OF NATIONAL DEFENSE

HIGH ON THE DECK of a bulk carrier at the Hudson Bay port of Churchill, Man., biologist Farrah Chan carefully lowers a fine-meshed plankton net into the dark of the ship's ballast tank. Far below, a scuba diver assists her by collecting samples of marine life from the vessel's hull. Chan is looking for alien species — aquatic invertebrates and plants that ride from port to port with the global shipping fleet, suspended in ballast water or clinging to ships. They can enter an ecosystem far beyond their natural range when a ship discharges its thousands of tonnes of ballast water, or when the organisms release larvae or are scraped off the hull.

"If non-indigenous species establish a breeding population in a new area," says Chan, who is completing her doctorate at the University of Windsor's Great Lakes Institute for Environmental Research, "they can severely damage their new environments, as well as economies and infrastructure — just as zebra mussels have done in southern Canada."

As summer ice shrinks and resource exploitation grows, more ships than ever before will visit the Arctic, each a potential carrier of alien species. Warming temperatures could make it easier for organisms from more temperate areas to survive. "We need to know what species are hitchhiking into the Arctic," says Chan. "We have information for most of the world — there are even some studies from Antarctica — but not the Canadian Arctic. My research is filling that gap."

> 'We need to know what species are hitchhiking into the Arctic.'

She chose the grain port of Churchill because it is one of the very few Canadian Arctic ports that receive vessels from global shipping points, ports such as Murmansk (Russia), Flushing (Netherlands), La Corunna and Gijon (Spain) and Annaba (Algeria). She's been finding a wide variety of invertebrates — mussels, barnacles, copepods and arthropods — and it's a major challenge, she says, to determine which species are non-indigenous.

Chan's work is helping determine where in the Canadian Arctic the risk is greatest, and this knowledge is essential for developing ways to keep invasive species out. "This research gives us a chance to protect the coast by directing proactive management efforts at high-risk sites," she explains. "It's much easier to prevent invasive species from being introduced than it is to control them later."

This is the latest in a blog series on polar issues and research presented by *Canadian Geographic* in partnership with the Canadian Polar Commission. The polar blog appears online every two weeks at cangeo.ca/blog/polarblog, and select blog posts are featured in this space in each issue. Check out the State of Northern Knowledge in Canada report at www.polarcom.gc.ca.

CANADIAN Geographic

Canadian Polar Commission
Commission canadienne des affaires polaires

on the map

EXPLORING CARTOGRAPHY

Arctic alive

Behind the finds: how four Museum of Nature Arctic specimens were collected

Before an artifact or specimen can find a home in a museum, it must, of course, be found. That's where field researchers come in. For each of the Canadian Museum of Nature's main disciplines — paleobiology, mineralogy, zoology and botany ("Fine specimens," page 55) — there are teams of scientists who, for decades, have scoured the Arctic collecting fossils, minerals, plants and animals. Both this map and its much larger counterpart, the *Arctic Alive* giant floor map (TOP RIGHT), which also depicts the ecozones (major ecological systems) of Canada's North, were made in partnership with the Canadian Museum of Nature, and show the landcover of Canada's Arctic, ice included, as it appeared in the summer of 2013 — a snapshot of most researchers' field season. And while the museum's vast collection of artifacts forms a legacy that helps us understand the North, each specimen has its own story to tell. Here is a glimpse into four of those stories.

—*Sabrina Doyle*

MINERALOGY

WHAT Galena
WHERE Polaris Mine, Little Cornwallis Island

This five-centimetre by four-centimetre chunk of galena hails from Nunavut's now-closed Polaris mine, on uninhabited Little Cornwallis Island. Located about 100 kilometres northwest of Resolute, the sample was extracted from somewhere between 60 and 300 metres beneath the island's frozen surface.

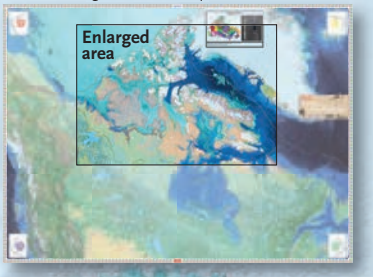
PALEOBIOLOGY

WHAT *Puijila darwini*
WHERE Haughton Crater, Devon Island

Imagine Natalia Rybczynski's excitement when she and her team discovered a nearly complete skeleton of *Puijila darwini* — the fossil mammal known as the "missing link" in the evolution of seals and their relatives — because her ATV ran out of gas next to the fossil site. The Museum of Nature research scientist reported in 2009 that the specimen was found in a 24- to 20-million-year-old lake deposit, near rabbit and shrew fossils, which led some researchers to suggest that the environmental conditions in the crater were once less severe than they are today.

To book the giant floor map, go to canadiangeographic.ca/educational_products/flora_and_fauna_map.asp

Arctic Alive giant floor map



Mid-July land and ocean cover

- Permanent SNOW AND ICE
- Seasonal SNOW AND ICE
- SEA ICE
- OPEN OCEAN
- FRESH WATER
- BARREN LAND
- Sub-polar or polar BARREN-LICHEN-MOSS
- Sub-polar or polar GRASSLAND-LICHEN-MOSS
- Temperate or sub-polar GRASSLAND
- Sub-polar or polar SHRUBLAND-LICHEN-MOSS
- Temperate or sub-polar SHRUBLAND
- Sub-polar taiga NEEDLELEAF FOREST
- Temperate or sub-polar NEEDLELEAF FOREST

ELLESMERE ISLAND

Grise Fiord (Aujuittuq)

BAFFIN BAY

Island

A N N E L

Arctic Bay (Ikpiarjuk)

DAVIS STRAIT

Qikiqtarjuaq

BAFFIN ISLAND

BOOTHIA

Igloolik

Melville

Hall Beach (Sanirajak)

Prince Charles Island

Peninsula

FOXE BASIN

Repulse Bay (Naujaat)

Cape Dorset (Kinngait)

Southampton Island

Coral Harbour (Salliq)

Kimmirut

HUDSON STRAIT

Ungava Peninsula

Ungava Bay

ZOOLOGY

WHAT Muskox
WHERE Ukkusiksalik National Park, Wager Bay

In 1903, the Canadian government took the first significant step toward asserting authority in the eastern Arctic. A crew went north on the schooner *Neptune* to patrol and show the flag, establish customs practices and a police post, and survey the territory. During that expedition, geologist Albert Low collected this muskox specimen for the Geological Survey of Canada, from which the Canadian Museum of Nature's collections originated.

BOTANY

WHAT *Rhizocarpon geographicum*
WHERE Coral Harbour, Southampton Island

As far as lichen specimens go, this is a lucky one. It was collected by John Thomson, who was something of a superstar in North American lichenology in the 1970s. Thomson was the first person to systematically collect, identify and map the lichens in the tundra regions of northern Canada and Alaska. His book *American Arctic Lichens* remains the main technical resource for the subject.

PHOTOS, FROM LEFT TO RIGHT: FIRST, THIRD AND FOURTH, COURTESY CANADIAN MUSEUM OF NATURE; SECOND, SPECIMEN PROPERTY OF THE NUNAVUT TERRITORIAL GOVERNMENT; MAP: CHRIS BRACKLEY/CANADIAN GEOGRAPHIC

THE BIG BAD WOLF?

Exploring our love-hate relationship with the wolf

BY ALANNA MITCHELL

THE YEAR WAS IN ITS LAST FEW BONE-CHILLING HOURS when Peter Schleifenbaum got the call that a timber wolf from his 324-square-kilometre forest sanctuary near Haliburton, Ont., was on the loose. At first, he wasn't too worried. Alarms like that happened every few months and, so far, all had been false.

Nevertheless, he abandoned his New Year's Eve celebrations, hopped in his car, and rushed to check things out. It was far worse than he'd imagined. Gaping holes had been cut through the centre's pair of encircling 2½- and three-metre-high metal fences, allowing four of the pack's nine wolves to get out. Given another 15 minutes, the remaining five would have followed.

Within hours, he found evidence that a big black male had been shot and killed just around the corner from the sanctuary. As 2013 began, three more wolves were on the run through the snowy yards of this cottage country holiday area. Schleifenbaum was desperate to lure them back inside their pen. Could he save them before anything else happened?

A nine-month-old wolf pup trots in the snow in Banff National Park.

Wolves play on a beach on British Columbia's north coast (THIS IMAGE). A sculpture of Romulus and Remus, Rome's twin founders, suckling a wolf (OPPOSITE BOTTOM).

HUMANS HAVE HARBOURED CONTRADICTORY VIEWS of wolves since we domesticated them about 30,000 years ago, producing the first dogs. Wolves, once the terrestrial mammals with the broadest natural distribution, infuse human myth both as saviours and as soulless villains.

"There has never been a single, simple human response to the wolf," writes the medieval folklore scholar Stephen Glosecki, one of a spate of academics who have attempted to untangle our complex relationship with the creatures.

'There has never been a single, simple human response to the wolf.'

As far as anyone can tell, the incident at the Haliburton Forest Wolf Centre was the fatal intersection of two irreconcilable attitudes toward the wolf. The police and private investigations suggest that someone who loved wolves set them free; someone who hated them shot one on sight.

It's a war that has raged for millennia. Norse fables tell of the wolves that were noble guardians of Odin (considered a father of gods), protecting him from his greatest enemy — another wolf. A wolf was the revered foster mother of Rome's twin founders, Remus and Romulus, and to this day, she suckles them in the famous *Capitoline Wolf* sculpture in a Roman museum. Count Robert of Artois, nephew of 13th-century French King Louis IX, kept a pet wolf.

By the 15th century, Glosecki writes, wolves had come to symbolize evil incarnate. Even Dante, the Italian poet, had veered far from the nurturing wolf-mother of Rome, reimagining the wolf in his writings as a symbol of deadly sins. The scheming wolf came to represent wilderness, the untamable spirit, a creature unbowed by the rules of civilization or organized religion, intent on indiscriminate slaughter. Whether true or not, legends are still told declaring that wolves developed an insatiable taste for human flesh as they feasted on the dead of the Black Death. Those stories live on in such bloodcurdling tales as *Little Red Riding Hood*, whose big, bad wolf swallows the grandmother whole.

Human retribution was swift. Hatred of wolves was at a fever pitch in North America by the 18th and 19th centuries. Wolves' natural prey — deer, moose, elk and bison — were killed off as the land was settled, so wolves began to eat livestock. In many jurisdictions, governments put bounties on wolves' heads to encourage settlers to kill as many as possible.

"There was a psychological narrative in the early 19th century that the wild needed to be tamed and wolves were the symbol of what needed to be gotten rid of," says Harvey Locke, a co-founder and strategic advisor to the North American Yellowstone to Yukon Conservation Initiative.

Eyewitness journals in the early 20th century from Silas Claiborne Turnbo, who lived in the Missouri Ozarks, describe the attitude: "It was said that the depredations of wolves were

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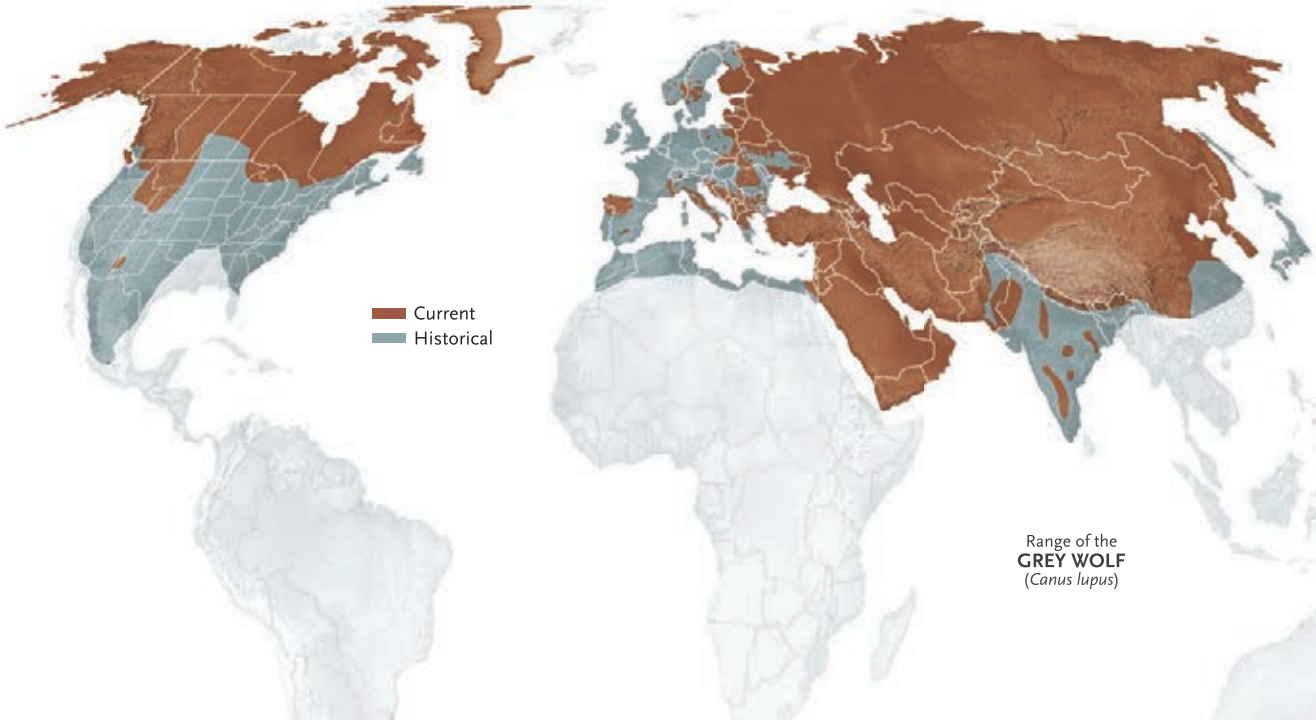


so terrible on stock that the pioneers ... in some cases inflicted the most cruel treatment on the ravenous beast they could invent in payment for the destruction of property." Turnbo describes his own act of flaying a wolf alive, a common act of revenge: "Our barbarous treatment was too much for it died at the moment we completed the horrible work."

Millions of wolves had been eliminated from most of the lower 48 states by the early 1900s. Today the wolf is extinct in about a third of its original range, including much of western Europe, the United Kingdom, Mexico and the United States. The most robust populations are confined to the remote wildernesses of Canada, Alaska, and northern parts of the United States, Europe and Asia, according to the International Union for Conservation of Nature's Red List of Threatened Species.

But at about the same time, a pro-environment ethos started emerging across the Western world as biologists began to catalogue for the first time how wolves affect other creatures in an ecosystem. The wolf became the metaphor for a lost paradise that many longed to see restored.

Two radically different world views then began vying for dominance in public policy and in the public discourse: some people think nature ought to be left to its own devices as much as possible and others, that nature needs to be controlled by humans, Locke says. Wolves became a symbol of each of those views, either as good or as evil.

On New Year's Eve at Schleifenbaum's six-hectare wolf centre, those perspectives clashed. Says Locke: "All those images came together in that one spot."

AS NEW YEAR'S DAY 2013 DAWNED, Schleifenbaum was calculating the losses. Wolves are highly social animals, living in packs with tightly defined hierarchies. One male and one female take the lead and only they breed. They're called the alphas, named after the first letter in the Greek alphabet. When the two fences were cut at Schleifenbaum's reserve, the alphas led the way out and the two strongest males followed, leaving behind only the weakest members: five females.

It represented the destruction of the wolves' social structure and possibly the end of the pack itself. Schleifenbaum vowed to do everything he could to get the wolves back. His team set up live baited traps that would keep the wolves safe if they ventured in. Two of the escaped wolves hung around the enclosure and even bedded down near their pack mates inside, but bolted whenever anyone got close enough to shoot them with a tranquillizer. As the days passed, the wolves started roaming farther and farther away. But Schleifenbaum was certain they would return for good.

Then, on the 10th day, horrible news: The alpha female, a sturdy grey with eerie yellow eyes who had ruled the pack for four years and borne two litters of pups, was found shot in a ditch, barely alive, blood soaking the snow beside her. The staff took her back to the centre, called in the vet and tried to cajole her into eating raw sausage. She died three days later.

In the meantime, two more wolves, the strong black alpha male and his feisty grey son, were at large, roaming backyards right alongside cottagers' tasty pet dogs and cats. Were sharpshooters out there looking for them, too?

WIKIMEDIA COMMONS; MAP: CHRIS BRACKLEY/CANADIAN GEOGRAPHIC

Arctic wolves explore windswept Ellesmere Island (THIS IMAGE). Luna, the alpha female of the Haliburton Forest Wolf Centre pack, with one of her male pups, one of four born in the spring of 2014 (OPPOSITE TOP).

THE HALIBURTON AREA IS PRIME COTTAGE COUNTRY, a three-hour drive north of Toronto, nestled on the frontier between wilderness and cultivation. The county lies at the southern edge of Ontario's crown jewel park, Algonquin, where Canada's first wolf research took place in the 1960s. Along with Alaska's Denali National Park and Michigan's Isle Royale National Park, it is one of the early epicentres of wolf research in North America.

John and Mary Theberge, whose 14-year Algonquin study represents the largest and most intensive Canadian research on wolves, say they encountered virulent hatred of wolves at the beginning of their study there.

"People would say: 'What good are they?' " says Mary.

"People's eyes glazed over with hatred and it encompassed us, too," says John.

'Wolves are a litmus for competing worldviews on nature and life.'

In the subsequent decades, knowledge of just how dramatically wolves affect an ecosystem has grown. Today, it's clear that having wolves around increases a system's biological diversity. It's not just good for wolves, in other words, it's also good for everything from eagles to aspen and from beavers to songbirds. Taking wolves out of the system impairs its ability to function. The U.S. acknowledged the species' importance in 1974 when it declared wolves endangered in the lower 48 states, meaning they had protection from persecution.

By 1995, the body of scientific work had persuaded American park rangers and lawmakers that they wanted wolves back, so they took some from Canada and reintroduced them to Wyoming's Yellowstone National Park and central Idaho and more recently into New Mexico and Arizona. It was wildly controversial in the states bordering Yellowstone, which launched lawsuits contesting the reintroductions, but the wolves flourished anyway, becoming celebrities. Mary Theberge says that when she studied the Yellowstone wolves, tourists would beg to look through her scope and then begin to cry with joy at the sight of a wolf.

Today, the number of grey wolves is so strong that the United States government is considering removing them from the endangered species list throughout the lower 48 states, a decision expected this year. The grey wolf is already off the federal list in the northern Rocky Mountains and the western Great Lakes states.

But attitudes still veer from love to loathing. In June 2014, when California voted to extend state protection to wolves, some supporters sported "wolf costumes, and one commenter broke into an a cappella ode to wolves," according to a story in the *Los Angeles Times*. When in early 2012 Canada's federal government announced a plan to kill wolves in Alberta to protect endangered woodland caribou near the oilsands, the public outrage was immense.

On the other hand, about a year ago, the group Idaho for Wildlife sponsored a coyote and wolf derby, the poster for which featured a wolf's face in the crosshairs of a riflescope. And when five wolves broke free from the Colchester Zoo in the United Kingdom in late 2013, police immediately sent in a helicopter and armed officers to allay public panic. Three wolves were shot dead, including one cowering in a hedgerow near the zoo.

"Wolves are a litmus for competing world views on nature and life," note John and Mary Theberge.

SCHLEIFENBAUM IS JUST A FEW METRES from his wolves, inside the enclosure but behind a fence, stepping nimbly over a growing puddle of beaver blood. The smell of thawing

Alanna Mitchell is an award-winning journalist and author who often writes about marine issues. Her most recent book is Sea Sick: The Global Ocean in Crisis. *It's now a play set to come to stages across Canada.*

© MINDEN PICTURES/MASTERFILE

skinned beaver carcass is overpowering in the midday heat and so is the frenzy of the wolves, snapping powerful jaws and growling fiercely as they jump for it in vain.

Holding a beaver by its flat tail, he chucks it over the fence and the wolves pounce. One of them captures the prize and immediately carries it to a choice feeding spot, hungrily ripping out its guts, gobbling down the meat and fending off the other wolves. Upstairs behind one-way glass in the viewing chamber, about 30 visitors are watching the riveting spectacle.

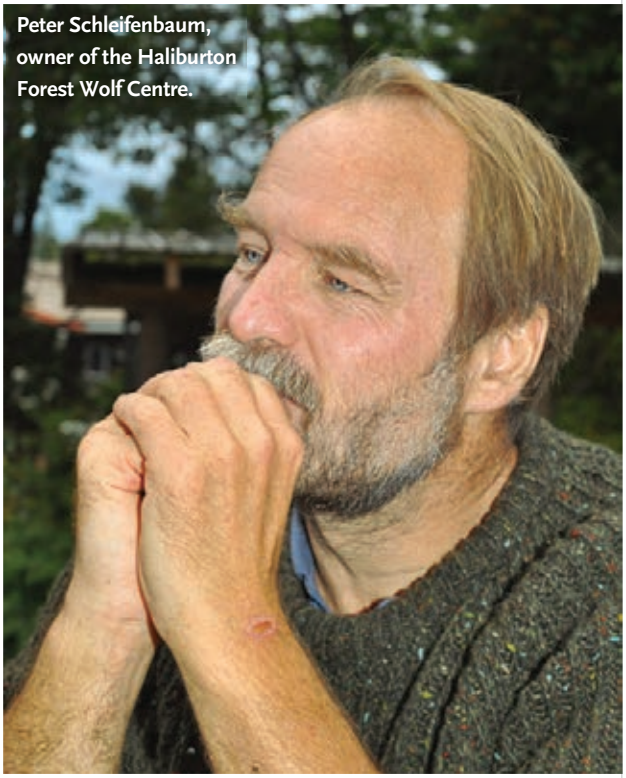
"As you can see, this is not a real glitzy job," Schleifenbaum says as he stoops to pick up another bloody beaver. It's been almost two years since someone let the wolves out. Schleifenbaum brought in a new male who successfully bred with one of the females to produce four pups — three of which are now vying for beaver bones a few metres away — making them the new alpha pair.

The two remaining escaped wolves never returned. They haven't been sighted since the start of 2013's bitterly cold winter. Schleifenbaum is pretty sure they're dead — shot or starved. By a cruel twist of fate, the people who loved the animals enough to liberate them have succeeded in fulfilling the wishes of those who hate wolves, who say the only good wolf is a dead one.

The wolves are fed, for now, and two of them are playing tug-of-war with the guts of one of the thawed beavers. More visitors are crowding into the viewing chamber every minute to watch. For Schleifenbaum, who holds a PhD in forestry, this is all about education. He grew up in Germany, where wolves were killed off in the 1800s, and he wants to teach people that the animals are neither noble nor evil; they're just part of a natural ecosystem.

But it hasn't been easy. Just opening the place almost 20 years ago here in the forest he owns was controversial because some residents said no wolves were too many. And then, in April 1996, a few months before the centre was to officially open, several of its captive wolves ganged up on Patricia Wyman, a 24-year-old biologist less than a week into her job, and killed her. It was like every nightmarish, wolf tale come true. The wolves were killed and wolf biologists such as the Theberges still talk about the bad press.

But the centre opened three months later and now boasts 30,000 avid visitors a year. If there's a bright side to the fence incident, it's that Schleifenbaum's dream of wolf ambassadorship may be working. When the fences were cut, no one called for a lockdown or helicopters or police with guns. People would phone up and say: "I saw your wolf in my backyard. How beautiful it is. What an amazing experience."



Peter Schleifenbaum, owner of the Haliburton Forest Wolf Centre.

Read an interview with Peter Schleifenbaum at mag.cangeo.ca/jf14/wolfman.

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The NATIONAL BIRD PROJECT

Four essays to inspire your participation in helping choose CANADA'S NATIONAL BIRD

WITH ILLUSTRATIONS BY CHARLENE CHUA

THERE ARE MORE THAN 400 SPECIES OF BIRDS ACROSS CANADA, but not one of them — not the goose that Will Ferguson admires, the osprey with which Charlotte Gray feels a kinship, the owl that Alissa York believes we can learn from or the raven that Noah Richler thinks is quintessentially Canadian — has been designated as our national bird, a title that for too long hasn't been made official. It's time to change that.

These four prominent authors' essays on their choice for that appellation mark the beginning of *Canadian Geographic*'s National Bird Project, the goal of which is to help designate an official bird for Canada by 2017, the country's sesquicentennial. And we want your help, whether it's voting for your favourite species or contributing your own 300-word essay. To find out more about each of these first four candidates for Canada's national bird and how you can participate in the National Bird Project, visit nationalbird.cangeo.ca. >>>

Canada goose

Big, bold and fiercely loyal

By Will Ferguson

I'M EXCITED. The choosing of an official national bird for Canada would allow us to finally mitigate the egregious error we made in naming the beaver as our national rodent, a creature whose most noble trait — I've often pointed out — is that he thinks to slap his tail and warn his buddies before he runs away. Joining *Castor canadensis* as national icon, I thereby nominate the strikingly coloured and conveniently named Canada goose.

Like the beaver, the Canada goose has webbed feet, but that's where the similarities end. Canada geese don't run away from anyone. They are highly adaptable to human environments, meaning they aren't intimidated by us in the least. They will chase you across a public park simply because they don't like the looks of you. These are big, bad-tempered birds. The largest of the species, *Branta canadensis maxima*, can weigh a whopping eight kilos, with a wingspan of two metres. (A typical bald eagle? Six kilograms, with a wingspan of 1.9 metres. I'm just sayin'.)

The Canada goose flies in distinctively crisp V-formation and is highly vocal, handsomely plumed and — being Canadian — likes to winter occasionally in Mexico. This is a goose with attitude. If birds could get tattoos, I have no doubt that the Canada goose would be first in line. But they are also fiercely loyal. Among the first to arrive in spring, and last to leave in winter, they mate for life and both parents share in raising their young. A fine role model all round, I'd say. And if I'm going to be chased through a public park anyway, I would rather it be by a national emblem.

Will Ferguson is author of the novel 419, *which won the 2012 Giller Prize. His next work, the travel memoir* Road Trip Rwanda, *will be published by Penguin in 2015. He lives in Calgary.*

Great grey owl

Graceful and efficient inspiration

By Alissa York

THE GREAT GREY OWL is seldom seen. Silent flier, it haunts that most boreal of landscapes, the black spruce bog. It wears its common name like a cloak; somehow the Latin binomial, *Strix nebulosa*, strikes nearer the mark.

Unlike many of its order, *S. nebulosa* is abroad at all hours. By night it mimics shadow, by day it all but disappears. Its patterns overlap, each plume translucent, the illusion layers deep. Beyond the yellow eye, the knife-edged bill, little about it comes clear.

Don't picture it cat-sized, a storybook owl. Imagine instead the height of a husky, a wingspan to rival your own. Much of this is show. Cross-sections reveal the truth: inside the bulk there hunkers a compact pilot, a puppeteer's skilful hand. This explains the manoeuvres, the great shade threading through close-ranked, twilit trees.

Its killing swoop is a wonder. *S. nebulosa* is a watcher, a listener. Under feet of snow, a lone vole trundles, pausing to scratch for seed. The great grey tenses, and then separates from its perch. Perhaps you've chanced upon the aftermath: beads of rodent blood on the whiteness, a perfect impression of wings. It's as close as you're likely to get. Most of us, be we urban or rural, native or new, will never set eyes on a great grey.

All the same, it remains a bird worthy of our regard. In honouring the elusive *S. nebulosa*, we too might learn to take what we need with grace and efficiency, to navigate through space in the knowledge that we are both great and small. Best of all, we might learn to pay attention. Imagine it, Canada, all of us listening. All of us keeping watch over this vast and vulnerable land, bringing our quietest minds, our keenest perception to bear.

Alissa York is the author of three novels, the most recent of which is Fauna. *Her next,* The Naturalist, *will be published by Random House Canada in 2016. She lives in Toronto.*

Osprey

Swift and steadfast

By Charlotte Gray

I FIND IT EASIER TO ELIMINATE birds than to select one. Chickadee? Too cute. Canada goose? Why pick a fowl whose golf-green habits have made it, and us, international pariahs? Yellow-bellied sapsucker? Doesn't fit our new warrior-nation image.

I know others don't share my hesitations, but I'm hamstrung by Canadian diffidence. Nevertheless, I'll swoop in and nominate the osprey as Canada's national bird.

Why? The most distinctive sound of my summers is the *cheep cheep cheep* of baby osprey. There is an osprey nest in a white pine near my family's lakeside cottage south of Ottawa, and its occupants arrive before we open the place in May. By Canada Day, the chicks are in residence, and within days, like kids at McDonald's, they are demanding food. The parents circle over the lake, occasionally dropping with ferocious speed and then, talons firmly embedded in a fish or water snake, climbing aloft. Soon the offspring will try their own wings, and the parents will depart. But until well after Labour Day, the young osprey hang on, uttering plaintive demands. *Cheep cheep cheep*.

The osprey would be a perfect national bird because its life and habits mirror ours. Osprey are found coast to coast, and have a distinctive architectural style for summer nests; we do clapboard or log, they do messy twigs. Like Canadians, they're frequently mistaken for being something they're not; we as Americans, they as eagles or, as British visitors may exclaim, "Falcons!" And ospreys mate for life — something we try to do, anyway.

By the time my husband puts our boat into the water next spring, Mr. and Mrs. Osprey will have returned to their nest, ready to hatch another brood and enjoy another summer with the noisy neighbours — we get cheeping, they get operatic arias and the buzz of chainsaws. We'll both be going after the largemouth bass in the lake, but by Thanksgiving, with winter's silence approaching, we'll both have left. What could be more Canadian? *Cheep cheep cheep*.

Charlotte Gray is author of nine books, the most recent of which, The Massey Murder: A Maid, her Master and the Trial That Shocked a Country, *won the 2014 Toronto Book Awards. She lives in Ottawa.*

Raven

Mischievous and sly survivor

By Noah Richler

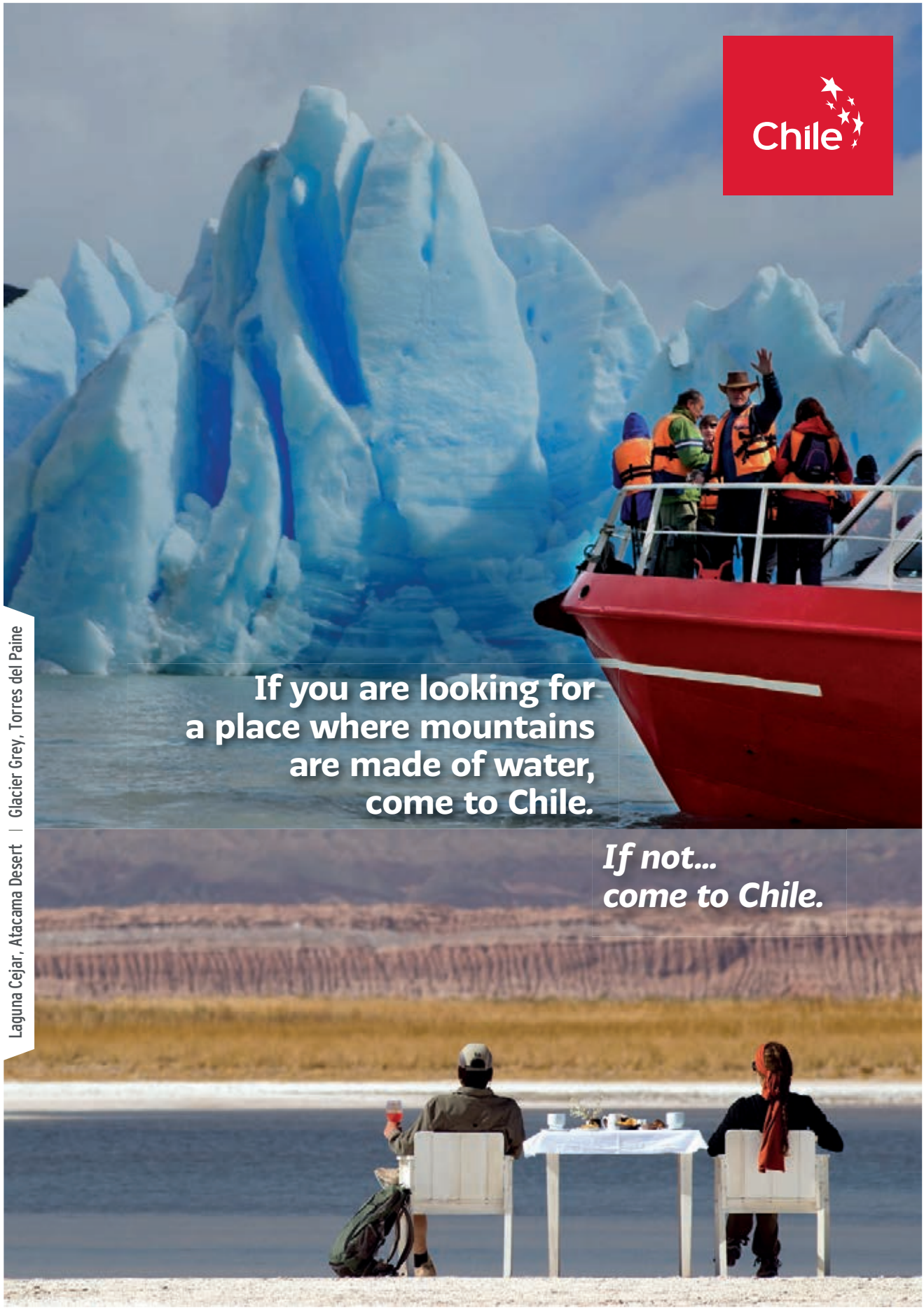
WELL, I WOULD CHOOSE THIS BIRD: the first off Noah's ark, the subject of stories (our stories), and a storyteller too. Raven, charting the course Canada's first inhabitants later took, crossed the Bering Strait to arrive here. And if that pedigree, one that precedes this country's mere statehood, is not enough, consider too the importance this corvid has had in native stories ever since. Raven is Trickster. Raven is *family*. Raven can be found from sea to sea to sea, and beyond, so that inevitably, and like the Canadian, Raven is an internationalist, too. In truth, we share the mythology of Raven with other countries and their histories — those of Europe and Scandinavia, mostly — though perhaps it is we who understand Raven best. Raven is not pretty, elegant or graceful, though we know him to be smart and mischievous, and do not generally demonize the bird — as, for instance, many Scots have done since, in 1424, King James I decreed it to be vermin.

Misguided others would rather not heed the noisy chatter of a bird easily disregarded, and is this not the condition of the Canadian citizen in the world?

Above all, Raven is resourceful, a survivor, as the territory compels most Canadians to be. He stores his food in caches, a habit of the land — though really I shouldn't be saying "he" as, consistent with our progressive laws, Trickster also stands outside of gender. Raven is playful — makes toys! — and uses the *kluk-kluk* and *kaw* of a language that can often sound like an aboriginal one to tell his companions where his hoardings are. (Is Raven the mimic, or are we?) And even this tendency — to take to the road out of necessity and then return home and relate the things he's seen — is an atavistic Canadian one of hunting and gathering. From the first Thule hunters to the Newfoundlanders of today travelling to Alberta to hunt and gather work, it has been the Canadian's lot to scour the land for opportunity, and then to bring home a tall tale or two.

Oh, there may be more beautiful and mellifluous contenders, but no other bird can really make so quintessential a Canadian case.

Noah Richler is the author of This Is My Country, What's Yours? A Literary Atlas of Canada *and* What We Talk About When We Talk About War. *He lives in Toronto.*



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KEEPING THE WILD

Wildlife rehabilitation sites across the country help injured and abandoned animals recover and get back to where they belong

BY CAROLINE BARLOTT

THE SWAINSON'S HAWK is wrapped tightly in a large grey bath towel, head poking out one end, talons out the other. Its beak hangs open as it gasps for breath, its long, pointed tongue falling to one side. The bird is in shock from its injuries but still alert, eyes wide and staring at Kim Blomme, a wildlife rehabilitator who's holding the hawk in her gloved hands.

Blomme has already examined the bird, noting its inflamed elbow and swollen wing. But its bloody tail feathers provide the biggest clue to how it was injured. Electrocution — probably from hitting a power line — is the likely cause, with the tail injury indicating where the current exited the body.

It's an educated guess informed by Blomme's experience as founder of the Wildlife Rehabilitation Society of Edmonton, where she's worked since it opened in 1989, and her more than 30-year career as an animal health technologist. "That's one of the challenges of working with wild animals," says Blomme, 58. "If you're working with a pet, then the person who brings them in can usually tell you something."

In the coming days, a vet will be consulted — a regular occurrence in wildlife rehabilitation centres — and detailed notes will be taken on the condition of the hawk, which will be known only by a number. That might seem coldly clinical, but being a number in a wildlife rehabilitation centre is actually a *good* thing; the animals that have names tend to be those that never leave.

EM

THE WILDLIFE REHABILITATION Society of Edmonton is one of more than 50 similar non-profit organizations across Canada, all of which require a provincial or territorial permit (and a federal permit if caring for migratory birds) in the name of a wildlife rehabilitator, who must be licensed. These organizations typically operate with a small staff, a large network of volunteers, plenty of dedication and a small budget. Funding can come via the slow drip of public donations, by selling memberships or by securing the occasional grant. While many of the organizations offer educational programs and allow the public to view their permanent residents, they have little in common with admission-charging zoos; their main goal, after all, is to release animals back into the wild.

Despite wildlife rehabilitation being a recognized and respected job — universities and colleges offer degree programs in it, and international conferences are held to discuss the latest techniques — all the challenges can still make it seem a thankless task. So why do people such as Blomme bother, especially when provincial governments are responsible for wildlife at the population level? After all, according to Gordon Court, a provincial wildlife status biologist with Alberta's department of environment and sustainable resource development, except for instances where very rare or endangered species have been rehabilitated, the activities of wildlife rehabbers are largely considered biologically neutral and to have no notable impact on the populations of any of the hundreds of species of birds and mammals in Canada.

To hear Jody North tell it, however, every animal counts. North, the co-host of the *Hinterland Who's Who* public service announcements and a wildlife expert who for 13 years co-directed Ontario's Muskoka Wildlife Centre, says that since human activity causes most wildlife injuries, it's our duty to help — especially when you consider the impact of losing even one animal from, for instance, the 98 species of mammals and birds in Canada that are threatened or endangered. "Each ecosystem is a carefully balanced community with just the right amount of each species to be healthy," says North. "When any one player is taken out of that community, it can tip the balance and disrupt that ecosystem."

IT'S FEEDING TIME at the North Island Wildlife Recovery Association in Errington, B.C., and Knut is hungry. The 19-year-old black bear lopes over to a small opening in his enclosure, squeezes his head through and takes bites of salmon from the hand of Robin Campbell, who co-founded the organization with his wife, Sylvia, in 1985. Knut was born in captivity,

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At the Wildlife Rehabilitation Society of Edmonton, Kim Blomme examines an injured porcupine (RIGHT) while a volunteer vet preps a beaver for surgery (OPPOSITE TOP). On Vancouver Island, the North Island Wildlife Recovery Association cares for orphaned black bears (OPPOSITE BOTTOM) and injured golden eagles (PREVIOUS PAGES).

COURTESY WRSE/JUDITH PAQUIN

so he'll never know what it's like to be wild. Other black bears at the facility, however, stand a good chance of avoiding Knut's fate, thanks to the association's black bear rehabilitation program.

Prior to Campbell starting the program in 1997, the provincial government didn't believe anyone could safely rehabilitate black bears, so Campbell's only option had been to euthanize orphaned bear cubs he believed he could save. Some of these had mothers that conservation officers had been forced to kill after the bears became so accustomed to humans that they began raiding garages or attacking people, behaviours they'd eventually pass on to their young.

After more than a year of debate with the provincial ministry of environment, which included demonstrating he could provide adequate shelter for cubs, Campbell was given permission to rehabilitate them. At the same time, the association acquired and started to raise Knut, whose behaviour would help Campbell learn about his new wild charges. Knut's need for play and stimulation, for instance, led to Campbell creating cub enclosures with running water and pools.

Unlike Knut, who is only occasionally fed by hand, the cubs are always treated in a way that helps keep them wild. Visitors can see them only via closed-circuit TV, while feeding time involves staff banging on the door of the bears' enclosure, causing the animals to scatter. Rehabilitators, making every effort to avoid interaction with the bears, then bring in hollow logs and stumps filled with blueberries, salmon and grains. It's a twofold strategy that ensures the bears learn to use their natural scavenging instincts and remain naturally fearful of people when released, which usually occurs in the fall or spring, when they're about 18 months old. Campbell estimates that over the program's 18 years, about 175 of the roughly 200 bears admitted into the program have been successfully released into the wild.

Being a number in a wildlife rehabilitation centre is actually a good thing; the animals that have names tend to be those that never leave.

Building a successful wildlife rehabilitation centre has been a long and often challenging road for Campbell, who believes the association's work with black bears and other animals has gone largely unnoticed until recently. "Before, people were only interested in the whole species, not in the individual cases," he says. Today, the association regularly hosts international students who want to learn about wildlife rehabilitation, and Campbell has more than 50 volunteers. "We're very blessed," he says. "We're in a wonderful community. We have bears, cougars, orcas, you name it, and we're surrounded by people who love animals and are interested in education."

CAROL KELLY, the founder and executive director of the Medicine River Wildlife Centre, about 60 kilometres southwest of Red Deer, Alta., echoes Jody North when she reveals that the majority of the centre's cases involve animals that have sustained injuries related to human activity, whether it's the porcupine struck by a car or the songbird that flew into a window.

But human activity of a different sort poses a big challenge for the centre. Every year, people call about or bring in animals they think have been orphaned; 40 per cent of these turn out not to have been. Baby hares and fawns — the latter are born scentless and left alone for hours by their mother, whose scent may attract predators — top this list. Kelly says she can receive upward of 50 fawn-related calls in spring, and once even fielded such a request during her daughter's wedding reception.

In truth, fawns are hardly helpless. They can stand within 20 minutes of being born and walk a few hours later. Still, they must learn the skills they need to survive in the wild, skills Kelly believes they can't learn in captivity. "They need a doe to teach them

Caroline Barlott is a freelance writer whose work has appeared in Reader's Digest *and* Alberta Venture. *She is the former managing editor of* Avenue, *a lifestyle magazine in Edmonton.*

Preparing to release a Western screech-owl at the North Island Wildlife Recovery Centre (THIS IMAGE) and a bald eagle at Alberta's Medicine River Wildlife Centre (BELOW).

the ways of the world," she says. "If they're raised in this safe, secure enclosure and then put in a strange place, they have no idea how to survive." This is where a technique called fostering comes in, whereby orphaned baby wild animals are placed with a new, same-species family that have young of a similar age.

Kelly has been using the method on a variety of animals for about 10 years, but it's her fawn-fostering program that's received the most attention (she's spoken about her work at conferences in Alberta, Virginia, California, Oregon and Tennessee), largely because no one initially believed it could be done.

Her doubters included Susan Lingle, an assistant professor of biology at the University of Winnipeg, who has researched the behaviour of white-tailed and mule deer, and who told Kelly that she didn't believe fostering would work. But after Kelly explained the process, Lingle offered to support it by providing fawn distress calls, used to attract potential foster does. The calls helped improve Kelly's method, and today she tracks the fawns to chart the program's success rate. Of the seven she started tracking in June 2013, for instance, three were killed by predators a few weeks after connecting with a new doe, while the remaining four were still alive in the spring of 2014.

For their first few days at the centre, fawns are bottle-fed by a staff member, who wears a dark hoodie and a deer mask. The disguise helps prevent fawns from becoming used to the sight of people. Once the animal is ready to be released — usually when it's about four weeks old — Kelly drives it in the centre's white Dodge Dakota to forested areas throughout central Alberta. She turns on the loudspeaker atop the truck and the high-pitched wail of the distress call rolls through the woods. When a doe appears and exhibits the correct response, Kelly places the fawn a few feet from the trees and drives away. Although each fostering scenario is different, sometimes the doe will sniff the fawn's back, pace a few laps — ending each with another, almost contemplative sniff at the young animal — and then dash into the trees, the fawn in hot pursuit.

IT'S TWO DAYS AFTER the Swainson's hawk was brought into the Wildlife Rehabilitation Society of Edmonton, and the swelling on the bird's wing has increased. Animals that have been electrocuted often suffer severe internal damage, and their condition can deteriorate quickly.

More rehydration fluid and rest do not help, and by the next day, the swelling is even worse. The hawk's energy levels are depleted, all its alertness gone as it lies limp in Blomme's hands. She decides to euthanize the bird. It's never an easy decision, but Blomme remembers overhearing a father explaining to his daughter why some animals can't be saved. "He told her that we can't control the outcome," she says, "but only give the best care possible."

Watch videos of cubs that are part of the black bear rehabilitation program at the North Island Wildlife Recovery Association at mag.cangeo.ca/jf15/rehab.

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■ **My blood pressure was 157/90** and I had side effects from prescription drugs. I bought a monitor. After 6 months on Bell #26 I was down to 120/80. *Toni L. McCuistion, 52, Elizabethtown, PA.*

■ **Blood pressure went from 170/110 down to 110/70.** Was on three medications that didn't help. Within a month on Bell#26 my BP dropped to 110/70. I thought I didn't need it anymore and the BP went up to 170/110 again. I will now stay on Bell. I am surprised about its effectiveness without side effects. Bell exceeds my expectations. Patrick McManus, 52, Edmonton, AB

■ **At work my driver's medical** test was too high at 170/100. After taking Bell #26 for a few days I went down to 128/84 which allowed me to pass my work medical. *Kris Geier, 48, Windsor, ON.*

Frequent BATHROOM TRIPS?

Men Bell Prostate Ezee Flow Tea

#4a NPN 80051642

Men have relief in 3-5 days from dribbling, burning and rushing to the toilet. Relaxes blood flow for better erections. **Helps also with male incontinence.** Works in virtually every case. If you are considering surgery, try this tea first. Hundreds of delighted men testifying on our web site: ■ **Had to get up every hour** at night. Now I get up once a night. *Joseph Whittaker, Sewell, NJ* ■ **I cancelled my prostate surgery.** Get up once a night. I'm so happy not to have to face the torment of a prostate operation and possible incontinence and impotence. *Albert E. Blain, 74, Schumacher, ON* ■ **Even after TURP prostate surgery** and microwave therapy had to get up many times. Now down to 1-2 times. Tea is 100% better than drugs. *Robert G. Stocker, Eustasis, FL* ■ **After 1st year drinking tea** my PSA went down to 4.5; after 2nd year to 2.9; after 3rd year to 2.3. I highly recommend the tea. A real life saver. *Thomas M. Thurston, Forsyth, GA.*

Women Ask for #4b Bladder Control Tea for Women. It seems so unbelievable, most women don't know there is a delicious tasting herbal tea available in all health food stores that stops incontinence, bladder infections, UTis within days and women keep on wearing costly pads and diapers. Try the tea. It is guaranteed. Go shopping and travelling again worry free. We have helped tens of thousands of women.

Stop Heartburn & Reflux Naturally

#39 NPN 80053642

Prevent reflux by having an alkaline balanced stomach with the Bell Acidic Stomach & Alkaline Balance #39. You may not need more antacids or drugs ever after. Many millions suffer needlessly. Read the guarantee. **Alkaline balanced cells and body** gives us more comfort, better digestion and strengthens our immune system to fight all illnesses including cancerous cells which we have in our body every day.

Truthful actual experiences from real people:

■ **Reflux gave me a sore throat and I could not sing in the church choir anymore.** After taking Bell #39 I have no more reflux and rejoice in singing again. *Helene Giroux, 65, Quebec, QC.*

■ **Have family history of heartburn.** For last 10 years I suffered a lot with acid reflux. I told all family members about #39 being all natural, giving quick relief with no side effects and no antacids needed anymore. *Michael Fasheh, 49, Port Ranch, CA.*

■ **Heartburn, acid reflux, stomach trouble for many years.** Doctors gave me different pills, but I had no lasting relief. Had every test known to man. I finally talked to my health food store and they said Bell Acidic Stomach/Alkaline Balance really works. It sure does. I had my husband and son take it and they all had the same results. I can now eat even spicy food with no problems. *Verna Conti, 80, London, ON.*

Snoring? Sleep apnea? Trouble falling asleep?

#23 NPN 80045172

As recommended by Dr. Gifford-Jones M.D. University of Toronto professor states that 69% of adults have sleeping problems. Bad sleep reduces physical and creative energy all next day. Almost all families are affected. Sleep apnea may cause high blood pressure, strokes, heart attacks and irregular heart beats. Can be very destructive in relationships. **Hundreds of true testimonials on the Bell website from people like you.**

■ **I really didn't snore** or gasp for air anymore. I sleep through the night and feel rested and refreshed in the morning. *Mark Wilson, 40, Hudson, NH* ■ **Sleep apnea capsules worked first night.** For 15 years I had sleep apnea and my doctor made me buy a CPAP machine, which I could not use. Finally Bell #23 helped the first night and every night thereafter. Like a miracle. Unbelievable. *Karen Braun, 67, Glace Bay, NS* ■ **For 20 years I was waking up frequently** gasping for air. During the day I would start napping every time I would sit down, because I was tired. Since taking #23 sleeping 6 hours is heaven. It made a substantial change in my life. *Mary C. Myrick, 62, Jackson, MS* ■ **It is such a joy** not having to use the CPAP machine anymore. *Wayne Burse, 63, Beamsville, ON.*

69% of all adults don't sleep well
They work at half their best
Billions of dollars are wasted every day
Biggest drain on the economy
Greatest handicap for personal success

Prevent COLDS & FLUS

#51 NPN 80036946

Helps immune function. The only cold medicine with a money-back guarantee. Four **medical doctors** that wrote in their book SHARK LIVER OIL that you can prevent colds and flus. Dr. Hubert wrote since his own high-school age children took shark liver oil they have no more colds. Dr. Haimes's grandchildren have been taking shark liver oil for 6 months and he writes they have no more infection of any kind. **Read many testimonials on the Bell website:** "I had 3-4 flus every winter. None last 5 years." "Amazing! All of us have no more colds." "No more asthma, no puffer, no cold, no flus, changed my life". In North America this is a by-product from the restaurant industry. No sharks are caught for their liver or their cartilage. ■ **No more colds, also my eczema disappeared!** Last 2 years I would get colds often due to stress as I am an athlete and body builder. After starting Bell Shark Liver Oil #51 I had no more colds or even a sign of a cold. *Dennis Tudos, 23, Kent, WA.*

Happiness for couples is a satisfying sex life.

#6 NPN 80051008

Eroxil™ #6 helps most men to perform like in their 20's. Evidence of a few hundred testimonials on our web site with full names and towns. All 100% true: ■ **Eroxil is the best** of all the supplements for men I've tried. Boosts my sex drive and I'm able to function anytime. *Angus Gutke, 45, Calgary, AB.* ■ **Regained virility in 3 days.** My libido was restored for good sex. I've given it also to friends with the same results. One of them is a diabetic and overweight. *Dr. Louis Rolland, 72, St. Hyacinthe, QC.* ■ **Wonderful to feel like a man again.** It's wonderful to feel close to my wife again. God bless you! *Charles E. Palen, 77, Burnaby, BC.*

Women **Erosyn™ #7 is the only product that helps most women** to restore libido, desire and the ability to climax. There is no drug or natural product like it. Doctors on the Dr. Oz TV show said that the most frequent complaint they get is "Being very tired" others call it fatigue. Both #6 and #7 will function like a spark plug and restart energy, mood and libido. Instead of feeling worn out, you can do more all day long physically and creatively. Read the hundreds of testimonials on the Bell website from people like you. Satisfaction is guaranteed.

ACNE

Eczema & Psoriasis

#60 NPN 80044199

Works by cleaning blood from the inside, instead of attacking skin with creams or washes from the outside and leaving actual cause untreated. **Actual Results.** ■ **After 1 week** my severe acne became quite mild and after 2 weeks it had completely vanished. I suffered for 5 stressful years of having acne and extremely dry, irritated skin. Bell Help for Skin Disorders **"saved my life"**. My skin is now beautiful and you would never know I suffered from acne and other skin problems for years. *Zach Lustgarten, 18, Oshawa, ON.*

RED NOSE/CHEEKS ROSACEA gone in less than a week. Was fighting it for 30 years with topical creams and prescriptions without getting satisfaction. I live a healthy life, don't smoke and don't drink. People thought a reddish face comes from drinking. This is a myth. Will take it for the rest of my life when needed. *Donald E. Gillespie, 56, Innisfil, ON.*

PSORIASIS ■ **I had severe psoriasis** over 95% of my body. Last 5 years I have stunned every doctor and dermatologist. I spent tons of money on remedies. After I got Bell Help for Skin Disorders, I've never seen anything work as fast in my life. Within 2 days I saw my skin clearing up. I'm speechless. It was inexpensive compared with what I spent before. *Jessica Shantz, 25, Dawson Creek, BC.*

ECZEMA **For 6 years my family doctor and dermatologist** tried many medications and creams. After taking Bell Help for Skin Disorders for just a few days my eczema itching stopped and my face started to clear up. After suffering so long I am amazed with the results. *Andy Yuen, 58, Vancouver, BC.*

60 MORE NATURAL MEDICINES on the Bell website. All guaranteed to help.

Natural medicines are not altering the chemistry of our body and cause virtually no side effects

President's own story: 15 years ago I started to have arthritis, prostate, kidney, snoring and sleep apnea problems, which were all helped quickly with natural health products. I made it my life's purpose to help others. ***Nick A. Jerch***

100% Truthful testimonials with full names and towns. Real people you can call, if you want more reassurance. No money is paid for testimonials. ***To ensure this product is right for you, always read labels and follow instructions.***

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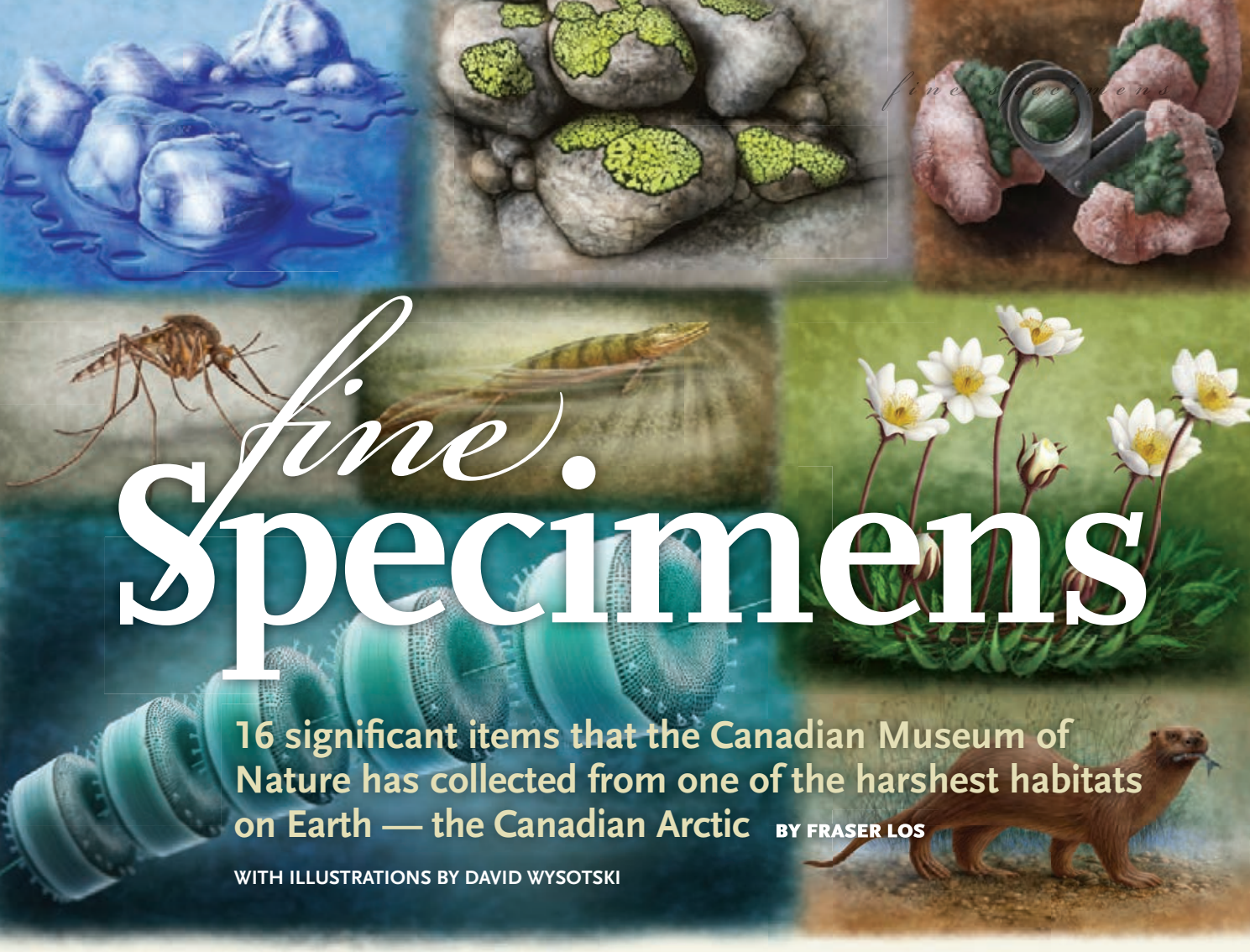


fine Specimens

16 significant items that the Canadian Museum of Nature has collected from one of the harshest habitats on Earth — the Canadian Arctic

BY FRASER LOS

WITH ILLUSTRATIONS BY DAVID WYSOTSKI

VISIT THE CANADIAN MUSEUM of Nature's sprawling research and collections facility in Gatineau, Que., and you're in for a far different experience than exploring the museum's public-focused exhibit building in downtown Ottawa.

Also known as the Natural Heritage Campus, the more than 20,000-square-metre space is packed to its high ceilings with more than 10 million specimens, filed in drawers, assembled on shelves and preserved in jars. This is where museum curators do their behind-the-scenes work: collecting, cataloguing and studying an ever-expanding supply of fossils, minerals, plants and animals that provide a record of Earth's history. At more than 40 per cent of Canada's landmass, the Arctic figures prominently in the museum's collection, which is one of the largest storehouses of Arctic specimens in the world. But it only scratches the surface of what there is to learn.

In the Arctic, scientific discovery is still at a frontier, much as it was a century ago, when the Canadian Arctic Expedition of 1913-1916, the first official government expedition in the nation's Far North, tapped into the mysteries of this immense and often underappreciated region.

"We don't often hear about the vast majority of species that are in the Arctic," says Jennifer Doubt, the museum's botany curator. "At the height of the very short growing season, when all of the flowers are blooming and the creatures are finishing what they need to do before winter, it's so full of life." Doubt says there is an urgent need to study the Arctic today, since climate change is altering the region more quickly than any other place on Earth, while melting is uncovering new clues about how life responded to past climatic upheavals and migrations.

To bring this collection into classrooms, the museum and Canadian Geographic Education have produced a giant floor map, complemented by lesson plans and educational resources. The map (see "On the map," page 32) and lesson plans highlight Canadian Arctic species and substances (both past and present) from each of the museum's main disciplines — paleobiology, mineralogy, zoology and botany — that can help us understand the importance of the Arctic. Here's a look at some of those animals and artifacts.

Fraser Los (@flosGreenPages) is a regular contributor to Canadian Geographic *and numerous other national magazines. Natural sciences illustrator David Wysotski's work has appeared in countless books and magazines.*

Watch an interview with a paleobiologist from the Canadian Museum of Nature about the facility's Arctic collection at mag.cangeo.ca/jf15/arctic.

PALEOBIOLOGY PIECES

PLIOCENE CAMEL

IF YOU GET A CHANCE to see the fossilized tibia of an extinct giant camel in the museum's research and collections facility, you might easily mistake it for an old hunk of wood. But the 30 leg-bone fragments — found on a steep, sandy slope near Strathcona Fiord on the west-central side of Nunavut's Ellesmere Island — are actually the most northerly evidence of the earliest camels, which originated in North America more than 45 million years ago. Collagen from the bone indicates it most closely matches modern one-hump camels and the Yukon giant camel, thought to be the ancestor of modern camels. The fossils are about 3.4 million years old, which means these camels lived alongside the beavers and other boreal creatures found at a nearby site called Beaver Pond (see "Beaver," BOTTOM).

TIKTAALIK ROSEAE

ANOTHER RARE MISSING LINK, *Tiktaalik roseae* has been called a "fishapod" because this extinct species helped scientists fill the evolutionary gap between fish and four-legged animals (tetrapods). Discovered in 2004 on southern Ellesmere Island in rock sediments formed by an ancient river system, *Tiktaalik*'s fossilized remains date back 375 million years. At three-metres long, with a flat head and big jaws, *Tiktaalik* resembled a present-day crocodile. Its fins, which were strong enough to prop itself up on land, either in shallow water or along the water's edge, were on their way, in evolutionary terms, to becoming feet. When *Tiktaalik* lived, Ellesmere Island was much farther south, due to continental drift, and resembled a subtropical floodplain.

PUIJILA DARWINI

IT'S RARE FOR SCIENTISTS to uncover a new genus and species, rarer still when that extinct creature provides a crucial missing link in evolution. The fossilized remains of *Puijila*, which means "young sea mammal" in Inuktitut, were discovered in an ancient lake deposit on Nunavut's Devon Island by museum researchers in 2007. The bones were incredibly well preserved in the Haughton Crater — a 16-kilometre-wide impact site created by a meteor strike about 24 million years ago. An ancestor to modern seals, *Puijila* had legs that allowed it to hunt on land and an otter-like body and webbed feet for swimming in freshwater lakes.

BEAVER

BEAVERS IN THE TREELESS ARCTIC? It may seem hard to believe, but about three million to five million years ago, Canada's Arctic was much warmer than it is today and largely covered by a larch-dominated boreal forest landscape. At the Beaver Pond site on Ellesmere Island, Canadian Museum of Nature researchers found the fossilized remains of an extinct beaver, along with preserved wood that had been unmistakably gnawed by beaver teeth. The fossils were found in peat with molluscs and other plant matter, offering the scientists a treasure trove of material for studying the climate of that time, known as the Pliocene Epoch.

BOTANY BITS

RHIZOCARPON GEOGRAPHICUM

RHIZOCARPON GEOGRAPHICUM IS often called the "map lichen" because it grows in patches bordered by black lines and, as a result, looks like a map with little rivers and roads. It's the original lichen used for lichenometry, a process that dates exposed rock and other surfaces. Since the lichen only grows at a fraction of a millimetre each year, lichenometrists can use the size of a lichen to date whatever surface it's growing on. *Rhizocarpon* is also an extremely tough organism that thrives in the most extreme Arctic environments. To test its toughness, researchers decided to take a colony into Earth's orbit, where it was exposed to empty space for nearly 15 days. It survived unharmed, of course.

AULACOMNIUM TURGIDUM

AULACOMNIUM TURGIDUM IS A VERY HARDY MOSS; so hardy, in fact, that researchers were recently able to bring some back to life after it had lain dormant for more than four centuries under the Teardrop Glacier in Nunavut. With its bright yellow-green colour and spongy texture, it's an attractive and distinctive High Arctic species that grows especially well in damp tundra landscapes. If you've ever felt the "springy" Arctic tundra under your feet, that's likely *Aulacomnium turgidum*. It's also found in isolated, remnant patches of alpine tundra, such as the Ouimet Canyon on the north shore of Lake Superior, near Thunder Bay, Ont., where it still remains after the glaciers retreated 10,000 years ago.

THALASSIOSIRA NORDENSKIOELDII

THIS UNICELLULAR ALGAE SPECIES (a diatom) is so tiny you need a microscope to see it. But despite its size, these and other common phytoplankton form the base of the Arctic's marine food chain. Wherever they float in northern waters, a feeding frenzy is sure to follow — from tiny crustaceans to the biggest whales. Like other diatoms, *Thalassiosira nordenskioeldii* is often said to live in "glass houses," because it resides within clear silica cell walls called frustules, which stay in the environment long after the organisms die. After sinking to the sea floor, the glass shells provide key physical evidence for researchers learning about earlier climates and conditions in which the organisms grew.

DRYAS INTEGRIFOLIA

LIFE IS NOT EASY for flowering plants in the High Arctic. In an urgent frenzy during the Arctic's short summer season, *Dryas integrifolia* (the mountain aven) and similar species have to grow, flower and then produce seed, all before winter returns. A member of the rose family, this plant's stem and leaves are fuzzy, creating a thin layer of still air that protects it from the Arctic's extremely dry, moisture-sucking winds. Inuit often called these plants *malikkaat*, or "the followers," because they follow the seasons: the flowers fold out in one direction when summer is coming, and twist and fold the opposite way for winter.

ZOOLOGY OBJECTS

MUSKOX

MUSKOX — OR *OMINGMAK,* as the Inuit call this Arctic herbivore — are well adapted to the Arctic, both physiologically and behaviourally. Distributed throughout much of Canada's High Arctic in small herds of roughly 20 individuals, muskox thrive in the region's extremely dry, cold conditions, grazing on low-lying grasses, mosses, Arctic willows and shrubs. With their compact bodies and long hair that covers a soft, dense undercoat, they preserve even more warmth through harsh winters by huddling together and sharing body heat. The Inuit have relied on muskox for millennia, using the meat for sustenance, fur for warm coats and skull and horns to carve into works of art.

AMPELISCA MACROCEPHALA

FORMING HUGE, DENSE BEDS on the sea floor — sometimes up to 16,000 individuals per square metre — *Ampelisca macrocephala* are a major food source for everything from diving seabirds to grey whales, which scoop up vast quantities within their massive jaws. Described as "filter feeders" because they consume tiny food fragments that sink from the surface, *Ampelisca* produce silk from their legs so they can latch onto food particles. Most of the museum's preserved specimens are from Cape Bathurst in the Beaufort Sea, where prevailing currents create an upwelling of cold, nutrient-rich water, which mixes with surface water — an ideal scenario for the zooplankton and phytoplankton that provide their sustenance.

ARCTIC COD

SWIMMING IN MASSIVE SCHOOLS throughout the entire circumpolar region — from northern Russia and Greenland to Alaska and Canada — *Boreogadus saida*, or Arctic cod, is distinguished from other types of cod by its forked tail and protruding mouth. A sleek, slender fish that grows up to 30 centimetres and feeds on plankton near the surface, it's another major link within the Arctic food chain, providing a steady diet for seals, seabirds and beluga whales. With antifreeze proteins in its blood to stave off the cold, Arctic cod is one of the few fish on the planet that can thrive in sub-zero temperatures.

MOSQUITO

YOU MIGHT THINK mosquitoes only frequent forested landscapes, where swamps and freshwater lakes abound. But after the Arctic snow melts, in those few short weeks or so of warm temperatures, the tundra is like a sopping sponge in standing water, partly because an impervious permafrost layer impedes excess water from draining away. The conditions are tailor-made for breeding mosquitoes, which have been known to turn the sky grey as they swarm for sweet nectar and blood in the region. Where the caribou herds roam, the voracious insects can suck up to 300 millilitres of blood from each animal every day. Imagine that the next time you're swatting bugs on your back porch.

MINERAL MEMENTOES

ICE*

ICE IS FOREVER SHAPING the Arctic landscape. It may seem immobile, but it's constantly shifting, receding and melting. And every time it changes form, ice affects all other Arctic features — from the surface rock it scrapes under constant pressure to the organisms that traverse its slippery slopes, pursuing prey or fleeing predators. More melting ice in the Arctic is a harbinger for accelerated warming to come. The amount of Arctic sea ice has been declining for decades, as ancient glaciers melt, break off into icebergs and open up new shipping lanes that didn't exist when this country was born.

**[Naturally occurring ice meets the five requirements of a mineral substance, and can thus be considered a mineral. — Ed.]*

GALENA

A SHINY AND METALLIC lead-sulfide mineral, galena is a major ore used in the production of lead, and is found alongside large zinc deposits in Canada's North. Two large mines processed galena in Canada's Arctic until they were both closed in 2002 because of declining resources: Baffin Island's Nanisivik mine, which opened in 1976 as Canada's first Arctic mine, and the Polaris mine, on the southern tip of Little Cornwallis Island, the most northerly base-metal mine in the world when it was shut down.

DIAMOND

THE DIAMONDS IN CANADA'S ARCTIC formed millions of years ago, as a carbon compound crystallized under searing heat and pressure deep below the surface, then bubbled up in magma flows from long-extinct volcanoes. As these formations cooled, they left diamond-laced rock formations — called kimberlite pipes — closer to the surface. Canada's major diamond mines, which have propelled the country into the top 10 diamond producers in the world, sit atop these key formations. Most are in the Northwest Territories, where the Diavik, Ekati and Snap Lake mines operate, and another, the Gahcho Kué project, is being developed. Other diamond mines include Nunavut's currently dormant Jericho mine and northern Ontario's Victor mine, near James Bay.

GORMANITE

MINING IN THE YUKON is about far more than the Klondike gold rush of the late 1800s. In the last few decades, several new minerals have been discovered in northeastern Yukon, between Rapid Creek and Big Fish River, and west of the Mackenzie River delta. Named after Donald "Digger" Gorman, who first discovered it in 1981, gormanite is a bluish-green mineral that appears in a radial-spray form on fractured rock surfaces — so-called fracture fillings — in phosphate-ironstone rock formations. Although it has little economic value, gormanite is considered a collectors' item, partly because of its rarity throughout the world.

A HUMPBACK IS BORN

Humpback whales are a common sight in Canada's East Coast waters each summer, but these migratory giants begin their journey north from important calving grounds near the Dominican Republic

PHOTOGRAPHY BY MIKE BEEDELL WITH TEXT BY JESSICA FINN

Divers film a humpback cow and her calf while a male circles below (THIS IMAGE). A calf nuzzles its mother's chin in affection (PREVIOUS PAGES).

THEY GLIDE EFFORTLESSLY through the world's oceans on the farthest known seasonal migration of any mammal (the longest on record is 9,800 kilometres), often heaving their bodies, which can exceed 15 metres in length, out of the water in a mesmerizing display of acrobatics. And while the humpback whale's remarkable movements are a wonder to behold, its life cycle is equally incredible.

Most North Atlantic humpbacks feed in nutrient-rich waters from spring to fall. Two of their six distinct feeding areas are off Canada's East Coast: the Gulf of Maine and the Scotian Shelf (a 700-kilometre-long by 125- to 230-kilometre-wide area off the south coast of Nova Scotia), and a region encompassed by the Gulf of St. Lawrence and the waters around Newfoundland and Labrador. Born without blubber, newborn calves cannot withstand freezing temperatures, so the whales move to tropical waters each winter to feed, breed and give birth.

The humpback whale's remarkable movements are a wonder to behold; its life cycle is equally incredible.

The most populous Atlantic calving grounds are near the Silver and Navidad banks, off the Dominican Republic, where these photos were captured. Males sing and compete aggressively to breed with females. Females are pregnant for about 11 months and typically give birth to a single, four- to five-metre-long calf in February of the following year.

From birth, the cow maintains close contact with her offspring (the males take no part in parenting). She guides the calf to the surface to breathe, and touches it frequently with her long fins, which are one-third of her own body length. The calf can nurse between 190 litres and 600 litres of nutrient-rich milk each day, helping it grow a thick layer of blubber. By spring, the calf is ready to learn the northbound migratory route, following its mother back to her feeding grounds.

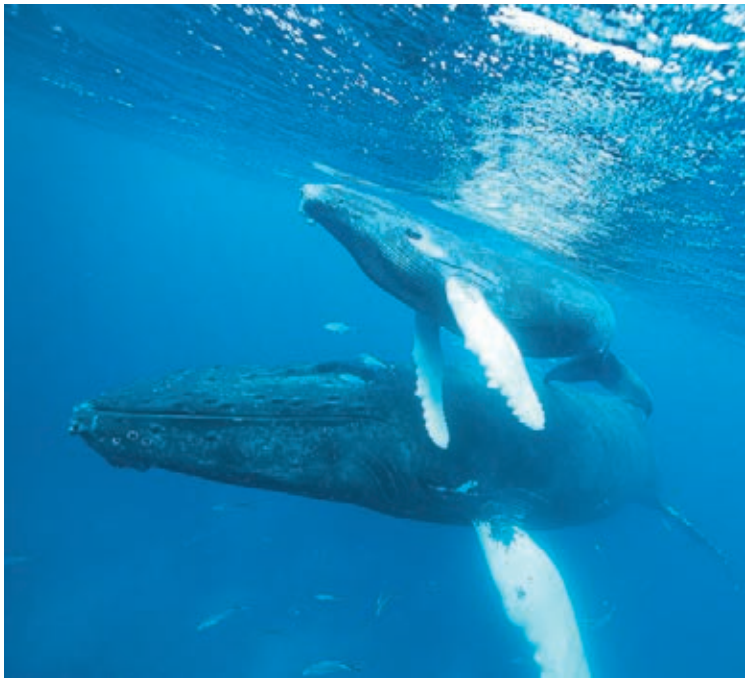
The relationship between mother and calf can last up to a year. Thought to be largely solitary, adult humpbacks form pods only for short periods of time, making the cow-calf bond the longest relationship of individual humpbacks.

The humpback's habit of returning to the same feeding and breeding areas year after year once made them easy prey for whalers. Subsequently, worldwide populations dropped by about 90 per cent during the 18th and early 19th centuries. A global ban on commercial humpback whaling in 1966, however, has helped most populations make a comeback. Estimated at more than 12,000 individuals today, North Atlantic humpbacks are one of the healthiest populations of the species on the planet, and are set to continue their amazing journey for years to come.

Mike Beedell (mikebeedellphoto.ca) has contributed to Canadian Geographic *for more than 30 years, focusing much of his photographic energy on raising awareness of habitat loss and the need to protect critical wild spaces. Jessica Finn is* Canadian Geographic*'s photo editor.*

A calf and its mother rise out of the depths to surface and breathe (THIS IMAGE and OPPOSITE BOTTOM).

Clockwise from right: a mother and calf surface; a calf pirouettes, its long pectoral fins helping it perform elegant underwater manoeuvres; a mature humpback rises out of the sea as it breaches.



The female guides the calf to the surface to breathe, and touches it frequently with her long fins, which are one-third of her own body length.

See more of Mike Beedell's amazing humpback whale photos and read about a new whale-watching app at mag.cangeo.ca/jf15/whales.

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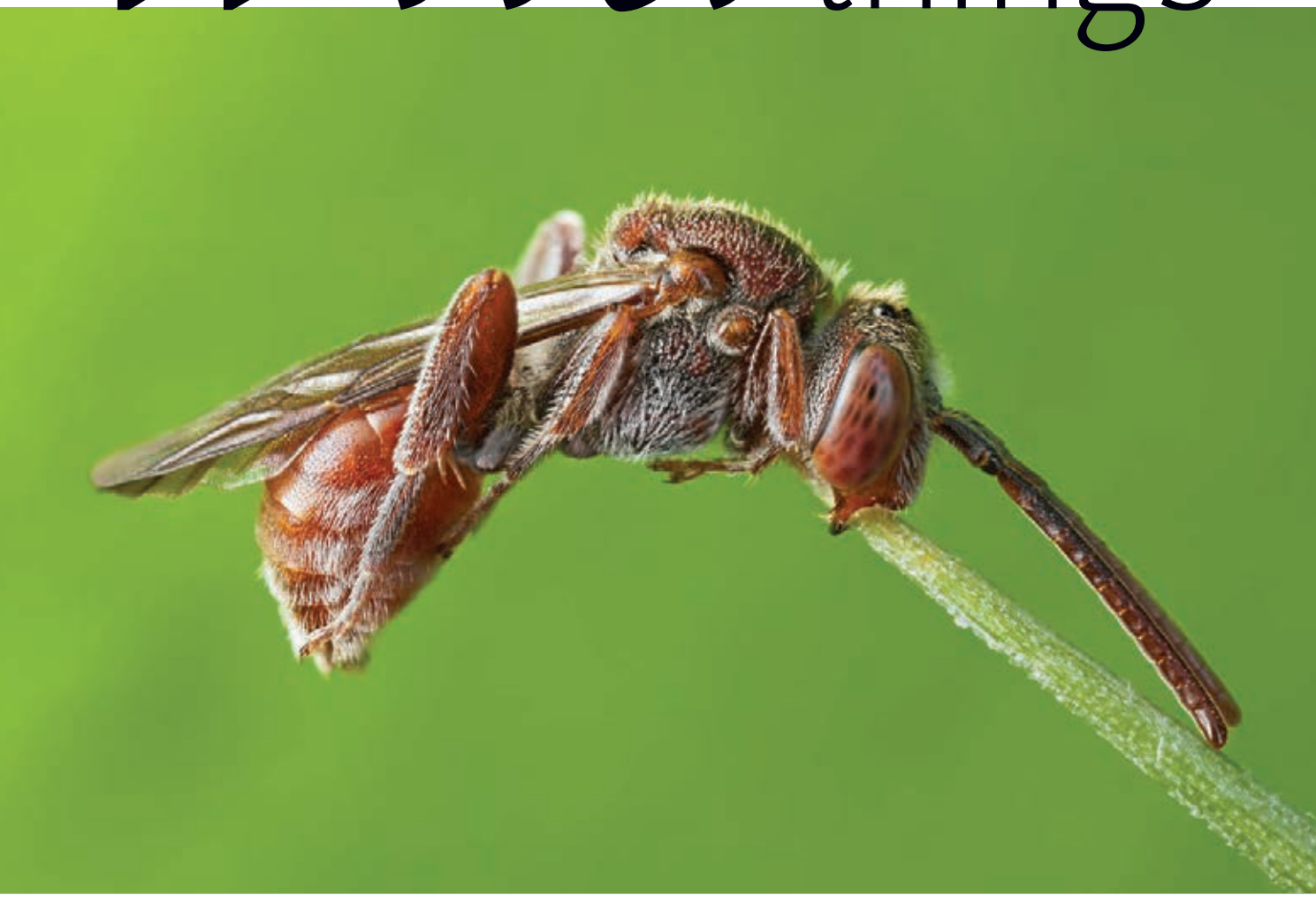
wild things



CATEGORY WINNER | LITTLE LIFE

Leigh Ayres
A bee at sunrise in
Frontenac County, Ont.

CANADIAN GEOGRAPHIC AND THE CANADIAN MUSEUM OF NATURE PRESENT THE WINNERS OF THE WILDLIFE PHOTOGRAPHY OF THE YEAR COMPETITION

Canada is known for its spectacular wildlife. Naturally, this makes for some spectacular photos. Photographers across the country submitted their best snaps to *Canadian Geographic*'s 2014 Canadian Wildlife Photography of the Year Contest, which showcases the astounding diversity of the nation's critters. *Canadian Geographic*'s photo editor Jessica Finn, the Canadian Museum of Nature's Roger Bull and Ottawa-based photographer Tony Beck sifted through thousands of entries to eventually select the five category winners pictured.

See all the winning images, including runners-up and honourable mentions, from the Canadian Wildlife Photography of the Year Contest at wpy14.canadiangeographic.ca.

CATEGORY WINNER | WHAT'S IN THE WATER

Todd Mintz
Sockeye salmon in the Adams River, near Scotch Creek, B.C., head to their spawning grounds from the Pacific Ocean.

CATEGORY WINNER | ON THE PROWL

David Wambolt
A piping plover keeps a watchful eye on her youngster in Beach Meadows, N.S.

CATEGORY WINNER | THINGS WITH WINGS

Ken Crebbin
A rufous hummingbird and honeybee vie for the same delphinium flower in De Winton, Alta.

CATEGORY WINNER | YOUTH

Luke Bergen
A red squirrel looks on from the safety of a tree in Slave Lake, Alta.

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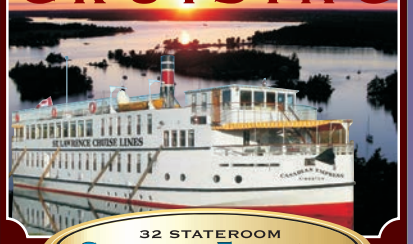

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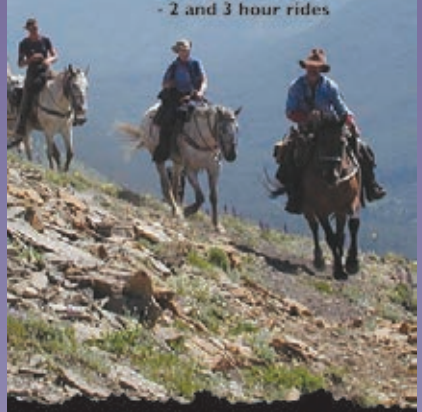

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COMMENT

Your feedback

Space and point

On page 67 ("The future of Canada in the cosmos," October 2014), there is an illustration of a large-scale agricultural building in space. I have travelled to the Arctic twice, and it occurred to me that we should be installing the same types of buildings in the Arctic to bring down the price of food. Where is Agriculture and Agri-Food Canada in the space age? Why not use this knowledge for Nunavut's benefit?

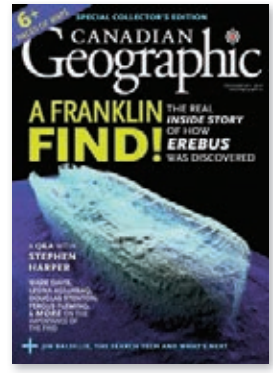
Jean Janes
Forest, Ont.

Franklin find fans

I remember a story in the early 1990s about a pilot who, while flying from Hat Island to Byron Bay, looked down and saw a ship. But when he circled around, he was unable to locate it again. It looks like someone else did. Apparently the search is planned to resume in August-September 2015. Why not the spring? There is 24-hour daylight and drifting ice is not a problem. I eagerly await further explorations on *Erebus*.

Lyle Hawkins
Sherwood Park, Alta.

All Canadians may be glad to see Franklin's ship *Erebus* discovered at last. A few years ago, I had heard that the ship might be well preserved due to the cool waters. And there it is, in an upright position. The pictures online tell



the story of what should be the conclusion of many searches in the past. The second ship is probably in pieces and scattered.

Walt Hoffmann
Calgary, Alta.

Hometown crowd

Captain Francis Crozier, who was second-in-command on the ill-fated Northwest Passage expedition, came from our hometown of Banbridge in Northern Ireland. Because of this, we have been watching the latest developments with bated breath, as have the descendants of Captain Crozier.

Banbridge Chronicle
Banbridge, Northern Ireland

Corrections:

From "The history" (December 2014): "Melville Sound" should have read "Viscount Melville Sound"; After John Franklin's 1825-27 expedition, about half — not all — of North America's north shore had been mapped; Sledge parties went much farther than "480 kilometres from their mother ships" looking for Franklin — Lieut. George Mecham sledged 2,470 kilometres in spring 1854.

From "The maps" (December 2014): The first Franklin search parties left in 1848, not 1850; John Rae was not "sent to track down Franklin's fate" but, as noted, to survey the west coast of the Boothia Peninsula.

COVER VOTE

How we chose this issue's cover

When it comes to our wildlife covers, it's statistically proven that predators sell — particularly bears and wolves. So when we decided a wolf would grace the cover of this edition, we had no doubt we'd have great options to choose from, and hopefully another bestseller on our hands. That said, the cover vote for the issue was still hotly contested. Option one was the favourite of Annie Gabrielian, our newsstand cover expert from St. Joseph's Communications. She noted that the colours worked well together, that the cover lines stood out well and that their positioning was ideal. Our cover voters, on the other hand, clearly favoured option two (it received 44 per cent of the tally, while options one and three received 34 and 22 per cent of votes). Voters commented that they liked the colours and the visibility of the wolf. That left our editorial team with a tough decision. We sided with the public at large and selected option two. Now prove us right.

Not already receiving our cover vote email? Visit cangeo.ca/newsletter and sign up for the *Canadian Geographic* newsletter to get in on the action.

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Comments may be edited for length and clarity.

TOP: DECEMBER 2014 COVER IMAGE COURTESY FISHERIES AND OCEANS CANADA; BOTTOM: JAN/FEB 2015 COVER CONCEPT PHOTOS BY © JOHN E MARRIOTT/WILDERNESSPRINTS.COM

TRENDING

What was your most memorable wildlife encounter?

Floating down the Squamish River in Brackendale, B.C., surrounded by hundreds of bald eagles.

—Catherine Boisseau Simard

Hiking in -40 C temperatures through waist-deep snow and coming across a lynx. We shared a moment before we parted ways.

—auraborealis199

Witnessing a feeding-frenzy in the Bay of Fundy between two humpback whales, hundreds of herring gulls, great and sooty shearwaters, a few harbour porpoises and one minke whale. I had to stop taking pictures. All I could do was watch the frenzy unfold.

—Nina Stavlund

About 20 years ago, I was sitting with my back to a small window and I got the feeling that I was being watched. I turned around to see a huge dark head looking in at me. It was a moose helping herself to my vines outside!

—Lynn L. Crawford

Near Mew Lake airfield in Ontario's Algonquin Provincial Park, a wolf came out of the trees, stared at us, kept walking, then doubled back while keeping its eyes fixed on us. Exhilarating!

—Chris Bob Harper

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PULSE

The geography poll

How do you feel about the use of baiting to capture wildlife photographs?

To check out and vote in our latest poll, visit cangeo.ca/poll.

TOP: LISA HUFNAGEL, FIRST RUNNER-UP - WHAT'S IN THE WATER/CANADIAN WILDLIFE PHOTOGRAPHY OF THE YEAR/CG PHOTOCLUB; BOTTOM: MIGUEL LOW FOON/LA BASTIDE PRODUCTIONS/CG PHOTOCLUB

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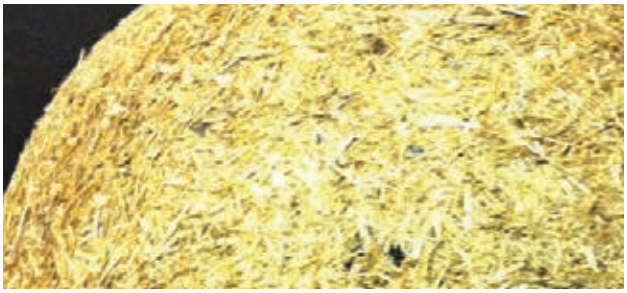
WHAT'S THIS?

Recognize this mystery object and how it relates to Canadian geography and history?

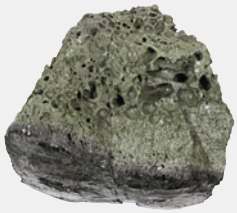


- Visit cangeo.ca/whatsthis for a hint, to enter your guess and for a chance to win one of five copies of *Canadian Geographic Pets Photography 2015* special issue.* Follow @CanGeo for more hints.
- The deadline is March 18, 2015.
- The correct answer will appear in the April 2015 issue.

* Five winners will be randomly selected from all correct responses.

Canadian Geographic and the Canadian Heritage Information Network have partnered to showcase important artifacts from Canadian history and geography. Each object comes from a museum across the country that is part of CHIN's network.

LAST ISSUE'S OBJECT: Impactite from the Manicouagan Crater



Approximately 215 million years ago, a five-kilometre meteorite hurtled toward the super-continent Pangaea and crashed into what is now eastern Quebec, forming a massive 100-kilometre-wide crater — Réservoir Manicouagan, also called the eye of Quebec. The collision was so great the resulting energy fragmented, melted and vaporized the rocks, turning them into impactites. Though erosion has reduced the diameter of the Manicouagan Crater, it can still be seen from the moon.

With files from the Musée de la nature et des sciences de Sherbrooke. Learn more about this artifact and others in the museum's collection at naturesciences.qc.ca.

Explore more stories from Canada's past through cangeo.ca/whatsthis.

LEFT: COURTESY SHAWNIGAN LAKE HISTORICAL SOCIETY; RIGHT: COURTESY MUSÉE DE LA NATURE ET DES SCIENCES DE SHERBROOKE

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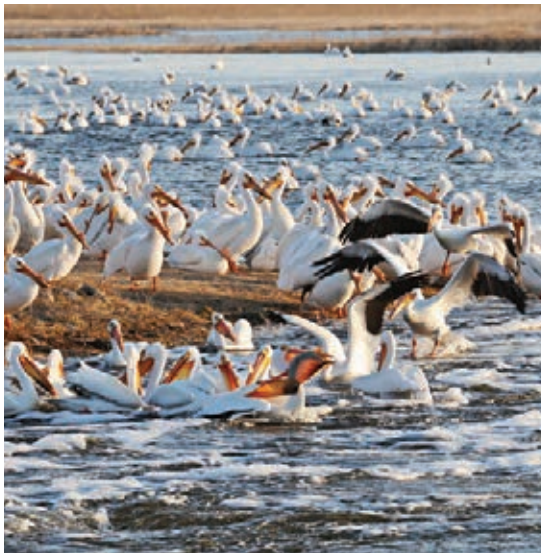
WHERE'S THIS?

Identify this landmark using the following three hints

1. This wildlife preserve was Canada's first protected area for the conservation of migratory birds, including cranes, geese and ducks.



2.

3.

LOWELL STRAUSS/© ENVIRONMENT CANADA 2014; MAP: CHRIS BRACKLEY/CANADIAN GEOGRAPHIC

- Need a clue? Visit cangeo.ca/wheresthis for another hint, then enter your guess for a chance to win a copy of the new *Canadian Geographic Atlas of Canada*.*
- The deadline is March 18, 2015.
- Want more help? Follow us on (@CanGeo) and (facebook.com/cangeo) and watch for the hashtag #hint.

* One winner will be randomly selected from all correct responses.

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YOUR SOCIETY

NEWS FROM THE ROYAL CANADIAN GEOGRAPHICAL SOCIETY

RCGS President Paul Ruest (far left) and CEO John Geiger (far right) at the 2014 Fellows Dinner with eight Canadian astronauts and Governor General David Johnston (centre).

BONNIE FINDLEY/CANADIAN GEOGRAPHIC

OUT OF THIS WORLD

It's no small feat to eclipse a crowd of the country's top explorers, scientists, educators and industry leaders, but eight astronauts have that effect.

Yet when 400 Fellows and supporters of the 85-year-old Royal Canadian Geographical Society gathered at the Canada Aviation and Space Museum in Ottawa for the College of Fellows Annual Dinner on Nov. 19, they were also celebrating the Canadian Space Agency's 25th anniversary. The astronauts, including Roberta Bondar, Steve MacLean and Marc Garneau, received the Society's Gold Medal for their part in a quarter-century of scientific research, space travel and major contributions to our understanding of geography.

As Governor General David Johnston, Patron of the Society, said during the award ceremony, "All of you laureates understand what it means to explore, to add to our store of knowledge and to innovate. Many will build upon your achievements, just as you owe a debt to the stargazers who preceded you."

Johnston officiated at the presentation of eight RCGS awards (see sidebar, RIGHT), including the Lawrence J. Burpee Medal, which went to the Parks Canada team that found Sir John Franklin's wreck *Erebus*. The 2014 Victoria Strait Expedition partners were again honoured for their historic discovery, as RCGS CEO John Geiger, Laureen Harper, wife of Prime Minister Stephen Harper, and Environment Minister Leona Aglukkaq spoke about the find.

Canadian Space Agency president Luc Brûlé shared the keynote speech, about Canada's space heritage and role in international space exploration, with the country's two active astronauts, Jeremy Hansen and David Saint-Jacques. "Together, we're taking the next step in exploration as we continue to venture further away into the cosmos," said Saint-Jacques. "And that can inspire the next generation. That's something the Canadian Space Agency shares with the RCGS: the spirit of exploration and the vision of inspiring young Canadians."

—*Nick Walker*

2014 RCGS AWARD WINNERS

MASSEY MEDAL
For career achievement in the exploration, development or description of Canada
Derald Smith, professor of geography, University of Calgary (awarded previously)

GOLD MEDAL
For a major achievement in the general field of geography
Canadian astronauts Roberta Lynn Bondar, Marc Garneau, Jeremy Hansen, Steve MacLean, David Saint-Jacques, Robert Thirsk, Bjarni Tryggvason and Daffyd Rhys Williams

CAMSELL MEDAL
For outstanding service to the Society
Chris Burn (professor) and Iain Wallace (professor emeritus), geography and environmental studies, Carleton University

LAWRENCE J. BURPEE MEDAL
For making Canada better known on a national or international level
Parks Canada's Vice President of External Relations Andrew Campbell and Underwater Archeology Service members Marc-André Bernier, Ryan Harris and Jonathan Moore, for their role in the discovery of Sir John Franklin's *Erebus*

MARTIN BERGMANN MEDAL
For excellence in Arctic leadership and science
Donald Forbes of Dalhousie University, for his life's work on climate change in coastal Arctic communities

SIR CHRISTOPHER ONDAATJE MEDAL FOR EXPLORATION
For a singular achievement in exploration
George Hobson, for his work as a geophysicist, director of the Polar Continental Shelf Project and leader on past searches for the Franklin expedition

3M ENVIRONMENTAL INNOVATION AWARD
For an innovative contribution to environmental change
Ross Thurston, president and co-founder of the Livestock Water Recycling system

INNOVATION IN GEOGRAPHY TEACHING AWARD
Mike Farley, department coordinator of Canadian and world studies, University of Toronto Schools

To read more about the 2014 RCGS award winners, go to mag.cangeo.ca/winners.

COLLEGE OF FELLOWS ANNUAL DINNER

The 2014 RCGS College of Fellows Annual Dinner took place at the Canada Aviation and Space Museum (ABOVE) on Nov. 19. Among the attendees were (clockwise from TOP LEFT, left to right): Laureen Harper, Parks Canada's Andrew Campbell, Minister of Environment Leona Aglukkaq and RCGS President Paul Ruest; RCGS past-president Denis St-Onge, Robert St-Onge, former Speaker of the House Peter Millikin and Marc St-Onge; the new 2014 RCGS Fellows; Mike Farley, the Innovation in Geography Teaching Award winner, his wife Nandita and Laureen Harper; Elizabeth Dowdeswell, Lt.-Gov. of Ontario; Fellow Jean Fournier; and Fellow Marilyn Dressler and her son Max.

BOTTOM: BONNIE FINDLEY/CANADIAN GEOGRAPHIC; OTHER PHOTOS, THIS PAGE AND NEXT: MATT ZAMBONIN/CANADIAN GEOGRAPHIC

For more pictures from the event, visit rcgs.org/fellows14.

The Royal Canadian Geographical Society

Founded in 1929, the Society is a non-profit educational organization. Its object is to advance geographical knowledge and, in particular, to stimulate awareness of the significance of geography in Canada's development, well-being and culture. Primary fields of interest include our people, resources, environment, heritage and the evolution of our country. In short, the aim is to make Canada better known to Canadians and to the world. *Canadian Geographic*, the Society's magazine, is dedicated to reporting on all aspects of Canada's geography — physical, biological, historical, cultural and economic — and on major issues of concern to Canada in which geographical dimensions play a significant role.

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THE ROYAL CANADIAN GEOGRAPHICAL SOCIETY
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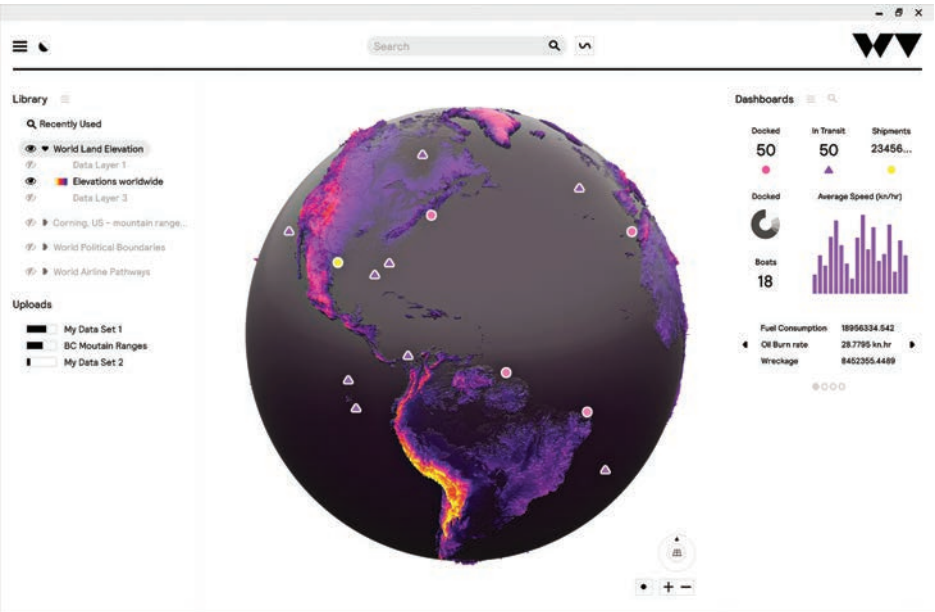
WORLDVIEW SET TO FULFILL 'DIGITAL-EARTH CONCEPT'



In 1998, former U.S. vice-president Al Gore gave a speech titled "The Digital Earth," rhapsodizing about the future of geospatial information. Within years, he predicted, it would change how we understand the world around us. Today, that vision is reaching fruition in a new software package from Calgary-based PYXIS innovation.

Known as WorldView, the PYXIS software integrates geospatial data streams — on the fly — creating 3D maps for analyzing issues. PYXIS CEO Perry Peterson describes it as the first tool to fulfill the digital-Earth concept.

"[Gore's] main metaphor was a child able to zoom in and out and explore the Earth on many levels," Peterson says. "That vision is what's driving many of us interested in creating a new medium to search for and explore information."

WorldView works on a global map made up of cells, each one able to hold and display spatially referenced data, like a super-charged spreadsheet. Say you want to look at moose distribution in Alberta. You'd start with a provincial map and stream in tracking data on moose. Concerned about run-ins with vehicles? Drop in data on roadways, and you'll see where moose populations and traffic concentrations intersect. The more data you add, the more detailed the picture.

WorldView's applications are myriad, ranging from policy and research to business and industry. Education is a particularly important area, and Lynn Moorman, a professor in the department of Earth sciences at Calgary's Mount Royal University and a Canadian Geographic Education executive, is collaborating with PYXIS to develop a version of the software for schools, especially at elementary levels.

"We've been building the interface from scratch, informed by pedagogy and research," says Moorman. "We want something that has an easy flow, that uses a natural language. If I say, 'Here's some information I want,' I can easily visualize it on this technology. Then I can ask specific questions. That's the power of it."

The classroom adaptation of WorldView — funded by Tecterra Inc., a geomatics technology-commercialization agency, and in-kind contributions from Calgary's Connect Charter School and Canadian Geographic Education — goes beyond basic learning, Moorman adds. It also shows students the power of geospatial information and the role it plays in problem solving.

And that may be its greatest value. Says Moorman, "It gets the students thinking about being enablers of a solution."

—Cooper Langford

LEFT: © 2014 THE PYXIS INNOVATION™; RIGHT: REBECCA HALE/NATIONAL GEOGRAPHIC

NEW GIANT FLOOR MAPS

Two new giant floor maps are now circulating schools. *Arctic Alive*, a partnership with the Canadian Museum of Nature, explores the diversity of Canada's North and challenges students' perceptions of the region. *Wild Migrations*, produced with the Canadian Wildlife Federation, is Canadian Geographic Education's first giant floor map of North America and features the migratory paths of 20 species at risk. education.canadiangeographic.ca

VICTORIA STRAIT EXPEDITION

The 2014 Victoria Strait Expedition helped uncover HMS *Erebus*, a lost ship of Sir John Franklin's 1845 Arctic expedition, in September 2014. Through six learning activities, teachers can bring the thrill of the find into the classroom. Download them for free at cgeducation.ca/franklin.

CANADIAN GEOGRAPHIC CHALLENGE

This year the Canadian Geographic Challenge (formerly the Great Canadian GeoChallenge) is completely free and has integrated cutting-edge technology with the support of CG Education's new partner, Google. Registration for school level winners must be completed by February 28 and the qualifying exam for the provincial/territorial level will be held between March 13 and 27. canadiangeographic.ca/challenge

PROFESSIONAL DEVELOPMENT CRUISE

From July 5 to 17, Canadian Geographic Education and Adventure Canada are offering teachers a unique professional development opportunity aboard the *Ocean Endeavour* on a cruise of Newfoundland and Labrador. The cruise will combine the breathtaking landscape of the region with unique learning opportunities, including workshops with Google Education's John Bailey. For more information, visit adventurecanada.com.

—Michela Rosano

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next issue

APRIL 2015

Canadian Geographic's exclusive expeditions coverage

Dana Meise (TOP) with his RCGS flag at Summit Lake, B.C., the Alaska Highway's highest point. A diver with the Sedna Epic Expedition (ABOVE), also funded by the RCGS, navigates pack ice near Labrador.

With a Twitter handle like @TheHikingFool, you've got to suspect that Dana Meise might be a bit loco. When you learn he's hiked most of the 20,000-plus-kilometre extent of the Trans Canada Trail alone, it pretty much confirms he's a different breed.

Had it not been for route-blocking, dangerous blizzard conditions past Whitehorse, the 40-year-old forest technologist from Prince George, B.C., would have completed the cross-country trek of the world's longest recreational trail — a network of nearly 500 trails that connect the nation — in December 2014. Sponsored by The Royal Canadian Geographical Society as its Expedition of the Year, this final leg of "The Great Hike," as Meise's journey is known, was to be 4,500 kilometres from Fort Saskatchewan, Alta., to Inuvik, N.W.T., over six months. Delayed but not discouraged, Meise is going back to complete the expedition in 2015.

While hiking this most recent segment, Meise updated his Twitter, Facebook and Instagram accounts regularly, creating a de facto journal of his jaunt. *Canadian Geographic* has collected the best of his social media missives for our April 2015 issue. It's an enlightening glimpse into the region's geography, people and Meise himself, and is just one part of our feature package highlighting all of the 2014 RCGS-funded expeditions.

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TOP: COURTESY DANA MEISE; BOTTOM: © SEDNAEPIC.COM/JILL HEINERTH

our country

REVEALING CANADA

Robert Bateman

The renowned wildlife painter on how he's inspired by the natural beauty of Saltspring Island, B.C.

Saltspring Island feeds my soul. My home sits on 80 acres, next to a small lake surrounded by pastures and Douglas fir forest. Mount Maxwell hangs in the distance, seeming to rise out of the sea.

Just outside my studio window is a tiny heritage orchard of four or five apple trees, and I often sit and watch the birds at the feeders. A 1930s farmhouse, where my granddaughter was born on the floor, lies beyond, and every time I look at it I'm reminded of family.

A sloping meadow leads to a swamp bordered by tall, dead cedars and teeming with birds. Often in the mornings, my wife and I sit in bed and watch the bald eagles, hawks and Steller's jays from the window. The birds here are a source of inspiration for my work.

Every day after lunch, we hike one of my favourite paths in the world, a grassy old farm road that cuts through the forest. There is a stream that trickles through the woods and pools near this path, and it's full of little fish. Gigantic swamp lanterns, with their big foliage and bright yellow flowers, line the pond and make beautiful reflections in the water.

I have made many trails through these woods, as I've done everywhere I've lived, and each has carefully chosen spots where I can stop to enjoy the view. But there are many parts of this forest I've never set foot on and maybe will never see.

—As told to Michela Rosano

What's your favourite Canadian place? Tell us on Twitter (@CanGeo) using the hashtag #faveplace.

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*Based on a comparison of 2014 EnerGuide highway fuel consumption ratings for 2014 Ram 1500 4x2 with 3.0L EcoDiesel V6 and 8-speed automatic (up to 40 MPG highway) and 2014 Ford F-150 4x2 EcoBoost V6 6-speed automatic (up to 31 MPG highway). [2]Based on 2014 *Automotive News* Full-Size Pickup segmentation. Optional feature available. [3]Based on third-party Canadian competitive "trade-in" data for MY2008 to MY2013 new full-size pickups. [1]Not available on 3.0L EcoDiesel V6 engine. Available on 5.7L Hemi V8 when properly equipped. [4]Based on longevity of entire Ram large pickup segment compared to all competitive large pickups on the road since 1988. Longevity based on IHS Automotive: Polk Canadian Vehicles In Operation data as of July 1, 2013, for model years 1988–2013 for all large pickups sold and available in Canada over the last 26 years.