INTERNATIONAL WOLF

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SUMMER 2023



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INTERNATIONAL WOLF

International Wolf Center

VOLUME 33, NO. 2 THE QUARTERLY PUBLICATION OF THE INTERNATIONAL WOLF CENTER **SUMMER 2023**



How a Cat Parasite Makes Wolves Take Greater Risks

One tiny parasite reproduces only in cats—but it exists worldwide, and can infect any mammal or bird. Yellowstone wolves share their environment with cougars and other felids, and exposure to the parasite can change their behavior, making them more likely to take risks. Researchers including our author are still seeking answers as to why.

By Kira A. Cassidy



Restoring Wolves to Yellowstone—the Unpublicized Backstory

The U.S. had nearly eradicated wolves by 1950. They were reintroduced in the 1990s. But how did they get here, and who did the work? Here is Part 1 of the backstory, when a tenacious, steadfast crew did miserably hard work against poor odds, amid cruel weather and bureaucratic interference to restore an essential predator to its natural environment.

By Steven H. Fritts



Mexican Wolves: A Comeback Story

Mexican wolves were driven so close to extinction in the U.S. and Mexico by 1970 that a captive-breeding program became necessary. Its success is a story that includes managing a growing wild population, collaboration between countries, working with Mexican wildlife agencies to grow their population, and building human relationships that support the presence of wolves.

By Aislinn Maestas



Doug Smith Retired after 28 Years Leading Yellowstone Wolf Project

Last fall, a wolf research legend packed up his radio collars and packed in a 28-year career. Doug Smith was on hand to receive the first wolves translocated to Yellowstone in 1995. Days after, Doug was in the air to monitor the newcomers, and he didn't stop there. He'll be missed and long-admired by colleagues across the nation.

By Norm Bishop



On the Cover

Photo by Voyageurs Wolf Project

Paradise Pups: This image was captured by a trail camera placed by the Voyageurs Wolf Project at the entrance to the den of the Paradise Pack, a wolf pack just south of Voyageurs National Park in northern Minnesota, USA. The project visits dens to record litter size and other important reproductive data. The den itself was in the root system of a very large Northern White Cedar tree. The pack had a litter of five pups that year. After a day of playing with each other, two of those pups ventured out of the den to rest and take in the cool spring air.

Visit www.voyageurswolfproject.org to learn more about the project.

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Remembering Ray Leonard, 1950-2023

By Dick and Deb Thiel



Theresa Simpson

Ray Leonard, chairperson of Timber Wolf Information Network (TWIN) from 2011 to 2023, died unexpectedly at home on April 11, 2023 after a brief illness. He attended the University of Wisconsin – Stevens Point, studying wildlife biology. After college, he gained work experience in California, later returning to Wisconsin, where he was employed as an engineer at Joerns Healthcare.

Loving the outdoors, he became intrigued by wolves while bow hunting for deer in Wisconsin's Central Forest. One evening, walking back to his truck after hunting, he discovered large wolf tracks within the boot tracks he'd made only hours earlier! He was hooked.

After attending a Wisconsin Department of Natural Resources (DNR) carnivore-track training clinic, he attended a TWIN wolf ecology workshop and soon became a member. By the late 1990's, Ray was running winter wolf-track surveys and conducting summer howl surveys in the Central Forest. A consummate professional, he immersed himself in reading everything wolf, and attended regional Wolf Stewards and International Wolf Center conferences, where he learned from the biologists monitoring wolves in Wisconsin, Michigan and Minnesota. Ray represented TWIN on the Wisconsin DNR's Wolf Stakeholders Committee beginning in 2010, became a TWIN wolf ecology instructor in 2011 and was elected to the board that same year. Shortly after, he took the reins as chair, a position he held for 12 years.

Ray is survived by a loving sister, a nephew and several nieces, all living in Wisconsin. His family suggests that people who wish to honor Ray's love of animals and the environment make memorial contributions by visiting www.shudafuneral.com.

Ray believed in science. He was rigorous, dedicated and a mentor to many along the way. He was truly a champion of wolf conservation.

There is a howl missing in the Central Forest tonight. ■

From the Executive Director

And the Survey Says...

Last fall we asked all of our International Wolf Center members to complete a survey to help us prepare our new strategic plan. We were so pleased to receive more than 250 responses filled with compliments, heartfelt stories and well thought-out feedback. I want to share a few highlights.

Where we asked members to describe the work of the International Wolf Center, several words and phrases appeared again and again: education, awareness, science-based, trustworthy, caring and fun! Over 86% of you said you were very satisfied with your membership, and a similar number said you would (and do!) recommend an International Wolf Center membership to your family and friends.

Two International Wolf Center experiences were most commonly reported as highly memorable. Several of you described visits to our Center in Ely (even 10-plus years ago) as deeply meaningful milestones in your "wolf enthusiast" journey. Others described how regular observations of our ambassador wolves, whether in person or online, significantly changed their understanding of wolves and wolf behavior.

Survey responses made it clear that you continue to love our magazine and its emphasis on the world of wolf science. Our live webcams were also highly appreciated as were our webinars, monthly email newsletters and the International Wolf Symposium.

When asked what we could do differently, many of you requested new opportunities to directly engage with ongoing wolf research, possibly through field trips to see wolf biologists in action. You asked for programs to be more available in places outside of Ely—though it was clear that several of you just wished you lived closer to northern Minnesota! Finally, some members felt that we should spend more time directly educating policy makers and those most impacted by human-wolf conflict.

I am so grateful to have this survey data available as we develop our new four-year plan. Our strategic planning consultant reminds us regularly, "Strategic planning is planning for change." While the International Wolf Center must change to reach new audiences and increase our educational impact, we can't lose sight of our core purpose—those central elements that make us unique and have helped us effectively connect with people like you for almost 40 years. Thank you for reminding us of what is most important and challenging us to keep getting better. ■



Grant Spickelmier
Executive Director

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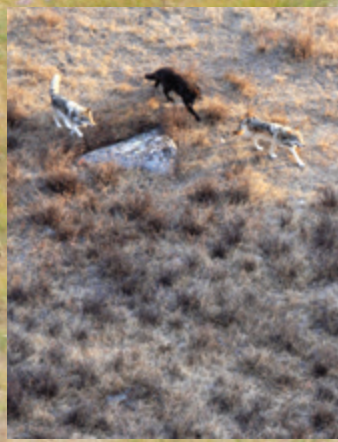
How a Cat Parasite Makes Wolves Take Greater Risks



BY KIRA A. CASSIDY

Unless noted otherwise, all photos courtesy of the author/NPS

Research by the Yellowstone Wolf Project has found that the parasite *Toxoplasma gondii* infects wolves and can change their risk-taking behavior.

In a place well known for its mountains, unique geysers, thermal features and large mammals, this common microscopic organism has far-reaching impacts on wolves, their populations and how they interact with other species.

Toxoplasma gondii is a tiny parasite that is found worldwide and can infect any mammal or bird. Its only requirement is to reach the digestive system of its definitive (final) host—any domestic or wild member of the cat family—to complete its life cycle and sexually reproduce. This doesn't limit the parasite much, as felines are found most places in the world—and since cats are one of the few species we've domesticated and allowed to sleep (and defecate) in our homes, the parasite frequently has access to humans, as well. Seropositivity rates (the percent of people in a tested sample who test positive for the parasite) for humans ranges from 10–90% depending on location and, worldwide, averages about 30%.

Generally, healthy animals that are exposed to *T. gondii* have only short-term, mild symptoms such as fatigue, and sometimes don't even realize they have been infected. However, if an animal is pregnant during initial infection, the parasite can be extremely dangerous to the fetus(es) and often causes miscarriage or extreme developmental problems. Infection can also be dangerous to those with weakened immune systems.

Exposure to *T. gondii* comes through ingestion of either the parasite's oocysts, which are defecated by infected cats, or its bradyzoites in muscle tissue of infected animals not adequately cooked. A few weeks after ingestion, an animal exposed to *T. gondii* develops cysts in its brain and muscle tissue.

Some studies show that cysts in the brain affect hormone production and processing. They change the production of, and links between, hormones such as dopamine and testosterone. Cysts can change the behavior of the infected animal, giving it a hormone "reward," like dopamine, for taking greater risks and performing acts that would normally be stressful. Infected mice in labs strolled around in the open and even sought out the scent of cat urine. Overall, the parasite's cysts make it easier for the host to be killed and eaten by a feline. Only there, in the cat's stomach, can the parasite complete its life cycle.

Cysts can change the behavior of the infected animal, giving it a hormone "reward," like dopamine, for taking greater risks and performing acts that would normally be stressful.

This cycle has been happening across the globe for millennia but has rarely been studied in the wild. Yellowstone has healthy populations of felids, especially cougars, plus many years of wolf disease-screening results and observations of wolf behavior. Thus, this seemed to be a great location to study the effects of the parasite on wild animal behavior.

The first research goal of this Yellowstone Wolf Project study was to figure out which wolves get infected. Each wolf pack is a family of individuals that differ demographically. Some wolves are young, some middle aged and some very old; populations include males and females, black and gray coat colors, and different genetic lines. Certain individuals are more susceptible to some diseases due to their age, sex, genetics and other factors. Yellowstone Wolf Project researchers tested 256 wolves,







and 27.1% of them were positive for *T. gondii*. We also found the likelihood of toxoplasmosis infection depended on how many cougars the wolf might have encountered as it patrolled its territory. We were able to use a heat map of cougar density developed by Dr. Colby Anton as part of his PhD dissertation to visualize places in Yellowstone with high numbers of cougars.

Wolves living in areas with high cougar density—at least 1.8 cougars per 100 square kilometers—were much more likely to test positive for *T. gondii* (28.4%) than wolves in places that only partially overlapped high cougar density (12.5%) or with cougars at low density (4.7%). Overlap with cougars better predicted which wolves tested positive for *T. gondii* than any individual variable such as age or sex. Even very young wolves in areas with many cougars were likely to test positive, whereas a very old wolf in a place with few cougars might stay uninfected its entire life. Wolves were likely becoming infected when they accidentally ingested the *T. gondii* oocysts as they sniffed, licked or ate cougar scat (much like domestic dogs raid a cat's litter box).

It may be that infection truly does give some wolves a benefit. Future research aims to determine if infected wolves have different survival and reproductive rates compared to uninfected wolves.

What about wolf behavior? Do the brain cysts affect wolves the same way they affect rodents in the lab—by making them take risks? To answer this, we had to identify behaviors that would qualify as "risky" for a wolf. We measured wolves dispersing (leaving their packs), becoming pack leaders, showing certain habituated behaviors (getting within 10 meters/33 feet of a vehicle or person), and dying in one of two specific ways: aggressive encounters with other wolves or due to human-caused injuries. We then tested to see if *T. gondii* serostatus (being positive or negative for infection) helped to explain the pattern of risky behaviors. We focused only on the time in a wolf's life we knew its serostatus, to eliminate correlations with personality. (A bold wolf might be more likely to get infected AND to disperse, for example.) The results were clear: wolves with a *T. gondii* infection had 11 times greater odds of dispersing and 46 times greater odds of becoming a pack leader than uninfected wolves. This pattern arose only during the known infection time.

Dispersal is a common behavior for wild wolves. It helps them find unrelated mates and fill in vacant territories or expand wolf range. But it is also very dangerous, and survival for dispersers is fairly low compared to wolves living in packs with established territories. If a wolf survives dispersal, it often becomes a breeder. Becoming a pack leader is a major achievement for a wolf; this dominance status comes with a breeding position. It is rare for a wolf to become a pack leader through overtly aggressive measures. In any group of wolves a leader is bound to arise as a result of success in complex group tasks such as hunting large prey, patrolling territory and defending against other packs. Because wolves with *T. gondii* infections are more likely to end up in leadership and breeding positions, this brings up important questions about the potential advantages or disadvantages of being infected, and also about how these wolves influence their uninfected packmates.

It may be that infection truly does give some wolves a benefit. Future research aims to determine if infected wolves have different survival and reproductive rates compared to uninfected wolves. Both positive and negative biological effects of infection occur; however, as infection during pregnancy could kill an entire litter—quite a loss for a wolf that, on average, only lives three to four years. Leadership is also a topic of future work, especially to determine if infected wolves that attain leadership positions are good or poor leaders. It may be that they take too many risks and put themselves and their packmates in danger.



The leaders and parents of the pack are the ones teaching their packmates and offspring how to be successful, and if leaders are taking greater risks due to the cysts in their brains, their packmates may be learning to take greater risks by observing their leaders. Socially-mediated learning is simply another word for culture, so those leaders may be guiding their packmates through a cultural evolution of embracing risks.

So will more and more wolves be taking greater and greater risks? Likely not. *T. gondii* has coevolved with cougars and gray wolves for millennia, and this is not a new interspecific dynamic; we just understand it better. In addition, we don't live in a world where animals, especially carnivores, are allowed to exhibit risky behaviors around humans without the swift result being death.


Adobe Stock / swkrullimaging







For every risk a wolf takes, its chance of dying increases. This ensures some evolutionary checks and balances on behavior exist where a wolf might take a few risks and may even experience increased success—but do that too often, and the result will be death—and the end of that individual's breeding and pack influence.

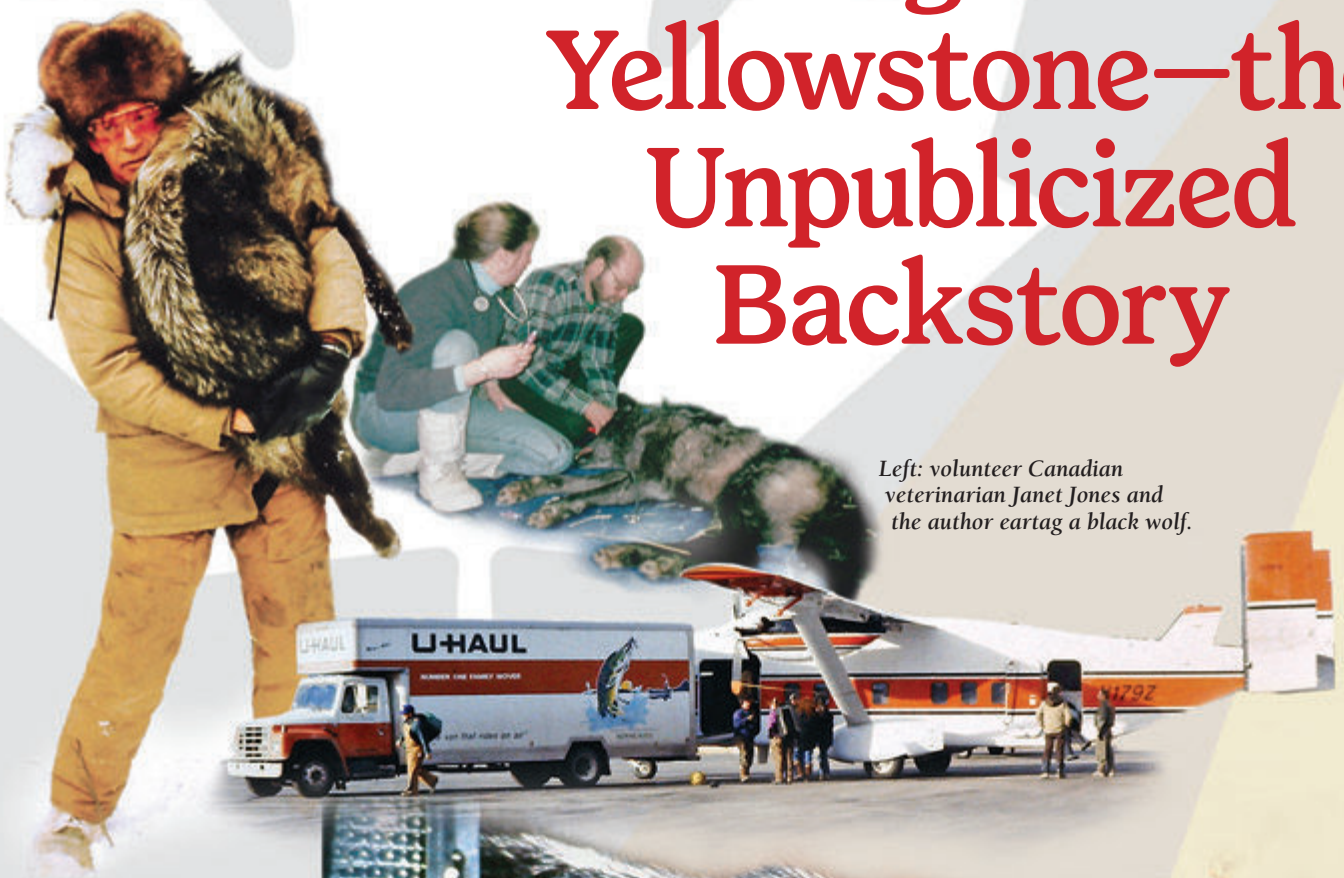
What about the interactions between wolves and cougars? Do infected wolves seek out felines—much like the rodents were drawn to cat urine in the lab? If so, infected wolves may be more comfortable, and even excited by, using territories that overlap high density cougar zones. Wolves are rarely killed by cougars; in Yellowstone this has been recorded only twice in 28 years. But cougars are occasionally killed by wolves. So the accidental infection of a predator and intermediate host might not be to the benefit of the definitive host or the parasite since it would so rarely make it back to a feline digestive system. While we answer some questions, more arise. The scientific process continues.

Studying a large, fascinating, social creature like the wolf in a place like Yellowstone is a scientist's dream come true. It has been a humbling, delightfully curious effort to zoom in to a microscopic level to examine how a tiny parasite can change behavior. We continue to ask questions about how that parasite might have far-reaching effects on entire populations and multi-carnivore interactions. ■

Kira Cassidy is a research associate with the Yellowstone Wolf Project.

Restoring Wolves to Yellowstone—the Unpublicized Backstory





Left: volunteer Canadian veterinarian Janet Jones and the author eartag a black wolf.

Above: Alaskan darter Ken Taylor, Alaska Department of Fish and Game, carries a wolf.



Released wolf: USFWS

Groundwork for that 1995 Accomplishment Began Years Earlier

BY STEVEN H. FRITTS

Photos by LuRay Parker for USFWS, unless noted otherwise

This is part one of a two-part story that took place over decades—beginning long before that celebrated day when wolf paws once again hit the ground in Yellowstone.


Yellowstone National Park

When I attended the International Wolf Symposium in October 2022, my first conference in years, I was struck by how much of the content concerned Yellowstone wolves. I also mused about the various ways in which the establishment of Yellowstone wolves and their neighboring populations has affected both ecology and people, and came to the conclusion that now, 28 years since reintroduction, the Yellowstone wolf population is a bit taken for granted.

Who among my readers remembers when no wolf packs roamed Yellowstone and surrounding areas? No wolf jobs; no research opportunities for graduate students; no books; no Bob Landis videos; no Rick McIntyre with a spotting scope and a surrounding crowd; no wolf-generated eco-tourism. Who remembers how wolves arrived there to create these opportunities—as well as the relentless controversy over their arrival?

Journal entry: January 7, 1995—Forestry Tech Center, Hinton, Alberta: *"We arrived at the Tech center to find a line-up of satellite-TV trucks awaiting us. At this point I am feeling overwhelmed by the responsibility of overseeing this thing with so many eyes upon us and so much at stake."*

All along, it was the responsibility of the U.S. Fish and Wildlife Service (FWS) to lead wolf recovery, and I was its chief scientist for recovery in the northern Rockies. I had just arrived from my U.S. office at the command center of the first effort to capture and send wolves to Yellowstone National Park (YNP) and central Idaho. It had taken decades of monumental effort by scores of people just to get to this point—the recovery team recommendations, proposals from Congress, "Wolves for Yellowstone?" studies, the Wolf Management Committee, an Environmental Impact Statement (EIS), the official Record of Decision, public meetings by the hundreds, litigation by opponents—and then, at long last, the way was cleared for action. The EIS, led by the FWS with Ed Bangs at the helm, had made the difference.

Just 15 days earlier (two days before Christmas) we had been in court dealing with yet another attempt to stop the program. To be honest, I doubted our day would ever come because the opposition was so determined to prevent the presence of wolves in Yellowstone and Idaho. And yet, here we were, and I, representing the FWS, had the main responsibility to see that this next part of the operation was carried out.

Several uncertainties hung over us. No one had ever pulled off a successful reintroduction of gray wolves. In

the final year of work on the EIS I had developed an overall design for reintroduction—but none of the planning mattered if we were unable to capture wolves, keep them alive, send them to YNP and Idaho, and then get them to establish or maintain pair bonds, stay where we wanted them, and reproduce. So we planned as well as we could, fully aware some adjustments would be needed.

The plan involved taking wolves from southwestern Canada, so the cooperation of Canadian officials and citizens was essential. Sending wolves from another country created challenges such as transporting supplies, obtaining import permits, disease screening, approval of fiscal contracts and border crossings, and others. We needed skilled personnel to manage every phase of the intense media coverage on both sides of the border; any mistakes would be publicized far and wide. Opponents were paying attention—and they desperately wanted us to fail.

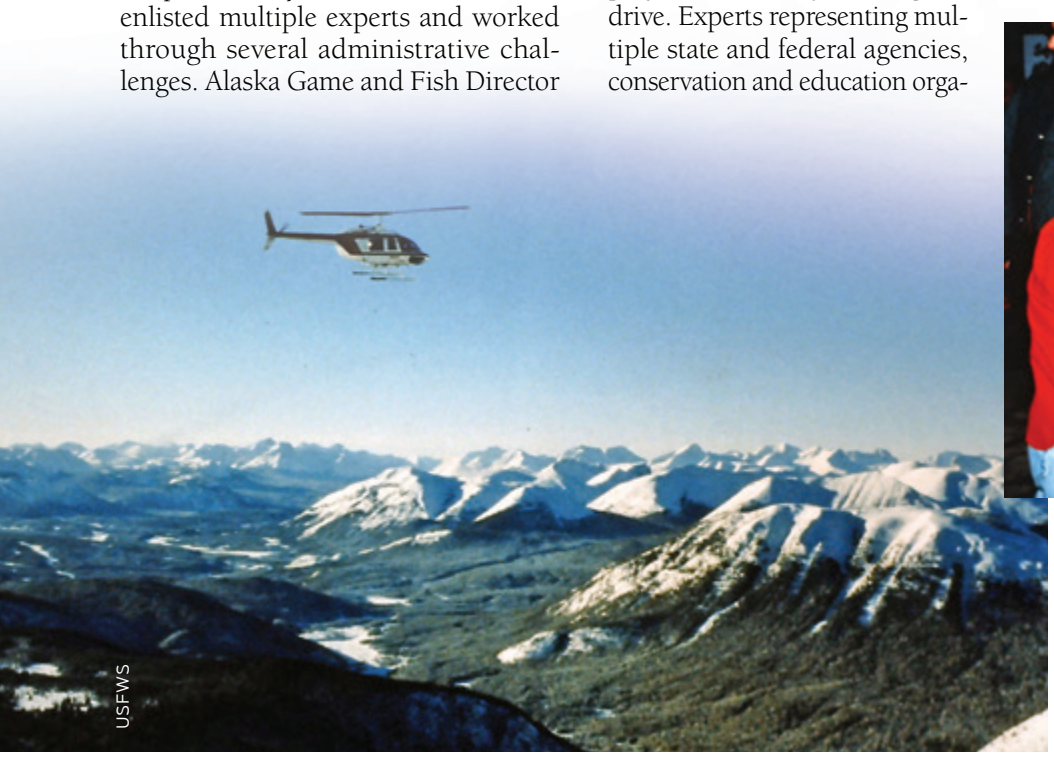
1995 – Alberta

Three of us and the support staff at the Helena FWS office had spent months getting some part of the operation set up. Ed Bangs had laid the groundwork for preliminary fieldwork in Canada, enlisted multiple experts and worked through several administrative challenges. Alaska Game and Fish Director Dave Kellyhouse provided skilled aerial trackers and darters whose work was critical to the operation. Joe Fontaine from FWS in Helena had overseen other logistics. We would work out of a single site in Alberta during the first year, with John Gunson of the Alberta Fish and Wildlife Division providing approval and support.

Although wolves had been offered by the Canadian wildlife agencies, they wanted us to make sure the source populations had sufficient animals before and after our work. That preliminary monitoring required the capture and radio-collaring of local wolves, which in turn required help from local trappers. In November 1994 we sent a vanguard team of five biologists to Alberta to work with local fur trappers who would radio-collar wolves in order to study the local population; we hoped that would expedite aerial captures when the time came. Carter Niemeyer and others had won the confidence of the Alberta trappers so necessary to get the project off the ground. He and local trapper Wade Berry made many of the local, on-the-ground arrangements required.

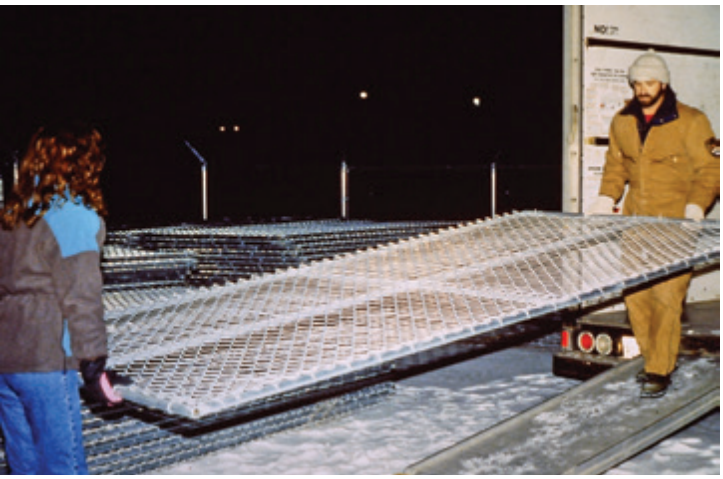
Litigation by opponents put us behind schedule. In January 1995, the project was finally shifting into overdrive. Experts representing multiple state and federal agencies, conservation and education organizations (including the International Wolf Center Director Walter Medwid), and multinational volunteers were converging near Hinton, Alberta. Some 20 news media representatives showed up—a contingent as large as our crew. My task was to lead the Canadian end of the operation from this point forward, and that first evening found me in the dorm room asking for divine support.

Switzer Provincial Park outside Hinton in west-central Alberta was our center of operations. My first full day on site started with a media briefing. Our vanguard team, with the help of local trappers, had five captive wolves waiting for us and 13 radioed wolves roaming the capture area. One urgent priority was to unpack supplies and set up a processing lab inside a heated garage at Switzer. Constructing holding kennels from the steel fencing panels (which Joe Fontaine had driven from Helena in a U-Haul truck) was equally critical. The five multinational veterinarians assembled a field lab in an adjoining trailer house. In the garage, the incoming wolves would be examined more thoroughly and treated with more TLC than I had ever witnessed. Following Mark Johnson's strict veterinary protocol, they would be vaccinated, tested


USFWS



Veterinarians assisted in Alberta. Left to right: Terry Kreeger (in the background), Beth Regehr, Dave Hunter and Mark Johnson.



Joe Fontaine and Alice Whitelaw unload panels for the kennels. Joe had driven them all the way from Montana.



Jim Till and Val Asher construct kennels.

We needed skilled personnel to manage every phase. Opponents were paying attention—and they desperately wanted us to fail.



Mark McNay, Alaskan Department of Fish and Game, examines a wolf that he has darted and prepares it for transport to our headquarters.

for every disease, parasite and infirmity imaginable, and have tissue sampled for genetics studies. Both helicopter wolf-capture crews flew that day and returned with word that wolf capture via aerial darting would be difficult because of too little snow and too many trees—not what I was hoping to hear.

Nonetheless, by the second day the two helicopter crews were already bringing in wolves. It quickly became clear that capturing entire packs (as we had deemed ideal) would be too difficult, so we would have to combine breeding wolves from different packs and hope for the best.





Ken Taylor, Alaskan Dept. of Fish and Game, carries a wolf to the processing center from the helicopter landing site.



Clockwise from right:

Mark Bruscino, Wyoming Game and Fish, (left) helps the author fit a radio collar to a wolf.

The author examines transport boxes in commercial moving truck.

Eldon Bruns, Alberta Fish and Wildlife, and Dave Mech carry an anesthetized wolf to be prepared for transport.





On the third day, six wolves were brought in, and I was on the phone arranging a first flight to the U.S. By January 11, we had 12 wolves ready for transport. We received word that the Forest Service plane would be on a tight schedule, and we would have to get the wolves to the Hinton airport by 11 a.m. Our crew started early and worked frantically that morning. I kept my promise to do an early-morning interview with National Public Radio. Joe and Carter had difficulty starting the U-Haul truck we used to get the wolves from Switzer to the airport—that was a tense moment. Each crew member was assigned a role in the process: I fitted wolves with radio collars as Dave Mech helped structure that operation. Then we rushed the wolves to the airport and arrived on time, only to learn that the pilots, having somehow heard that the weather was bad in Hinton, were sitting in Edmonton, drinking coffee.

Four times I sent word that our weather was great, and I was about to blow a fuse when finally, the Sherpa—a small military transport aircraft designed to operate on unpaved runways—arrived four hours late. The wolves were loaded, each in its own metal transport box, and the plane took off, headed southeast.



Transferring wolves in their transport boxes from UHaul truck to Sherpa aircraft at the Hinton, Alberta airport.

I vividly remember watching that awkward looking, red and white airplane finally clearing the tarmac and slowly disappearing into the frigid Canadian air. It was one of the sweetest sights I have ever witnessed—a moment to pause, reflect and feel a real sense of accomplishment.

The entire crew was feeling that satisfaction as we feasted at The Eagle restaurant in Hinton, Alberta, that night. But before we finished, a phone call came in, informing me that when the wolves arrived at their destinations in Yellowstone or central Idaho, they would not be allowed release from their small transport boxes thanks to a "stay" issued by a judge resulting from a legal motion filed by the American Farm Bureau. I announced the news to the crew; conversation became subdued. What would happen to those wolves if the program were stopped dead-cold? Returning them to Alberta was not an option, as Canadian authorities had made it clear they did not want them back. The wolves' lives, at that point, were subject to forces we could not control. ■

Part two of this saga, in which wolves become once more a part of Yellowstone's ecology and also return to Idaho, will appear in the fall edition of *International Wolf*.

With a 1979 Ph.D. from the University of Minnesota, the author spent his 32-year career locating, researching, writing about and restoring wolves, working alongside colleagues to change the future of the U.S. environment, and receiving the U.S. Fish and Wildlife Service's Meritorious Service Award upon retirement.

What would happen to those wolves if the program were stopped dead-cold? Canadian authorities had made it clear they did not want them back. The wolves' lives, at that point, were subject to forces we could not control.



Walter Medwid

Mexican Wolves: A Comeback Story

By AISLINN MAESTAS

Photos by Aislinn Maestas, U.S. Fish and Wildlife Service

Milestones in wildlife conservation are fairly rare. Recovery of an endangered species can take years, often decades, and progress is marked with as many setbacks as leaps forward. As the Mexican wolf recovery program progresses, two recent milestones are cause to reflect on the program's history.

This year marks the 25th anniversary of reintroduction of Mexican wolves to the wild and the first time more than 200 Mexican wolves have been documented in the wild since reintroduction efforts began.



In 2022, the minimum number of Mexican wolves in Arizona and New Mexico reached 241— a 23 percent increase from the previous year and the seventh consecutive year of growth. To achieve recovery, the population in the U.S. needs to average at least 320 Mexican wolves over an eight-year period. In addition, 22 wolves released from captivity need to survive to breeding age (two years).

"To go from zero wild Mexican wolves at the start to 241 today is remarkable," said Brady McGee, Mexican wolf recovery coordinator for the U.S. Fish and Wildlife Service (USFWS). "However, these numbers tell only part of the story. The scale and scope of this program are immense. We are managing a growing wild population, collaborating on a binational captive program, working with wildlife agencies in Mexico to grow a second population, and building relationships in communities where wolves are present."





Saved From Extinction

The story of the Mexican wolf is a familiar one for predators in the West. Once common throughout parts of the southwestern U.S. and Mexico, this subspecies was systematically hunted, poisoned, and eradicated. By the 1970s, it was all but eliminated from the wild.

After the Endangered Species Act (ESA) took effect in 1973, wolves were among the first species on the list. The Mexican wolf was listed under the ESA in 1976 as endangered, and the USFWS was required to protect the Mexican wolf and draft plans for its recovery.

However, Mexican wolves were considered extinct in the wild in the U.S., and numbers in Mexico were dwindling fast. This meant the path to recovery would depend on successfully breeding a population of the subspecies for reintroduction.

Toward this end, captive breeding of the Mexican wolf began in the late 1970s. Under an agreement between Mexico and the U.S., five Mexican wolves were captured in Mexico between 1977 and 1980 and brought to the U.S. These wolves, known as the McBride lineage, formed the basis for the Mexican wolf captive breeding program. Two additional lineages in captivity—the Aragon and Ghost Ranch lineages—were managed separately until advanced DNA analysis proved they were pure Mexican wolves.

[1976] Mexican wolves were considered extinct in the wild in the U.S., and numbers in Mexico were dwindling fast. The path to recovery would depend on breeding a population of the subspecies. Toward this end, captive breeding of the Mexican wolf began in the late 1970s.

The three lineages were combined in 1995, giving a genetic boost to Mexican wolves and raising the total number of founders to seven. Two years later, the U.S. Department of the Interior gave the green light to reintroduce Mexican wolves to a portion their historic range in Arizona and New Mexico.

Returned to the Wild

Reintroduction of a top predator such as the Mexican wolf is highly complex and often controversial. In addition, little information was available to build upon, as wild populations were effectively killed off before they could be studied.

Before releases could begin, the USFWS and partners conducted public opinion surveys, public meetings and hearings, and site feasibility studies and surveys for areas that would support naturally occurring wolves.

In 1998, three family groups of Mexican wolves were released in the Apache National Forest in eastern Arizona. Additional releases followed. In 2002, the birth of the first wild-born litter from a wild-born parent occurred in the U.S., at which point natural reproduction in the wild began to reduce the need for releases from captivity. In 2011, efforts to establish a second population in Mexico began with the release of five Mexican wolves in Sonora.

"Reintroducing an apex predator to its historic habitat has been a monumental undertaking," said Maggie Dwire, deputy Mexican wolf recovery coordinator with the USFWS. "Controversy has surrounded this program from the start,





and with every hurdle we have overcome, new ones appear on the horizon. With our partners, we have been able to meet these challenges, learn from past mistakes and improve how we manage wolves in the wild."

Connected by Conservation

In many ways, the story of Mexican wolf recovery is a tale of partnerships. In 1998, when wolves were first reintroduced to the wild, it was with the help of the Arizona Game and Fish Department, the New Mexico Department of Game and Fish, the U.S. Forest Service, and USDA Wildlife Services.

Today, dozens of partners are working on Mexican wolf recovery. Together, they discuss challenges to recovery, develop strategies for reducing wolf-livestock conflict, pool resources to address conservation needs and make decisions about how to move the program forward.

The captive breeding program has also continued to grow. Managed under the Saving Animals from Extinction (SAFE) program, approximately 60 facilities house 350-plus Mexican wolves in captivity across the U.S. and Mexico. Although these wolves are spread out among facilities, they are managed as a single population.

Each spring, pups from these captive facilities are selected for the Mexican wolf fostering program. Fostering is a proven method of increasing genetic diversity in the wild Mexican wolf population, whereby genetically diverse pups within the captive population are transported within 14 days of birth to the wild and mixed with similarly aged, wild pups.

Once all the pups are placed into the wild den, the breeding female will feed and care for both the wild and captive-born pups. The pups will be raised with the skills and knowledge needed for a life in the wild.

To date, a minimum of 13 fostered pups have survived at least two years in the wild and reached breeding age. These wolves count toward the recovery criteria of 22 released wolves reaching breeding age. As these fostered wolves breed and produce offspring of their own, they continue to improve the genetic diversity of the wild population.

"Fostering is when our two primary partner-driven efforts come together. It takes great coordination from the SAFE facilities and our field partners, to get these young, vulnerable pups from facilities across the country into wild dens," says Dwire. "While we did not develop fostering as a conservation tool, I think everyone agrees we have nearly perfected it."

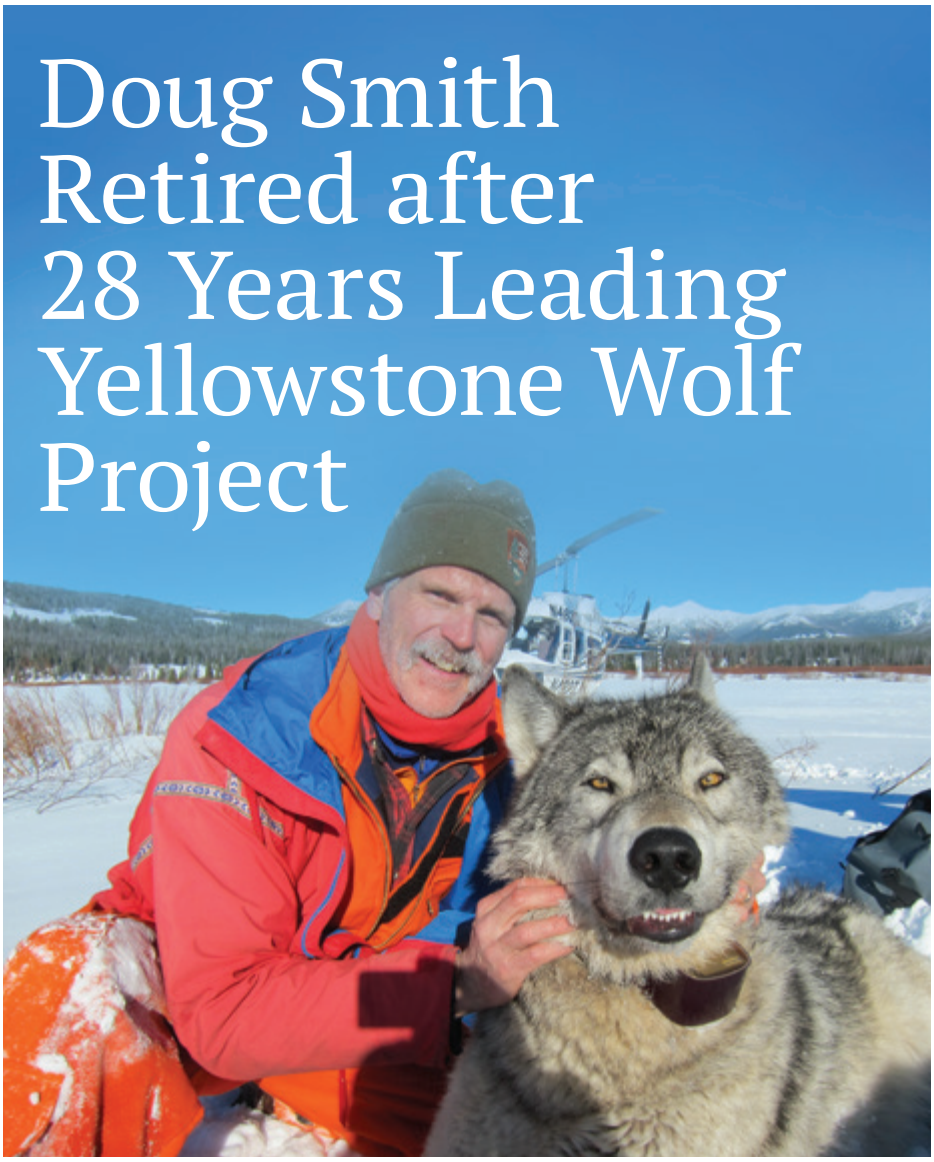
What Comes Next

Staving off extinction and growing the wild population to a minimum of 241 Mexican wolves is a remarkable feat. However, Mexican wolf recovery continues to face challenges, including pressure to release more wolves from captivity, pressure to remove wolves in response to conflicts with livestock, addressing illegal mortality and improving the genetic diversity in the wild population. These challenges, like previous ones, will be addressed head-on. Collaboration, flexibility and communication remain the cornerstones of this program, laying the groundwork for recovery wolf-by-wolf, so one day a self-sustaining population of Mexican wolves may thrive in the wild. ■

Aislinn Maestas is a public affairs specialist with the U.S. Fish and Wildlife Service.



Doug Smith Retired after 28 Years Leading Yellowstone Wolf Project



National Park Service

Doug Smith in his element.

BY NORM BISHOP

Twenty-four years into the planning process to restore wolves to Yellowstone, Mike Phillips arrived as the Yellowstone Wolf Project leader. He, in turn, was pleased to have an outstanding young wolf biologist with 15 years of field experience in wolf research as the park's wolf biologist. That was Doug Smith, 28 years ago. Doug's last day of service was November 26, 2022.

Yellowstone was Doug's fourth job with wolves. His first was with Erich Klinghammer's captive wolf colony at Wolf Park, a job that gave Doug a behavioral perspective—something Dr. Klinghammer reminded Doug of until his death. Second, under the supervision of Dr. Rolf Peterson, he did wolf-moose research seasonally, on and off, for 15 years, including nine summers and two winters. During that time, he also worked for Dr. L. David Mech in northeastern Minnesota, where he handled his first wild wolf.

In 1994, Doug hit the ground running in Yellowstone, and was on hand to receive the first 14 wolves translocated from Alberta on January 12, 1995. Beginning the day the wolves were released from acclimation pens, Doug was in the air almost daily to monitor the newcomers, all of whom had been radio-collared. He modeled his Yellowstone study, with slight variations, after the Isle Royale winter study, and by mid-November, he had fielded a team of volunteers to observe wolves from the air and the ground (later using GPS collars, as well) daily for 30 days. That study has been duplicated every early winter and every March since then. His is the cornerstone study for the project, producing an unparalleled set of data from which came many publications including annual reports, peer-reviewed journal articles and books. Radio collaring wolves was critical to this work, and Doug oversaw the capture of about 500 different wolves for a total of 600-plus captures. He learned helicopter darting on the job, tranquilizing without injury approximately 350 wolves.

A key part of the Yellowstone Wolf Program was its collaborative nature, and Doug used his previous connections in the wolf world to bring in an impressive cast of biologists and scientists, including Dr. Mech and Dr. Peterson. Others included Bill Gasaway (deceased) Francois Messier, Robert Wayne, Blair Van Valkenburgh, Todd Fuller, Bob Hayes (deceased), Lu Carbyn, Carlos Lopez, John and Mary Theberge, Paul Paquet, Tim Coulson, Andy Dobson, Pete Hudson, John Vucetich, Olof Liberg, Mark Hebblewhite, Jane Packard, Layne Adams, James Halfpenny, Daniel Tyers, Adrian Wydeven and John Weaver. Some of them visited Yellowstone for extended periods through what was called the 'Visiting Scholars' program.

As important, he set up a volunteer program that allowed young biologists to

gain experience necessary for graduate school or to move on to paid positions on the Wolf Project. More than 400 people worked on the Wolf Project in this capacity. Some of these volunteers who stayed on or went on to become graduate students are Dan Stahler, Erin Stahler, Kira Cassidy, Matt Metz, Dan MacNulty, Ellen Brandell, Chris Wilmers, and Shannon Barber-Meyer. Doug is as pleased with this accomplishment as he is with the research program.

Doug and his team published more than 100 peer-reviewed scientific articles, many book chapters and popular articles, and five books. His team never missed writing an annual report. He gave more than 1,500 speeches, presentations and field trips, and about 1,000 interviews for the likes of *National Geographic*, British Broadcasting Company (BBC), National Public Radio, and CBS's 60 Minutes. Yellowstone offered a stage, and Doug used it. Wolves needed a voice.

Doug had important professional relationships in Yellowstone. Rick McIntyre, Bob Landis and Roger Stradley are notable. Rick was assigned to Doug because managers thought Doug was the one supervisor who could "handle" him. Doug understood Rick, and they developed a 20-year working relationship as well as a friendship. Rick used his decades of observations of wolves to produce several books—among them the outstanding *The Rise of Wolf 8, The Reign of Wolf 21, Redemption of Wolf 302, The Alpha Female Wolf.* Bob Landis shared all the film he shot the entire time Doug was in Yellowstone, greatly enhancing both research and outreach to the public. Roger Stradley, one of a family of consummate pilots, flew Doug for thousands of hours.

Asked why he retired when he did, Doug says he loved work as a biologist or scientist, but in recent years, he'd had to spend less time in the field and more as a manager. Now he is free to spend as much time in the field as he wants. Skiing and canoeing the rivers of Canada with his wife, Christine, and their sons, Sawyer and Hawken, will be high on his list. ■

Norm Bishop has studied wolves and wolf recovery professionally and personally since 1985. He was the principal interpreter of wolf recovery on the Yellowstone Center for Resources team that restored wolves to Yellowstone in 1995, and he has worked to restore wolves to Colorado since 2016. Bishop lives in Bozeman, Montana.



National Park Service / Jacob W. Frank



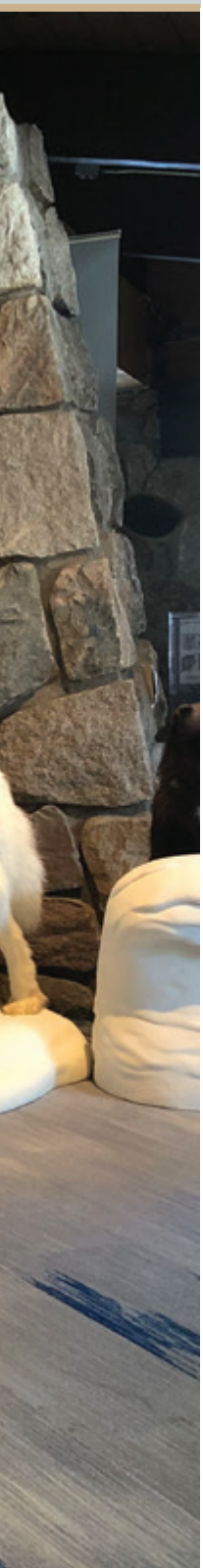
National Park Service / Jacob W. Frank

Yellowstone offered a stage, and Doug used it. Wolves needed a voice.

National Park Service, Doug Smith



All photos: International Wolf Center





Wolves are not the only predators in the world that hunt and eat prey larger than themselves, but their ability to do so is impressive to witness.

A particularly dramatic example of this takes place in the Arctic, where some of the wolves' main prey animals are musk oxen. A new display now in place at the International Wolf Center in Ely highlights this relationship and makes clear the dramatic difference in size and stature of the two animals. The display features a windswept tundra background and several animals that live in this arctic landscape, including a musk-ox, an arctic wolf, a wolverine and an arctic hare.

Interpretive Center Director Krista Woerheide explains the importance of updates at the Center. "We work hard to keep our Center contemporary, so there's something new every year; this year it's the musk-ox display. The realism in that animal grouping creates a real 'WOW' experience for visitors, serving its educational purpose well."

To coincide with the new display, the Center's two arctic wolves in the Exhibit Pack, Axel and Grayson, will be featured in one of the summer programs held daily in the auditorium.

Thank you for considering a visit to the International Wolf Center in 2023!

To learn more, visit wolf.org or call us at 218-365-HOWL. ■



SUMMER 2023 PROGRAM SCHEDULE

Daily programs

Below is the schedule for hourly programs at the interpretive center. Programs are held every hour in the auditorium from May 26 through mid-August.

9:00 am	Open
9:15 am	Ambassadors to the Wild
10:15 am	Arctic Wolves
11:15 a.m.	Gray Wolf 101
12:00 p.m.	Enrichment
1:15 p.m.	Ambassadors to the Wild
2:15 p.m.	Arctic Wolves
3:15 p.m.	Gray Wolf 101
4:00 p.m.	Enrichment
5:00 p.m.	Close

Behind the scenes

Again in 2023, we're offering unique, behind-the-scenes tours for members at 4 p.m. on Tuesdays and Thursdays until mid-August—a chance for members to learn about the ambassador wolves and the people who care for them. You're encouraged to pre-register at wolf.org.

What's for Dinner?

The popular "What's for Dinner?" program every Saturday at 7 p.m. gives visitors the opportunity to watch the Exhibit Pack enjoy its main weekly meal. The program is a great time to wolf-watch and observe a variety of important behaviors.

Howling Safari

Howling Safaris are an exciting chance to head out on a field trip, and if all goes as planned, hear wild wolves! These events are held on Wednesday and Friday nights in August and Saturday nights in September and October. Pre-registration at wolf.org is required.

Comparison of Social Bonds —One Year Later

By Lori Schmidt

A casual observer might assume that raising wolf pups new to the exhibit pack would be a repeat performance each time—especially with back-to-back "pup years" in 2021 and '22. Nothing could be farther from the truth, and the pup care team can attest to that fact. There are far too many variables in the scientific process of pup rearing, the most critical being the age of pups when team members begin the socialization process.

In 2021, Reika was 12 days old when she first met International Wolf Center Wolf Specialist Abby Keller. Her eyes were just starting to open, so her world revolved around humans as she developed. Blackstone and Caz stayed with their wolf mother until 24 days of age before having significant time with human caretakers. Center wolf care team member Abby Keller and volunteer Awen Briem met Caz and Blackstone at 34 days of age. The images in this article show the obvious difference in the pups' situational awareness at those ages.

We have a saying in wolf care: When a wolf pup starts to hear (around 14–18 days of age), it starts to fear. This reaction is called "neophobia"—fear of any new stimuli.

A 3-week-old, wild wolf pup will start exploring outside of its den and may benefit from a fear-based avoidance response to aid in its survival. When raising pups in captivity, however, delays in socialization after 3 weeks can increase fear avoidance and may limit the bond pups form with human caretakers. We are experiencing a bit of this with the 2022 pups.

Caz and Blackstone, who spent more time with their wolf pack than with humans during the critical bonding period, have a stronger social attachment to canids than humans. While Rieka displays a high-intensity tail wag, whining and interest in greeting the human caretakers, Caz and Blackstone are more reserved. Yet the pups show the same tail-wagging excitement when with the Exhibit pack, and even when the staff dogs enter the enclosure. A wolf's brain seems to limit bonding to whoever dominates its time during its "critical bonding" period. In captivity, it's either humans or wolves. In the case of wild-wolf survival mechanisms, pups that bond with their pack as they emerge from the den and start exploring their world are more inclined to seek comfort from their socially bonded pack members.

This doesn't mean that Blackstone and Caz don't trust the staff, but it requires more diligence by our team to maintain positive associations and avoid negative conditioning as humans meet the pups' physical, behavioral and medical needs.

To learn more about the ambassador wolves, consider subscribing to the Center's Youtube channel for weekly clips, or register for our monthly wolf care webinars to ask questions of team members about wolf care. ■



Rieka at 12 days of age as she starts the socialization process with Abby Keller



Blackstone at 34 days old, meeting wolf-care team member Awen Briem



Caz at 34 days old, meeting wolf-care team member Abby Keller

All photos: International Wolf Center

Lori Schmidt is the wolf curator at the International Wolf Center.

INTERNATIONAL WOLF CENTER

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Gifts between December 1, 2022 and February 28, 2023

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Thank You!

Wolves Target of Love, Hate Across Europe and Emulation in Japan

By Tracy O'Connell

THE NETHERLANDS

In fall 2022, a plan to use paintballs to deter wolves that had been deemed troublesome was shot down in court here. After several instances of bicyclists being pursued by wolves in the Hogue Veluwe National Park, media reported that rangers were authorized to use paintballs to deter aggressive animals, a solution seen not as harmful to wolves, but painful enough to teach them to avoid humans. The plan had the additional advantage, supporters noted, that wolves marked with paint would be easy to identify when encountered again. The goal was to keep wolves at least 100 feet (30 meters) from humans.



A nature conservation society Faunabescherming, or Fauna Protection, objected to the plan, wondering if wolves *would* be harmed. Alternatives had not been sufficiently explored, the group argued. The court agreed, overturning the proposal and calling paintballs an "experimental tool" in this usage; it also questioned whether wolves marked by paint might be shunned by their packs. Pleased by the action, the organization's chairperson, Harm Niesen, reportedly said in a statement, "The judge chose the wolf and not the humans."

The park is in the country's largest province of Gelderland—population just over 2 million. It contains the nation's largest forest region and portions of major rivers, including the Rhine. The Netherlands is believed to be home to about 20 adult wolves including a pack, some pairs and several lone wolves. More than a dozen pups are believed to have been born last summer.


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Concerns about rapidly growing wolf numbers include not only several reports and videos of park visitors being pursued by wolves, but also wolves' excessive predation on other wildlife. The park announced last year that wolves had killed large numbers of mouflon, red deer, roe deer and wild boar, posing "some serious dilemmas regarding wildlife management, economic damage, habitat and species protection, and visitor expectations." Mouflon, which are small, feral sheep native to the Mediterranean region, are said to fill a specific niche in the environment, and their depletion is cause for concern.

The *Brussels Times* reported that some wolves' interest in following and sometimes pursuing bicyclists has been called unnatural and held up as suspicious in more than one corner of the debate. Some, seeing it as an example of habituation, call for the park to better


Adobe Stock / Martin Mecnarowski

protect wolves from becoming comfortable around people. Others—specifically members of Fauna Protection—accuse the park of encouraging habituation of wolves so more drastic measures can be taken against them. (This column in the last issue of *IW* addressed concerns about the park management's views on wolves.) In response, park director Seger van Voorst argued that vandals illegally brought a "problem" wolf to the park.

SWITZERLAND

An estimated 1,000 head of domestic livestock—sheep, goats, cows and donkeys—will be killed here by wolves this year, according to the Kora Foundation, which deals with Swiss predator ecology and wildlife management. The prediction, by the organization's managing director Christian Stauffer, compares with a decade ago when 112 animals were lost to wolf predation. Only one pack hunted there then, and now they number 20, Stauffer told *Blick*, a German-language daily Swiss newspaper.

Parliament approved new rules last December that ease restrictions on culling wolves, allowing individual animals or whole packs to be killed preventively if they are believed to pose a threat to livestock. The plan goes into effect this summer. Game wardens will also be allowed to shoot wolves that approach humans and inhabited areas in a threatening manner, and wolves against which flock protection measures are ineffective.

Under new rules, cantons (like U.S. states) will no longer have to prove the extent of damage but will have to justify control measures and their objectives, according to *SwissInfo.ch,* an online media outlet that produces news about Switzerland in 10 languages. Cantons will be required to obtain federal approval before culling wolves. Shooting will be authorized from September 1 of this year to January 31, 2024.



Wikimedia Commons / Arto Häkkilä



FINLAND

Wildlife migration will be restricted by the construction of a wall along the southeastern border with Russia, conservationists say. Wolves, bear, wild boar and red deer are expected be affected. The structure is supported by leaders of the nation's major political parties and planned to be 130 to 260 kilometers (80 to 161 miles) long—approximately one-tenth the length of the border between the two countries. Some worry that the design, three meters (close to nine feet) tall and topped with barbed wire, will not allow the passage of large mammals. Requested by the Finnish Border Guard to cut immigration, the project is expected to start this summer. The Border Guard is exploring ways to mitigate environmental challenges, according to *Yle*, an online public service broadcaster.



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ISRAEL

A white wolf has been spotted in the Negev desert here on trail cameras set up by the Nature and Parks Authority. White wolves are rare in this part of the world but not unknown. The media outlet *Jewish News Syndicate* reports that in 2012 a white wolf was seen at the Evrona Nature Reserve, and in 2015 a female white wolf was seen at the Mishor Yamin plateau. She was later known to have pups, but the article did not say whether they were white.

The wolf in Negev is believed to have leucism, a condition that causes a partial loss of pigmentation. The eyes of leucistic animals remain dark, while those of albino animals seem pink.

JAPAN

A love of wolves has taken some interesting forms here.

Concerned with protecting their crops from ravening ungulates, farmers' use of robot wolves (reported previously in these pages) has expanded in scope and variety, according to British newspaper *The Sun*. In addition to protecting fields from wildlife that cause up to an annual $120 million U.S. in damages, some seek the robots' protection against increasing numbers of attacks on humans by wild boar and bears, which have twice proven fatal in the last two years.

The need exists because the number of licensed hunters in Japan has dwindled by 91%. Efforts to reintroduce wolves to reduce ungulate numbers, and therefore crop damage, have stalled despite the strong role of wolves in the nation's lore and many years of public relations efforts by supporters such as the Japan Wolf Association.

Robot wolves, made by a number of firms here, can cost up to $11,000 U.S. One version, a drone, can make a barking sound heard on the ground from more than 300 feet in the air. Other models shoot fireworks.

In another effort to incorporate wolfishness into daily life, a man who requested anonymity has spent 3 million yen (nearly $25,000 U.S.) to make himself look like a wolf according to *Mint*, a business publication based in India. The costume was specially-made by Zeppet, a Japanese firm known for making models and sculptures for movies.

The customer said that he changed his appearance out of his love for animals and realistic animal suits. "We checked images of real wolves to discuss the smallest details until we incorporated many features in the specifications," he is quoted as saying, including vents for easy breathing and the ability to put the suit on without assistance. The costume took just under two months to make.

"At the final fitting, I was amazed at my transformed self in the mirror. It was a moment when my dream came true. My order to 'look like a real wolf walking on hind legs' was difficult but the complete suit looked exactly like what I imagined."

SWEDEN

What is being described as the largest wolf cull in modern history was scheduled to take place in 2023 with an approved take of 75 animals out of a wild population of 460. While environmentalists decry the scope of the action, claiming it is a gift to the nation's strong hunting faction, those in favor of fewer wolves—including the majority of the Swedish parliament—prefer to see the total population closer to 170, the lowest figure approved by the European Union.

Scientists from top European universities argue in the journal *Science* that the move toward a lower population threshold threatens an already fragmented and fragile wolf population. Next door, Norway's government already has a fixed population target aimed at allowing only four to six pups every year.

The nature group Aktivt Rovdyrvern notes in *The Guardian* that one needs about 1,500 individuals in a population to allow genetic variation. Seeing the current trend as a slippery slope, it warns "Sweden and Norway seem destined to be reduced to about 200 individuals in total, with 170 of them in Sweden and the remaining 30 in Norway." The concern with genetic variability is timely, as a new study at Sweden's Uppsala University shows that Scandinavian wolves (which originated from only three individuals after the historic population was killed off) carry around 100,000 harmful mutations in their genome. "As long as the harmful mutations can be compensated by a healthy genetic variant, this does not need to pose a problem," the article stated. However, the possibility of double harmful variants—a set inherited from each parent—has increased with each generation due to inbreeding.

For the first time, researchers at Uppsala University have investigated this occurrence of harmful mutations, studying 100 wolves in the Scandinavian population and a corresponding number of Finnish and Russian wolves. They found each individual has an average of approximately 100,000 harmful mutations across the entire genome (which, in wolves, consists of around 2.4 billion positions) reports *Miragenews*, an online media source based in Australia. ■

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



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Paw Prints: Books for Kids about Wolves

By Polly Carlson Voiles

So many books for children with "wolves" in the title (or for adults, as well), appropriate the wolf for purposes that have nothing to do with the science of the real animal. And sadly, writers often feel comfortable featuring wolves with made-up "facts."

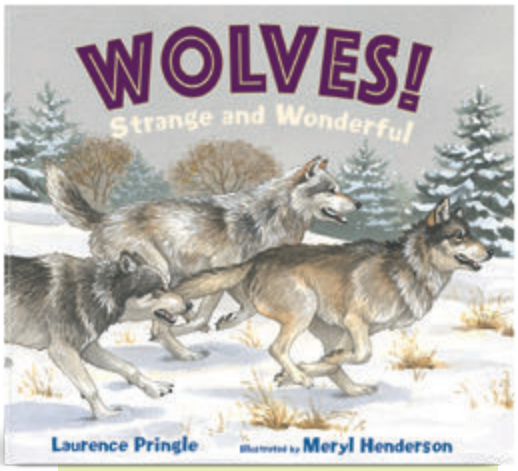
As a parent, educator and writer, I feel we have the obligation to—as much as we can—get it right for young readers. Here are two well-written books for kids starring wolves: one an overview, the other focused on the Yellowstone ecosystem.

Wolves! Strange and Wonderful (2022), by Laurence Pringle, an author of more than 100 non-fiction books for children, is an excellent 32-page survey for a future course in wolf knowledge. It invites the reader in with a howl and then presents a collection of the major topics: about both gray wolves and red wolves, dogs-from-wolves, wolves as predators, family or pack life, communication (and yes, the howl). It also covers hunting, wolves in history, human feelings about wolves, the return of wolves to Yellowstone, the wolf as founder of our nation of dogs, and the challenge of protecting an environment for the presence of wolves in a modern world. The text is brought to life with accurate and sometimes intimate art by Meryl Henderson, whose love of canids is clear in her inviting depictions. This overview is sure to spark a child's interest in wolves and their important role in the balanced ecosystem. Grades 2-5.

Bringing Back the Wolves: How a Predator Restored an Ecosystem (2020), written by Jude Isabella, illustrated by Kim Smith, focuses on the reintroduction of wolves into the Yellowstone ecosystem. The theme of the book—that reintroducing the wolf has restored an ecosystem through resulting *trophic cascades*—is controversial. However, this 40-page book, although necessarily oversimplified, contains paintings and wonderful graphics illustrating concepts like the food web, and direct and indirect interactions of the wolf with other animals and plants, focusing on the many forces that make up Yellowstone's complex ecosystem, including insects, fish, weather, and climate change. Perhaps this concluding statement should have been the book's overriding theme: *"Studying the wolves has exposed just how complex and interconnected the ecosystem is, revealing surprising links no one could have imagined."* (In this case, I would encourage young readers to investigate further the concept of *trophic cascades*.) The presentation of this book is welcoming, kid-friendly and accessible. Grades 3-7.

In both books, excellent glossaries and references for further study are included. ■

Author Polly Carlson Voiles, two-time winner of the Northeastern Minnesota Book Award, has been inspired by years of canoe trips, cabin time, teaching, and by her home atop an ancient rock ridge overlooking the Boundary Waters Canoe Area Wilderness,

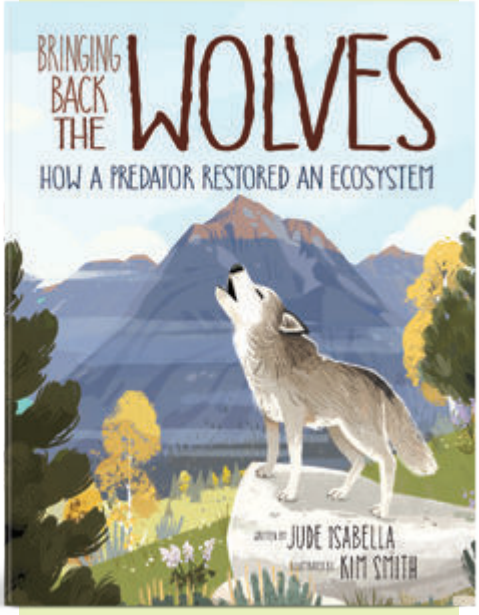


Wolves!
Strange and Wonderful

By Laurence Pringle
Illustrated by Meryl Henderson

Publisher: Astra Young Readers

32 pages



Bringing Back the Wolves: How a Predator Restored an Ecosystem

By Jude Isabella
Illustrated by Kim Smith

Publisher: Kids Can Press

40 pages

A Momentary Gaze—and a Lifelong Memory

By Cree Bradley

Henry David Thoreau wrote,

"What a wonderful miracle, if only we could look through each other's eyes for an instant."



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Standing face to face with a wolf, only a dead deer lying between us, I won't pretend to know what the wolf was thinking. But it felt as if I were experiencing Thoreau's miracle—that the deer was a truce and we both knew it, through that steady gaze of our eyes.

The day had begun with a leisurely ski down a trail near our property in northern Minnesota. My husband and I, with our dog, Ruby, on skijor harness, had taken advantage of the brilliant February day: full sun, yet too cold to work our maple-sugaring lines, the sap-collection tubing being too brittle at those temps to repair more than we damage. Knowing our lives would soon become busy with demanding work for 10 months straight, we paused our work for a day of play.

Shortly into the trip, only 20 minutes by ski from home, we heard from the trail ahead a confounding rustle we could not identify. It stopped almost as soon as it started. Seeing and hearing nothing more, we skied on. Soon enough, to Ruby's delight, we happened upon a medium-sized deer lying in the middle of the trail, dead.

Or was it?

The deer was so "just dead" that we had to examine it to make sure it was *actually* dead. It was warm to the touch; there was no rigor mortis in the joints or muscles yet, and we found no broken bones, blood or visible bites. The deer was indeed dead, but the cause was a mystery. We wondered if it had suffered cardiac arrest and happened to drop right there for us to find and ponder. The snow was deep that winter, which made it difficult for humans to get around in the woods (as we knew well from our sugaring work). We figured it couldn't be much easier for deer.

Ruby's interest in the deer and our love for venison sparked a natural and excited response to finding such a recently deceased animal. We thought, *"How incredibly fortunate!"* As commercial farmers, fishers and sugar makers, our modest livelihood is based on harvesting food from the environment, so a freezer full of venison is a genuine gift. Without thought to right or wrong, legality or any other considerations, we devised



Cree Bradley

a way to use our skis, skijor harness, tether and work ethic to finagle the deer home through the deep snow.

Upon reaching our house and preparing to process the deer, a heavy realization dawned on us. We possessed a deer, it was not hunting season, and we lacked a permit—a thought that never once entered our minds as we hauled the deer home. We stopped all activity and thought, *"Now what?"*—when suddenly, a chorus of wolf howls abruptly rose from the north with resonant clarity. The wolves were quite close, apparently in the exact area we had just post-holed out with dead deer in tow. It was then that we realized, with an even heavier burden of guilt, *"This was not our kill. This is not our deer to take."*

We loaded up the carcass, this time with a sled and snowshoes to ease the journey back through the deep snow, and with some trepidation about just how close those wolves were, we hauled the deer back to where it came from. All in all, the full-circle task took less than two hours—a whirlwind of activity on a day that had surprised us in more ways than one.

We unloaded the deer, wanting to get out of the woods quickly to limit the interruption we had already caused in what would have been a natural feed by our local wolf pack. Our best guess as to what happened, given the snow conditions of that winter, is that the wolves worked hard to take down that deer, the deer worked too hard, perhaps, to outrun their chase, and its heart or some other critical organ gave out.

Before leaving, we paused. We were looking upon the deer and pondering this theory, when a lone wolf popped into the pathway on the other side of the deer, its eyes set in a steady gaze upon us. We took in that miracle of close eye contact for a brief moment, feeling neither fear nor danger.

Then we turned to leave, saying as we departed, *"It's all yours."* ■

Cree Bradley is a member of the International Wolf Center board of directors, and, with her husband Jason, owner-operator of the nearby Chelsea Morning Farm and Never Summer Sugarbush where this wolf encounter took place. She experiences many wildlife encounters through her off-farm work in Minnesota public lands and the Superior National Forest, but this was one of her closest and most awe-inspiring.



Cree Bradley



Wolves and Wisconsinites: Improving Relations?

By Debra Mitts-Smith

In 2022, in preparation for updating the Wisconsin wolf management plan, the Wisconsin Department of Natural Resources (DNR) designed an eight-page scientific survey of the public's views about wolves and wolf management in Wisconsin. This was the DNR's second such survey. In 2014 Wisconsin DNR social scientists developed a statewide scientific survey on residents' perceptions of wolves and the factors shaping them. The purpose of both surveys was to inform wolf management decisions and policies.

The 2022 survey replicated many of the 2014 methods and questions, allowing researchers to compare responses while measuring shifts in attitudes. Additions and modifications to the 2022 survey reflect changes in political, legal and socio-cultural contexts regarding the wolf.



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Participant Demographics

Four population and geographic samples were included in the study. Survey participants were randomly selected from four categories: wolf range rural; wolf range urban; non-wolf range rural; and non-wolf range urban.

Of the 8,750 households surveyed, 3,158 (38%) responded. Households from rural wolf counties had the highest response rate (44%); those from urban, non-wolf counties, the lowest (31%). Fifty-five percent of the respondents lived in wolf range. The average age of respondents was 50, and 65% identified as male.

Participants were allowed to self-identify as belonging to one or more of the following "affinity" groups: animal lover, environmental advocate, farmer or livestock producer, hunter and/or trapper, landowner, outdoor enthusiast, tribal member and other. Forty-nine percent identified as hunters and/or trappers. These labels suggest (and perhaps predict) how responses may reflect the values, livelihoods or interests of particular groups.

Wisconsinites' attitudes toward wolves are overwhelmingly positive

Participants were asked to indicate their level of agreement or disagreement with nine statements about wolves. Over 70% agreed or strongly agreed with each of the following statements: (1) Wolves keep nature in balance. (2) Wolves are special animals that deserve our admiration. (3) Wolves are culturally important. (4) People and wolves should be able to co-exist. Eighty percent agreed or strongly agreed that maintaining a wolf population in Wisconsin is important.

Just as most respondents agreed with the positive statements about wolves, most disagreed or strongly disagreed that (1) Wolves provide no benefits

to people (66%) and that (2) Previous generations were right in eliminating wolves from the landscape (75%).

The remaining two negative statements elicited mixed responses. Although 49 percent disagreed or strongly disagreed that wolves are a nuisance, 30% indicated they were unsure. Forty-two percent disagreed or strongly disagreed that wolves negatively impact deer hunting in Wisconsin while almost the same number (40%) neither agreed nor disagreed with the statement.

Researchers found that those who identified as animal lovers, outdoor enthusiasts, environmental advocates or tribal members had much more favorable views of wolves than farmers or livestock producers, hunters and/or trappers and landowners. Researchers also found that, overall, those who lived in wolf range expressed "significantly" less favorable views of wolves than those residing outside of it.

Comparison of responses indicates that Wisconsinites' attitudes toward wolves grew more favorable from 2014 to 2022—regardless of whether they lived inside or outside of wolf range.



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Rare encounters

Seven questions focused on Wisconsinites' encounters with wolves. First-degree encounters were defined as seeing wolf tracks, hearing a wolf howl or seeing a wolf in the wild. Second-degree encounters were defined as experiencing or knowing someone who experienced wolves attacking, injuring or killing domestic animals.

Encounters with wolves are relatively rare. Sixty-one percent reported never seeing a wolf in the wild, 55% had never seen wolf tracks, and 45% had never heard a wolf howl. Second-degree encounters are even more rare: 15% reported knowing someone whose pet or livestock was attacked, and 12% reported knowing someone whose domestic animal was killed by wolves. Farmers, livestock producers and hunters and/or trappers were more likely to have had experiences with wolves in the wild.

Comparisons between the 2014 and 2022 surveys also point to significant declines in both first- and second-degree encounters with wolves.

High appreciation for wolves—yet safety concerns remain

Several 2022 survey questions asked respondents to consider the degree to which thinking about wolves evoked feelings of anger, excitement, appreciation or frustration. The majority reported having no feelings of frustration (72%) or anger (80%) when thinking about wolves. Sixty-five percent indicated they felt excitement while thinking about wolves and 70% reported feelings of appreciation for wolves. Those who lived in wolf range reported higher levels of anger and frustration; those living outside of wolf range reported higher levels of excitement and appreciation.

Three 2022 survey questions asked participants to indicate their safety concerns while outdoors in areas where wolves live. Sixty-one percent expressed worry for pets, 53% expressed worry for children and 31% expressed worry for personal safety. Further, farmers, livestock producers or hunters and/or trappers were more likely to worry about safety than animal lovers, environmental advocates or outdoor enthusiasts. Researchers also found that experience with or knowledge of second-degree wolf encounters (attacking, injuring and killing domestic animals) increased respondents' perceived risks of wolves.

Comparison of 2022 responses with those of 2014 shows that, although most respondents still express worry for personal, pet or child safety, the numbers have decreased over eight years.

Wolf numbers and distribution

Currently roughly 1,100 wolves live in Wisconsin. When queried on preferences for the size and distribution of Wisconsin's wolf population, 45% of participants statewide would like wolves to occupy about the same amount of space they currently occupy. Those who would like to see a decline or elimination of wolf population were on average more likely to have had both first- and second-degree encounters with wolves. Between 2014 and 2022, the number of those who would like fewer or zero wolves has declined, while those who prefer the number of wolves to remain the same or to grow has increased.

Wolf management options and lethal control

Respondents were also asked to rate the importance of various wolf management options by the Wisconsin DNR. A majority considered the following options to be very important: educating the public about wolves and wolf behavior, monitoring wolf population size and distribution, and conducting research on methods to prevent wolf-human conflict. Forty-four percent believe that it is very important to create refuge areas to protect wolves while 36% indicated it was very important to reduce wolf populations in places with frequent wolf-human conflict.

Management options that received the lowest relative support were those used to address wolf predation on white-tailed deer and elk, and compensation for hunting dogs. Many (30%) indicated that it was not important to reduce wolf predation on ungulates, while a majority agreed it was slightly important (31%), moderately important (22%) or very important (17%). Forty-five percent of the respondents felt it was not important to compensate hunters for hunting dogs killed by wolves on public lands, while more than half indicated that it was very important (16%), moderately important (16%) or slightly important (23%).

Respondents were asked whether they supported or opposed lethal options in dealing with four kinds of

wolf-human conflicts: wolves attacking domestic livestock, wolves attacking hunting dogs on public lands, wolves regularly approaching people and wolves attacking pets near residences. Statewide, the majority of participants approved of lethal control in each of these situations. Yet 35% opposed lethal control in situations involving wolves attacking hunting dogs on public lands. Roughly 15% of respondents also opposed lethal control measures in response to wolves attacking livestock, wolves regularly approaching people and wolves attacking pets.

The 2014 and 2022 surveys presented the same four wolf-human conflict scenarios and statements regarding lethal control. A comparison of responses shows that opposition to lethal control for each scenario had increased slightly (5–6%) since 2014.

Wolf Season

Researchers queried respondents on their support for or opposition to a regulated wolf hunting and/or trapping season. Forty-six percent support or strongly support a wolf season, while 29% oppose or strongly oppose. Twenty-five percent were undecided. Support for a regulated season correlated with awareness of the state law requiring a wolf season when the wolf is no longer listed as "endangered" on federal or state lists. The most common reason (75%) for opposing a wolf season was fear that wolves would become endangered again. Seventy percent opposed trapping and 64% opposed the use of hunting dogs.

Researchers found that of those against a wolf season in Wisconsin, only 15% were against all forms of hunting. Instead, most (55%) support some forms of hunting—just not hunting wolves; 62% think we don't need to hunt wolves, and 57% recognize that wolves are culturally significant to Native Americans, and hunting wolves is offensive to them. Respondents had the opportunity to list "other" reasons for opposing a wolf hunt. These responses reflected concerns that hunting wolves is unethical, involves inhumane practices, interferes with the balance of nature, is hard to regulate and disregards the rights of individual wolves and wolf packs.

Comparisons between the 2014 and 2022 surveys show that statewide, support for regulated wolf hunting and/or trapping seasons declined from 61% in 2014 to 46% in 2022.

Overall, these surveys suggest that over the past eight years, Wisconsinites' attitudes toward the wolf have become more favorable, and that while support for lethal control and hunting remain, that support is waning. And, as a recent DNR virtual townhall meeting on public feedback to Wisconsin's proposed wolf plan revealed, wolves and wolf management remain controversial. ■

Additional Reading

Bradshaw, Lauren, B. Beardmore, M. Henry, A. Scott R. Holsman and D. J. Watermolen. (September 2022). *Public Opinions Regarding Wolves and Wolf Management in Wisconsin.* Technical Report to the Bureau of Wildlife Management. Wisconsin Department of Natural Resources, Bureau of Wildlife Management. Madison, Wisconsin, USA.

Wisconsin Department of Natural Resources. 2022. *Wisconsin Wolf Management Plan,* Wisconsin Department of Natural Resources, Bureau of Wildlife Management. Madison, Wisconsin, USA.

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.



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