# INTERNATIONAL

A PUBLICATION OF THE INTERNATIONAL WOLF CENTER SPRING 2018

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# INTERNATIONAL



VOLUME 28, NO. 1

#### THE QUARTERLY PUBLICATION OF THE INTERNATIONAL WOLF CENTER

SPRING 2018



#### What Is The Future for Wolves and Caribou on Michipicoten Island?

Wolves on Isle Royale have been studied for years. Now, a new drama plays out on Michipicoten Island, on the east side of Lake Superior, where the interactions of relatively new populations of wolves and caribou gain attention from researchers and conservationists. The author explains some of their findings.

By Tracy O'Connell



#### Apparent Competition: Predator-Prey Relations in Multi-Prey Ecosystems

Not surprisingly, wolves have been implicated in those habitats where numbers of prey animals are declining. Yet studies where only one predator the wolf—and a single prey species live show that predator and prey populations tend to track each other, and there are multiple reasons for that.

By Debra Mitts-Smith



#### Researchers Visit Wolf Dens to Learn about Pup Survival and Wolf Population Dynamics

As part of a state and tribal project to understand how wolf populations grow, DNR researchers have for several years visited wolf dens in Minnesota to learn about the condition and survival rates of wolf pups. Sam Cook wrote this piece for the *Duluth News Tribune*. Statistics have been updated.

By Sam Cook for the Duluth News Tribune

#### Exhibit Pack members Luna and Boltz in 2012.

#### On the Cover

Photo: Adobe Stock/H. Kuchera

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# From the Executive Director

# Do We Use Technology? Lend Me Your Ear, My Friend

t a dinner party over the holidays, friends and I got to talking about my job at the International Wolf Center. I fielded the normal questions about wolves and our Center's work regarding education. But then came an unexpected question. "How much do you use technology at your non-profit?" a friend asked.

The question felt as if it carried an implication—as though surely a non-profit couldn't



Rob Schultz

be on pace with the rest of the world when it comes to technology. After the bruise to my non-profit ego healed, I went on an extended technology-related rant.

Obviously, my friend had no idea how we use technology to support our mission and connect with people around the world. From our interpretive center in northern Minnesota, our employees use video conferencing to present live classroom programs to schools throughout North America. In the wolf enclosures, webcams broadcast live video of our wolves 24/7. And nearly 2 million people visit our wolf.org website annually to learn about wolves, download wolf research and scientific papers, and to dis-

cover all the ways the Center is making a difference.

I particularly enjoyed seeing the surprised look on his face when I shared that our wolf curator Lori Schmidt's popular YouTube channel had just surpassed 42,000 subscribers. Then there's our Facebook page, the Twitter feed, our wolf photo collection on Pinterest, and even a "Wolf Quest" app for your smartphone that our staff helped develop! Heck, we even use computers to watch the movement of wolf packs in the wild through GPS signals.

And little did he know...I was just getting started.

Behind the scenes right now, we're preparing to overhaul our "Wolves and Humans" exhibit at our interpretive center in a cutting-edge way. Among suggestions for the new exhibit are a howling simulation room, an animatronic wolf and the introduction of augmented reality!

Yes, we love to use technology. We use it well, and we always aim to use it better. Educating the world about wolves isn't an easy task, but technology allows us to keep in contact with our members around the world. We'll be using every tool imaginable to fulfill our mission.

Sincerely,

Rob Schultz Executive Director

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# What Is The Future for Wolves and Caribou on Michipicoten Island?

The Isle Royale ecosystem has been a focus of research for several years as the wolf population declined, and as a result, the number of moose on the island rebounded. Now, a new drama is playing out on another Lake Superior island and gaining attention from conservationists and researchers.

Michipicoten Island lies just 10 miles (16 kilometers) offshore within the Canadian province of Ontario, and has been under the jurisdiction of Ontario Parks since the mid-1980s. The 71-square-mile (183-square-km) island's native caribou population died out from over-hunting in the mid-1800s. In 1981, a single bull caribou was observed on the island, presumably crossing on a winter ice bridge. The following year, in an effort to repopulate Michipicoten's historic stock of the species, the Ontario Ministry of Natural Resources relocated seven caribou there from the Slate Islands, an archipelago of small islands in northern Lake Superior that had been home to Ontario's largest herd of these ungulates. The new herd grew-at times reflecting the largest growth rate seen anywhere for these animalsand reached an estimated 680 members by 2011.

In 2014, four wolves crossed an ice bridge from the mainland onto Michipicoten Island and bred in this isolated environment perfect for a predator-prey study similar to that on Isle Royale. Some have suggested the wolves will eradicate the caribou this year—especially if a second pack with a breeding pair splits off. Six of the Michipicoten

By TRACY O'CONNELL

Some have suggested the wolves, which now are believed to number about 20, will eradicate the caribou this year—especially if a second pack with a breeding pair splits off.

wolves were collared in 2015 by Brent Patterson, a research scientist for the Ontario Ministry of Natural Resources and Forestry, but only three collars are still sending data. Patterson that year found the caribou population to be down to approximately 300, roughly half of its highest estimate, according to an article on *National Geographic's* website.

#### Michipicoten Island and the Ecological Significance of the Study

Michipicoten is the third-largest island in Lake Superior (after Isle Royale and St. Ignace), which itself is the largest of the five Great Lakes lying between the United States and Canada. The island is in the northeastern part of the lake. It is 16.8 miles (27 kilometers) long and 6.2 miles (10 kilometers) wide at its widest point.

The name is an adaptation of Mishipikwadina, the term for "big bluffs" used by the Ojibwe, native peoples living in Canada and the northern United States. Their name for the island refers to the geography bordering the mouth of the Michipicoten River on the nearby mainland. Made up of ancient lava bedrock and heavily forested with several inland lakes, Michipicoten has been termed a "floating island" in the lore of the Ojibwe people because a frequent fog layer affects one's experience of the island's apparent size, location and other features. Shrouded in mystery, it was believed to be a place of malevolent spirits and giants.

The island was once a source of copper for Ontario, recognized on French maps as early as 1647 with accounts of malleable surface copper. Serious mining attempts were made for about 50 years starting in the mid-1800s. A lighthouse was established in 1912 on the eastern end of the island and staffed until 1988.

Slate Islands

Canada

Lake Superior

Isle Royale

During the spring, summer and fall, sea kayakers visit the island, some as part of commercial tourism ventures, for stays of up to a week. Other visitors are owners of small, private landholdings, and commercial fishers. Charter boat and float plane are the typical ways to access the island, where abandoned mines and ramshackle buildings are scattered across the interior, and a couple of shipwrecks litter the waters near shore. In winter it is usually uninhabited.

Michipicoten Island

United States



There is a third player in the wolf-caribou drama—the beaver. With as many as 1,300 active lodges, beavers...provide a dietary mainstay for the wolves on Michipicoten during much of the year. The caribou of Michipicoten are considered ecologically important because they are, along with those of the Slate Islands all that "conclusively and verifiably remain" of a population once found throughout the federally-recognized ON6 Lake Superior caribou range, according to a 2012 report by the Canadian Wildlife Service. The 2016 caribou survey by the Ontario Ministry of Natural Resources and Forestry/Parks Canada failed to conclusively observe any caribou remaining along the north shore of Lake Superior, meaning that possibly, the region's only surviving animals are on these islands.

# Other Factors Complicate the Scenario

There is a third player in the wolfcaribou drama on Michipicoten—the beaver. With as many as 1,300 active lodges in autumn 2015, beaver numbers are higher on Michipicoten than researcher Patterson has seen anywhere else in North America. The animals provide a dietary mainstay for the wolves on Michipicoten during much of the year while still keeping their numbers strong. During the winter, when beavers are locked under the ice, caribou become the main menu option for the wolves.

It might seem this narrow window of vulnerability would not be so hard



on the caribou, but the beaver presence upsets the balance between caribou and wolves. If the caribou were the only food source for the wolves, their declining numbers would result in a lower wolf population. The secondary food source, however, keeps the wolf numbers strong while the caribou struggle to repopulate in the presence of the predators. (See the effects of this phenomenon elsewhere in North America, page 9.)

A similar situation seems to be playing out to the north. While the Slate Islands once had the larger caribou population, perhaps as high as 650, today far fewer of the ungulates survive on the Slates, according to Steve Kingston, a biologist at Ontario Parks. Winter ice bridges in 1994, 2014 and 2015 brought wolves to the Slates but by autumn 2017 there was no sign of continued wolf presence. A 1999 study of the stomach contents of one wolf that died in 1996 on the Slates showed it had recently fed on beaver, not caribou.

Last fall the Canadian Broadcasting Corporation (CBC) reported several voices calling on the ministry to relocate the wolves from Michipicoten to protect the caribou that remain. One location that has been suggested: Isle Royale, which lies across Lake Superior in United States waters off Minnesota. Others urge that instead, the caribou should be moved to save them. Possible destinations include the Slate islands, and Leach and Montreal Islands in Lake Superior, where populations of caribou were killed off when winter ice bridges brought wolves.

In December 2017 the Minister of Natural Resources announced that some caribou would be moved from Michipicoten to the now predator-free Slates in January 2018 to help ensure the persistence of coastal caribou. Research scientist Patterson, who also teaches part-time in the graduate Environmental and Life Sciences program at Ontario's Trent University, will continue to lead the ministry's study of wolves on both Michipicoten and the Slate Islands as part of a team that will investigate this interplay of species.

These are not the first studies of caribou and their predators in this region. Canadian caribou expert Arthur



T. Bergerud decades ago proposed a test to assess the viability of "the range hypothesis versus the predation hypothesis" for explaining caribou population declines. Bergerud, a population ecologist researching caribou in North America since 1955, is considered the world's foremost authority on the wood-land caribou. His 30-year study (1974 to 2004) of two caribou populations, one in Ontario's Pukaskwa National Park and the other on the Slates and neighboring islands, is considered the most comprehensive ever done on the animals.

"Range" in Bergerud's hypothesis refers to the ability of the caribou population to increase despite the lack of lichen on the Lake Superior islands. Lichen had long been believed to be a mainstay of the woodland caribou's winter diet, but this was disproven with Bergerud's research, which saw caribou numbers increasing on the relatively lichen-free islands. The predation hypothesis stated that with the appearance of wolves, the caribou numbers should decline. Due to the lack of predators on the Slates and neighboring islands when the study was developed, Bergerud used a comparable setting-a national park on the Canadian mainland—to see how wolves affected the caribou. Caribou numbers did decline in the presence of wolvesnot only in the initial Ontario park setting, but in each instance where wolves subsequently arrived via ice bridge on islands populated by caribou.

Bergerud and his research colleagues, writing in 2007, said, "These studies strongly support the idea that ecosystems without predators are limited bottom-up by food, and those with wolves top-down by predation; however, the proposed crucial test that has been initiated on Michipicoten Island remains to be completed, and population numbers offer a limited window of opportunity for unequivocal results."

#### Additional Reading

Bergerud, et. al, Woodland caribou persistence and extirpation in relic populations on Lake Superior, Rangifer, Special Issue No. 17: pp. 57-78, 2007.

Environment Canada. 2012. Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal population in Canada. Species at Risk Act Recovery Strategy Series.

Tracy O'Connell is professor emeritus at the University of Wisconsin-River Falls in marketing communications, and serves on the Center's magazine and communications committees.



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# Apparent competition: Predatorin

Adobe Stock / Jillian

www.wolf.org

For more than a decade concern has grown about a decline in the number of moose in northeastern Minnesota and woodland caribou in certain parts of British Columbia. Many fear that both these iconic ungulates are on the road to extinction in those areas. Not surprisingly, the predator that shares these habitats—the wolf—has been implicated as a cause behind both declining populations.

Yet studies of single predator-prey ecosystems such as Isle Royale, where there is one predator (the wolf) and one prey species (the moose) show that instead of the predator rendering the prey species extinct, the predator-prey populations tend to track each other. When the moose population increases, the number of wolves subsequently increases; more moose mean more food for wolves, and more wolves survive. With more wolves surviving, predation on moose increases, resulting in a decline in moose population. As the moose population dips there is less food for wolves, so fewer wolves survive. With fewer wolves hunting, more moose survive into adulthood, and their population begins to increase—and the cycle begins again.

But ecosystems are complex, and many factors can affect predator-prey numbers, including weather, climate change, poor nutrition, disease, ticks, habitat loss and human hunting. Two recent studies highlight yet another factor that may be contributing to the decline of moose in northeastern Minnesota and caribou in the rain forests of British Columbia.

These two regions are multi-prey ecosystems, meaning that there are mul-

tiple prey species available for wolves to hunt and consume. Shannon Barber-Meyer and Dr. L. David Mech explain this in their paper, "White-tailed Deer (Odocoileus virginianus) subsidize Gray Wolves (Canis lupus) During a Moose (Alces americanus) Decline: A Case of Apparent Competition?" In multi-prey systems, when one prey species declines, the predator population can also go into decline (as in a single-prey system) or it can expand its diet by hunting and feeding on an alternate prey species. In this case, the predator's numbers continue to increase because its diet is supplemented by the alternate prey species; at the same time, the predator also continues to feed on the primary prey species, thus reducing it. Wildlife biologists call this phenomenon "apparent competition." Barber-Meyer and Mech describe this as occurring "when two prey species negatively interact through the sharing of a common predator."

Barber-Meyer's and Mech's study focused on the predator-prey dynamics of a multi-prey system located in the east-central Superior National Forest in northeastern Minnesota. The wolves there have three prey species available: moose, white-tailed deer, and beavers, with deer being most abundant. From 2006 to 2016, the moose population in this region decreased by 55 percent, from approximately 8,900 to 4,000. The investigators sought to determine whether wolf numbers also fell, or whether wolves supplemented their diets by eating more of an alternate prey source, in this case, deer. The biologists compared wolf numbers and diet by analyzing wolf scats

# Prey Relations Multi-Prey Ecosystems

By DEBRA MITTS-SMITH

before and after the moose decline. To estimate wolf numbers, they tracked and counted radio-collared wolves in the scat study area.

Their study revealed that as the moose population declined by more than half, the wolf population almost doubled during the same period (from 23 during 2001-2002 to at least 42 in 2010-2011 and a minimum of 37 in 2012-2013). The wolves' most common prey were deer (fawns and adults), followed by moose calves and beavers. Barber-Meyer and Mech suspect that wolf numbers did not initially decline along with the dip in moose numbers because of the abundance of white-tailed deer in the study area, suggesting that apparent competition may be at least partly responsible for the continued moose decline. Wolves began eating more deer, and deer supported the higher wolf population.

At the same time, the increased number of wolves did not stop preying on moose calves, which in turn contributed to the continued drop in moose numbers. Wolf numbers, however, did not decline for several years. The results of the Barber-Meyers and Mech study suggest that the wolf-moose-deer relationship may be an example of apparent competition.

Finally, it should be noted that following the conclusion of this scat study, Barber-Meyer and Mech found that wolf numbers also began to decline. This suggests that the white-tailed deer population, which at first supplemented the wolf's diet, began to decline because of the increased wolf predation on it. The drop in deer numbers as well as the decreased moose population eventually began to limit wolf numbers.

A second study, "Experimental Moose Reduction Lowers Wolf Density and Stops Decline of Endangered Caribou," led by biologist Robert Serrouya investigated the role of apparent competition in the decline and recovery of woodland caribou in British Columbia. Extensive logging opened up forage in the Columbia and Cariboo mountain ranges, triggering an influx of moose into a region once dominated by caribou.

Moose are considered an invasive species there; they are also the primary



more predator species." By removing the moose, one could indirectly reduce the number of wolves. Serrouya and his team used this approach to test whether reducing the moose population to earlier levels would lead to fewer

> wolves, thereby helping caribou recover.

The team established a "treatment" area and a "reference" area in the Columbia and Cariboo mountain ranges. In the treatment area, they increased human hunting to reduce the moose population. Three caribou herds inhabit that area. The reference area had two caribou herds and no

moose reduction. Moose reduction was prey of wolves, the main predator in the area. An increase in moose meant more food for wolves. So even though caribou declined, the influx of moose helped sustain the wolf population. Wolves began to consume moose while continuing to feed on, and thus limit, the caribou population. The moosecaribou-wolf relationship suggests a

case of apparent competition. Serrouya and his co-authors identified three possible ways to help the caribou recover:

1. Reduce or eliminate logging in the caribou range, which would in turn reduce the food supply for the invasive moose. To reverse the adverse effects of deforestation, however, takes time, which the caribou in this region do not have.

2. Reduce the number of wolves, which has been useful in other regions where caribou herds are at risk of extirpation. However, for this to be successful, it needs to be an ongoing process because wolf numbers can quickly recover. Further, the removal of wolves has become controversial.

3. The option taken by the Canadian government: manage the moose population. Underlying this option is the concept of apparent competition "which can occur when a novel prey species colonizes a new area, stimulating an increase in the abundance of one or initiated in 2003, but to understand population trends and dynamics of these three species, the study's authors collected, evaluated and compared data on caribou, moose and wolf numbers before and after the moose reduction began, from 1992 to 2014.

The study revealed that the moose population in the treatment area fell by 70 percent, while there was no decline of moose in the reference area. Wolves in the treatment area also declined due mainly to dispersal, but also to starvation and a low pup-survival rate. The caribou herds continued to decline in the reference area while the largest herd in the treatment area has remained stable for 14 years. Still, the authors point out, the stabilization of a caribou herd, although encouraging, does not signal recovery. Instead, they warn that although limiting or reducing the number of moose helped stop the caribou decline, growth and recovery of the caribou most likely will require both habitat protection and a direct reduction of wolves by hunting, trapping or other control measures.

So are wolves responsible for the decline and possible extinction of the moose in northeastern Minnesota and the caribou in British Columbia? On the surface, these two studies suggest that wolf populations, instead of decreas-

ing as the moose and caribou decrease, are instead increasing and continuing to hunt and consume both moose and caribou. But they also suggest that the underlying cause of the increase in the wolf populations is not increased appetite or ravenous behavior on the part of wolves. Instead, it is the presence of an alternate prey species that helps keep wolves fed and their numbers high. In addition, the mere vulnerability of any of these prey animals to wolves is usually related to other factors including weather, diseases and parasites.

These studies reveal the complexity of ecosystems where a range of variables are at play, including weather and climate change; disease; the kinds, numbers, and sizes of predator and prey species; human disturbance and destruction of habitat; and hunting and nutrition. The interconnectedness and mutability of these factors underscore the difficulty in trying to understand, disentangle, and reduce or eliminate them to save a species from extinction.

The simple answer is not always so simple.

#### Additional Reading:

- Barber-Meyer, S. and L.D. Mech. "White-tailed Deer (Odocoileus virginianus) Subsidize Grey Wolves (Canis lupus) During a Moose (Alces americanus) Decline: A Case of Apparent Competition?" The Canadian Field Naturalist 130 (4) (2016): 308-14.
- Mech, L.D. The Wolf: The Ecology and Behavior of an Endangered Species. Garden City, NY: Natural History Press, 1970.
- 🐏 Serrouya, R., B.N. McLellan, H. van Oort, et al. "Experimental moose reduction lowers wolf density and stops decline of endangered caribou." PeerJ 5:e3736; DOI 10.7717/peerj.3736 2017.

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# Researchers Visit Wolf Dens to Learn about Pup Survival and Wolf Population Dynamics

This article was originally published in the *Duluth News Tribune* in April 2016. Data on Minnesota wolf population has been updated. The author, Sam Cook, has written about outdoors topics in northern Minnesota for more than 35 years. From somewhere in the dark recesses of the den came nearly inaudible squeaks and whimpers. Carolin Humpal, a wildlife research biologist for the Minnesota Department of Natural Resources, had already peeked inside. She knew what she would find once she slithered head-first down the entry hole and into the den.

A pile of wolf pups. Maybe two weeks old. Five of them.

Humpal and a team of other wildlife biologists had come to examine the pups and place a trail camera outside their den. The research is part of a state and tribal effort to better understand the dynamics of Minnesota's wolf population.

"It's a component of our broader wolf monitoring," said the DNR's John Erb, a wolf research biologist based at Grand Rapids. "The pup part of it is kind of a pilot project. We're trying to get some experience with locating dens, and we're looking at options for monitoring dens and counting pups."

The work eventually will help wolf researchers monitor pup survival and learn more about what factors influence that survival, Erb said. Minnesota's wolf population was estimated at about 2,856 in 2017, according to the DNR.

This den was just west of Cloquet on land owned by the Fond du Lac Band of Lake Superior Chippewa. The band's Resource Management Division is working with the DNR on wolf research. Along with Humpal on this mission to find wolf pups on a mid-April afternoon were DNR wolf research biologist Barry Sampson; Mike Schrage, wildlife biologist for the Fond du Lac Band; and Terry Perrault, a technician for the Band's Resource Management Division.

#### Tough to find

Just finding the den was a challenge. It had taken five researchers, walking abreast at intervals through the woods, nearly an hour to locate the den. Working from mapped GPS-tracking movements of a radio-collared adult wolf in this pack—though not the pups' mother— Schrage had led us to this patch of woods. We were looking for a hole in the ground with freshly excavated dirt all around.

"Found it!" Sampson called out finally. He and Humpal assumed the female wolf that had given birth to these pups was somewhere not far away, observing our visit and waiting for us to leave. The pups' mother is part of a pack estimated at five wolves in all, Schrage said. The den site is in an area near homes, small farms and paved roads. Yet the wolves go mostly unnoticed.

"They've probably been there for years," Schrage said, "and yet mostly they stay out of sight and conflict with people."

#### Entering the den

Now it was time to go to work. Humpal scooched down the entry hole until only her lower legs and boots remained outside. Later, she described the five pups she saw.

"They were all piled together," she said. "It was still fairly chilly, so they have to be huddled up together to share body heat."

The pups' eyes were open, indicating they probably were a couple of weeks old, Sampson said. Although they moved away from Humpal a bit, she said the plump little furballs didn't struggle as she picked them up one at a time and handed them out to Sampson.

He checked their physical condition and determined whether they were males or females.

Perrault eased the pups into soft flannel bags. He weighed them quickly about 3½ pounds each. Schrage recorded the pups' weights and genders — four male, one female. One by one, the pups went back to Sampson and then to the waiting hand of Humpal, who still was mostly inside the den. Each pup was back in the den within less than a minute.

"Nice belly," Sampson said, inspecting the plump tummy of one pup before it went back to Humpal.

After work at the wolf den is completed, Department of Natural Resources wildlife research biologist Barry Sampson smooths dirt near the mouth of the den to help remove human <u>scent</u>.

The biologists performed their tasks quickly and in hushed voices. These intrusions at dens are kept to a minimum, Sampson explained, to disturb the wolves as little as possible. All of us wore rain gear to minimize our scent, and we had been sprayed with a scentmasking compound. Everyone wore latex gloves.

In less than 15 minutes, with all work completed and a trail camera hung on a nearby tree, the biologists left the site. Sampson had smoothed the dirt at the edge of the den. The pups were all in a heap again.

Their mother was never seen.





#### The value of research

So far, researchers have visited and inspected pups at a dozen to 15 dens in the past three or four years, the DNR's Erb said. Pup counts and pup survival are not a necessary component of the DNR's wolf population estimates, he said. But tracking birth and death rates, as DNR researchers do for some other species, could help the agency develop better population models, he said.

In addition, better understanding of wolf pup survival could help researchers relate that information to other wolf population factors such as prey density or the presence of parvovirus, Erb said.

Following our visit to the den site, it was difficult to know what effect the intrusion would have on the pups' mother, the DNR's Sampson said.

"There's no doubt she's going to know we've been here," Sampson said. "The question is whether it's enough to make her move them."

"Any time you visit the den of an animal, at some level there's an effect," Erb said. "Our early experiences combined with results from pup studies in Ontario and Idaho suggest that some will move pups to a new den after a visit."

But there's no information yet, he said, that it has any important effect on pup survival, even in studies that have deployed radio-collars on pups or surgically implanted radio-transmitters.

And often, wolves change den sites even without human intrusion, he added.

A wolf pack and its pups typically remain associated with a den site through early to mid-summer, Erb said. Later in summer, the pack often moves to a Left: Minnesota Department of Natural Resources wildlife research biologists Carolin Humpal (left) and Barry Sampson (right) confer with Mike Schrage, wildlife biologist at the Fond du Lac Band of Lake Superior Chippewa, over a map showing the likely location of a wolf den west of Cloquet.

Below: Terry Perrault, a resource management technician with the Fond du Lac Band of Lake Superior Chippewa, holds a wolf pup about 2 weeks old that had been temporarily removed from its den by wildlife biologists.



Aike Schrage, wildlife biologist for the Fond Du Lac Banc

so-called rendezvous site. The pups are more mobile then, he said, but are not yet hunting with the pack. In fall, when the pups are large enough, the rendezvous site becomes less important, and the young wolves begin traveling more with their parents.

According to the Minnesota DNR, during mid-winter 2016-2017, Minnesota hosted 508 packs, with an average pack size of 4.8, and an estimated 2,856 wolves. Pack size typically doubles once pups are born in the spring. But not all of them survive through the next year. Along with some mortality among adult wolves, that typically brings wolf numbers back down to near the previous mid-winter's level, researchers say.

# Tracking the Pack

## Seasonal Tests, Magnified by Medical Concerns

#### by Lori Schmidt

S ince the International Wolf Center's wolf management program began in 1989, wolf care staff members have had many years to study the intricate details and dynamics within a wolf pack. From the development of the neonate wolf pup to the aging of a retired pack member, understanding individual wolf behavior and interpreting the influence on the pack is critical. Wolf care team members are on site 365 days a year, charged with the task of employing the best management practices to ensure the physical and social needs of the ambassador wolves are met.

The winter of 2017-2018 heightened the staff's observational skills when Aidan, the Exhibit Pack's dominant male, was scheduled for surgery in early November to remove what would be his second mast-cell tumor in six months.

Aidan had become the Exhibit Pack's dominant male in February 2011 after former pack leader Shadow was retired in July 2010. Winter is the time for seasonal hormones that typically heighten dominance behavior in our wolf pack. The bad timing of Aidan's medical condition was exacerbated by the fact that Axel and Grayson, new pups in 2016, were reaching maturity and had begun testing social limits as a form of rankorder dominance. Even in the calmer summer season, removing the pack leader-if only for a brief period for medical care—can cause the other pack members to test for status when they are reunited. So taking a leader out of the

> Aidan is nearing 10 years of age about the age at which a change in pack leadership typically occurs.

pack at the height of the winter hormonal season was not a decision made lightly.

Why not just do the surgery and retire Aidan early? Not an option. While Aidan's physical presence may have been weakened by his medical issues, his social presence in the pack was strong. So, rather than take Aidan out to do the surgery, the staff moved the pack to the retirement area, and Aidan's recovery took place within the Wolf Care Center and adjoining exhibit space, out of view of the rest of the pack.

Six hours elapsed before staff let the pack members return—first Axel and Grayson as juveniles, and two hours later Boltz and Denali, the higher-ranking wolves, were reunited. By then, Aidan had fully regained his faculties after surgery and was waiting, with a dominant posture and a possessive greeting, over the food resources used as a distraction.

As far as the pack knew, Aidan had not been removed from the pack; the pack had been removed from Aidan. Rather than testing Aidan upon reuniting, the pack merely resumed its regular

social order—and the wolf care staff heaved a great, collective sigh of relief.

Veterinary plans for wolves must include behavioral aspects as well as medical considerations. To see the video of Aidan's surgical recovery, check out the archived video on the Center's YouTube channel – November 17, 2017.

Aidan maintains a leadership role despite his age, and it was important that his surgery didn't affect his status in the pack. Wolves clockwise: Axel, Aidan and Grayson



### INTERNATIONAL WOLF CENTER Member Profile

# "Mind-full" of Wolves

by Madison McHugh

Solution of the realized that he didn't want to continue his education in biology. But after working in the IT world for many years, Ted decided it was time to make another change and start living a life that reflects his values.

Nowadays, when he is not daydreaming about wolves or far-off worlds, Ted stays busy teaching at the University of Massachusetts Center for Mindfulness. He also hosts two very successful podcasts. *The Secular Buddhist* boasts more than 1.5 million downloads—and he has completed more than 100 epi-



sodes of his newer podcast, Present Moment: Mindfulness Practice and Science.

Ted received his bachelor's degree in biology at Lake Forest College in Illinois. It was there that his journey with wolves began. While he was studying wolves for a research paper, and the International Wolf Center was under construction in Ely, Ted had the opportunity to hear Dr. L. David Mech speak in Illinois, and he shared his excitement with his family-where, he admits, he'd have to compete with his brothers for the title of "biggest wolf lover."

An education-focused, science-based approach to learning and teaching about wolves is something that Ted appreciates about the Center. His only complaint is that the Center is too far away from his forested home in Massachusetts. Although there are no wolves where Ted lives, he and his wife enjoy watching moose, coyotes and bears. (The bears are more popular when they aren't destroying the family's bird feeders).

Ted has purchased the Center's adoption kits for Axel, Grayson and Grizzer. He loves watching the wolf cams online at wolf.org to check up on the ambassador wolves' development and activity. After watching the webinars and videos offered by the Center, Ted noticed a lot of similarities between the behaviors of



the wolves and his own "pack." When Boba (a Chihuahua) beats up on Pogo (a Brittany Spaniel cross) Ted is reminded that size does not always correlate to dominance.

One of Ted's fondest wolf-related memories is from a stay at a cabin in Wisconsin with his brother. They had heard that a wolf pack frequented the area, so Ted gave a wolf call. Both were surprised when they received a response. Ted also attributes many fond memories to the interpretive center in Ely. He appreciates the fact that there are so many different ways to connect with the Center online and in person.

Thank you, Ted, for your membership support of the educational mission at the International Wolf Center!

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Axel (left) and Aidan (right)

# How Do Wolves Keep Warm?

By Laura MacDonald and Morgan Roppe

During winter, humans put on coats, hats, mittens and boots to go outdoors.

Do wolves wear hats? No! But they have **adapta-tions** that help them stay warm outside in the snow.

Adaptations are physical traits that have evolved to keep an animal alive. Wolves have very thick fur that keeps them warm all **winter**.

The wolf's fur, or **pelage**, has two **layers**. The **guard hairs** grow up to four inches long, and protect the wolves from rain, wind and **snow**. The **undercoat**, beneath the guard hairs, grows thick and soft in the fall to trap air and insulate the wolf

from cold weather. These layers are so warm that wolves can tolerate temperatures far below zero. Snow doesn't even melt when it falls on wolves' fur. In spring, the wooly inner layer is **Shed** to keep the wolf cool during the summer. It comes out in clumps and often gets stuck on branches or bushes as wolves brush against them.

Wolves also use behaviors to keep warm. They curl up by themselves or near other wolves to keep warm. You can see examples in the pictures of Boltz, Axel and Denali.

### Word Find

ZG

Use the Word Bank below to find as many words as possible in the Word Find puzzle. Words can run horizontally, vertically or diagonally.

S	D	Ρ	Х	W	D	W	Ν	I	Ν	
Ρ	R	Е	Е	0	Μ	I	0	С	D	
W	Е	I	Н	Ν	Α	Ν	I	Х	Ρ	
С	Q	L	Α	S	F	Т	Т	Н	J	
Η	Н	Н	Α	Н	V	Е	Α	Ρ	F	
G	G	W	D	G	D	R	Т	Η	Q	
Ε	С	Κ	Т	Q	Е	R	Ρ	Ν	W	
U	Ν	D	Е	R	С	0	Α	Т	J	
S	R	Е	Υ	Α	L	F	D	U	Q	
Υ	Δ	Q	0	D	Δ	н	Δ	Y	G	

Guard Hairs Undercoat Pelage Shed Adaptation Snow Winter Layers



# **Hunting Prey**

Wolves hunt many different kinds of prey such as ungulates, rodents and rabbits.

**Ungulates** are large animals with hooves, such as deer and moose. Working together in a pack, wolves can kill a deer or even a big moose, even though these animals are much larger than they are. The smaller prey, such as beavers and rabbits, are easier for one wolf to hunt by itself, but the wolves need more of these prey animals to feed the pack.

Wolves in Minnesota eat mostly white-tailed deer. Deer eat plants, which makes them **herbivores**. Wolves eat meat, so they are **carnivores**.

A wolf has a great sense of smell, and can smell its prey from more than one mile away! Once they find the prey, wolves use their strong teeth to pull their prey to the ground. Deer can defend themselves from the wolves—they can kick with their hooves, and the males have antlers on their heads that can hurt or kill a wolf.

In the winter, deer have a more difficult time avoiding wolves. Their thin legs and sharp hooves sink down in the snow, making it harder to run. Wolves, however, have an easier time hunting in the winter. They have very big feet, which act like snowshoes and help the wolves walk and run on the snow. A pack of wolves walks in a single-file line so the snow packs down, and wolves in the back don't use up as much energy walking through soft, fluffy snow.



Antlers Large Paws Hooves Herbivore Strong Teeth Great Sense of Smell Carnivore Pack Ungulate

# Wolves of the World

# Habituation, Recolonization, Hybridization and Inbreeding: **Topics of Study**

by Tracy O'Connell

#### ISRAEL

A spate of wolf attacks on humans in 2017 has drawn considerable media attention. Ten attacks last summer, in a narrow stretch of the Judean Desert between popular tourist locales along the shore of the Dead Sea, have resulted in warnings to campers, especially those with young children. Children who were attacked were rescued by adults with only minor wounds but underwent precautionary treatments such as injections against possible rabies. Rangers destroyed one offending wolf and translocated another. Wolves number between 100 and 150 in Israel; about 20 are believed to be living in the area where attacks occurred.

Authorities identify habituation as the cause of the problem, citing instances of hikers and campers who make food available to wild scavengers, and have little awareness of how to be safe around wild animals. Rangers are posting warning signs for people, and using paintball and pellet guns, among other non-lethal techniques, to scare the wolves from camping areas.





Above: Two wolves in a pack of at least four are photographed in a nature reserve near Rome.

Left: Romulus and Remus, founders of Rome, are *depicted in a wolf statue.* 



#### ITALY

For the first time in more than a century, wolves are living near Rome, where legend says the founders of that historic city, twin brothers Romulus and Remus, were foundlings suckled by a wolf. The modern-day pack of two adults and at least two grown pups has been photographed by trap cameras in a nature reserve.

An estimated 1,500 to 2,000 wolves live in Italy, mostly in the Apennine Mountain range and the Alps, the Christian Science Monitor reports, noting, "Every few months an Italian landowner, angry at having lost livestock to lupine jaws, will shoot a wolf and dump its corpse by the roadside—sometimes mutilated or decapitated—in protest against government policy." The Monitor adds that last year Italian regional governments approved a limited cull of wolves, the first in 46 years, but 200,000 people signed a petition against it, and the plan was dropped.

Tracing the incursion of wolves across Europe in recent years, the Monitor cites "rewilding" as a cause, noting, "As farmers across the continent abandoned economically unproductive small farms and sought easier lives in towns, large tracts of countryside have reverted to woodland, creating new habitat for large animals. Italy, for instance, now has twice as much forest and woodland as it did at the end of World War II; 35 percent of the country is covered in trees."

The *Monitor* describes Rewilding Europe, a conservation movement founded in 2011 that works throughout the continent to restore a million hectares (nearly 2.5 million acres) to wilderness by 2022. The organization



would like to see wild horses of the type seen in prehistoric cave drawings in France and Spain, as well as European bison and ibex reintroduced to areas they once inhabited. Rewilding Europe maintains that the presence of big mammals would encourage eco-tourism and help people in parts of Europe that suffer from high unemployment.

Interestingly, a similar finding appeared last September in *The Economist*, a weekly international news magazine, which reported that France has experienced a return of forest cover to a third of its rural area formerly farmed or mined, and similarly suggested tourism prompted by native fauna might be an antidote to a sluggish economy.

Experts say the medium-sized Roman wolves pose virtually no threat to humans, nor are they a menace to livestock—contrary to wolves throughout the rest of Italy. Analysis of their excrement has shown that their diet is made up exclusively of wild boars that roam the countryside around the capital in ever-increasing numbers.



#### RUSSIA

An archaeology website, www. ancient-origins.net, reports that remains of dogs and wolves found at the Srubnaya-culture settlement of Krasnosamarskoe in the Russian steppes, dating back 4,000 years, indicate that participants in a ritual ate the sacrificed canids.

"Researchers suggest that the peculiar finds could possibly provide the first archaeological evidence of war bands made up of male teenagers as they are described in ancient texts," the report states, adding that such initiation ceremonies "correlate with myths mentioned in texts from as early as 2,000 years ago by speakers of Indo-European languages across Eurasia."

Not everyone agrees with the theory; opponents counter, "Indo-European mythology suggests that Late Bronze Age folks regarded dogs as having magical properties and perhaps ate them in rituals of some kind. But no other archaeological sites have yielded evidence for teenage male war bands or canine-consuming initiation rites."



#### SCANDINAVIA

Inbred wolves is a topic of concern in Norway and

Sweden, which share a wolf population along a long border. It has long been known that Scandinavian wolves are descended from just a few animals that first populated the region more than 30 years ago. Researchers have now studied the genome of 100 wolves from this region and determined the genetic consequences of intense inbreeding in a threatened species. Their work was reported last fall in the journal *Nature Ecology & Evolution*.

The DNA samples they used came both from wolves that lived a few decades ago and more recent denizens. One came from the female considered the ancestral mother of the entire wolf population of these two Nordic nations. Researchers developed "family trees" for each wolf to determine which were related to which, but found that was only part of the picture, because the two copies of a chromosome in an individual—one from the father and one from the mother—can both originate from the same ancestor.

"Inbreeding has been so extensive that some individuals have entire chromosomes that completely lack genetic variation," said Hans Ellegren, professor at the Evolutionary Biology Center at Sweden's Uppsala University. "In such cases identical chromosome copies have been inherited from both parents."

Since wolves began to repopulate the region in the early 1980s, only four to five wolves have dispersed to the area and successfully reproduced—and only since 1991. These wolves came from Finnish and Russian populations to the east, a dangerous journey that takes them through the reindeer herding country of the Sami people, who are permitted to shoot wolves. Researchers were surprised that even some "immigrant" wolves repopulated by game managers from elsewhere in Scandinavia were partly inbred.

Inbreeding does not seem to have hurt the Scandinavian population so far, but some effects have been noted, such as severely inbred parents having fewer



The genetic distinction of Arabian wolves may be threatened, a report suggests.

pups, a situation observed by tracking family groups in winter and examining scats. Researchers believe the lack of genetic variability will eventually result in genetic diseases and a weaker gene pool, necessitating the introduction of new bloodlines.



#### SAUDI ARABIA

Hybridization with feral or domestic dogs may be threat-

ening the genetic distinction of Arabian wolves (Canis lupus arabs), the largest carnivore on the Arabian Peninsula, a subspecies of the gray wolf (C. lupus), distinct from both the Indian (C. l. pallipes) and European (C. l. lupus) subspecies. That's the finding in a report issued by the Canid Specialist Group, part of the International Union for the Conservation of Nature (IUCN). Arabian wolves are considered endangered, and their numbers are declining despite legal protection. Keeping this lineage distinct is important in conserving the biodiversity of the region, researchers note; however, no focused conservation efforts are being made, and the presence

or absence of hybridization has not been thoroughly studied in this population.

Chris Barichievy of the Zoological Society of London and his team report that anecdotal evidence from the Dhofar region in Oman suggests pale, "dog-like" wolves have been thought to be a result of hybridization, and video footage of a canid pairing in central Saudi Arabia seems to provide evidence of interbreeding between a female wolf and a dog, or wolf-dog hybrid.

Researchers note the consequences of hybridization may be far reaching, since the Arabian wolf's diet and behaviors make it better adapted than hybrids to desert life, and less prone to unwanted behavior such as stock raiding. Management plans for other unique canid species such as the Ethiopian "wolf" (C. simensis) involve castration and spaying programs for known hybrids. However, given the lack of data on Arabian wolf distribution, abundance and the extent of hybridization, a program of ecological research is required to determine appropriate conservation actions.



### 

The return of wolves to the Nyesyag Valley in the Manang

District of Nepal was verified by trap camera sightings for the first time since anecdotal reports indicated wolves had returned to the region after an absence of as much as 50 years. The finding, by researchers led by Rinzin Phunjok Lama, was published by the Canid Specialist Group of the International Union for the Conservation of Nature (IUCN).

The Nyesyang Valley is located in the "rain shadow" (an area where the mountains block the advance of weather systems, creating dryness) of the Annapurna



Range, covering an area of approximately 700 square km (270 square miles). That area is covered mostly by coniferous and conifer-birch mixed forests and by grasslands mixed with scrubs at higher elevations. The valley is rich in carnivore diversity: snow leopard, red fox, golden jackal, beech marten, mountain weasel and Pallas's cat. Blue sheep and musk deer are the main prey of the snow leopard. Small prey species include the large-eared pika and Royle's pika.

In spite of the prevalence of prey, interviews with herdsmen found 11 yaks and three goats had been killed by wolves in the prior year and a half, resulting in negative feelings and conflict that is likely to intensify. To avoid the extirpation of the canids like those that resulted from livestock depredations in the valley a half-century ago, researchers are calling for education programs, livestock insurance plans and a detailed ecological study.

Tracy O'Connell is professor emeritus at the University of Wisconsin-River Falls in marketing communications, and serves on the Center's magazine and communications committees.

A Himalayan wolf pup (Canis lupus himalayensis) roaming the Transhimalayas of north-western Nepal.





Encounter

An Elusive Wolf—and the Months Spent Tracking Him

By Tom Gable

Ver the past four summers, I have studied wolves in Voyageurs National Park (VNP) in northern Minnesota. I rarely see them, and when I do it is usually for a fleeting moment. Dense summer vegetation makes the forest appear impenetrable, and observing wolves often enough to study them is practically impossible. Instead, I must often resort to tracking wolves around the woods, trying to understand what the animals have been doing or thinking based on places they have been and the signs they have left.

This is the story of one wolf and the months I spent "chasing" him around

where "the green, dark forest was too silent to be real." (Thanks, Gordon Lightfoot!)

On May 16, 2016, I was on the Moose River with Austin Homkes, who also studies wolves in VNP, checking traps we had set a few days earlier on an old railroad grade that runs along the river just outside the park. We were trying to catch wolves and fit them with GPS collars as expeditiously as possible so we could follow them throughout the summer.

When we climbed out of the boat, we saw that we had captured a wolf along the railroad grade—and then noticed it was wearing a collar and ear tags. Here was Wolf V028, the breeding male of the Moose River Pack.

V028 was first caught in fall 2014 and fitted with a GPS collar that recorded locations every six hours. However, in summer 2015 the collar stopped working, and we lost contact with the wolf.

Austin and I quickly got our equipment together, sedated Wolf V028, and started to process him (change the collar, monitor vital signs, collect samples, etc.). While doing so I noticed that he had sustained a few injuries since we first caught him. The most obvious was a large gash that had scarred over on the top of V028's head. I could only presume that such an injury was from getting kicked by a deer or a moose. Similarly, on the wolf's front leg was a two-inch laceration, deep and partially healed that had split the flesh open. I had no idea how this might have occurred. In addition to these injuries, many of V028's teeth were missing, broken or substantially worn down. It was apparent that V028 was a rugged animal who had figured out how to survive in a hostile world. Indeed, we estimated V028 to be 8 years oldmuch older than the typical wolf living in and around VNP. After collecting all the necessary data, we administered the



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Above: Photograph of V028 caught from a game camera in early spring of 2015.

Right: Picture taken when V028 was re-collared in May 2016.



om Gable

drugs to wake V028 up, and within an hour, the wolf was on his feet and back to patrolling the northern wilderness.

We had fitted V028 with a GPS collar that recorded locations every 20 minutes in the hope of understanding the wolf's hunting habits. Summer wolf predation in Minnesota is poorly understood because observing wolves hunting prey is nearly impossible in dense vegetation. Further, wolves mainly hunt small prey (e.g. beavers, white-tailed deer fawns) during the summer, and finding evidence of predation can be challenging because wolves can almost wholly consume small prey in a short period. During the winter, researchers can study wolf predation by searching clusters of GPS locations from collared wolves to locate wolf-killed prey. Austin and I were optimistic we could use this same technique to locate kills from V028 in the summer, and thus understand where, when and how often V028 was hunting and killing prey.

From May through November, Austin and I had a singular goal: to follow V028 day-in and day-out. Wherever V028 went, we went also. This exhilarating experience was also physically and mentally challenging. Much of the Moose River Pack territory is remote and hard to access, often requiring us to bushwhack five to 10 miles just to reach a few clusters of locations. The summers in northern Minnesota can be quite unpleasant, with a combination of insects, heat, rain and humidity to challenge the most stoic individual. Most summer days we found nothing at clusters but bed sites, as V028 killed prey only once-maybe twice—per week. Because of this, it felt as though we spent the summer locked in our bug shirts, visiting random points scattered across the vast forests of VNP. Still, I was always amazed that in just a few hours V028 traveled distances that took me an entire day to cover.

Despite all the challenges, I felt, in the end, that I understood (or at least had the illusion of understanding) how this wolf lived and what it was doing. I was able to discern patterns in its behavior and movements, and understand where the wolf was going and why. Throughout the summer, V028 would frequently run the same route among a handful



in August 2017.

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of beaver ponds, visiting a pond, bedding down next to a beaver trail, moving one or two miles to another active pond, and repeating. In fact, for a little while, V028 became so predictable that I could guess which pond the wolf would go to next based on the pond he was currently visiting.

Interestingly, though, of all the places where V028 killed beavers, it was never at one of these ponds. What was it about these ponds? Was there an obvious clue I was missing?

From May to November, Austin and I spent more than 200 days in the field following V028, trying to understand how he survived. Yet, despite all our time in the field, we never actually saw V028, though we were often less than a few hundred meters from him, according to GPS collar locations. In early November 2016, V028's collar dropped off, as programmed on the edge of an active beaver pond. I hiked out to the pond on Nov. 10 to collect the collar, which V028 (or his pack mates) had buried in mud. Collar in hand, I headed to the far side of the beaver pond where V028 had provided his last cluster of locations. V028 had visited this pond more than 15 times during summer and fall, presumably to hunt beavers, but was never successful. The last cluster, which occurred three hours before the collar dropped, was a beaver kill just below the active dam.

Over the months I followed V028, I gained an intimate perspective on his habits, behavior and life. Although V028 no longer has on a GPS collar, gamecamera photographs show that he still roams the northwoods, surveilling his territory and hunting prey.

Tom Gable is a PhD student at the University of Minnesota, studying wolf predation on moose, deer and beavers in Voyageurs National Park (VNP). He recently completed his master's at Northern Michigan University where he studied wolf-beaver interactions in Voyageurs. In his free time, Tom enjoys exploring northern Minnesota's wild places, which he thinks go well with Gordon Lightfoot and John Denver ballads, and any Sigurd Olson book.

# A Look Beyond

# Wolves, Polar Bears and Two Conferences

Text by Debra Mitts-Smith, photos by Rob Schultz



Thompson, Manitoba, is a mining town in the boreal forest of Canada, an area rich with wildlife. This town of about 13,000 people is seeking to become a "Wolf Center of Excellence" in order to supplement its mining economy with eco-tourism. Wolf statues dot the town, and a wolf mural covers the side of a prominent building, visible a mile away. The creation of a wolf observation and education center similar to the International Wolf Center is a civic goal for coming years.

On Monday, October 16, 2017, several International Wolf Center board and staff members, volunteers, and donors—including me—boarded flights to Thompson to attend the second Wolf and Carnivore Conference.

On Tuesday, some of us boarded a charter flight from Thompson to Churchill, Manitoba to participate in the pre-conference event—a polar bear expedition. Churchill, which sits on the tundra on the shores of Hudson Bay, is

> a frontier town. There are no roads connecting Churchill with the



rest of Canada, and last year, its rail link washed away in a flood. The last ship of the season had departed a week before our arrival

Polar bears gather on the shores of Hudson Bay each fall, waiting for the bay to freeze so they can venture out to hunt seals on the frozen sea ice. Polar bears are common on the streets of Churchill. There is even the world's only "Polar Bear Jail"-a repurposed aircraft hangarfor bears that have shown too keen an interest in exploring the town. Several bears were in jail during our visit. The bears are held in temporary captivity for a month or until Hudson Bay freezes, when they are released to join fellow bears in the migratory hunt for seals. Although encounters with polar bears can be dangerous, the bears are also a source of pride to the local residents, who eagerly share stories of their chance meetings with bears on the streets of Churchill.

Safe in our "Tundra Buggy," we saw two polar bears napping and a variety of birds, including a snowy owl perched on a boulder, as well as two arctic hares. But a highlight of the day was watching two foxes—an arctic fox and a black red fox—hunting and caching lemmings. It was an exhilarating look at a natural scene most of us had never before witnessed.

The conference met all day on Wednesday and Thursday at a lodge outside Thompson, bringing together



a mix of people from wildlife biologists and managers to academics, authors, and lay people interested in wolves, polar bears and other large carnivores. Four keynote speakers included wolf expert and International Wolf Center founder Dr. L. David Mech; Russian zoologist, wildlife biologist and polar bear expert Dr. Nikita Ovsyanikov; wildlife ecologist and Director of Science at Alpha Wildlife Research and Management, Ltd. Dr. Gilbert Proulx; and biologist and author of *Wolves in Canada*, Erin McCloskey.

Dr. Mech explored whether wolves are responsible for declining moose and caribou numbers. Dr. Ovsyanikov's presentation focused on the impact of climate change, habitat loss and human interference on polar bears. Dr. Proulx explored and questioned the practice of culling wolf populations in western Canada to help prevent caribou from being extirpated. McCloskey spoke on eco-tourism and citizen science, as well various wolf populations found across Canada.

Wildlife biologists, managers and academics presented on a range of topics including: public education to minimize and prevent human-bear conflict; size variation in the eastern coyote; various aspects of wolf predation such as diet, social behavior and pack size; the desire to stop the use of poison and snaring of wolves in Alberta and British Columbia; and the status of the Qamanirjuaq







Clockwise from left: Volker Beckmann, Nancy jo Tubbs and Dr. L. David Mech speak to attendees at the second Wolf and Carnivore Conference.

caribou herd of Manitoba. Rob Schultz, executive director of the International Wolf Center, and Nancy Gibson, the Center's co-founder, shared the history of the Center, information about its ambassador wolves, and recent exhibits and programs, as well as the Center's success and growth as a wolf education organization. They also offered suggestions to Thompson's civic leaders who hope to emulate the Center's success. Debra Mitts-Smith is a School of Information Sciences faculty member at the University of Illinois. Her research and teaching focus on visual culture, children's literature, history of the book and storytelling. Her book, Picturing the Wolf in Children's Literature, was published by Routledge in 2010.

#### A Conference for You

If you are a wildlife supporter interested in wolves, mark your calendar now for the 2018 International Wolf Symposium, "Wolves in a Changing World." Sponsored by the International Wolf Center, the symposium will run from October 11-14 at the Minneapolis Marriott Northwest in Minneapolis, where wolf experts from around the world will speak on all things wolf.

Dr. L. David Mech will be a keynote speaker, and Mike Phillips, executive director of the Turner Endangered Species Fund, will be the banquet speaker. Dr. Doug Smith, project leader for the Yellowstone Wolf Restoration Project, and filmmaker Bob Landis will be the featured speakers during a special presentation on the 20 years of wolves in Yellowstone. Plenary sessions and panel discussions by leading experts will focus on the status of wolves around the world, the wolves of Ellesmere Island, Michipicoten Island and Isle Royale, wolves and livestock depredation, eastern *Canis* including red wolves, eastern wolves, and Mexican gray wolves. The symposium will hold poster sessions throughout the conference, and feature concurrent sessions covering a range of topics from the distribution of wolves around the world, to wolf ecology, wolf-human interactions, wolf management and policies, wildlands and ecosystems, wolf conservation and education, and emerging research and technologies.

Register for the conference at www.wolf.org/programs/symposium-2018/.

Book Review

### Wolves and Free-ranging Dogs Observed and Analyzed

Book review by Nancy jo Tubbs

few years ago, while walking a rural road on the Big Island of Hawaii, a friend and I saw three big dogs crest a hill nearby and stand focused on us. When my friend quietly reached down and picked up a chunk of lava from the roadside, the dogs turned and trotted away.

It's not uncommon to encounter an unleashed dog or three in a rural area or even in a town, and if the dogs are unfamiliar, the question arises about just how differently the group might behave from their ancestors—a pack of wolves.

Stephen Spotte, in *Societies of Wolves and Free-ranging Dogs*, draws on close observations of the behavioral biology of both, and on heavily-footnoted research from around the world. From dingoes in Southeast Asia to free-ranging dogs in Israel, Brazil and Baltimore's alleys, he details the similarities and differences of the two species.

Like wolves, the Baltimore dogs chose travel patterns for easy access away from people, but unlike their ancestors they traveled alone or in groups up to five, casually meeting and separating again as they foraged around trash and dump sites. Dogs in Alaska sometimes cooperated to hunt snowshoe hares, and dingoes in Australia are known to kill kangaroos, but in other places wild dogs rarely attacked large, wild prey.

While dogs and wolves share many forms of visual communication, dog breeds are often handicapped by their physical features. A tail that's positioned high, low or wagging signals dominance, submission or excitement in both wolf and dog—unless the dog breed has the handicap of a nubby tail. If a breed of dog can't bare its teeth, or it has tiny ears or a wrinkled face, it is limited in its ability to use those features to communicate.

Both dogs and wolves exhibit scentrolling behavior, and Spotte's vast experience as a marine biologist is perhaps best exhibited in his story of dogs brought to a beach where a whale had died. "They appeared stunned at first, overwhelmed by ancestral olfaction myths about Dog Heaven suddenly come true. I can state with certainty that nothing seems more joyful to a dog than

taking a good roll against the collapsed carcass of a putrid whale."

Through mating behavior and litter size, dominance hierarchies, pack membership, genetics, inter-breeding and more, this book explores the wolfish heritage and human influences on dogs, domestic and wild. Students of behavioral ecology will find the detailed research fascinating, and the layperson will enjoy the author's candid observations about these canid cousins.



Societies of Wolves and Free-ranging Dogs

By Stephen Spotte Publisher: Cambridge University Press, 2012 377 Pages

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