


INTERNATIONAL WOLF

A PUBLICATION OF THE INTERNATIONAL WOLF CENTER
SPRING 2023

- 
- A dark brown wolf with yellow eyes is standing in a grassy field, looking towards the camera. The wolf's fur is thick and dark, and it has a slight smile on its face. The background is a blurred natural setting with trees and rocks.
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INTERNATIONAL WOLF



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Planning a Future for Wolves and People 2023 Minnesota Wolf Management Plan Update

Minnesota's very first plan for managing the state's wolf population was published in 2001. It guided the Minnesota DNR through several ESA listings and de-listings of the wolf, but was never updated—until 2022, when the new plan was released. Here, Debra Mitts-Smith describes the planning process, the highlights and the future vision for that plan.

By Debra Mitts-Smith



Seeking Common Ground: Building Community to Protect Wolves and People

Literature abounds with accounts of human hatred and persecution of wolves. This article, instead, offers a glimpse of the hope and possibilities borne of friendship, and the willingness of wolf advocates and ranchers to take a chance on each other in Colorado. Author Courtney Vail tells us how that happened and what it might mean for the future.

By Courtney Vail



Ice Age Ancestors: Today's dogs carry genes from two ancient wolf populations

Ever look at your dog and wonder if you see signs of a wolf? Geneticists and archaeologists are still trying to answer parts of that question, but they know its howls echo back to the Ice Age, and that its ancestors were not one, but two wolf populations. Here's the story of how their research is progressing world-wide.

By Cheryl Lyn Dybas



On the Cover

Photo by Julie Argyle

To see more of Julie's photography visit: <https://2-julie-argyle.pixels.com>

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Her latest picture book, *Wolves: Western Warriors* is available online at major book resellers.

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Senate Media Services



Remembering Doug Johnson 1942-2022

By *Ellen Sampson*

In 1986, I received a call from State Senator Doug Johnson. The Committee for the International Wolf Center was hoping to build a wolf center in Ely, Minnesota, which was part of his district, and needed a lobbyist to shepherd the proposal through the legislative process.

I knew the senator both from my time as a lobbyist and as a staff person for the Minnesota State House of Representatives. He first caught my attention when I heard him give an eloquent speech in favor of granting voting rights to the citizens of Washington, D.C. Later, as a staff person at the legislature, I learned to respect the senator's devotion to northern Minnesota, where he was born and educated, and lived and worked. He was also a smart, hard-working politician. After I graduated from law school and joined a local law firm, a colleague and I successfully lobbied for state funding for a project at an environmental center in Sen. Johnson's district. That project and our earlier contacts no doubt led to his call.

To a non-Minnesota native who knew wolves only from fairy tales, accepting his offer seemed like a stretch, but the senator was persuasive, and I agreed. So began one of my favorite projects. It gave me the opportunity to work with the Center's board members, Dave Mech, Nancy Gibson and many others. The Science Museum of Minnesota had agreed to donate its outstanding Wolves and Humans exhibit if the Center was built to house it. Sen. Johnson and his colleague State Representative David Battaglia supported the committee's desire to build the new Center in Ely. Ely had been a center of debate over issues surrounding the BWCA, and they thought this project would benefit everyone involved. Unhappily, we did not get the funding the first year; eventually the legislature appropriated some money to decide where the Center should be built. Once Ely was designated as the location, the lobbying began anew. Sen. Johnson worked tirelessly during the next couple of years to keep the project alive, as did his House colleague Rep. Battaglia and several others, including State Rep. Phyllis Kahn. By then, the Committee had long exhausted its funding for lobbying, but we had developed such a strong rapport fighting for this compelling project, that I agreed to continue in a more pro bono capacity.

Finally in 1990 money to build the Center was included in the proposed bonding bill. As the conference committee worked through the night, Nancy (who was monitoring the hearing) called me at home to say she was afraid they were going to take the funding out.

The Conference Committee was chaired that night by then Sen. Mike Freeman. I told Nancy I was on my way—but first I'd call for help. I called Rep. Kahn and then Zora Radosevich, Sen. Johnson's assistant, to ask if she could get him to the capitol. Shortly after I arrived, Rep. Kahn walked in. Sen. Freeman then asked for testimony from me. Just after I sat down at the witness table, Sen. Johnson arrived and took a seat next to me at the table. After assuring the committee we would take the amount included in this bill, Sen. Freeman called for a vote, and the committee howled in the affirmative!

The senator and I smiled and thanked the committee—and the International Wolf Center still counts Doug Johnson as one of its earliest and most faithful benefactors. ■

After serving as a lobbyist and a staff member in the Minnesota House of Representatives, Ellen Sampson, JD was a partner at Stinson Leonard Street law firm in Minneapolis for many years, retiring in 2017. She practiced in the areas of labor and employment law, government relations and alternative dispute resolution.

From the Executive Director

“Did you hear about the coyote that attacked a toddler?”

When a friend asked me that question recently, I immediately got suspicious about what anti-predator propaganda I was about to hear.

“Where did you hear about that?”

“On the news—there’s a video and everything.”

While still doubtful, I reluctantly did a search online. Sure enough, someone in a gated community in LA had video from their doorbell camera of a coyote grabbing a young girl from behind. It dragged her on the ground for several feet before her dad came to her rescue.

As a parent and wild canid lover, it was very difficult to watch. While the girl was not harmed beyond a few scratches and bruises, I knew that the psychological damage had been done. Not just for that girl, but for everyone who watched that video. I knew that this story would be picked up and disseminated by those who already think there are too many predators on the landscape. It wouldn’t matter that this was a coyote habituated to living near people, and not a wild wolf.

In today’s world, driven by social media, a 22-second video such as this one has a lot more influence than research that tells us this type of aggressive incident is extremely rare for coyotes and almost non-existent for wolves. This is why it so important to have strong wolf education programs to correct the misinformation inevitably passed along with the story. It also illustrates the importance of wildlife management programs that use science-based techniques to address and minimize human/predator conflict. If we continue to value the expansion of predator populations, these programs will become essential.

This issue of *International Wolf* includes several stories exploring the challenges of managing the wolf/human relationship—from the release of an updated Minnesota Wolf Management Plan to one state’s efforts to proactively address conflict in Colorado. No matter what your thoughts are about wildlife management’s role in wolf recovery, I encourage you to read these stories with an open mind.

I’ve met many state and federal wildlife managers, and I have great respect for the work they do—often under complicated and emotion-laden circumstances. These folks and their work are important parts of the wolf recovery story. ■



A handwritten signature in black ink that reads "Grant Spickelmier".

Grant Spickelmier
Executive Director

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Planning a Future for Wolves and People

2023 Minnesota Wolf Management Plan Update is Ready!

By DEBRA MITTS-SMITH

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In 2001, Minnesota published its first wolf management plan after the U.S. Fish and Wildlife Services' (USFWS) recommendation that the gray wolf be delisted from the federal Endangered Species List, returning wolf management to states.

That plan has been in place more than 20 years, guiding the Minnesota Department of Natural Resources (DNR) through several listings and de-listings of the wolf. Currently, wolves in Minnesota remain protected by the federal Endangered Species Act (ESA), but the DNR plays a role in population monitoring, wolf research and depredation control, making a state plan necessary regardless of the wolf's federal status. Much of the 2001 plan remains relevant, but recent research results and modern management methods have necessitated revisions. These are highlights of the new plan:

Vision for Wolves

The 2001 plan described its purpose as ensuring “long-term survival of wolves in Minnesota while addressing wolf-human conflicts that inevitably result when wolves and people live in the same vicinity.” The 2023 plan's vision is more robust, reflecting the change in the wolf's status from “in recovery” to a resilient, thriving species: “Minnesota's wolf population will continue to be healthy, widespread across suitable range and stable after decades of recovery from historical lows.” And while the updated plan allows that human-wolf conflicts remain, it also recognizes that many Minnesotans acknowledge wolves' right to exist and their vital role in the ecosystem.

Minnesota: State of the Wolf

The 2023 wolf plan recounts the story of the gray wolf in Minnesota, past and present. An estimated 4,000 wolves inhabited the area prior to the

arrival of European settlers. By the mid-twentieth century, habitat loss, government eradication and decline in prey species reduced the wolf population to 300-800 and its range to forested areas along the Canadian border.

The 2023 plan's vision is robust, reflecting the change in the wolf's status from “in recovery” to a resilient, thriving species: “Minnesota's wolf population will continue to be healthy, widespread across suitable range and stable after decades of recovery from historical lows.”

By the late 1960s, after decades of eradication efforts across the lower 48 states, Minnesota was one of few places where the animals remained. In 1974, the gray wolf in Minnesota received complete federal protection under the ESA as the USFWS established a population goal of 1,400 wolves for Minnesota. Numbers rebounded, and in 1978 the wolf's status was downgraded from endangered to threatened. Since the late 1990s, the population has remained relatively stable at about 2,700 wolves with a range that encompasses roughly one-third of the state.

Today, according to the 2023 update, nearly half the estimated 6,000 wolves in the lower 48 live in Minnesota.

Strategic Issues and Goals

The 2023 plan recognizes six strategic issues that underlie and impact wolf management. These include people's diverse and changing wildlife values, tribal wolf interests, funding for wolf management and conservation, wolf depredation and predation, wolf population objectives, and wolf research and monitoring needs.

Closely aligned with these issues are the plan's six goals or "outcome-oriented purpose statements." These focus on maintaining a resilient wolf population, collaboration with partners to implement the wolf plan, minimizing and redressing human-wolf conflicts, informing the public about wolves in Minnesota, conducting research to inform wolf management and administering the wolf program to fulfill the DNR's responsibilities. Each goal is further supported by objectives, strategies and performance measures.

People: Diverse Perspectives

The wolf plan is not only about wolves; it is also about humans who experience and view wolves in different ways. Indeed, one of the most striking aspects of the DNR's 2023 plan is its incorporation of stakeholders' diverse views.

In preparation for the revision, the DNR gathered data on Minnesotans' attitudes, values and behaviors regarding wolves and wolf management. From September through December 2019, the DNR and the Minnesota Cooperative Fish and Wildlife Research Unit at the University of Minnesota developed and mailed a 12-page questionnaire to 9,750 Minnesotans across the state. To be statistically representative of the population, the survey targeted individuals from three population segments: 5,250 Minnesota residents from different regions of the state, including the Twin Cities Metro area; 2,000 resident deer hunters; and 2,500 livestock producers in areas inhabited by wolves. The overall response rate was 41%, with 53.4% of livestock producers, 46.6%

of deer hunters; and 32.8% of general residents responding.

Questions focused on attitudes toward wolves, wolf management, and hunting and trapping; experiences with wolves; and views on the number and distribution of wolves in Minnesota. Some questions were specific to each population group. The general resident population was queried on its interest in nature, wolves and outdoor recreation, deer hunters on their hunting ethos and experiences, and livestock producers on depredation by wolves.

Overall, survey participants agreed that maintaining a wolf population in Minnesota is important, and that the current wolf population and range should be maintained. Opinions diverged on hunting and trapping, attitudes toward the DNR, and the value of wolves in nature. Among livestock producers and hunters, 80% favored a wolf hunting and trapping season, while only 40% of general residents favored a wolf hunting season and 30% a wolf trapping season. General residents reported having a high level of trust in the DNR, while livestock producers reported the lowest level.

On average, 62% of livestock producers and 52% of hunters in wolf range revealed a negative attitude toward wolves, while 68% of general residents held a positive attitude. Responses on the value of wolves varied across the three groups. General residents agreed that wolves were important to the ecosystem, they had a right to exist, and that it is important for future generations to enjoy wolves. Livestock producers' and deer hunters' responses were similar, but they also valued wolves for the opportunity to hunt or trap them.

Throughout the revision and drafting process of the 2023 plan, the DNR invited online public comments and collected feedback in online public meetings.

Committees

The 2023 plan includes input from both the Wolf Plan Advisory Committee (WPAC) and the Wolf Technical Committee (WTC). The 20-member WPAC is composed of members-at-large as well as representatives from animal

rights and wolf advocacy groups, environmental protection organizations, livestock and agriculture groups, hunting associations, and local governments. The DNR strove to include members from different regions of the state who were familiar with wolf management and represented different perspectives. The WPAC was charged with developing wolf management options and preferences—with emphasis on controversial aspects of wolf management.

The 2023 plan recognizes six strategic issues.

These include people's diverse and changing wildlife values, tribal wolf interests, funding for wolf management and conservation, wolf depredation and predation, wolf population objectives, and wolf research and monitoring needs.

The Wolf Technical Committee (WTC), composed of wolf management staff and researchers from state, tribal and federal agencies, universities, and other NGOs, was charged with reviewing and assessing the 2023 plan, and making recommendations on population monitoring, research and management strategies.

The DNR shared survey data with the stakeholder and technical committees to help them make informed decisions.

Tribal Interests

Seven Ojibwe reservations and four Dakota communities occupy parts of Minnesota as sovereign nations. Throughout these lands, wolves are a natural, as well as a cultural and spiritual presence. Since Minnesota's wolf plan affects tribal nations, the DNR consulted with tribal, cultural and religious leaders throughout the drafting process. Ojibwe governments in Minnesota, along with the Great Lakes



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Indian Fish and Wildlife Commission, provided Ojibwe beliefs and perspectives on wolves and wolf management, and tribal biologists participated in the WTC, consulted with the DNR and observed WPAC meetings.

Dakota communities chose not to participate in updating the plan, but instead deferred to Ojibwe contributions. *Ma'iingan* (the wolf) plays an important role in the Ojibwe creation story, by the end of which the Ojibwe and the wolf are brothers whose fates are intertwined. For the Ojibwe, the term “management” is inappropriate, as “one does not ‘manage’ one’s brother.” Instead, the Ojibwe prefer “stewardship” or “protection,” which more accurately describes their relationship with the wolf as one of reciprocity, responsibility and gratitude for the benefits the wolf provides.



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Ojibwe people share the landscape with wolves, and tribes have the authority to conserve wolf habitats, monitor wolf populations and undertake wildlife research. In general, the Ojibwe recognize *ma'iinganag's* inherent right to exist, do not view the wolf as a threat to humans, and value their role in keeping the ecosystem healthy.

Overall, tribal governments and staff favor nonlethal methods to prevent wolf depredation on domestic livestock and certain prey populations. Yet some Ojibwe people acknowledge that lethal removal of wolves may be warranted in certain contexts, such as when they pose a threat to recovery of a prey species such as moose.

The wolf in the room

How does the plan deal with wolf hunting and trapping seasons? The answer is found in the plan's appendix. It begins with an assumption:

Currently, the wolf in Minnesota remains a threatened species under the protections of the federal ESA. This means the state does not have the authority to hold regulated wolf hunting and trapping seasons. The 2023 wolf plan therefore does not call for a wolf season. Instead, it describes the process, principles and framework that DNR will use to determine whether there will be a wolf season *if* wolves are removed from the protections of the federal ESA.

The 2023 plan is intended to guide Minnesota DNR's wolf conservation and management for 10 years with updates and revisions to be made five years after its adoption. The updated wolf plan describes a process that includes factors to consider and constituencies to consult.

Into the Future...

The 2023 plan is intended to guide Minnesota DNR's wolf conservation and management for 10 years with updates and revisions to be made five years after its adoption. The updated wolf plan describes a process that includes factors to consider and constituencies to consult. While recognition and inclusion of diverse perspectives and backgrounds play an important role in the 2023 plan, its implementation requires consensus, collaboration, coordination of resources and transparency. ■

Additional Reading

Minnesota Department of Natural Resources. *Wolf Management Plan Update Draft*. (<https://files.dnr.state.mn.us/wildlife/wolves/wolf-plan>).

Schroeder, S. A., Landon, A. C., Cornicelli, L., McInenly, L., Stark, D. (2020) *Minnesotans' attitudes toward wolves and wolf management*. University of Minnesota, Minnesota Cooperative Fish and Wildlife Research Unit, Department of Fisheries, Wildlife and Conservation Biology.

(https://files.dnr.state.mn.us/fish_wildlife/wildlife/wolves/attitude_report_final.pdf).

Author bio: Debra Mitts-Smith researches and writes about the wolf in literature and art. Her book, *Picturing the Wolf in Children's Literature*, was published by Routledge in 2010. She is currently working on a cultural history of the wolf.



Seeking Common Ground:

Building Community to Protect Wolves and People

By COURTNEY VAIL

We live in a world increasingly defined by our differences. Conflict is a daily part of our lives, even as we seek to coexist with each other, human-to-human.

The story of humankind's coexistence with wolves and other apex carnivores dates back millennia to well before Euro-American colonists embraced manifest destiny and the march westward, destroying native wildlife populations and Indigenous

Todd Hagenbuch

communities in their path. The wolf was eliminated from many natural landscapes by the mid-1900s.

Popular and scientific literature abounds with accounts of intense hatred of wolves and their ongoing persecution by humans. In contrast, this article offers a glimpse of tempered hope and possibility borne of friendship and willingness of wolf advocates and ranchers to take a chance on each other in Colorado.

The last native wolf in Colorado was shot in 1945. But in November 2020, voters changed the course of history for the wolf in Colorado. By a small margin, voters said 'yes' to Proposition 114, mandating that the Colorado Parks and Wildlife Commission develop and implement a plan to reintroduce gray wolves to Colorado by the end of 2023.

Based on the results of public opinion surveys, one might get the impression that most Coloradans welcome wolves to the landscape. However, we know that not everyone does. These apex car-

nivores will place additional stress on ranching operations that already deal with predation from other species such as coyotes, and other pressures including drought and the closing of rural industries many communities depend on for jobs and economic health.

Jo Stanko and I met at a gathering hosted by Colorado State University (CSU). Jim and Jo Stanko's ranch near Steamboat Springs has been in the family since 1907; the ranch now runs mostly on cows, calves and hay. Stakeholders at the CSU meeting met to explore ways to reduce conflict between humans and predators, and more specifically to foster tolerance, acceptance and collaboration that benefits wolves and people. Jo and I made a personal connection over coffee and launched the idea to bring wolf advocates and ranchers together for a weekend of conversation, field demonstrations and other engaging programming. The goal of such an event? To foster mutual awareness and understanding about sustainable ranching and living with predators by

bringing together divergent viewpoints.

The event was held in mid-September 2022 in Steamboat Springs with the collaboration of Rocky Mountain Wolf Project, CSU, CSU Extension, the Routt County Farm Bureau, and the Stanko Ranch. We aimed to promote dialogue, build community and find common ground to live and work with wolves and other wild carnivores through programs that minimize conflict.

Although embracing the challenges that Colorado wolf restoration poses may not be comfortable, it allows us to find shared values. We begin to see each other as fellow human beings deserving of respect. It also offers hope that we can work together for a better future for wolves and people.

Studies have shown that successful coexistence with wolves may be more about social, rather than ecological, carrying capacity. For those of us working to foster understanding and soften attitudes toward wolves before their reintroduction in December 2023, engaging and communicating with ranchers and other stakeholders is imperative.



Courtesy Vall

Promoting science alone is not enough to build trust. No shortcut exists for building community among diverse and often competing interests. It is hard work, accomplished individual-to-individual, one person at a time. Trust is born through shared experience and genuine interest in the well-being of others.

The rationale behind holding our meeting was simple. The scientific literature around bias, belief perseverance, and attitudinal change emphasizes the value and influence of personal relationships on peoples' preconceived notions of each other. In other words, nurturing friendships, or at least collegiality, between individuals can build bridges between entire groups. These relationships serve as stepping stones that can pave the way for civil and authentic dialogue between the extremes of opinion—and everything in between.

All of us are potential stakeholders in reducing conflict to support successful coexistence with carnivores on the landscape. *We can choose to feed the conflict, or we can work together toward solutions.*

Few things are more difficult than “loving thine enemy,” but often the enemy is of our own design and making, propped up by the stories we tell and the biases we keep. A humane and enduring future for wolves will require each of us to dismantle the rhetoric that keeps us divided.

Those who welcome wolves to Colorado and those who don't do not fit into tidy little boxes. We all are more than the labels that attempt to put us on opposite sides of a perceived divide. Nobody is completely one-dimensional, and labels don't do any of us justice.

Starting a slow and delicate process on a weekend in Steamboat Springs, the lines between rural and urban denizens blurred as participants mingled on ranchlands. Five ranches took part in a lightly facilitated weekend of conversations and demonstrations, sharing meals and life experiences. The event on the Stanko Ranch invited local producers to share their stories and operations. In a display of trust and willingness, they opened necessary conversations about the realities of coexisting with predators in ranching communities.



Courtney Vail



Courtney Vail

Although embracing the challenges that Colorado wolf restoration poses may not be comfortable, it allows us to find shared values. We begin to see each other as fellow human beings deserving of respect.



Todd Hagenbuch

If there is a “divide,” it is nothing more than a dotted line that separates those who embrace the rhetoric that perpetuates division from those who look for opportunities to understand one another. We can erase that line by demonstrating a bit of faith in each other.

Despite some media accounts, a diverse community has pulled together to support producers in northern Colorado where wolves originating from Wyoming preyed on cattle on at least one ranch. Wolf advocates took part in nighttime patrols at the ranch and contributed to efforts to install fladry (fence flagging), donate equipment and funds, and support workshops to share information about livestock management methods to reduce depredations.

While these efforts bode well, along with possibilities for emergent friend-

ships and deeper collaborations, it will take more of this hard work to temper animosity toward wolves that simmers around the borders of Colorado. Just over a month after our community dialogue in Steamboat Springs, media reports suggested that three of the eight wolves in the itinerant pack inhabiting rangeland near Walden had been shot after crossing the border into Wyoming.

Clearly, we have more work to do. But the good news coming out of northern Colorado is that civil dialogue and even cooperation is possible.

We extend our sincere gratitude to Jo and Jim Stanko and the families who shared their stories, welcoming visitors to their ranches so that we might learn, grow and better understand the challenges agricultural communities will face as we restore wolves to Colorado.

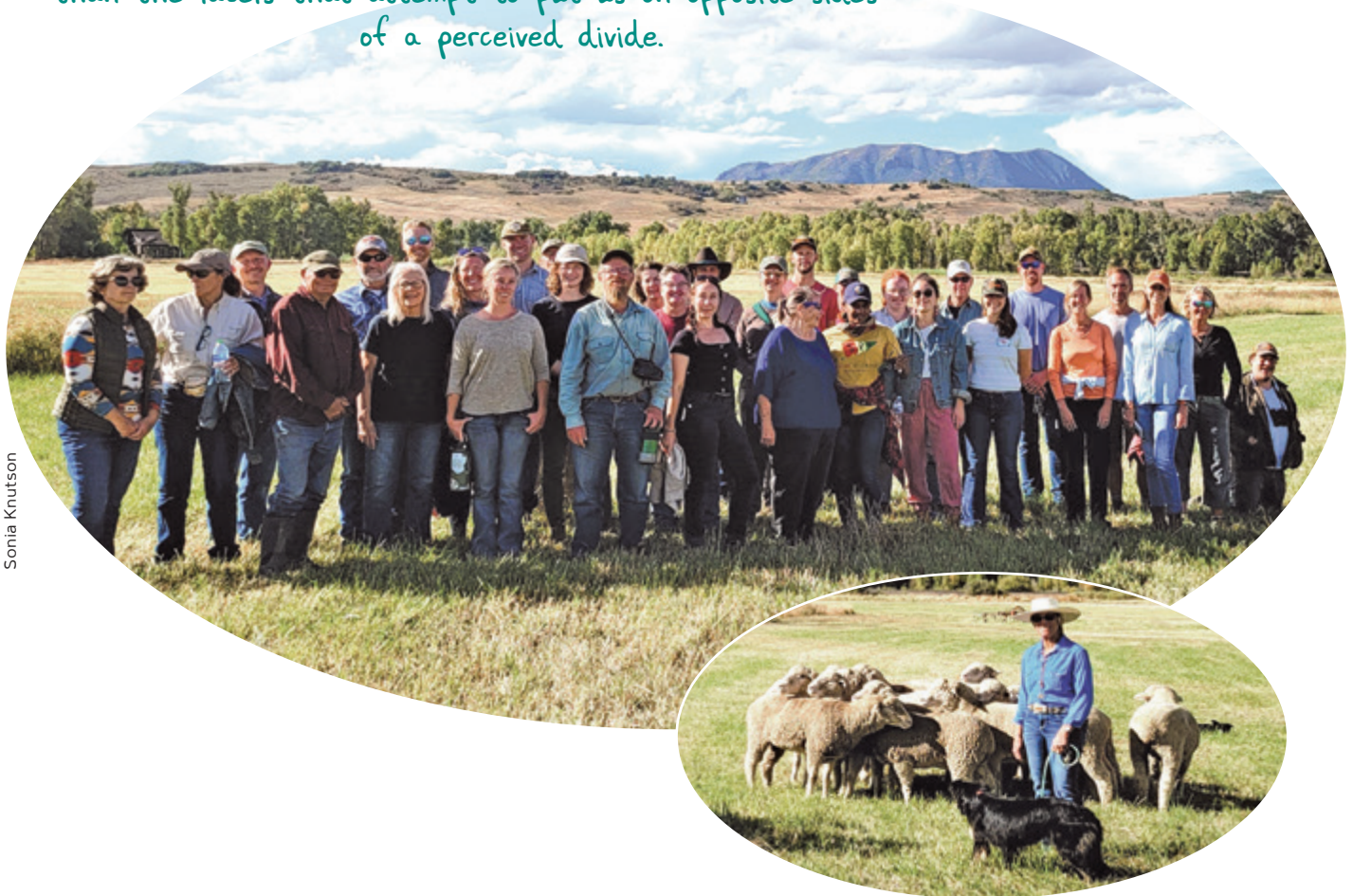
We also thank the wolf advocates who pushed through the discomfort of spending time with perceived opponents—only to find that a spectrum of attitudes towards wolves exists within the ranching community just as it does within the environmental community.

As the citizens of Colorado prepare to return wolves to the vast, wild landscape of the state’s Western Slope, this September weekend of community building and goodwill in Steamboat—with plans for more dialogues like it—offers a glimmer of hope. Indeed, the event may just mark the beginning of a framework of mutual respect, tolerance and acceptance that wolves and people desperately need. ■

Courtney Vail is a biologist and social scientist who serves as an advisor to the Rocky Mountain Wolf Project. She supported the successful passage of Proposition 114, the public ballot initiative that will bring wolves back to the Colorado landscape.

Those who welcome wolves to Colorado and those who don't do not fit into tidy little boxes. We all are more than the labels that attempt to put us on opposite sides of a perceived divide.

Sonia Knutson



Ice Age Ancestors:

Today's dogs carry genes from two ancient wolf populations


By CHERYL LYN DYBAS

Howl. Chase. Pounce. Bark. Ever look at your dog and wonder if you see signs of a wolf?

In fact, your canine pet carries genes from not one, but two populations of ancient wolves that contributed to the evolution of dogs as we know them today.



Background photo: Adobe Stock / superjoseph
Wolf, left: Adobe Stock / Stephen Canino
Wolf, right: Adobe Stock / виктория жарикова/Евгем
Dogs: Adobe Stock / cynoclub



Dogs' ancestors can be traced to wolves that lived in the Ice Age at least 15,000 years ago, say geneticists and archaeologists at the Francis Crick Institute in London, among other institutions. The findings bring scientists a step closer to solving the mystery of how dogs underwent domestication—one of the most intriguing, unanswered questions in human prehistory.

Howls from the Ice Age

The domestication happened during the last Ice Age, researchers have found. But where it occurred and whether it was in one location or in multiple places are unanswered questions. Previous studies using the archaeological record and comparing the DNA of dogs and modern wolves didn't provide definitive answers.

For the new study, published in *Nature* in June 2022, researchers turned to ancient wolf genomes to learn where the first dogs evolved from wolves. The scientists analyzed 72 ancient wolf genomes spanning the last 100,000 years in Europe, Siberia and North America.

Anders Bergström of the Crick's Ancient Genomics Lab and co-first author of the *Nature* paper says that “through this project we have greatly increased the number of sequenced ancient wolf genomes, allowing us to create a detailed picture of wolf ancestry, including around the time of dog origins.”

Diego Ortega-Del Vecchyo, a biologist who was not involved in the study, is a population geneticist at the National Autonomous University of Mexico in Queretaro, Mexico. He adds that “the

research offers new insights into the demographic history of wolves and how natural selection has driven changes in the species during the Pleistocene epoch. It helps us get a better understanding of the origins of dogs, a topic of high interest in ancient DNA studies.”

The grey wolf (*Canis lupus*) was the first species to give rise to a domestic population of canids, state the biologists in their *Nature* paper. “The wolves were widespread throughout the last Ice Age, when many other large mammal species [such as woolly mammoths and cave lions] became extinct. Little was known, however, about the history and possible extinction of past wolf populations, or when and where the wolf progenitors of the present-day dog lineage (*Canis familiaris*) lived.”

Bergström says that “by trying to place the dog piece into this picture, we found that dogs derive their ancestry from at least two wolf populations—an eastern source that contributed to all dogs, and a separate, more westerly source that contributed to some dogs.”

The previously excavated ancient wolf remains used in the study included those of a puppy buried 18,000 years ago in the frozen mud of Siberia. The puppy turned out to be a male wolf about two months old. Dogor, as researchers refer to him, means “friend” in the Yakut language of Russia.

David Stanton, a paleogenomicist at Queen Mary University of London and a co-author of the paper, says that “our research revealed that Dogor was in fact a wolf. He would have lived near the end of the last Ice Age, so would have been an ancestor of many of the wolves that live today.”

“The research offers new insights into the demographic history of wolves and how natural selection has driven changes in the species during the Pleistocene epoch. It helps us get a better understanding of the origins of dogs, a topic of high interest in ancient DNA studies.”

Two lineages

The project started with an ancient wolf-genome sequencing initiative. Several labs collaborated on generating DNA sequence data. In their paper, the scientists state that “the resulting genomic data set was possible only because of many years of work on the excavation, curation and zooarchaeological study of wolf remains,” noting that ancient DNA labs in the United Kingdom, Sweden, Germany, Denmark, Austria and the United States joined forces. The researchers believed that wolf genomes would be key to understanding the origin of dogs.

“This is the first time scientists have directly tracked natural selection in a large animal over a time scale of 100,000 years, seeing evolution play out in real-time,” says Pontus Skoglund, the paper’s senior author and group leader at the Crick Ancient Genomics Lab.

The researchers were at first surprised, they say, at how interconnected wolves and dogs were worldwide. “The breakthrough on the dog question,” says Bergström, “came several months into the data analysis, when results showed that ancient wolves from the east had different relationships to dogs compared to wolves from the west.”

The scientists found that both early and modern dogs are more genetically similar

to ancient wolves in Asia than to those in Europe, suggesting that domestication happened somewhere in the East.

Early dogs from northeastern Europe, Siberia and the Americas appear to have a single, shared origin from an eastern source. Early dogs from the Middle East, Africa and southern Europe, however, likely date back to another wolf source in the Middle East, in addition to the eastern source.

The eastern Eurasia source, which the scientists call “eastern dog progenitor,” may have contributed as much as 100% of the ancestry of early dogs in Siberia, the Americas, East Asia and northeastern Europe. The western Eurasia source, “western dog progenitor,” contributed 20% to 60% of the ancestry of early Near Eastern and African dogs, and 5% to 25% of the ancestry of Neolithic and later European dogs. The western ancestry then spread worldwide, the biologists believe, helped along by increasing prehistoric agriculture in western Eurasia and the colonial era expansion of European dogs.

“These researchers have shown convincing evidence for a dual ancestry of dogs, answering a long-standing ques-

tion about canine domestication,” says Michelle Trenkmann, a senior editor at *Nature*.

One explanation for the dual ancestry is that wolves underwent domestication more than once, with the different populations mixing. Another possibility is that domestication happened only once, and the dual ancestry is a result of those early “first dogs” then mixing with wild wolves. “None of the analyzed wolf genomes is a direct match for either of these dog ancestries,” the scientists write in *Nature*, “meaning that the exact progenitor populations remain to be located.”

Canids were the only animal to undergo Ice Age domestication. “As such,” the researchers state, “dogs represent a remarkable episode in human prehistory in which a bond with humans shaped the biology, behavior and cognition of another species.”

Unlike later examples of domestication, according to Bergström and Skoglund, there is no clear archaeological record of a very early presence of dogs in a single geographic region. Dogs first appear in the archaeological record around 10,000-15,000 years ago in multiple regions of the world.

Wolf populations were genetically connected throughout the Ice Age, Skoglund and Bergström discovered,



Photos by Sergey Fedorov and Love Dalén

One explanation is that wolves underwent domestication more than once, with the different populations mixing. Another possibility is that domestication happened only once, and that the dual ancestry is a result of those early “first dogs” mixing with wild wolves.

“much more so than present-day wolf populations.”

That connectivity allowed the authors to identify mutations that became more common during the 100,000 year time series, finding several cases in which mutations fanned out to the whole species. That was possible because wolves interacted across large distances. The ability of beneficial mutations to spread, the researchers claim, hints at how wolves managed to survive the Ice Age.

The 72 ancient wolf genomes analyzed spanned some 30,000 generations, so it was possible to look back and build a timeline of how wolf DNA changed, tracing natural selection in action. The biologists found that over a period of about 10,000 years, one gene variant went from being very rare to present in every wolf. Today, it's in all wolves and dogs.

The variant is important in the development of skull and jaw bones. Its spread might have been driven by a change in prey available during the Ice Age, giving an advantage to wolves with a certain head shape, but the gene could have other, currently unknown, functions.

Genomic hunt continues

The team's continued hunt for the closest wolf ancestor of dogs could reveal more precisely where domestication took place. The scientists are focusing on genomes from additional locations, including those from more southerly regions. A challenge lies ahead, however. In warmer climates, DNA is less well-preserved—there's no natural freezer.

Bergström muses that “as other genomic data sets spanning 100,000 years or more become available, studies like ours will reveal how other animals evolved and adapted. Similar time series from the Ice Age, in humans or other animals, could provide new information on how evolution happens.”

Today, he says, “ancestry from at least these two wolf populations is ubiquitous in modern dogs and is the major determinant of current dog population structure.”

As your dog howls, chases, pounces and barks, its genes indeed echo those of long-ago wolves. ■

Ecologist and science journalist Cheryl Lyn Dybas, a Fellow of the International League of Conservation Writers, often contributes articles to *International Wolf*, *BioScience*, *National Wildlife*, *Natural History*, *Ocean Geographic* and other publications.

Editor's Note: This research was introduced in our last issue in the section titled, “Wolves of the World.”





Remembering Erkki Pulliainen, 1938–2022

Wolf Biologist, Conservationist, Parliamentarian and Author

By TRACY O'CONNELL

The international wolf community lost a valued member in August with the passing of Erkki Pulliainen, 84, a biologist and 24-year member of the Finnish Parliament, representing the Green Party. An expert on wolves and dogs, he was popularly known as “Susi” Pulliainen—Susi being Finnish for “wolf.” A zoologist, geographer and geologist, he received his doctorate in 1965 on the biology of wolves.

Dr. Pulliainen was a professor of zoology at the University of Oulu in 1975–2001 and dean of the Faculty of Natural Sciences, 1980–1987. A long-time member of the International Union for the Conservation of Nature (IUCN) Wolf Specialist Group, Dr. Pulliainen was noted for his “Studies of the Wolf (*Canis lupus L.*) in Finland” as well as several other publications about wolves and large carnivores.

He belonged to several committees within the IUCN and was named by a variety of government and other organizations to working groups addressing diverse topics including salmon, game birds, reindeer and agricultural land use. He published numerous studies on nature and animals and was awarded an honorary doctorate from the University of Helsinki in 2001. Known as a hardworking writer, Pulliainen published 64 books, more than 500 scientific publications and numerous articles. He was awarded the Finnish Information Writer Award in 2007.

Dr. Pulliainen served in the Finnish Parliament from 1987 to 2011, representing an area surrounding Oulu—the nation’s fifth-largest city and one of the largest in the world existing entirely inside the subarctic continental climate zone. During much of this time he also served on the Oulu city council. In 2012 he was awarded the title of State Councillor, an honor bestowed by Finland’s president on elder statesmen. ■

Who Will Rieka Choose?

By Lori Schmidt

While the International Wolf Center's pack is composed of spayed or neutered individuals, history has shown that pack members still form a dominant male-female pair. These leaders share unmistakable social behaviors as they reinforce leadership within the pack.

Our most memorable pack leaders, Shadow and Maya (leaders from 2005 to 2010), displayed many pair-bonding behaviors, including sleeping in close proximity, rank-order dominance over packmates, shared rallies and howling sessions. The most poignant moment in our memory of Shadow and Maya was a behavior called a "parallel walk," where the bonded pair walk in unison with a matching stride and paw placement.

The development of a dominant pair in a group of non-related pack members is not an automatic process based on size or attitude. In 2004, we had a pair of four-year-old arctic brothers named Shadow and Malik that "adopted" 3-month-old pups—Grizzer, Maya and Nyssa. Nyssa was the more dominant female and weighed nearly 95 pounds her first winter, but that winter, Shadow seemed to choose Maya, a 75-pound, submissive female and began forming the social relationship that resulted in their pairing and leading the pack. Fast-forward seventeen years, and we have another pair of 5-year-old arctic brothers, Grayson and Axel, who not only adopted a female pup (Rieka) in 2021, but a pair of male pups (Caz and Blackstone) in 2022.

Since Rieka is the only female, she is the dominant female by default. Despite there being an age difference in the

male rank-order, the dominant-male position may be Rieka's choice. Her preference for sharing pair-bonding behavior may favor one of the maturing pups over the older males in the rank-order.

But how secure would the pups feel about moving up to lead the pack? They may show alliance within the male rank to the wolf that has welcomed them into the pack. Grayson is extremely attentive to the pups and acts the most as "pack guardian" against external threats. The pups seem to seek him out if they are fear-avoidant of external stress, and they are found sleeping near him far more often than they sleep near Rieka and Axel. This type of alliance may keep them from testing their rank, regardless of Rieka's behavioral displays. One thing is certain—the winter dynamics are bound to increase with a pack of five ambassadors.



Shadow and Maya display a "parallel walk;" the bonded pair walk in unison with a matching stride and paw placement.



Both photos: International Wolf Center



Top: By mid-fall, Blackstone seemed to establish an alliance with Grayson, following him around the enclosure and resting near him in the straw beds.

Above: Grayson is extremely attentive to the pups and acts the most as "pack guardian" against external threats.

To learn more about the ambassador wolves, consider registering for the Center's YouTube channel for weekly clips, or sign up for monthly Wolf Care Webinars to ask questions of the Wolf-Care Team about management decisions. ■

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and especially to the
wolves who teach and
delight us every day!
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Thank You!



Wolves Drawn into Issues of Cloning, Free Speech, Rewilding

By Tracy O'Connell

CHINA

A cloned arctic wolf pup named Maya was born to a surrogate mother here on June 10, 2022—one of 85 embryos created by a process called somatic cell nuclear transfer, the same method used in Scotland in 1996 to create the cloned sheep named Dolly. As reported in *Global Times*, the cloning was undertaken by the Beijing-based Sinogene Biotechnology company following two “painstaking” years of work. The cloned pup was introduced to the media in September, 100 days after her birth. She is destined to live among her kind at the polar-themed park, Harbin

Polarland, that had housed her biological mom, the original Maya, who died in 2021 of natural causes after living there for 15 years.

The process began with skin cells taken from the Canadian-born mother. These donor cells were fused with immature egg cells from dogs, creating 137 arctic wolf embryos. Of those, 85 were successfully implanted in surrogate mothers—in this case, beagles. Sinogene Biotechnology had previously focused on cloning pets for private clients. In another effort, six German shepherds were cloned for use by police.

Young Maya's birth was heralded by many as an effort to protect endangered species, especially at a time that has been called the “sixth extinction,” referencing a belief that this is the sixth time in our planet's history in which a large number of species have very quickly (in a geological sense) gone extinct—this time, due to human behavior.

Arctic wolves are not considered endangered at present, according to the International Union for the Conservation of Nature. Sinogene announced a new partnership with the Beijing Wildlife Park to clone more captive species in the future, although no specific projects have yet been announced, according to *Global Times*.

Other efforts to clone endangered or extinct species have been undertaken, for instance, in Australia to bring back the Tasmanian tiger and in Malaysia to restore the white rhino, both extinct. A U.S.-based non-profit, Revive and Restore, has successfully cloned a black-footed ferret, (*Mustela nigripes*) and a Przewalski's horse (*Equus przewalskii*), both endangered.

Ben Novak, lead scientist for Revive and Restore, is among those who see cloning technology as a way to maintain genetic diversity in declining species. He told *livescience.com*, “These genetic backups can then be introduced into the wild to replenish struggling populations.”

“For mammals, it appears that two species must share a common ancestor less than 5 million years ago” for the surrogate pregnancy to be successful, he added, which “opens up the possibility of reviving extinct species by using closely related, living surrogate species.”

Others note that cloning does not work for all species, that it has a low success rate, and it raises health and ethical questions that have not been fully addressed.





Adobe Stock / Stoyan Haytov

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Ogfbreeze

Meanwhile in China, five speech therapists in Hong Kong were found guilty of a conspiracy to publish seditious children's books, according to CNN. The books, which tell various stories about a village of sheep resisting a pack of wolves, were seen as an effort to portray the Communist Chinese government as predators set to destroy island residents of the former British colony.

The case pitches China's efforts to try cases it considers related to national security, against Hong Kong's laws protecting freedom of speech and has raised the ire of human rights groups. Interestingly, the role of the wolf in Chinese thought (which has been addressed in prior issues of this magazine) has changed over time and was at least partly influenced by the controversial novel *Wolf Totem*, which helped change the image of the animal as sneaky and predatory into a positive rendering of a brave and resourceful creature.

NORTH MACEDONIA

Environmentalists concerned with declining numbers of wolves are calling for limiting hunting, which otherwise goes unabated. Considered pests, wolves are believed to number 400 here and bring in a bounty of 50 Euros (\$50 US) each when killed. Other large predators, the bear and the Balkan Lynx, have greater protections according to globalvoices.com.

Seeking a more nuanced solution than total hunting bans or open hunting, the Macedonian Ecological Society suggests hunting restrictions for certain periods, as well as quotas, a stop to tourism hunting, and an improved wolf-count process for more accurate estimates.

The state advisor for forestry and hunting in the Ministry of Agriculture, however, claims the census methods, undertaken every 10 years, are adequate for an accurate count; that the bounty does not incentivize hunting (which actually stems from a concern for the safety of domestic cattle); and



that the stable wolf population proves the species is being managed. At one time, he notes, the wolf was protected but numbers got out of hand. Drafts of proposed new hunting rules keep the open hunting, the bounties and most other aspects of the old rules in place.

Wolves here mainly inhabit the mountains, preferring the forests and sometimes visit the lowland agricultural areas near villages, globalvoices.com notes. The environmental organization Eko-svest (which stands for eco consciousness) on World Wolf Day (last August 13), called for precautionary measures "to ensure the wolves stay in our forests, where they belong."

Wolves are among several species subjected to open hunting rules here, including the marten, fox, weasel and many birds. Wolves are legally hunted in

a number of other European countries that are not members of the European Union, including Russia, Belarus, Ukraine and Albania. Wolf hunts are a tourist attraction in many places. Limited legal hunting of wolves also occurs in Finland, Norway, Lithuania, Latvia, Estonia, Bulgaria, Romania and Slovakia, *globalvoices.com* notes.

EUROPEAN UNION

The expansion of wolves in the Netherlands is being heralded—cautiously. Glenn Lelieveld, national coordinator on the monitoring of wolves for the Dutch Mammal Society, told *Dutch News* that wolves are not a danger to children or others, having learned to avoid humans, and when found in populated areas most likely took a “wrong turn.” World-wide, he said, humans are more in danger of being hit on the head with a coconut than of being attacked by wolves. That said, the director of Hoge Veluwe National Park, where evidence of a new, fourth pack in the country was found last summer, had two years earlier launched a campaign for the removal of the wolf’s protected status to make controlled culling possible. He has placed fences around the park to protect the mouflon sheep population, which park managers

claim has dropped by half in one year, *Dutch News* reports.

To the east, it is estimated there are more than 300 wolf packs roaming the Alps, a number that has jumped by 25% in a year and could expand to 800 in five years. The Swiss-based wolf protection association Gruppe Wolf Schweiz described the growth as “exponential” and said most occurs in the border region between Italy and France. The group believes that wolves and other apex predators have ways to control their populations as they reach the saturation point, but that it would be “absolutely necessary” to protect livestock as the wolf population increases. (A significant amount of data indicate that wolf densities are generally controlled by the density of their prey.)

Meanwhile, *The Guardian* reports that in an analysis of data on 50 wild-life species whose population and geographic distribution expanded over the past 40 years, the wolf has returned most quickly, with 17,000 roaming across much of continental Europe. The study shows “how effective legal protec-



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Thank you volunteers!

In 2022, 8,003 hours were volunteered at the International Wolf Center by approximately 100 individuals!

- 20 Board members contributed over 3,774 hours.
- 32 Symposium volunteers contributed approximately 1,000 hours.
- 59 Twin Cities volunteers (and a few Ely locals) contributed about 552 hours.
- 14 Volunteer Wolf Care Staff devoted 2,677 hours caring for the wolves and their enclosure.

While these numbers are impressive, they don’t show the blood, sweat, and tears you poured into the work. We can’t thank you enough for making the International Wolf Center’s work possible.

tion, habitat restoration and reintroductions” can drive species recovery. The wolf population across the continent has increased by 1,800% while white-tailed eagles have increased by 445% and brown bears by 44%.

Compiled by researchers from the Zoological Society of London, BirdLife International and the European Bird Census Council, the report drew on data from the Living Planet Index Database, the European Union Birds Directive (the EU’s oldest legislation, aiming to protect all 500 species of wild birds naturally found in its territory) and the International Union for the Conservation of Nature’s red list, which measures extinction risk.

The advantages of assisting in the restoration of wildlife are numerous, representatives from Rewilding Europe noted upon release of the study. For example, wildlife “can help lock up more atmospheric carbon and increase soil fertility—a process known as ‘animating the carbon cycle,’” the World

Economic Forum’s site, weforum.org, explains in its coverage of the study. “Free-roaming herbivores at their natural population density can have a positive impact on climate change by increasing the amount of carbon drawn down and stored in plants.”

Research also shows that the loss of important predators can lead to uncontrolled growth of herbivore populations, leading to excessive grazing pressure and reducing the ability of ecosystems to absorb carbon.

“Restoring, rewilding and conserving the functional role of vertebrate and

invertebrate species can be a climate game-changer by magnifying carbon uptake by 1.5 to 12.5 times (in some cases more) across the world’s ecosystems,” Professor Oswald Schmitz of the Yale School for the Environment, who developed the “animating the carbon cycle” concept, told weforum.org.

The 50-year-old World Economic Forum says it is the “international organization for public-private cooperation” and “engages the foremost political, business, cultural and other leaders of society to shape global, regional and industry agendas.” ■

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



Eagle: Adobe Stock / szczepank

Bear: Adobe Stock / Antontoguillem

Adobe Stock / Matthieu

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

PERSONAL ENCOUNTER

Scoping out the Most Remote Pack in the Lower 48

Text and photos by Jeremy SunderRaj and Jack Rabe

Yellowstone National Park abounds with visitors each year—nearly five million in 2021. Most guests, as they struggle to find parking at famous thermal features or creep along in traffic jams caused by bison, probably don't feel like they're in the wilderness—but they're wrong.

Yellowstone is home to the most remote area in the continental U.S. It's called Thorofare; located 34 miles by trail from the nearest road, it is among the wildest places in the country. Characterized by the spectacular Trident (a deeply eroded plateau) and the Yellowstone River Delta, the

Thorofare is a genuinely unforgettable place to see.

In August 2022, Jack Rabe and I went there to conduct peregrine-falcon surveys along with Dylan Sanborn and Sarah Lindsay—two technicians from the park's bird program. We had another mission, too: to find wolves. Specifically, to see wolves from the Hawk's Rest pack.

We started our trip by jumping off the bow of a boat and onto a boulder along the edge of Yellowstone Lake's southeast arm. As we stepped onto dry land, the hard facts struck: behind us was the boat we wouldn't see for five days; in front of us, 20 miles of deep wilderness.

For years, the Yellowstone Wolf Project and Wyoming Game and Fish Department have used radio collars to monitor wolves in the Thorofare. This worked well—when the collars did, too. But in 2019, shortly after Wyoming radio-collared the dominant pair that

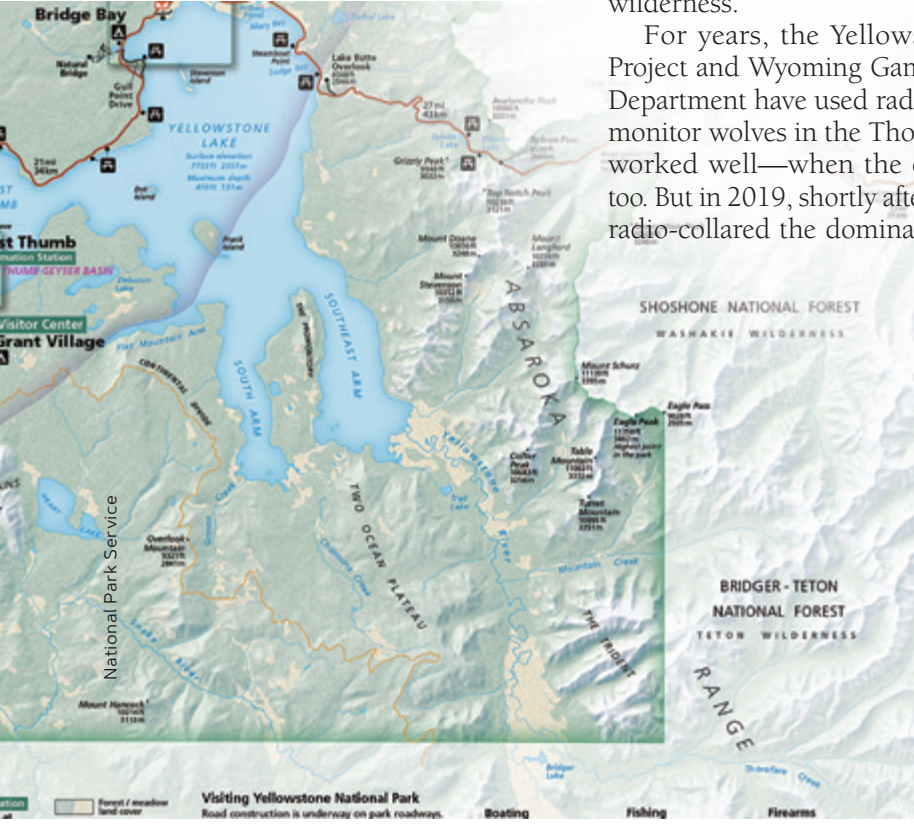


just months earlier had started the Hawk's Rest pack, those collars failed. And just like that, we had no way to keep tabs on the pack other than a few lucky sightings from a plane.

Those sightings proved valuable, revealing that in their first breeding season the dominant pair produced three pups. The following year, another litter, and by spring 2022 the pack was thriving with eleven adults. Yet by summer, nobody knew if they had pups, let alone where they were, due to remoteness of the Thorofare and the lack of functioning radio collars.

When we hopped on the trail, it wasn't long before we saw carnivore sign—just not the kind we were looking for. We saw one or two wolf scats from months ago, grizzly bear tracks and scat, and hours-old tracks from a male cougar. For the next two days and 19 miles, that was all we saw aside from the peregrines we were there to monitor. But early on the morning of the third day, things began to look up.

To reach our falcon observation point for the morning, we had to walk down a trail that cut through a willow-filled valley. We knew we were in great wolf habitat. Tracks and scat from wolves of all different ages appeared along the trail as we approached our destination: a sandy creek bank filled with log jams. Once we had observed the falcons and confirmed they didn't have fledglings, the two of us slipped away and began looking for wolf sign. We hadn't walked far along the bank before we saw that





p.m. the sun was still high, and it was hot—too hot.

Then, out of nowhere, “I got ‘em!”

Excitement rushed over us as we watched a non-collared, adult gray walk out of the trees and into the open meadow, traveling along the same trail



we had taken. While this was a great moment, seeing a single, non-collared wolf didn't give us much information. We already knew from the tracks that at least one wolf was around. We needed more, and it wasn't long before we got it.

it was littered with tracks of all different sizes. This had to be a rendezvous site, or the area where the pack reared its pups. We decided our best chance to watch without disturbing them would be to hike up an open hillside to the east that overlooked the valley and scan for wolves from there.

Later that evening, we set up our spotting scopes and watched. After two hours of seeing nothing interesting, our hopes began to dwindle. By 7

Minutes later, running out of the bushes after the adult, there appeared a gray pup—and then a second, a third and a fourth. Soon a total of five gray pups were piled together, wagging their tails and wrestling with each other.

While we watched, these six wolves continued to retrace our steps all the way to the sandy bank where we first discovered their tracks. In between play sessions and bouncing around on the

log jams, the pups took turns investigating our human tracks. Of all our wolf sightings over the years, this one was exceptional.



Most wolves don't have the luxury of living in a largely undisturbed wilderness, and even the Hawk's Rest pack doesn't have complete protection. The pack frequently ranges out of the park, becoming vulnerable to human hunters.

In most of the gray wolves' range, no matter the location, they must navigate a landscape riddled with danger. The existence of pristine areas like the Thorofare is comforting: an area where wolves can travel far and wide, unburdened by the sounds of gunshots, car engines and camera shutters. But sadly, this is the exception.

While we understand the importance of compromise and sacrifice in the places where most animals live—including humans—we also need these special places for conserving wildlife, especially large carnivores like wolves. ■

Jeremy SunderRaj is a biological science technician with the Yellowstone Wolf Project. He has a bachelor's degree in Wildlife Biology from the University of Montana and currently works on research, management and education while also monitoring of the wolf, elk and cougar populations in the park.

Jack Rabe, predator-prey biologist, has worked with the Yellowstone wolf, cougar and elk projects for five years. A Ph.D. student in Conservation Sciences at the University of Minnesota, he works with Dr. Joseph Bump to learn how Yellowstone's diverse predator community has affected the northern Yellowstone elk herd over 25 years. (In studying these animals, Jack has hiked enough miles to walk from coast to coast across America.)



USDA APHIS Wildlife Services’ Nonlethal Initiative: Keeping Livestock and Wolves Safe While Reducing Conflict

By Elizabeth Miller

Photos courtesy of USDA APHIS WS

Wildlife Services (WS)—a federal program within the USDA Animal and Plant Health Inspection Service (APHIS)—has existed in some form since 1885 to protect American agriculture and forests from wildlife damage. The scope of its work has expanded but protecting livestock from depredation by wolves and other predators has always been a major focus. Since 2020, Congress has funded WS to implement, research, and develop additional nonlethal tools for livestock protection from large predators. Using range riders, turbo fladry, fencing, harassment, guard dogs, and various tools under development, WS is

helping keep livestock *and* wolves alive while reducing conflict between them.

Some media coverage may have given the impression that WS is “rogue, indiscriminate, secretive, and clandestine”—claims that belie the mission and purpose of WS, which is to provide federal leadership and expertise to resolve wildlife conflicts, allowing people and wildlife to coexist. WS acknowledges that wildlife is an important public resource, highly valued by Americans—and also a dynamic resource that can damage agriculture and property, pose risks to human health and safety, and affect other natural resources. As the science of wildlife damage management evolves, WS considers a diverse and often conflicting range of public interests, including the conservation, biological diversity, and welfare of wildlife, as well as its use for enjoyment, recreation, and livelihood. While WS has always used a range of tools to manage wildlife dam-

age, including nonlethal tools, this newer congressional allocation increases the program’s capacity to deliver nonlethal methods to reduce large-carnivore livestock depredation.

WS does not develop or enforce U.S. regulations on wildlife management; those responsibilities fall to other federal and state agencies. These entities manage wildlife in accordance with the Public Trust Doctrine, which establishes wildlife as the public’s natural resource, to be maintained in trust for the people, including future generations. The U.S. Fish and Wildlife Service administers the Endangered Species Act, the Migratory Bird Treaty Act, and several other federal statutes, while state wildlife agencies typically manage species not federally protected. WS partners with these agencies to reduce human-wildlife conflicts and provide technical and operational assistance when requested.

WS complies with all regulations and thoroughly analyzes our actions in accord with the National Environmental Policy Act, which provides ample opportunity for public review and stakeholder involvement. Congress has authorized WS to enter into cooperative agreements and collect reimbursement of costs of resolving wildlife damage. Only about half its annual operating costs are covered by appropriations, the rest through reimbursable agreements.

So why would *International Wolf* readers be interested in this? The WS program manages wolf conflict as a part of our mission. Lethal removal is a highly contentious facet of our work, but despite media claims, there is nothing secretive about it. In fact, WS annually publishes on the APHIS website rigorously reviewed and verified summary figures (called Program Data Reports, or PDRs) of our activities and complies with Freedom of Information Act data requests. Generally, those reports are met with a wave of media coverage



highlighting lethal take of native and nonnative species in the name of wildlife damage management. Less frequently mentioned are the nonlethal measures employed. Example: In FY 2021, WS lethally removed 6.6% of all animals the program encountered, meaning nonlethal methods were used 93.4% of the time. The majority (77%) of the animals WS lethally removed were invasive species—including feral swine and brown tree snakes.

Some people accept the lethal removal of wildlife after considering those figures, comparing them to recreational take, or understanding the financial cost of wildlife damage. However, others object to killing wildlife—particularly native mammals like

the wolf—for any reason. Input from both of these positions is important to the national dialogue on wildlife-damage management in accordance with the Public Trust Doctrine.

Increasingly over the last decade, WS has collaborated with conservation organizations including Defenders of Wildlife (Defenders) and Natural Resources Defense Council (NRDC) on nonlethal projects to protect livestock from wolves and grizzly bears. These partnerships, mostly in the northern Rockies and Great Lakes states, have proven successful. In fact, early collaborations and support from Defenders and NRDC inspired legislation that became the WS Nonlethal Initiative. Defenders and NRDC recognized the

Below: As part of the Nonlethal Initiative, WS is continuing evaluation of livestock guarding dogs, including Turkish kangals, pictured here with sheep on summer range.



potential for WS to deliver additional nonlethal tools and services to agricultural communities that would benefit most from their success. The Initiative was first congressionally funded during FY 2020; funding has grown from \$1.38 million to \$4.5 million in FY 2023. The funding has also expanded to include nonlethal beaver damage management.

The original budget bill provided dedicated funding for WS to implement nonlethal solutions to livestock/large carnivore conflict. The next two iterations of the bill expanded this intent to general human/predator conflict and beaver damage management. The additional funding allowed WS to create new positions and redirect some existing employees, year-round or seasonally, to implement more nonlethal strategies.

Equipment and supplies were substantial start-up costs in the first year of the Nonlethal Initiative, and well-laid plans for outreach suffered during the pandemic, but opportunities began rebounding as society began to open. WS is still navigating ways to use Initiative funding as effectively as possible.

WS is primarily using range riding, various types of fencing and turbo fladry to reduce livestock loss to predators. We targeted 13 states with populations of gray wolves, Mexican gray wolves, and in a few cases, grizzly bears. They include Arizona, California, Colorado, Idaho, Michigan, Minnesota, Montana, Nevada, New Mexico, Oregon, Washington, Wisconsin and Wyoming as recipients of the funding. Many of these states also include black bears, mountain lions and

coyotes among other predators, on which our techniques are also effective.

In addition to using established

techniques, the program's staff is being creative. Innovative thinking by one district supervisor in the summer of 2022 led to the discovery that drones can be used to remotely harass wolves. Using a drone to search for wolves in an area of ongoing depredations, staff witnessed three wolves latched onto the hindquarters of a cow. The pilot used the drone to interrupt the attack and drive the wolves out of the pasture. That allowed our staff time to get to the site and assess the condition of the cow (which survived with minimal injury).

Other staff members are examining expanded use of guarding dogs, permanent fence designs, and nontraditional applications of existing tools, and developing new techniques for additional solutions.

WS also distributes Initiative funding to three units at our National Wildlife Research Center (NWRC): the Predator Research Project, the Human Dimensions Project, and an aquatic-mammals research scientist to investigate topics around the newly included nonlethal beaver damage management component. These entities are analyzing



Above: WS frequently collaborates with other agencies, conservation organizations, and landowners to implement and/or maintain projects, like electric and permanent fence building.



Right: WS staff installing turbo fladry in Montana. When properly installed and maintained, turbo fladry can be effective at preventing wolf depredation of livestock in appropriate situations.

the financial and practical effectiveness of the WS' tools and landowner attitudes before and after WS assistance. Understanding these things aids in the swift delivery of a tailored response to livestock/large carnivore conflicts and helps WS staff familiarize cooperators with new tools. The research directly

feeds into the WS mission by making all livestock-protection services more precise, more available and better-trusted.

With a steep learning curve behind us and much of the Nonlethal Initiative infrastructure established, WS' focus is on maximizing the impact of funds and considering how to maintain suc-

cess while expanding in the short- and long-term. WS field staff and researchers will closely collaborate with each other and external partners to increase options and efficacy, always looking for opportunities to support our mission of protecting American agriculture in a way that allows humans and wildlife to coexist. ■



Left: WS range riders may surveil tens of thousands of acres of land in a grazing season. Range riders deliver increased human presence on the landscape and often provide early detection of carcasses, injuries, and predator sign which can help make decisions about decreasing livestock vulnerability to predation.

More information, including contact information for WS in your state, as well as annual reports detailing accomplishments and expenditures, can be found on the WS website (https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/sa_program_overview/ws-nonlethal/nonlethal-ws-initiative) and more specifically on a story map about the Nonlethal Initiative (https://www.aphis.usda.gov/aphis/maps/sa_wildlife_services/ws-nonlethal-initiative).

Elizabeth Miller is a Staff Wildlife Biologist with the United States Department of Agriculture's Wildlife Services.



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Wolves and Dogs: between Myth and Science

Book review by Nancy jo Tubbs

For the layperson wishing an enticing introduction to the study of wolves and dogs, this book's several short, highlighted sections will be key. The titles give you a friendly welcome: "Life of a P(pee)hD student at the Wolf Science Center" tells Gwendolyn Wirboski's tale of learning how to take urine samples from a resident wolf, and Martina Lazzaroni relates "A journey into the world of FRDs" (free ranging dogs).

While this book is readable by an intelligent wolf-dog enthusiast with a dictionary at hand, *Wolves and Dogs: between Myth and Science* is most approachable by the serious academic. Authors Friederike Range and Sarah Marshall-Pescini have done key research and cite studies from hundreds of sources from their base at the Wolf Science Center (WSC) in Austria.

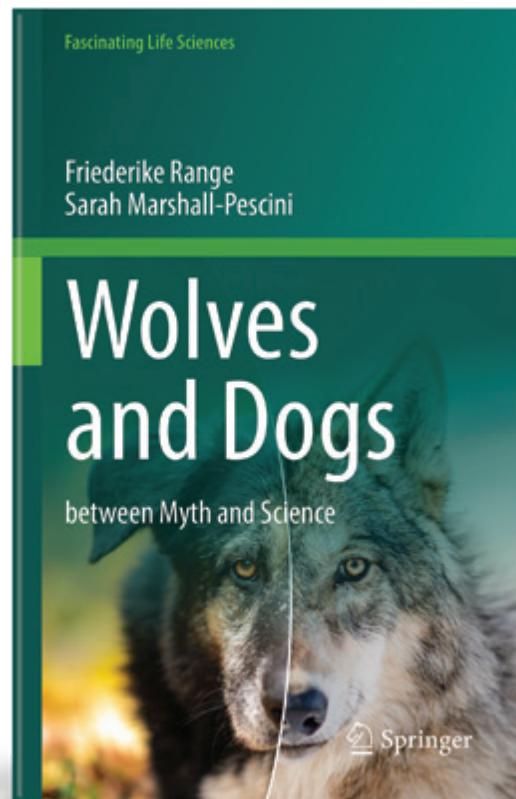
The WSC was founded by Range and fellow researchers Kurt Kotrschal and Zsafia Viranyi in 2008 and was assimilated by the University of Veterinary Medicine Vienna in 2017 to provide long-term stability. Its focus: all aspects of the dog-wolf comparison, including cognitive abilities, social behaviors among their own kind and relationships with humans. The main, overall approach of the research is to raise both wolves and dogs precisely alike and in a standard way so as to eliminate as a variable the manner of raising the creature. That is, most dogs are raised in a human household with children and other pets. The dogs and

wolves in the WSC are raised in standard lab settings and both are treated, fed and handled identically.

The book, one in a Fascinating Life Sciences series, introduces the reader to basic information about wolves, then takes a deep academic dive into findings and questions around many topics, including dominance and aggression, the socioecology of free-ranging dogs, and the many ways in which dogs and wolves can be compared.

The authors give much attention to the domestication of dogs from wolves and note that is an ongoing process. While we see breeds of dogs evolve year to year, they note that wolves have not stopped evolving. "This is why we should not refer to today's wolves as dog's ancestors, but rather as their 'closest living relatives.'"

In the book's foreword, Adam Miklosi writes "The science that is presented with great care in this book, taking into account different views, perspectives, and lack of knowledge, should invite any readers interested in biology to get a closer look at this species without actually getting cold or dirty, and they also do not need to stand the look of a wolf from a short distance." Miklosi, of the Family Dog Project, Department of Ethology, Eotvos Lorand University in Budapest, Hungary is one



Wolves and Dogs: between Myth and Science

By Friederike Range and Sarah Marshall-Pescini

Publisher: Springer Nature Switzerland AG

393 pages

of hundreds of sources from around the world whose ideas and research enrich this thoughtful—though expensive at around \$100—book. ■

Nancy jo Tubbs is a member of the Board of Directors at the International Wolf Center.

Upcoming Adventures



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Join our staff to learn about wolf tracking in a winter environment. In this program, participants will learn about the ways wolves adapt to the cold, snow and icy conditions. This program will also look at wolf tracking and radio telemetry in the winter, wrapping up with our weekly "What's for Dinner?" program. Wolf activity typically increases in winter, making this a great time to observe our ambassadors!

Additional upcoming adventures:

Wolves and Women's Weekend: Northwoods Winter Adventure

March 3-5, 2023

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For more information and to register, visit WOLF.ORG

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WOLF CARE FUNDRAISER

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Join us for our ninth annual online auction, featuring artisan-made, wolf-themed art; collectibles; photography; and wolf-shed knitted items. All proceeds support the exceptional care of our ambassador wolves, provided daily by wolf care staff.

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For complete details and a sneak peek of the items in this year's auction, visit:
<http://bit.ly/wolfauction>

Note: Regulations covering wolf-shed items vary among states based on their protective status of wolves. The auction site will include a current list of states that allow interstate commerce of wolf-shed items when the auction opens.

