

# INTERNATIONAL WOLF

A PUBLICATION OF THE INTERNATIONAL WOLF CENTER  
FALL 2017



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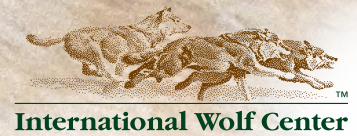


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# INTERNATIONAL WOLF



VOLUME 27, NO. 3

THE QUARTERLY PUBLICATION OF THE INTERNATIONAL WOLF CENTER

FALL 2017



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Jim Cumming

## Ma'iingan and Other Cultural Wolves

In the Ojibwe world view, the Great Spirit placed original man on earth, and the wolf became man's guide and brother. Tovar Cerulli explains that this spiritual understanding of the wolf can also be considered in secular terms, and that all of us—including wolves—might benefit if we did just that.

by Tovar Cerulli



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Courtesy Of US Fish & Wildlife Service

## Wildlife Research: From Ear Tags to Armchair

In part 2 of this real-life story, wildlife biologist Dave Mech continues his entertaining description of methods used by scientists to track, study and ultimately help preserve various species of wildlife. The process has changed dramatically over his lengthy career, going "from ear tags to armchair" with advancements in tracking technology. (Find part 1 in the summer 2017 edition of *International Wolf*.)

By Dr. L. David Mech,  
U.S. Geological Survey



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International Wolf Center

## Wolf Communication: We Still Have Much to Learn

The eerie, thrilling sound of a wolf's howl is both familiar and mysterious to humans. We know that wolves communicate with each other, and that howling is a form of communication they understand. But what we don't know—and biologists are still learning—is all the other ways they share essential messages that keep the pack together, and foster safety and survival.

By Tracy O'Connell



International Wolf Center

## On the Cover

A wild gray wolf (*Canis lupus*) runs from a charging bull bison who is defending an injured cow bison along the banks of Otter Creek in Yellowstone National Park.

Photo by Dave M. Shumway. Dave is a photographer, director of communications for Volunteers of America and adjunct professor of photography at Rocky Mountain College. His collection of photographs of wild creatures and fragile places from around the world can be seen at [www.DaveShumway.com](http://www.DaveShumway.com)

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—J. Ballot, elementary teacher, Noble Public School





## “Who Speaks for Wolf” 2017 Award Heidi Pinkerton

It is a great honor to recognize Heidi Pinkerton, who has become a core member of our pack at the International Wolf Center. It was ambassador wolf Maya and her untimely death in 2011 that drove Heidi to seek the solace of the Northern Lights where the night sky illuminated a broad spectrum of colorful particles. Accompanying the night show was the alluring howl of a lone wolf. The end result is a stunning “Howling from the Heavens” photograph that graces the walls of the Center in the memory of Maya.

That was just the beginning. Heidi’s passion for wolves, wild places and education was a perfect fit for the Center. She enthusiastically shares her wildlife experiences through social media, popular photography classes and her travels. You can often find Heidi in front of the wolf window patiently answering the visitors’ myriad of questions about the wolves, while her eyes are focused on her camera capturing their behavior. She readily promotes all aspects of the Center with her photography products, classes, promotions and presentations.

Heidi’s work on the “Aurora” summer exhibit, displaying her Northern Lights photography in 2014, is often cited for contributing to the Center’s increased attendance.

She was the steady hand, photographing and recording important behavioral patterns of the 2016 arctic wolves, which enhanced the Center’s presentations about their development.

With her eager smile, Heidi volunteers her time, donates her art and has enhanced the Center store and walls with her gifted photography. We are so grateful that she was lured by the wildlands of Ely. For all of this, the Board of the International Wolf Center honors Heidi Pinkerton with the “Who Speaks for Wolf” Award in 2017. ■



Nancy Gibson and Heidi Pinkerton

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# Ma'iingan Other Cultural

by TOVAR CERULLI

In July 2012, when the Wisconsin Natural Resources Board met to determine harvest quotas for that year's wolf hunting and trapping season, most people who testified spoke in terms of personal or professional opinion and experience, with frequent references to science. In marked contrast, Joe Rose, Sr.—representing the Bad River Band of Lake Superior Chippewa and the Voigt Intertribal Task Force of the Great Lakes Indian Fish and Wildlife Commission—told a creation story.

Rather than talking about population, predation, depredation or ecology, Rose spoke of the relationship between Anishinaabe (Original Man) and Ma'iingan (the Wolf). He told the 100-plus people attending the meeting how the Great Spirit placed Anishinaabe on Mother Earth and how Ma'iingan became Anishinaabe's guide and brother. He spoke of similarities between Anishinaabe and Ma'iingan, and of how the Great Spirit later set them on different but parallel paths. And he explained how it was prophesied that if the wolf passes out of existence, then the Ojibwe people will soon follow, as will all other humans and all wild nature represented by Ma'iingan.

Bad River Chairman Mike Wiggins then spoke. He began by saying that Joe Rose, as his elder, had set the "context and foundation" for understanding the Ojibwe worldview concerning wolves and wolf hunting.

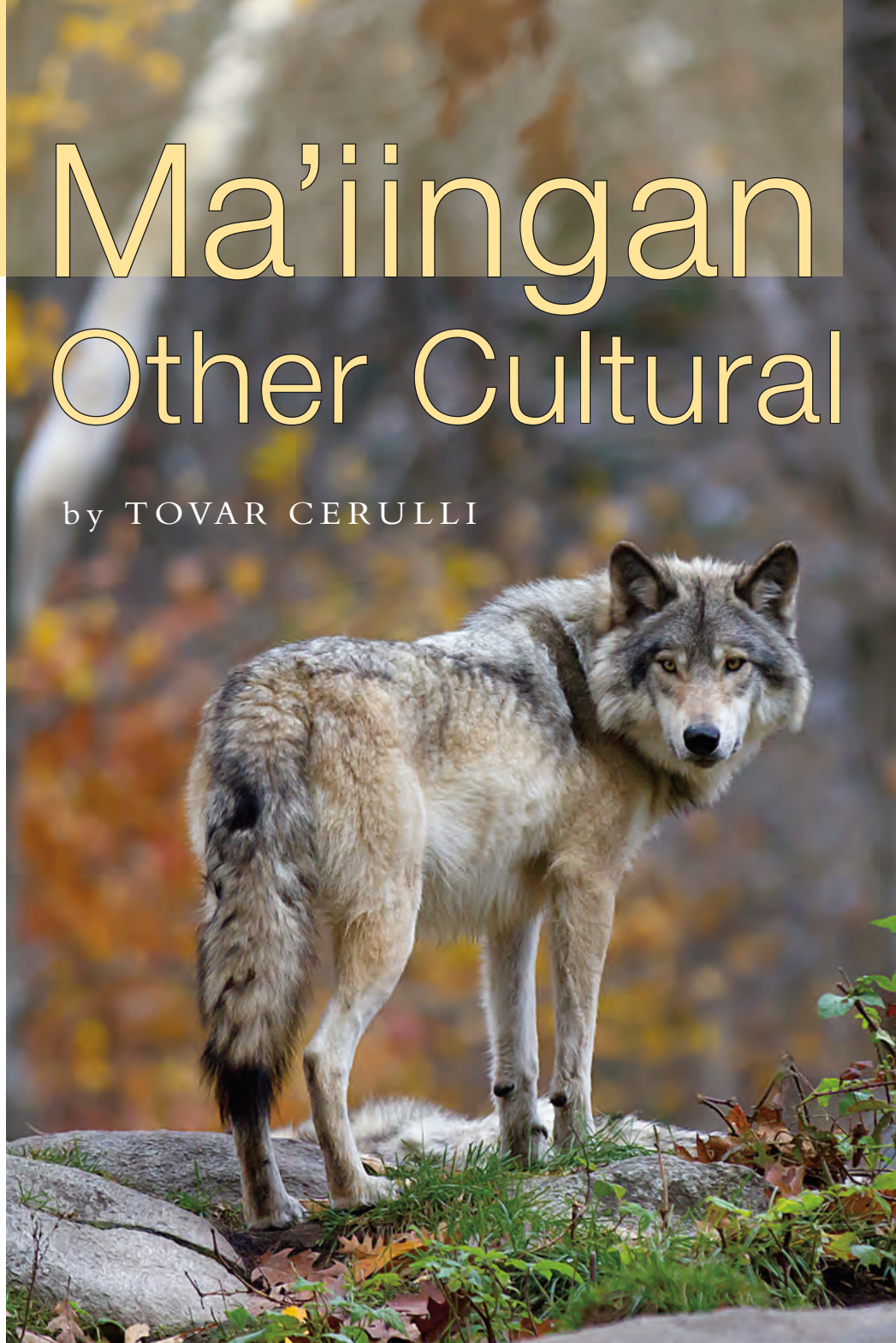
On hearing Rose's story—versions of which are often told by Ojibwe elders and leaders—non-Ojibwe listeners like me are apt to think, "Ah, this is a unique spiritual and cultural understanding of the wolf." And indeed, it is. Unless we

are careful, however, this line of thinking can diminish and distort what we hear.

One risk is that, in focusing only on the spiritual, we may fail to recognize that much of this perspective can be understood in secular terms. Part of what Rose and others are saying, for instance, is that they see the wolf as a companion—not a competitor. In their eyes, wolves are fellow hunters who pose no threat, with whom harmony rather than conflict is the

norm, and whose presence signals that a place is whole and healthy for many others, including humans. Becoming aware of such beliefs can help us understand this Ojibwe view more clearly. It can also help us recognize common ground; as it happens, some Euro-Americans speak of wolves in similar ways.

A second risk is that when we think of another group's view as shaped by cultural values, we tend to assume that





# and Wolves

When we hear a creation story, we need to refrain from leaping to the conclusion that this understanding is rooted solely in spiritual ground.

virtually impossible to imagine this issue being addressed in Wisconsin or Minnesota wolf plans. To most Euro-Americans, wolves are mere animals. What becomes of their carcasses is of little consequence, except that biologists might want to examine them. In marked contrast, this Ojibwe understanding holds that wolves are relatives whose remains are to be cared for in particular, respectful ways. Both of these understandings—the familiar and the unfamiliar—are deeply and equally cultural.

We would do well to realize that all wildlife conservation is profoundly shaped and driven by culture. Some of our values and practices remain relatively stable. State wildlife agencies have long sought to maintain healthy, sizable deer populations not because scientific analysis has told them they must, but because we, as hunters and as appreciators of wildlife, continue to want substantial numbers of deer despite the fact that high deer populations come with ecological and social costs. Other cultural values and practices change dramatically. Less than a century ago, it was commonplace for Americans to kill predatory birds like hawks, owls and eagles. Today, such behavior is illegal and widely reviled, even though some populations could be hunted sustainably in regulated seasons.

If we fail to recognize these facts, we are liable to think that unfamiliar “cultural” understandings are irrelevant to wildlife conservation. We are likely to exclude them from consideration in decision- and policy-making processes. We are especially apt to exclude perspectives we hear as “spiritual” or “religious” if we claim a cultural commitment to

our own perspective is less so. This was illustrated in 2012, when the Fond du Lac Band of Lake Superior Chippewa sent a letter to the Minnesota Department of Natural Resources (DNR), objecting to hunting and trapping seasons. In response, a DNR representative stated that wolf management could not take “cultural issues” into account and could hinge only on “issues of conservation, public safety and public health.”

We make this assumption habitually: Our own ways of thinking and doing things are neutral. Other people’s ways are “cultural.”

For instance, the Leech Lake Reservation’s draft wolf management plan expressed concern for the respectful handling and treatment of wolf parts possessed by tribal members and raised the question of how those artifacts would be passed down to descendants. It is

Adobe Stock / Jim Cumming



rationality, science, and separation of church and state. And we are apt to forget that Euro-American understandings of animals, including wolves, are partly rooted in a history of Judeo-Christian beliefs about human superiority and dominion over other beings.

A third problem is that thinking of this Ojibwe view as spiritual and cultural deafens us to its deep, historical significance. The idea of Ma'iingan and Anishinaabe's parallel paths or shared fates—often expressed as “what happens to one of us happens to the other”—is not some abstract, fanciful notion. It is an understanding grounded in concrete experience.

Listen closely to these speakers and you will catch references to historical events: loss of land, violent persecution by settlers, the boarding school era, prohibitions against languages and religious practices and the like. The references are often brief and oblique; when these speakers say that something “happened” to them in the past, they rarely mention Euro-Americans. But they understand, and sometimes say, that wolves and Indians have long been treated similarly—as threats and competitors to be controlled or eliminated.

The Ojibwe and other tribes are not alone in drawing this parallel. A 17th-century Massachusetts law, cited by Barry Lopez in his classic *Of Wolves and Men*, imposed a five-shilling penalty for shooting within town limits “on any unnecessary occasion, or at any game except an Indian or a wolf.” A 19th-century article reprinted in the *Milwaukee Sentinel* praised a Mexican policy toward the Apache: “It puts a price upon an Indian’s scalp the same as upon that of a wolf.” A 2012 letter to *Wisconsin Outdoor News* expressed anger at how non-tribal hunters and anglers have been “kicked in the teeth” both by the Ojibwe spearing fish and by wolves hunting deer. And the phrase “the only good wolf is a dead wolf” still appears online regularly, as does its equivalent, “the only good Indian is a dead Indian.”



Adobe Stock / John Wijsman

Is it any wonder that many Ojibwe object to wolves being removed from the federal endangered species list and to states issuing permits to white hunters and trappers? Is it any wonder that the language of institutionalized “management” so central to state wolf plans strikes many Ojibwe as distinctly cultural and decidedly disturbing? Is it any wonder that the idea of keeping or driving down wolf numbers to specific goals may “broaden the divide” (as it is understated in the wolf plan of the Red Cliff Band of Lake Superior Chippewa) between tribal and non-tribal natural resources agencies?

The parallel paths walked by Ma'iingan and the Ojibwe have had a brighter side. The wolf received protection under the Endangered Species Act in the 1970s—the same decade marked by the American Indian Religious Freedom Act and the American Indian Movement’s occupation of Alcatraz Island. Since then, wolf populations in the western

Great Lakes region have rebounded significantly. Since then, the Ojibwe have experienced cultural and political resurgence, including reaffirmation of treaty rights related to hunting, fishing and natural resources. As one tribal chairman put it to me, “The wolf population, when we were depressed, was way down, on the verge of extinction, endangered species. Wolf population’s coming back, tribes are doing better. For us, that’s what it’s about.”

There is, of course, no single, unified view of wolves among the Ojibwe. Like any group of people, they have diverse perspectives. Yet the understanding expressed by Rose and many others is the one put forth publicly by Ojibwe communities in the western Great Lakes region in recent years.

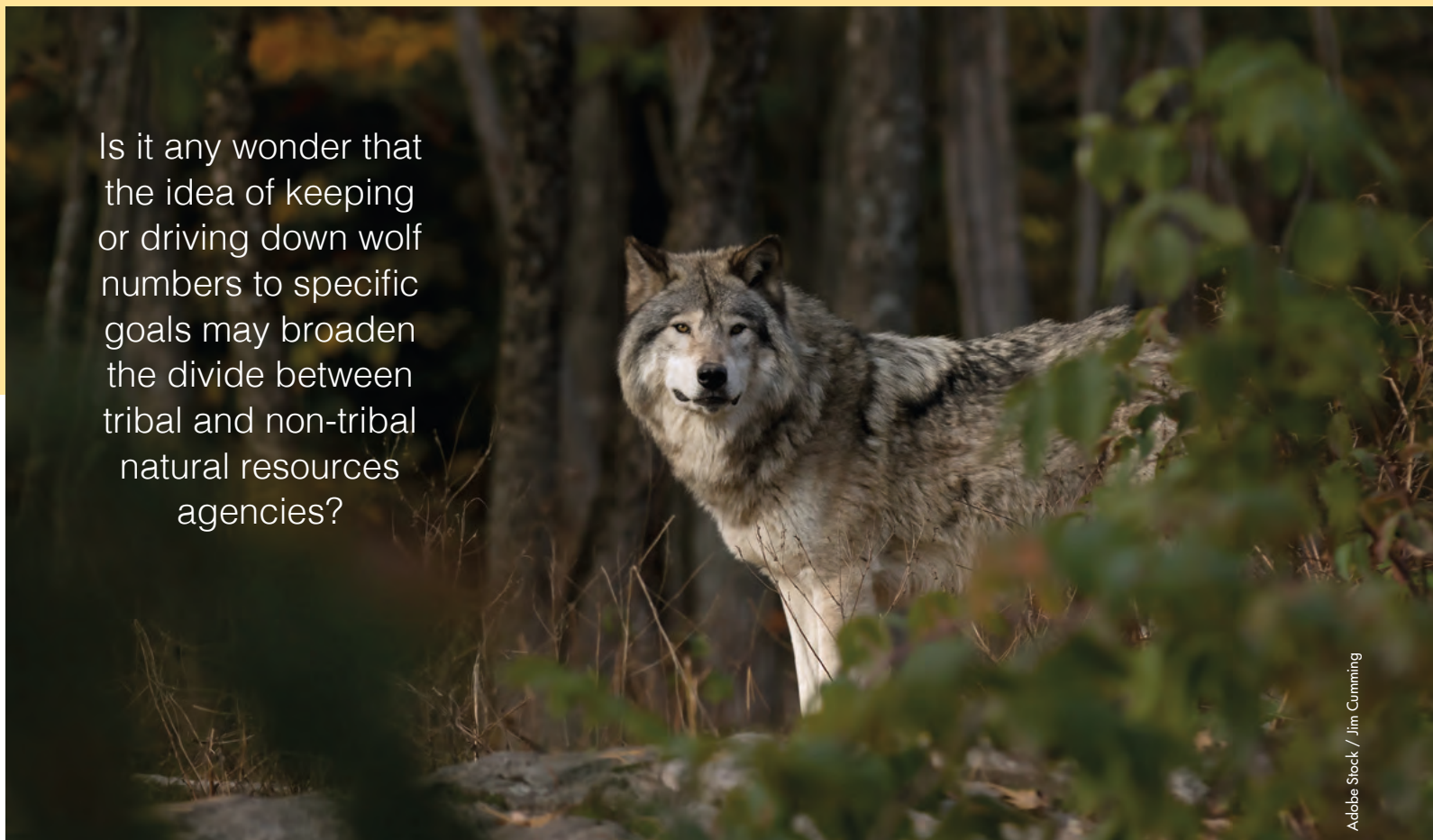
If non-Ojibwe people want to understand this view, and perhaps be able to discuss wolf issues with Ojibwe communities in a constructive way, we need to





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Is it any wonder that the idea of keeping or driving down wolf numbers to specific goals may broaden the divide between tribal and non-tribal natural resources agencies?



Adobe Stock / Jim Cumming

listen carefully. When we hear a creation story, we need to refrain from leaping to the conclusion that this understanding is rooted solely in spiritual ground.

To fathom how such a story sets the “context and foundation” for understanding the way many Ojibwe see wolves and wolf hunting, as Chairman Wiggins put it, we need to realize that this story speaks not only of a mythical past, but also of the historical past. And we need

to recognize that our own perspectives are just as cultural as anyone else’s.

To listen and think in these ways, we must dig deep. If everyone involved can do this, perhaps we can begin to treat each other with mutual respect. Together, perhaps we can come to understand wolves better than any of us can on our own. Together, perhaps we can relate to these four-footed hunters with greater grace and wisdom. ■

*Tovar Cerulli is a writer, speaker, conservation-communication consultant and author of The Mindful Carnivore. He is grateful to Mike Swan, Reggie DeFoe and Peter David for their generous assistance with this article, which is based on research he conducted as a doctoral student at University of Massachusetts-Amherst.*



# ***Wildlife Research:***

## ***From Ear Tags***

## ***To Armchair** PART 2* *Continued from summer 2017 issue*

By DR. L. DAVID MECH,  
U.S. GEOLOGICAL SURVEY

Oregon Department of Fish & Wildlife

Don Sahler/NPS



*In Part 1, veteran biologist L. David Mech described how, before the development of more modern techniques of darting animals, radio-collaring them and studying their locations by radio-tracking, biologists could only ear-tag or band them and hope they were found again elsewhere. To track bears, they had to catch them, tie them up and inject the drugs into the abdomen. In Part 2, the author brings us up to date on current methods of studying wildlife movements.*

Of course, for every species of wildlife a different technique was used. Not all had to be tied up and injected intraperitoneally (in the abdomen). Smaller animals could be captured in cage traps and anesthetized with ether or chloroform. Other species were too large to be tied up and couldn't be ear-tagged at all. Not until better drugs became available, that is.

In the early 1970s drugs were developed that could safely be injected into an animal's muscles. One could mount a syringe full of these drugs on the end of a stick and barely poke the trapped bear or other animal caught in a steel-foot trap or a cage trap. Or such drugs could be delivered by darts from a special dart gun. For years biologists had been experimenting with darting procedures, using a drug that could be injected intramuscularly. That drug was dangerous to an animal's heart and not practical to use on most species, but the drug-delivery technology was already available when the newer, safer drugs appeared.

So began the era of television documentaries featuring folks darting lions, rhinos and even elephants. As indicated in Part 1, things don't always work so smoothly as on TV. Hit the animal in the wrong place—for example, the belly—and the dart can drive right into the animal and kill it. Even with a well-placed hit in the muscular hip, it takes several minutes for the drug to take effect and the animal to drop. In the meantime the creature can run great distances and might not ever be found.

Some animals present special problems. For example, drugged elephants often remain standing, and the biologist must push them over. This practice requires keen judgment to be certain the animal is really drugged. One acquaintance of mine tried to push over an elephant he had darted in Kenya, and to his great dismay found the animal fully conscious. The elephant whacked him

over with his trunk and stepped on his thigh, crushing it. Only after many surgeries did my acquaintance ever get back to walking—albeit with quite a limp.

Just as anesthetic drugs have greatly improved since I began tying up bears, so, too, has technology for studying animal movements. Even in the late 1950s, when we were handling spread-eagled bears, we were measuring their neck circumferences because we were already anticipating the invention of tiny radios that could be mounted in a collar. By the early 1960s several groups were trying to develop such a device. A biologist with the Illinois Natural History Survey, Rexford D. Lord, inquired of a budding electronic genius, William W. Cochran, if he could make such a device for a cottontail rabbit. Cochran replied "You mean no one has done it yet?" He then proceeded to produce such a collar, and their jointly-published paper *A Radio-tracking System for Wild Animals*, launched a radio-tracking revolution in 1963.

It took a few more years for biologists and engineers, working together, to refine the radio-tracking technique, including building collars that would

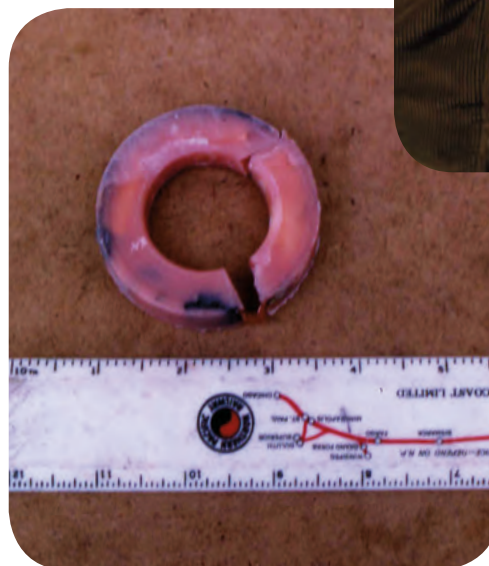
withstand not only the elements but also wear-and-tear inflicted by the animal. And to work on a great variety of wild species, radio attachment devices had to be tailored differently for various creatures. Rabbits scratched through collars with their hind feet until tough-enough compounds were found to protect the collar. External "whip" antennas worked perfectly well on deer but snapped off quickly when used on wolves. Birds posed a separate set of problems. Tiny harnesses were developed for them. Some transmitters were attached with glue to the back of a bird, and others to a bird's leg. For animals without much of a neck, like badgers, transmitters had to be implanted inside their bodies.

Nevertheless, after several years techniques were perfected, and species from dragonflies to whales are now being tracked by radio. Although there have been many improvements and refinements in radio-tracking devices over the years, a basic VHF (very high frequency) radio-tracking transmitter is now the



Dr. L. David Mech

*Above – Transmitters are often glued to a bird's back, such as the one on this saw whet owl.*



Dr. L. David Mech

*Left – One of the first radio collars successfully used for long periods on cottontail rabbits was molded in dental acrylic.*



*Some animals present special problems. For example, drugged elephants often remain standing, and the biologist must push them over. One acquaintance of mine tried to push over an elephant he had darted in Kenya, and to his great dismay found the animal fully conscious. The elephant whacked him over with his trunk and stepped on his thigh, crushing it.*

most commonly used wildlife research device. Manufacture of radio-tracking equipment is an annual multi-million-dollar business.

One of the ingenious refinements that flourished for several years in the 1960s was an automatic radio-tracking system, yet another invention developed by Bill Cochran, whose earlier work launched the tracking revolution. This system involved two towers one-half mile apart with directional antennas that rotated every 45 seconds. The antennas fed signals from radio-tagged animals living within a few miles of the towers into a bank of radio receivers where the signals were converted to optical displays that were then recorded on microfilm. Thus, the locations of these animals were recorded every 45 seconds, leaving virtual trails of the animals' move-

ments. Foxes, deer, raccoons, rabbits, snowshoe hares, skunks and badgers were all tracked with this system, and much interesting information about their movements was learned.

Another major variation on the basic radio-tracking idea soon came along in the form of tracking radioed animals from satellites. Instead of a biologist listening for an animal's signal from the ground or from an aircraft, a satellite detected such signals, and using the Doppler shift (the same principle that changes the sound of an aircraft flying by) the satellites calculated where on Earth the signal came from. Because it takes far more power to send a signal from an animal's collar to a distant satellite than it does to merely send a signal a mile or so to a listening biologist, satellite transmitters had to use much

larger, heavier batteries. The first such collars weighed over 20 pounds, and thus could be used only on the largest animals. Continual advances in technology now allow satellite transmitters to track birds as small as an ounce.

Fancier versions of wildlife telemetry (used for more specialized purposes) included a backpack system attached to monkeys or other primates that allowed researchers to send radio signals to the creatures' brains via lead wires attached to their skulls. Another innovation was a capture collar containing two darts hooked to the radio-tracking system; it allowed a biologist to remotely dart an animal by sending a signal to the collar, firing one of the darts. The other dart was a backup in case the first failed. It was an interesting sight, indeed, to be watching from an aircraft as a wolf-pack member wearing such a collar experienced the dart firing. As the pack would travel along single file over a frozen lake, suddenly the darted member would jump, star-



Dr. L. David Mech

*A directional, animal radio-tracking antenna mounted on each wing strut of an airplane allows a biologist with a special receiver to home in on radioed animals.*



ting his associates, stumble around and finally collapse. As the dazed wolf dozed off, the other pack members appeared to think it was taking a nap and continued on their merry way.

Biologists on the ground would home in by radio on the wolf's collar and begin their regular examination of the wolf, including weighing and blood-sampling. Being able to capture the same animal regularly over long periods allows scientists to keep close track of the animal's condition over time, as well as to collect several other kinds of data.

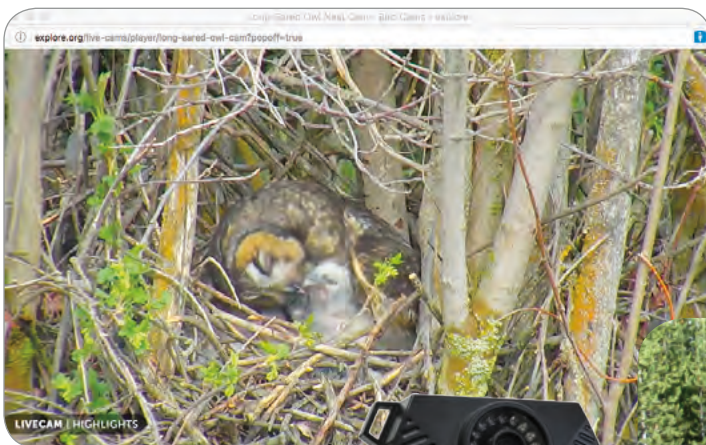
The current rage is use of the GPS collar. Versions small enough for Canadian lynx now allow tracking an animal every hour or so for several months. Larger, heavier collars (with more batteries) used on wolves, bears, elk and similar-sized species record the animal's location, date and time via one set of satellites and then relay those data back to the biologist's computer by a different satellite. A special program allows the biologist to

How GPS collars work

superimpose the data points on a map of the area or even on a detailed satellite photo from Google Earth. This space-age spying, now being put to good use by scientists like Doug Smith in Yellowstone, along with Dan MacNulty's experimental webcam system at the University of Minnesota, promise to greatly accelerate our knowledge-gathering about various elusive denizens of the wilderness.

As we modern biologists sit back in armchairs and scrutinize the wealth of data coming in, pondering the meaning of it all, I think back on the days of the spread-eagled bears and their shiny ear tags and marvel at how far we've come with wildlife research in this past half-century. It is truly mind boggling to imagine where we will be with these techniques 50 years from now. ■

*Dr. L. David Mech is a senior research scientist for the U.S. Geological Survey and founder and vice chair of the International Wolf Center. He has studied wolves for more than 50 years and has published several books and many articles about them.*



Trail cams and webcams are all the rage now, providing information formerly difficult or impossible to get. Trail cams have documented wolves in California, and webcams commonly allow the public to peek into eagles' nests.



Oregon Department of Fish & Wildlife





# Wolf Communication: We Still Have Much to Learn

Adobe Stock / Ronnie Howard

By TRACY O'CONNELL

**W**hat type of communication comes first to mind when discussing wolves?

Howling, of course. That long, mournful wail associated with a lone, hilltop animal silhouetted in the moonlight—or alternatively, the wild ruckus of a pack chorus that illuminates the deeply social nature of these animals.

In fact, though, wolves could be called the “Chatty Cathys” of the animal world. They engage in many different types of communication, both purposeful and involuntary, from nose to tail and from shoulders to paw pads, day and night, from infancy through adulthood. This article is devoted to the way wolves send and receive scent-based communications.



## What do wolves communicate?

Outside the pack, they seem to continually telegraph their presence, age, gender, bloodline (others can tell if they are related) and level of sexual arousal, as well as their degree of fear and submissiveness, or their level of aggression. Sometimes they appear to purposefully mask or withhold information—for example, when they encounter another pack and do not want to telegraph their presence.

Within the pack, their communication behaviors help them bond with each

other, mark ownership, and establish or reinforce rank. They also communicate to stimulate the automatic behaviors that help them thrive, as between mothers and pups.

## How do these messages flow?

Researchers Cheryl Asa and Fred Harrington addressed this topic in the 2003 book *Wolves: Behavior, Ecology and Communication*. In a chapter devoted to wolf communication they present the

results of in-depth studies by a number of biologists over several decades. Much, however, remains unknown and can only be surmised based on observation and studies of other canids such as coyotes, foxes and domestic dogs.

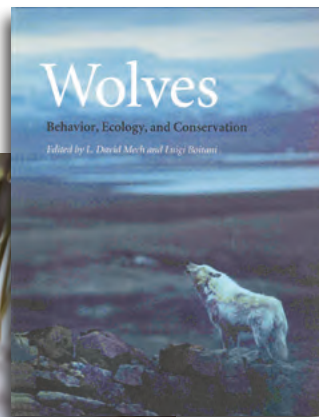
Wolves are believed to involuntarily secrete chemicals from three types of glands—sebaceous, apocrine and eccrine—that help keep the wolf's skin supple and hydrated, but also produce scents that communicate details of its identity.

Sebaceous glands are typically found in hair follicles, especially on the back, neck and tail, and at the intersection of the skin and mucous membranes in the lips, eyelids and vulva. Apocrine sweat glands, controlled by the central nervous system, are found in the skin of dogs, especially in the webbing between their toes, and also are likely to exist in wolves. Eccrine

glands in the foot pads secrete salty fluid in response to exercise or heat, performing a cooling function. Eccrine glands can also be stimulated by nervousness (think “sweaty palms” in humans). The fluid released, combined with diet and microflora on the skin or in the ducts of the glands, can produce an “odor fingerprint” by which individual wolves can recognize each other from scent left in the woods, much as dogs use their sense of smell to recognize and track humans.

Based on studies of domestic dogs, it is believed saliva provides identifying information as well, as it contains high levels of hormones. It also figures prominently in ritualized licking and social grooming. When mothers and pups interact, the mother's cleaning stimulates urination and defecation, and nursing pups leave saliva residue that may mark each nipple for future use by the same pup.

As one might predict, secretions from the sex organs are used to advertise availability for breeding. They also come into play in enforcing dominance over



Adobe Stock / H Kuchera



others, as when a male stands over another male and exposes his sheath area. In some cases, involuntary scent release gives information wolves might prefer not to share—for example, when a wolf encounters unfamiliar others to whom it feels submissive. Scent-rolling (the act of rolling in a smelly spot, getting the scent on the fur) is a behavior not well understood; it might be a wolf's effort to disguise its own scent information or to make itself more attractive to other wolves.

There are other means of scent-based communication that wolves use to their advantage. For instance, the paired sacs on either side of a wolf's anus are under the animal's voluntary muscle control, and contain both apocrine and sebaceous glands. These secretions vary by season and gender, and may relate information about breeding readiness, along with the

other signals. This assumption is supported by the observation that females show interest in the anal area only in breeding season. In nose-to-tail interactions, the more dominant wolf has been found to keep its tail away from the anal area, and the more submissive one, to clamp the tail over the anus.

Urination is another example of scent-based communication; it is frequently seen in domestic canids, as when male dogs lift their legs and urinate on trees or fire hydrants during walks. It's widely believed to be an example of marking territory, and the height of the mark may be significant to the "reader" of the message, as it gives an idea of the height of the urinating animal. However, research has shown that in the wild, urination is more for purposes of spacing—establishing and maintaining room between wolves from different packs—than to

larger testicles, can seldom be observed in the wild. Therefore, research has commonly relied on observations of captive-bred wolves. Studies of both captive and wild wolves show that wolves scent mark more often as the breeding season (mid-winter) approaches, and less often after.

In a 2006 paper, L. David Mech reported on 20 years of summer observations of arctic wolves on Canada's Ellesmere Island. Mech recorded all four postures of urination, two for males (raised-leg and standing) and two for females (flexed leg and squat.)

Mech noted frequent cases of summer urine marking among the wild arctic wolves, which were unafraid of humans and visible around the clock during the long daylight hours, affording extensive observation opportunities. His work led him to support the "frequency of urine-marking activities" reports by those who studied captive-bred wolves—activities which, in the Mech work, were highly variable but tended to decrease over the summer. He suggests that factors in the wolves' social milieu—something beyond testosterone levels—might affect the frequency of summer urine marking.

Mech also observed urine marking of emptied food caches, old food, settings where there would be the scent of prey but no real food available, and places where wolves from other packs had been eating. Similar behavior, observed in an unrelated study of coyotes by Fred Harrington in 1982, was termed by the author a "bookkeeping function," indicating that the food caches were no longer worth investigating even though the smell of prey might linger.

Leaving feces is another example of wolves' scent-based (though also visible) marking and can be done with or without excretions from the anal sac. Feces are often deposited conspicuously—on main trails or intersections of paths, where they are meant to be seen—and like urine marks, are believed to be used for spacing purposes.

Scraping the ground after urination or defecation is one of many examples of communication meant to be perceived by more than one sense. It may be done to provide a visual marker or to spread the scent more widely.



Kelly Godfrey

*Scent-rolling is a behavior not well understood; it might be a wolf's effort to disguise its own scent information or to make itself more attractive to other wolves.*

mark an actual boundary, especially among nomadic wolves. It can warn others away from a specific place and predictably is done more by dominant than submissive wolves.

Scent marking, which is associated with higher levels of testosterone and



Mech's work also addressed this summer ground-scratching behavior—a subject not covered in most other research. He found great variability in this activity from year to year. In some summers, there were few or no observations of wolves ground scratching before or after urination, while in others there were many examples, by males and females alike, sometimes one after the other at the same site. He notes that in 1992, the year of the most scratching and urine marking, there were other behaviors not typically exhibited among those wolves, which on three occasions chased and attacked non-pack wolves.


The urine marking seemed to center on an eastern boundary of the pack's territory, and the behavior was accompanied by looking around while scratching, and high degrees of alertness that seemed to indicate arousal and aggressiveness.

How do wolves take in this flow of information arriving by scent? Canids are believed to have olfactory receptors 100 to one million times more sensitive than humans, due to longer noses with larger odor-receptor areas, more receptors (280 million for dogs), and larger olfactory bulbs in the brain (four times larger than humans). Researchers believe their sense of smell is the primary way wolves locate prey and process other messages, rather than by their hearing or sight.

Wolf communication is varied, much of it taking place through a combina-

tion of messages coming through any or all of the five senses. Much of what has been observed is not well understood, and relies on research on other canids. Asa and Harrington, reflecting on the lack of knowledge in these areas, suggest several topics for potential future study. Perhaps additional research will help humans understand the flow of subtle and varied information these social animals share. ■

#### Additional Reading

 Harrington, F. H. and C. S. Asa. 2003. Pages 66-103 in Mech, L. David and Luigi Boitani (Editors), *Wolves: Behavior, Ecology and Conservation*, University of Chicago Press. 448 pages.

*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.*



*Although difficult to see from the front, this wolf is lifting his right hind leg and urinating on the tree.*

Canids are believed to have olfactory receptors 100 to one million times more sensitive than humans have... and olfactory bulbs in the brain four times larger than humans'. Researchers believe smell is the primary way wolves locate prey and process other messages, rather than hearing or sight.





# Tracking the Pack

## Data Observations Drive Management Decisions

By Lori Schmidt

As managers of the ambassador wolves, it's important for us to understand pack dynamics, social alliances and tensions that may arise within a wolf pack. Wolf care staff members conduct daily checks of the wolves' physical conditions and deliver a variety of nutritional supplements—and when necessary, prescribed medications—365 days a year. But the presence of the wolf care staff can influence pack dynamics as individual wolves compete for staff attention.

To get an unbiased view of pack dynamics, the Center coordinates behav-

ioral observation teams, all trained in the use of behavioral dictionaries called ethograms. The Center collaborated with Vermilion Community College in Ely, Minnesota, training spring-semester students in its BIOL1476: Wolf Ethology class in the use of our ethogram. They logged more than 100 hours of behavioral observations in 2017, watching the Exhibit Pack from late January to early May—months when ambassador wolves typically display a more ritualized dominance.

Here are a few things they observed on the dynamics of the Exhibit Pack:

*Wolves display more ritualized dominance in the winter, and behavioral observations are critical. As the winter advanced, arctic pup Grayson was the focus of Denali and Boltz's dominance displays.*



International Wolf Center

**Aidan** “... Aidan showed great patience with the pups, especially Grayson, who appeared most comfortable around Aidan. Aidan's relationship with his brother Denali was less engaging than his relationship with the other wolves. They both seemed to know their roles in the pack and stuck to their respective duties...”

**Denali** “...Denali seems most comfortable when left to his own devices...but he continues to display an inquisitive, almost pup-like set of investigatory behaviors. Whether he is observing from a resting position or actively investigating, his frequently pricked ears and wagging tail demonstrate a continued interest and excitement with regards to his surroundings and pack mates...”

**Boltz** “...He also was the most aggressive with the pups, asserting his dominance over them until Aidan inevitably intervened on the pups' behalf...”



Kelly Godfrey



## Member Profile



*The Exhibit Pack is composed of three different age groups and three different gray wolf subspecies. Left is Axel – Yearling arctic subspecies Middle is Boltz – 5-year-old Great Plains subspecies Right is Denali – 9-year-old northwestern subspecies*

**Grayson** “...Of the adult wolves, he seemed to be most comfortable and confident with pack leader Aidan, especially when feeding...He seems to enjoy the advantage of height, on more than one occasion walking atop the rocks near the left fence line...”

**Axel** “...He was usually the first wolf to walk up to the observation area to investigate the people behind the glass, and did so more often than the other wolves...”

If you'd like to test your observation skills, we have the ethogram for sale on an 8 GB flash drive in our Wolf Den store under the “Our Wolves” section. If you would like some hands-on training, consider attending our *Wolves After Dark* programs offered at the interpretive center in Ely. ■

### Pass The Mustard, Please

by David Kline

Lisa Nivens will not only pass the mustard, she'll include the spicy BBQ sauce, the hot sauce and the ketchup! For 13 years, Lisa has worked for The French's Food Company, calling on restaurant chains such as Chili's and Hardee's as the national accounts manager. She regularly partners with restaurant culinary and marketing teams to customize new sauces or menu items.

For Lisa, however, creating a tasty twist on a chicken sandwich takes a backseat to her excitement about wolves.

In Lisa's Austin, Texas office, visitors can't miss a wall covered with ambassador wolf photos—a visual that gives her a momentary, yet calm escape during a hectic day.

Her focus on wolves began with an Internet search in which she discovered the International Wolf Center. Because she loves wilderness and adventure travel, she booked a cabin near the Ely interpretive center and enjoyed a week-long “wolf immersion” vacation. That fall 2012 trip figuratively recharged her batteries and sparked her commitment to help wolves through a Center membership. In 2016, Lisa included the Center in her estate plans, as well.

Presentations and exhibits at the Center exceeded Lisa's expectations, convincing her that an educational emphasis is a smart way to advocate for this keystone animal. Back home in Austin, where she lives with and cares for her mom and her rescue dogs Charley and Luna, Lisa also supports the “domesticated wolves” at the local no-kill shelter.

Born in Japan, Lisa grew up in a bilingual home where her American dad and Japanese mom fostered her love of



Photo courtesy of Lisa Nivens

nature and animals. She recalls bringing home various stray animals to help “save them.” Her dad kindly told her she couldn't save them all, to which she replied, “But Poppa, I can try!”

At age 18, Lisa came to America to attend the University of Texas at Austin. As an international business and marketing graduate with a bachelor's degree in business administration, Lisa began her career at General Foods and worked at the Campbell Soup Company before going to French's.

Lisa has used her knowledge of wolf behavior and biology, gained from wolf.org and Center programs, to help change others' misperceptions about wolves. Her passion for the natural world has led her to pursue adventures in Antarctica, Asia, Africa, Australia, South America, Europe and America's national parks. Reading books is a spare-time pleasure for Lisa—especially the stories of wolves and the outdoors that soothe her mind, providing purpose and fresh perspectives.

Members such as Lisa throughout the world drive the education focus of the International Wolf Center. Thank you, Lisa, for helping the Center help wolves—and for adding a little spice to our global membership! ■



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# Thank You!



# Wild Kids

## Citizen Science

In our previous issue, we discussed how important citizen science is, and how kids just like you can get involved.

Citizen scientists' eyes and ears help us collect information that informs scientists who study wolves. For example, mange is a disease that can hurt wolf populations, and can even hurt our pet dogs. Our dogs can get veterinary care, so mange isn't such a big problem for them. But wild wolves don't have this luxury. Photographers in Yellowstone National Park act as citizen

scientists by submitting their wolf photos to scientists who analyze them for evidence of mange. This puts scientists "ahead of the curve" if a mange outbreak is likely and provides clues on possible reasons for the outbreak. Also, because photos capture amazing detail, researchers can use them to identify the same wolf in different locations. This helps scientists track wolves without having to fit them with radio collars.

Some citizen scientists go through collections of recorded wolf communications, including vocalizations (like howling) and body language, and put them in categories of behavior according to meaning. Their discoveries can help researchers narrow down wolf communication patterns, and helps explain their social behavior.

Practice your science and observation skills by identifying behaviors in all the wolf photos in this magazine.

Happy researching!

How many wolf behaviors can you identify in this picture of ambassador wolf Axel interacting with pack mate Boltz?



Leanne Martin

## Vocabulary

### Rendezvous Site

A rendezvous (pronounced "ron-deh-voo") site is an important in-between step—a safe area for pups born in the spring who are old enough to leave the den, but too young to safely hunt with the pack. The pups will stay close to this area, continuing to grow and develop until they are able to hunt full time with the pack—usually by winter.

*These photos, taken August 2016, show ambassador pack pups Axel and Grayson at the age when (in the wild) they would still be at a rendezvous site. (Photo credit: Andrew Broz)*



Leanne Martin



Leanne Martin



National Park Service

1.



# Meet the Canines

You may love canines, but do you know which species is which? Let's find out! Read about these canine species, study the pictures, and then see whether you can identify the animals in photos 7-12.



Don Gossett

**Gray wolf:** Long legs, broad face and muzzle, usually weighing 50-135 lbs.



A.K. Kerber

**Coyote:** Narrow muzzle, large ears relative to body size, smaller stature, usually not larger than 30-40 lbs.



National Park Service

**Gray fox:** Very small body, long tail with distinct black stripe, speckled salt-and-pepper coat. Tan on underside and behind ears.



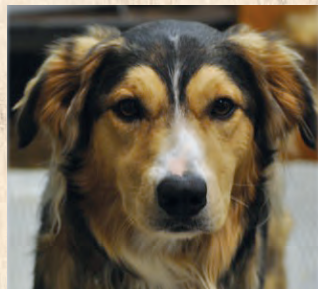
National Park Service

**Red fox:** Small body with large, fluffy tail. Usually a red coat can be other colors, as well. Always has a white tip on the tail.



B. Crawford

**Red wolf:** Only wild range is in NE North Carolina. Smaller than a gray wolf, but larger than a coyote. Muzzle is broad, ears are large, legs are long. Can weigh 40-70 lbs.



International Wolf Center

**Dog:** Most dog breeds can be easily distinguished from wild canines. Some can appear similar to wolves or coyotes, but usually can be distinguished by behavior—or by proximity to humans. Dogs usually have a broader chest than wolves.



Andrew Broz

## Ambassador Wolf Behavior: "Obnoxious" Submission

Lower-ranking wolves approach and greet higher-ranking wolves in a constant—and "annoying"—manner by whining, licking the muzzle and pawing at the higher-ranking wolf's face. The higher-ranking wolf may engage the lower-ranking wolf in a dominance display. Biting the muzzle of the lower-ranking wolf is a typical and common example. Wolf biologists interpret "obnoxious" submission behavior as an attempt to reinforce bonds within the pack. Wolves rely on their social bonds because they need to cooperate when taking down prey that can be 10 times their size.

Here, Axel demonstrates "obnoxious" submission by pawing at Aidan, the pack's dominant male. Aidan is showing his teeth with his ears pinned back, indicating he is not very tolerant of Axel's behavior. ■

## Now, Guess The Canines!



Cameron Feaster

2.



National Park Service

3.



National Park Service

4.



U.S. Fish and Wildlife Service/  
Steve Hillebrand

5.



U.S. Fish and Wildlife Service

6.

Answer Key: 1. Coyote 2. Dog 3. Gray fox 4. Red fox 5. Red fox 6. Gray wolf



# Wolves of the World

## Research Addresses Wolf Impacts on Second-Tier Predators, Possible Second Wave of Canid Domestication

By Tracy O'Connell

Research across Europe has suggested that an inverse relationship exists between the numbers of gray wolves and numbers of jackals. Principal researcher Miha Krofell, assistant professor of zoology and ecology at Slovenia's University of Ljubljana, was joined by a team from Bulgaria, Greece

and the United States, among others, in a multi-scale project seeking to determine if an increase in numbers or territory of an apex predator, the wolf (*Canis lupus*), has an effect on the population and distribution of a mesopredator (a predator of middle size) such as the golden jackal (*Canis aureus*). While this has been con-

ventional wisdom in remote areas, this team sought to determine if the correlation held true in human-dominated landscapes such as Europe.

To do this, researchers analyzed hunting data trends for both species in Bulgaria and Serbia, and jackal persistence in eight study areas that were re-colonized by wolves. They found the trends were consistent with predictions of suppression of jackals by wolves. In seven of eight cases jackals disappeared or were displaced in the wolves' newly established home ranges, leading to the suggestion that wolf extermination was a key driver of the expansion of jackals throughout Europe. Results also indicate that this pattern may be weakened where wolves are at reduced densities in human-dominated landscapes.



**An Australian-led** study meanwhile asks, *Are humans inadvertently creating a new wave of wolves that are domesticating into dogs?*

Thomas Newsome, who was on the team



Adobe Stock / Manuel

Wolf (above), and Golden Jackal (right)



Adobe Stock / Photocatch





Jonathan G. Wray

### Coywolf

studying the relationship between wolves and golden jackals reported above, was lead researcher in this study, released in the journal *BioScience* in April. Newsome, of Deakin University and the University of Sydney in Australia, reports on his website that he and his colleagues used case studies of gray wolves and other large predators to explore the effects of foods, found as a result of human presence. The biologists found numerous instances of species changing their social structures, movements and behavior to acquire these human-provided resources.

The authors question whether this close interaction is creating the right conditions for a new species of human-dependent wolf to split off from the wild gray wolf. Aaron Wirsing of the University of Washington, a member of the team, said, "In the very, very long term there is certainly the possibility that you would get certain populations of gray wolf that rely on human resources becoming isolated from wilder populations that rely on natural resources."



**In Canada,** DNA testing continues to show that wolves and coyotes have been mating in Newfoundland. John Blake, the province's director of wildlife, says 11 harvested animals were so confirmed since 2013. "It's just adding to the genetic

mix that's already very hybrid. The eastern coyote came here in the 1980s. That already had Algonquin wolf as part of its genetic makeup," he told the online Labradorian news source, adding, "There has been introgression of the more pure gray wolf—the Labrador gray wolf—into our Eastern coyote genetic mix on the island." (Introgression is the introduction of a gene from one species to another.)



**In Mongolia,** a traditional livestock guard dog, the Bankhar, is being brought back to protect the nomads' herds. Bruce Elfstrom, a biologist interviewed by the English-language *Nikkei Asia Review*, says he was producing a documentary in 2004 on the steppes of Mongolia when he was roused in his yurt by the sounds of wolves outside killing nearly 50 animals belonging to local herders.



Otto Simonetti

The interplay of animals living in this harsh environment is complex. Poaching may play a part in loss of the prey species wolves would normally hunt, driving wolves to kill livestock instead. Numbers of the endangered saiga antelope (valued for their horns and meat), red deer and argali mountain sheep have dropped precipitously, according to the Wildlife Conservation Society.

Subsistence herders, threatened by losses of livestock, fight back with recently acquired, modern weaponry, with the result that the predators they hunt—snow leopards and lynx as well as wolves—also face the threat of annihilation; snow leopards are on the endangered species list, and wolf numbers are declining due in part to high prices for wolf pelts and body parts in China. Meanwhile, over-grazing of the steppes has resulted in desertification.



Emmanuel Keller

Breeds similar to the Bankhar dog have been effective around the world (see articles cited below) in cutting livestock losses by as much as 80 percent. In Mongolia, however, use of this ancient breed declined under Soviet rule, when efforts to modernize wiped out traditional knowledge of skills like training and using the Bankhar dogs, and when the false belief that the dogs spread disease led to their destruction.



Adobe Stock / svetography

### Bankhar dog



Herders using these dogs report livestock losses have dropped from previous levels of 20 to 80 animals per year, to fewer than 10. Beyond helping reduce predation, the program has achieved unique benefits, according to the Nikkei article, which claims that use of the dogs can also help mitigate desertification. As the threat of predation is eased, nomads are able to reduce herd sizes, resulting in less pasture damage.

Another advantage cited in the article is that the use of Bankhar dogs encourages predators to focus on natural prey animals such as the Asiatic wild ass and Mongolian gazelle, which in turn graze in more compact areas, reducing pasture damage.



**In the Netherlands,** a dead male wolf in Drenthe (in the country's northeastern part, near the border with Germany) was apparently hit by a car in April. If the wolf was killed in the Netherlands, it would indicate that the animals are moving back into the country. There have been two confirmed sightings in the Netherlands in the past two years, according to the online, English-language Dutch News; before that, the last confirmed sighting was in 1869. In another instance, a dead wolf found in the Netherlands was determined to have been dumped there from another locality. In March 2014, the government announced the wolf will be a protected species when it returns to the Netherlands. This means farmers will receive compensation from a special fund if livestock are attacked and killed.



**In Scotland,** the Trees for Life charity has recruited a group of volunteers to stalk the woods pretending to be wolves in order to simulate the effect of reintroducing the species, which it claims would be advantageous.

The charity believes the presence of wolves would naturally cull the deer that are overpopulating and threatening plant species, and that wolves could become a tourist attraction. Third Force News, an online media outlet in Scotland, reports that, to prove its theory, Trees for Life



Christopher Michel / Flickr

*Helicopter wolf-hunting trips may be offered to wealthy tourists in eastern Siberia to cull predators there.*

recruited volunteers to roam the woodland around Inverness in the Scottish highlands for a number of weeks last spring to simulate the behavior of wolves. The thought was this behavior would cause enough disruption that deer would stay clear.

Meanwhile, landowners, gamekeepers and farmers remain strongly opposed to the proposed reintroduction of actual wolves.



**The Siberian Times** reported in March the proposal that wealthy tourists should be invited to pay \$10,000 to shoot a wolf in Siberia, to make money for the government while culling the predators in an effort to reduce losses of reindeer and horses.

Wealthy Russian and foreign tourists would be offered helicopter hunting trips in Yakutia, also called the Sakha Republic, an area in eastern Siberia that is twice the size of Alaska. There, 12,000 wolves—nearly one-fourth of the total number in Russia—are reported to have killed more than 9,000 reindeer and 500-plus horses. Local deputy Viktor Fedorov suggested offering the hunting opportunities to cut wolf numbers without negatively affecting the budget, since it costs the government \$3,400 U.S. to cull just one wolf.

"I searched the prices on trophy hunting in South Africa. Hunting an adult lion costs \$30,000, therefore \$10,000 for a

wolf is quite an acceptable price," he said. The cost of accommodation, transportation and food would be another 300,000 rubles (\$5,100 U.S.). ■

#### Additional reading in *International Wolf* magazine



*Bigger, Badder Dogs Could Help Western U.S. Sheep Ranchers*, Fall 2015 page 13



*The Persistence of the Iberian Wolf*, Winter, 2014 page 18



*Wolves of the World*, Summer 2013, page 16



*Wolves of the World*, Winter, 2012, page 17

*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.*



with great surprise I realized what I was looking at; six sets of eyes were staring at me, only 100 feet away. And then, I heard a muffled half-bark followed by a deep, smooth, heavy sound rising into the air. None of the other

# Personal Encounter

## Spring and Strife in Yellowstone

Text and photos by Kira A. Cassidy

Flipping up the visor on my flight helmet, I scanned the ground 800 feet below as the pilot throttled back the engine of the tiny, yellow two-seater plane and banked left.

"There! Off to the left, under the wing, 9 o'clock!" My voice betrayed the adrenaline rush. It was the Mollie's pack, less than a half-mile away from the den

of the Junction Butte pack, and quickly closing the distance to their rivals.

April is usually a quiet time for wolves in Yellowstone. The snow is melting in the low elevations, and rivers of green grass glow between the leafless, gray branches of aspens and the red stems of willows. Female wolves are choosing den sites—the hub of their family's summer activity, and the school and playground for the new pups. But all that tranquility was gone as I watched the Mollie's moving purposefully toward that den and the Junction Butte wolves sleeping nearby.

After another minute of watching and circling, holding my breath as I gripped the camera and noted the time on my watch, I saw the Junction Butte beta male, a huge black wolf with a silvery muzzle, jump to his feet. He couldn't see the

Mollie's, but his sense of smell had never betrayed him before, and something wasn't right. Within a few seconds the yearlings at his feet jumped up, too. There were the Mollie's, downhill and moving closer, noses to the ground. The Junction male took off running toward the enemy, the yearlings joining in, outnumbered by double. At the last second the Junctions veered off, but turned back and charged again, this time joined by the old, gray dominant male. His lifelong limp was forgotten as all the invaders' attention turned to him and, in that instant, the encounter turned serious. Both Junction males ran in the opposite direction of the den and the Mollie's sprinted after them. Footpads flew over sage and stone—the only space between lungs full of air, a heart pumping strong, and death.

For the next 45 minutes I watched, recorded and photographed as the Mollie's approached the den, only to have the Junctions run back, bark-howling in distress, baiting the Mollie's into chasing them. On their last attempt, the Mollie's were only 50 meters from the den entrance. They sniffed around, trying to figure out the maze of scents







in the area to narrow their search for the den. From the air I watched as a Junction female peeked out of the den. Deep underground behind her, her sister lay curled with all their pups, only a few days old. She watched the Mollie's, ears slightly flat, body barely moving, before she slipped silently back into the den.

By late morning the Mollie's pack had traveled away, abandoning their assault on the Junction Butte pack and

den. The Mollie's never reached the den entrance and the Junction Butte pack protected their own, regardless of the danger. They initially attacked, but when they saw they were outnumbered, they repeatedly drew their rivals away from the den and their vulnerable new pups the size of half-grown cottontail rabbits, with eyes not yet open. The mothers of the pups had wisely chosen an easily defensible site. If they stayed

underground and didn't run away in the confusion, there was no way any wolf would be able to get past them in the tight, sandy den corridor to reach the pups snuggled below.

Den attacks had been recorded in Yellowstone before, some resulting in the deaths of pups and even adults. This encounter didn't claim any lives but was an important event that spring. A few weeks later the Junction Butte pack pups—all nine of them—peeked above ground. Over the next six months a few of them disappeared, lost to the dangers wolves face in the wild. But the rest hunted, traveled, slept on the snow, played with their pack mates and, one year later, protected the pack's newest litter from any dangers that arose. ■

### Information from Yellowstone Forever website

Thirty-one wolves were introduced to Yellowstone National Park during 1995 and 1996. This monumental undertaking marked the first deliberate attempt to return a top-level carnivore to a large ecosystem. Its impact has been significant; wolves have affected the dynamics of the entire Yellowstone ecosystem.

Since then, Yellowstone Forever, the non-profit organization that partners with Yellowstone National Park, has contributed more than \$6.5 million toward ongoing wolf research and monitoring in Yellowstone as part of the Yellowstone Wolf Project. The Yellowstone Wolf Project also receives funding from the National Park Service.

Using a year-round strategy, the project is critical to the long-term health of wolves in Yellowstone. Yellowstone wolf biologists and field staff conduct research to capture and collar wolves, gather genetic samples for testing and lab work, conduct winter and summer field studies on predation and pup survival, and log numerous monitoring flights. This level of fieldwork helps biologists better understand wolf populations, territories, and relationships with prey species like elk and bison; helps them monitor the health of packs; and alerts them to disease or health issues in the population.

*Kira Cassidy is a research associate with the Yellowstone Wolf Project, where she started as a volunteer in 2007 and today specializes in wolf aggression and behavior. She completed her master's degree at the University of Minnesota, studying wolf territoriality under Dr. L. David Mech.*



# A Look Beyond

## Wolves Lose Federal Protection in Wyoming

by Edward A. Fitzgerald, J.D., Ph.D.

The controversial management of wolves in Wyoming has generated litigation and congressional action, the focus of which has been the Department of Interior (Interior) acceptance of Wyoming's wolf management plan.

Interior's acceptance of the plan was a requirement for delisting from the Endangered Species Act (ESA). Wyoming sought to manage the least number of wolves in the narrowest possible geographic area, while Interior insisted a statewide trophy-game designation was needed; that designation allows the state to regulate the method, season and number of wolves taken on state land.

Wyoming in 2003 passed a law that treated wolves, once delisted, as trophy game on federal lands. Wolves outside federal lands were considered

predators that could be shot on sight. Interior rejected the plan in 2004 primarily because of the broad "predator" designation, suggesting a statewide trophy-game designation instead—which Wyoming unsuccessfully challenged.

Interior in 2006 announced that it was considering establishment of the Northern Rocky Mountain (NRM) Distinct Population Segment (DPS) and delisting that wolf population—a proposal contingent on approval of Wyoming's management plan. Wyoming submitted a restrictive revised plan. Interior accepted and delisted wolves in the NRM DPS.

In 2008 the Montana federal district court invalidated Interior's acceptance of Wyoming's wolf plan in *Defenders of Wildlife (DOW) v. Hall*, finding that the

plan suffered the same defects as the one turned down by Interior in 2004.

Wyoming submitted a similar revised plan; Interior rejected it in 2009, and Wyoming brought suit. The Wyoming federal district court in 2010 held Interior's decision was arbitrary and capricious in *Wyoming v. Interior*. The court found Interior's insistence on a statewide trophy-game designation was not mandated.

Interior in 2009 delisted wolves in Idaho and Montana, but retained ESA protections for wolves in Wyoming. The Montana federal district court in 2010 struck down the regulation in *DOW v. Salazar*. The court held the NRM DPS cannot be subdivided on a state-by-state basis.

Congress intervened in 2011 by attaching a rider to Interior's appropriation bill that resurrected the 2009 regulation delisting the wolf in the NRM DPS except Wyoming and precluding any judicial review. Interior was instructed to reconsider Wyoming's plan. Federal



Jimmy Jones Photography



courts rejected a challenge to the rider in *Alliance for the Wild Rockies v. Salazar*.

A settlement was negotiated in which Wyoming agreed to manage 100 wolves and 10 breeding pairs on state land in the northwestern Wyoming trophy-game area that comprises 15 to 16 percent of the state. During peak dispersal season the trophy area expands 1300 square miles and covers an additional 1.3 percent of the state. The wolf is considered a predator subject to indiscriminate killing in the remainder of the state. Wyoming promised to manage the wolf population above the minimum level as a safety buffer. Interior then delisted the wolves in Wyoming.

In 2012 the Montana federal district court invalidated Interior's delisting of Wyoming's wolves in *DOW v. Jewell*. The court held that Wyoming's promise to establish a buffer population is not legally enforceable, and Interior cannot rely on Wyoming's promise to satisfy the ESA requirement of an adequate regulatory mechanism.

The D.C. Circuit Court of Appeals in 2017 reversed the district court and upheld Interior's 2012 regulation in *DOW v. Interior*, thus removing federal protections and returning jurisdiction for wolf management to Wyoming. The court held that Interior acted reasonably in approving Wyoming's management plan. I believe, however, that the court was mistaken because Wyoming's plan relies on many unenforceable promises. The ESA requires Interior to consider the adequacy of existing regulatory mecha-

nisms. An adequate regulatory mechanism must have the force of law. Interior should not rely on promises when evaluating existing regulatory mechanisms.

The court also held that the predator-control area in Wyoming, which is outside the national parks and trophy game area, was not a significant portion of the wolf's range. Again, I believe the court was mistaken. The court relied on Interior's 2012 interpretation that the significant portion of the range is the area necessary for the survival of the species as a whole. This seems contrary to the text, intent and purposes of the ESA, case law and Interior's prior position, all of which define the significant portion of the range as that part of the historic range once occupied by the wolf, where it is no longer present.

The predator-control area covers 19 percent of Wyoming's suitable wolf habitat and contains three of the 27 breeding pairs, eight of the 48 packs, and 46 of the 328 wolves in Wyoming (outside of Yellowstone National Park), and seems to me a significant portion of the wolf's

range. Migrating wolves, which are necessary for genetic diversity, traverse the area. Wolves leave protected areas to seek food and mate. Any wolf found in the predator-control area may be shot on sight. Furthermore, confining wolves to northwestern Wyoming will hamper the wolf's return to the Southern Rockies.

Wyoming is planning a fall 2017 wolf hunt that could decrease the population in the trophy game area by 50 to 160 wolves, leaving the minimum number of wolves needed to meet the state's legal obligation. ■

*Edward Fitzgerald, J.D., Ph.D., is a professor in the department of political science at Wright State University in Dayton, Ohio. He is the author of Wolves, Courts, and Public Policy: The Children of the Night Return to the Northern Rocky Mountains (2015) and articles including Defenders of Wildlife v. Jewell: Wyoming Wolves Receive a Warranted Reprieve—But for How Long?, 45 Environmental Law Reporter 10447 (May 2015).*



Dan Newcomb





Luna—Photo by Darcy Berus

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