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FALL 2018

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INTERNATIONAL WOLF

International Wolf Center

VOLUME 28, NO. 3 THE QUARTERLY PUBLICATION OF THE INTERNATIONAL WOLF CENTER **FALL 2018**

Returning Grazing Land to Nature Helps More than Wolves

Large carnivores and their prey need healthy, spacious habitat in order to thrive, but huge tracts of land have been decimated by the grazing of domestic livestock. About 2,400 grazing authorizations are granted to ranches across 12 western states each year. The author describes the problems that can cause, along with current efforts to return grazing land to a wild state.

By Tracy O'Connell

Wild Canids Among Us: Can We Coexist?

More than three billion people now reside in cities around the world. As we're moving into town, canids are right behind us, and they're subjects of growing scientific interest—so much interest that they have earned their own name: synanthropes. Here's what researchers are learning about this growing group of city-dwelling carnivores.

By Cheryl Lyn Dybas

Pros and Cons: The 2017 Mexican Wolf Recovery Plan

The 2017 Mexican wolf recovery plan, an update of a plan devised in 1982, has evoked strong reactions from biologists and environmentalists. Here, two experts present opposing viewpoints on the validity and effectiveness of the plan—one questioning the science involved, and the other declaring it solidly designed to assure the survival of this wolf subspecies.

By Jim Heffelfinger and Mike Phillips

On the Cover

Mexican Wolf © Bob Jensen

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Departments

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Popular "Wolves at Our Door" Programs, Presented to More Than 51,000 Minnesotans, Will Continue

International Wolf (1089-683X) is published quarterly and copyrighted, 2018, by the International Wolf Center, 7100 Northland Circle N, Suite 205, Minneapolis, MN 55428, USA.
email: internationalwolf@wolf.org.

Publications agreement no. 1536338

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International Wolf welcomes submissions of personal adventures with wolves and wolf photographs. Prior to submission of other types of manuscripts, address queries to Chad Richardson, publications director.

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The International Wolf Center in June concluded a unique, four-year program that taught unbiased lessons about wolves to more than 51,000 people in the state. "Wolves at Our Door" presentations educated and entertained more than 49,000 students and 2,000 state park and library visitors from September 2014 through June 2018.

Funding for the project was provided by the Minnesota Environment and Natural Resources Trust Fund as recommended by the Legislative-Citizen Commission on Minnesota Resources (LCCMR). That funding ceased at the end of June, but based on research results, the International Wolf Center has vowed to continue the program.

Before and After

Follow-up research conducted by educators indicates that the statewide program was a smashing success.

Educators took before-and-after surveys to gauge how much children knew about wolves and what they learned from the presentations, also measuring attitudes toward wolves held by young people before and after their exposure to the program. The results were impressive.

Using Clicker survey technology, students were surveyed pre-and post-program to collect data on knowledge of, and attitudes toward, wolves and wolf issues. The resulting data showed an increase ranging from 8 percent to 34 percent, pre-program to post-program, in knowledge of wolf facts, positive attitudes, and understanding of current issues concerning wolves and humans.

"The clear success of the program prompted our board of directors to find a way to continue offering it to schools across the state," said Rob Schultz, the Center's executive director. "We're thrilled that students will continue to receive this educational programming in their classrooms."

Using engaging video and photos, the PowerPoint-based "Wolves at our Door" covers basic wolf biology, predator-prey dynamics, the role of wolves in healthy ecosystems, myths and opinions about wolves, wolf management and the importance of wildland habitat. Students also learn by handling artifacts such as wolf, deer, and moose bones and pelts.

They Learned About Wolves (2014-2018)

1,981	The total number of classrooms in grades 2-12 that had an hour-long classroom presentation.
49,099	The total number of students who received the programming.
33	State parks in which programs were presented.
32	Public libraries that had Wolves at Our Door programs.
More than **52**	The number of Minnesota counties in which there was at least one program.
More than **124**	The number of school districts in which there was at least one program.

It's dynamic, fun and mega-fauna charismatic. And it's coming in 2019!

In some respects, it was a museum exhibit that led to the creation of the International Wolf Center. In the early 1980s, the Science Museum of Minnesota developed a natural history exhibit featuring the social, biological, mythological and ethical relationships between wolves and humans. The 6,000-square-foot "Wolves and Humans" display won awards, set attendance records and eventually went on tour in 18 cities around the United States and Canada. One of the main biologists from whom the material for that exhibit came was Dr. L. David Mech.

Rob Schultz

At the time, Dr. Mech was studying wolves in the Superior National Forest near Ely, Minnesota. He and his team commonly fielded questions from the public about wolves. The need for the exhibit to have a permanent home along with the stream of public interest about wolves eventually led to the 1993 opening of the International Wolf Center in Ely.

Since the Center opened, the exhibit has helped educate more than a million visitors from around the world. But scientific knowledge about wolves has increased significantly since the exhibit was created, and the story of how this endangered species has been recovering in the U.S. over the past few decades needs to be added.

Last winter, work began on a redesign of the entire exhibit. The new exhibit will be installed in May 2019, in time for our busy summer months in Ely. New features will include a howling room, interactive displays and even augmented reality. It's a huge undertaking at the Center, but we're ready for the challenge.

The new exhibit is funded, in large part, by a $1 million grant from the Legislative-Citizen Commission on Minnesota Resources. The funding was secured when Minnesota Gov. Mark Dayton signed the budget bill on May 30. We deeply appreciate the efforts of Rep. Rob Ecklund, Sen. Tom Bakk and the Ely City Council for their support of the funding.

We look forward to sharing this new exhibit with you in 2019! ■

Sincerely,

Rob Schultz
Executive Director

The Wolves and Humans exhibit, which helped launch the International Wolf Center.

Educational services and informational resources are available at:
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218-365-4695
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Returning Grazing Land to Nature Helps More than Wolves

By TRACY O'CONNELL

Laura Welp

Adobe Stock/ Carter

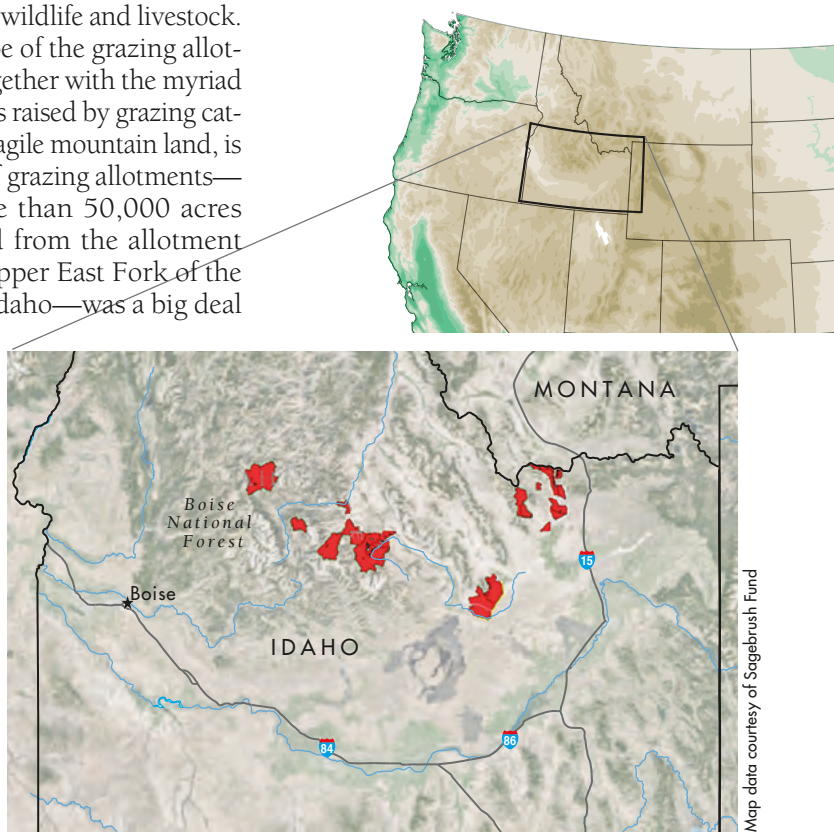
The importance of preserving wildlands to provide healthy, spacious habitat for large carnivores and their prey has long been realized by environmentalists. The International Wolf Center mission, in support of that idea, is to advance the survival of wolf populations by teaching about wolves, their relationship to wildlands and the human role in their future.

One prominent cause of wild ecosystem destruction is the grazing of domestic livestock such as sheep and cattle. Millions of acres of public land, managed by branches of the federal government such as the U.S. Forest Service and the Bureau of Land Management (BLM), are divided into allotments and pastures for management purposes. There, the practice of domestic livestock grazing coexists with the wildlife native to the region.

The Forest Service, part of the U.S. Department of Agriculture, notes on its website that it "supports livestock grazing on National Forest System lands." Such grazing, the site says, "if responsibly done, provides a valuable resource to the livestock owners as well as the American people."

In the U.S. Department of the Interior, the BLM's Rangeland Administration System handles about 18,000 applications and issues 2,400 grazing authorizations (in the form of permits, leases, and other agreements) with ranchers each year across 12 western states, noting online that it manages the public lands for the use of both wildlife and livestock.

The sheer scope of the grazing allotment program, together with the myriad ecological concerns raised by grazing cattle and sheep on fragile mountain land, is why the retiring of grazing allotments—such as the more than 50,000 acres recently removed from the allotment program in the Upper East Fork of the Salmon River in Idaho—was a big deal to supporters of wildland preservation. One such supporter is Lynne Stone, director of the Ketchum, Idaho, based Boulder-White Clouds Council, formed in 1989 to protect, defend and enhance Idaho's wildlands and wildlife, according to its web site. Stone notes that more than 39,000 acres of this retired allotment is in two new wilderness areas, the Jerry Peak and the adjacent Hemingway-Boulders, both created by Congress in 2015 and now protecting nearly 185,000 total acres.



Map data courtesy of Sagebrush Fund

The highlighted area includes recently retired allotments in the headwaters of the East Fork of Idaho's Salmon River, which will provide habitat for steelhead trout, bull trout and Chinook salmon, three top carnivores (wolves, bears and mountain lions), and bighorn sheep, among others.

Key to such an effort is the Western Watershed Project (WWP), whose executive director, wildlife biologist Erik Molvar, explained his group's work. "It's in the philosophical DNA of our organization to take on livestock grazing," he says, adding that while frequently teaming with other conservation groups to achieve a goal, WWP is seen as a leader in the grazing issue—a topic many don't want to touch because the grazing industry is very well connected politically. "We're a hardnosed organization," he says of WWP. "Regardless of the politics, we are free to take on problems and rock the boat."

Molvar says his group, with offices in several western states, is armed with a multi-million dollar fund the WPP has dedicated to buying out allotments from willing sellers. That fund is managed by a "semi-separate" organization with a friendlier image—the Sagebrush Habitat Conservation Fund—that exists to negotiate with ranchers, some of whom might not meet willingly with WWP because of its perceived anti-grazing image. The group has worked to restore more than 250 million acres of public land in the west—places where an array of birds, fish, mammals, amphibians and rare plants flourish.

The monies used by the Sagebrush Habitat Conservation Fund resulted from a unique alliance between WWP and Ruby Pipeline LLC, a subsidiary of El Paso Corporation. Under a legal settlement, WWP agreed not to oppose a 680-mile underground pipeline project intended to bring natural gas

Adobe Stock/ Brett

International Wolf

produced in Wyoming and other Rocky Mountain states to Oregon for distribution to West Coast customers. In exchange, Ruby agreed to pay $15 million over 10 years to be used for voluntary conservation projects.

When the Conservation Fund purchases land to return it to wild habitat and protect it from grazing, "It's a win-win," according to Molvar. The sellers typically want someone to take over the land, often because their children choose to forego ranching, with its marginal income, in favor of other careers, he explained. "We give them a golden saddle to ride off into the sunset."

While the return of grazing allotments to wildland provides much-needed space for large carnivores to live free of conflict with ranchers, it also brings multiple benefits to the rest of the ecosystem. Molvar ticks off examples of environmental degradation caused by grazing, and the improvements that occur as the livestock leave.

"Ranching takes all the natural forage away from the native herbivores," he begins, noting that bighorn sheep, bison and elk can be driven from an area used for livestock grazing by lack of forage. Additional harm comes from the trampling of vulnerable soil biocrusts which contain microscopic communities that capture nitrogen from the air and hold moisture, among other functions. One hoof print can destroy these crusts for 30 to 100 years, he says.

By destroying native grasses through heavy grazing, cattle provide an opening to the invasive cheatgrass (so called because it sends out long roots to cheat other grass of water) to take over. "Livestock are rototilling the land and creating conditions for cheatgrass monoculture," Molvar explains. Also called drooping brome, cheatgrass is an annual plant native to the Eurasian steppes, and because it seeds much more prolifically, it can eliminate competing native perennials such as bunchgrass and sagebrush. Highly flammable when it dries out in the summer, it is blamed for some of the severe fires in western states.

Damage to waterways is another detrimental effect of grazing allotments. Molvar explains that cattle evolved in a boggy, northern European landscape

Destroyed natural spring

Jonathan B Ratner

and spend a lot of time wallowing in streams. In addition to breaking down stream banks and eroding soil, they create a "serious to extreme" risk of *e coli* from their droppings, which pollute wild streams with bacteria to an extent often in violation of the Clean Water Act. Among its other work, WWP seeks to ensure that land management agencies such as the BLM and the Forest Service enforce environmental laws, including the Clean Water, Endangered Species, and National Environmental Policy acts.

Domestic livestock can spread disease to wild populations, as well. In the case of cattle, brucellosis can be transmitted to bison and elk. Cattle ranchers sometimes want bison killed to eradicate the threat of transmission to cattle, Molvar says, when it was actually the cattle that infected the wild herbivores.

Domestic sheep can spread the bacterium, *Mannheimia haemolycta*, which is harmless to them but can wipe out a bighorn population with a serious illness similar to pneumonia. Whole wild herds have been eliminated by this condition to which bighorn sheep develop no immunity.

"This region was an American Serengeti, as described by Lewis and Clark," Molvar comments, adding, "No one alive today has ever seen the massive herds of wildlife that roamed the western range." "People say wolves kill the prey," he continues, but points to Yellowstone National Park as an example of one of the best places to see elk, which is also an excellent place to see wolves. Elk are abundant where domestic livestock are not competing with them, he says, noting that WPP looks to strategically create large tracts that, by being free of livestock, also provide an area for wolves and bears free of conflicts with ranchers.

Melissa Cain & Google Earth

In northern New Mexico's Carson National Forest, a sheep grazing allotment is shown on the left. On the right, an ungrazed section of the same area. Sagebrush loss is apparent even from a Google Earth satellite.

While the areas removed from grazing are large, often the protections achieved are not permanent. "Most allotments are only closed for the life of the 20-year forest plan," Molvar explains, after which they can be reopened. Of the half million acres WPP has restored from grazing, more than 400,000 acres are permanently closed to livestock. Other times the Forest Service changes its policies one way or another so land that was considered protected is re-opened to grazing. On still other occasions, the passage of time and the natural destruction of fences lead to de-facto permanent preservation because it becomes too problematic to restore the required fencing in order to reopen the allotment.

As the Sagebrush Habitat Conservation Fund project helps reduce livestock grazing, create de facto permanent preservation, and allow retiring ranchers to benefit wildlands and wildlife, this does seem like a win-win. ■

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

Gerry Goldner

By CHERYL LYN DYBAS

Wild Canids Among Us

Can We Coexist?

Golden jackal searching for a meal in Croatia.

Miha Krofel / University of Ljubljana

Banff wolf pack hunting elk

Christopher Martin

For the first time in history, a majority of humans live in urban areas—more than three billion people reside in cities around the world. As we're moving into town, canids are right behind us. Or we're behind them, sometimes claiming turf they've already staked out.

In Moscow, feral dogs ride the subways, while halfway around the globe in Madison, Wisconsin, red foxes tunnel under garage floors to dig dens. Red foxes in Fairfax, Virginia go them one better, stealing newspapers from suburban front porches to line their domiciles—or, as one homeowner quipped, "…to read up on prime real estate in the neighborhood."

Urban canids not only provide endless "Can you believe?" tales; they are the subjects growing scientific interest, so much so that researchers have coined a term for these city-dwelling carnivores: synanthropes.

Life in the big city

Synanthropes demonstrate how quickly wild species can adapt to the pressures of living in unnatural habitats, says wildlife biologist David Drake, director of the Urban Canids Project at the University of Wisconsin-Madison. Beyond adapting, synanthropes are evolving; some researchers believe that urban living is accelerating the process. Changes that would usually take centuries are happening in decades or years.

For example, urban red foxes in Israel have higher survival rates and smaller home ranges than their country cousins. Human presence may have shortened the distance canids and other mammals roam by two-thirds, according to an analysis published in the January 26, 2018, issue of the journal *Science*. In areas with a large human "footprint," wild mammals' maximum ranges averaged 4.3 miles. In low-footprint areas, that estimate was 13.7 miles.

Some species fare better than others in cities and suburbs. Medium-sized canids such as coyotes and red foxes, also called mesopredators or mesocarnivores, are often "urban adapters." Much of their success stems from their diets; they're far from picky eaters. They trot along carrying everything from discarded fast-food wrappers to fishery bycatch that washes ashore.

The absence of large predators such as wolves from cities has also given urban adapters free rein. Infrequently, wolves have populated cities, and when their numbers decrease, mesopredators such as red foxes and coyotes often increase. For example, "Europe is currently experiencing a dramatic expansion of a new carnivore across the continent," says ecologist Miha Krofel of the University of Ljubljana in Slovenia.

The golden jackal is a native European species, but its range has been limited to the southern fringes of Europe for millennia. Now it's increasingly colonizing new areas, with reports of its arrival in the Netherlands, Denmark and Estonia. Two new studies have identified the likely reason: wolves. Or more precisely, states Krofel in the journals *Nature Communications* and *Hystrix,* a lack of wolves.

Gray wolves once were—and in many places, still are—persecuted by humans. At one time, wolves existed throughout North America and Eurasia, but were gradually eliminated until only those in remote areas survived, opening the way for European mesopredators like golden jackals.

Wolves once more at the door

That situation may be changing again. Protection of gray wolves is increasing their numbers in parts of Europe and elsewhere. Wolves now frequent refuse dumps in Israel, Italy, Canada and Romania. In Canada, some follow dump trucks carrying trash to landfills, timing their appearance to that of the trucks.

In France, where wolves were eradicated by the 1930s, they're creeping back, with some 360 now in the country. The French government recently announced a plan to allow 500 wolves nationwide

by 2023. Farmers can apply for funding to protect their sheep and other livestock from predators like wolves, but compensation is contingent on measures like installing electric fences.

"Biologically, wolves can and will live almost anywhere people will tolerate them, and that will vary with local culture and politics," writes Dave Mech of the U.S. Geological Survey's Northern Prairie Wildlife Research Center and the University of Minnesota in a 2017 paper in the journal *Biological Conservation*.

The founder of the International Wolf Center in Ely, Minnesota, Mech wasn't expecting wolves to stake out territory almost in the backyard of his University of Minnesota-Twin Cities office. But that's exactly what happened.

In the spring of 2015, gray wolves showed up near Isanti, Minnesota, 45 minutes from downtown Minneapolis. According to Mech, it's the farthest south in the state a pack has been found in recent history. The wolves thrived on the area's abundant deer.

Isanti resident Larry Hogie digs soil from ponds on his property and forms it into mounds of dirt for sale to gardeners and horticulture centers. One day Hogie glanced at the edge of the woods near his home…and a gray wolf looked back. Since then, he's spotted wolves four or five times. "But I don't think many of the wolves are around any longer," Hogie says.

Mech believes there may be one or two left, and he and his University of Minnesota colleagues hope to study them. "We'd like to find out if wolves could exist on a long-term basis so close to the Twin Cities," he says. Adds Hogie, "For that to happen, we need to learn how to live in peace with wolves and other predators."

Research reported in a 2014 paper in *Science* shows that humans and predators can successfully share the landscape. In areas where wolves and other carnivores prey on livestock, say the 76 co-authors of the *Science* paper, attempts to reduce the threat, such as installing electric fences and obtaining livestock-guarding dogs, can facilitate coexistence.

Photos: Ilya Raskin

Fox kits and adult near their den in the middle of a busy golf course in Islip, New York.

Fire Island, where canids (sometimes) coexist with humans

Wolves may be inching closer to cities, but red foxes are already there. Foxes are the most widespread, and possibly most abundant, urban canid in Australia, Europe, Japan and North America, according to Carl Soulsbury of the University of Bristol in the U.K. and co-authors of the book *Urban Carnivores: Ecology, Conflict, and Conservation*.

Sarah Karpanty of Virginia Polytechnic Institute and State University in Blacksburg, Virginia is conducting a multi-year study of red fox population density, spatial ecology and dietary ecology on Fire Island, New York. About 31 miles long, Fire Island runs parallel to the south side of Long Island, northeast of New York City. Karpanty's research territory extends from Robert Moses State Park at one end of the island to Fire Island National Seashore on the other.

The area has one of the highest red fox densities in the world. How the foxes got there, no one is sure, but they probably made their way across the 8-mile-long Robert Moses Causeway that connects the city of Islip, New York, with Fire Island.

On a May morning, with a stiff ocean breeze flapping small-craft warning flags, Karpanty and I, along with Karpanty's students Kat Miles and Claire Helmke, are at the Robert Moses State Park's Field 5—which is, in fact, a parking lot. We cross the asphalt in Karpanty's jeep and pull up near some dumpsters.

Not far from the trash receptacles, at the base of a pitch pine tree rooted in a dune, is an opening in the sand where a fox family has taken up residence. Before long, one, two… seven small, orange-red kits poke out their faces. We're well hidden in nearby shrubs, so the young foxes emerge and start to play, batting each other with small paws.

From there, we head south to Field 2 and the nearby Pitch & Putt Golf Course.

Here, as at Field 5, a fox den is hidden beneath vegetation, this time in a dense thicket of poison ivy and greenbrier. The park's ad states that the course "offers a taste of the ocean, with the high greenery and challenge of a true golf course." It might accurately add: "and with wildlife nearby." So near, in fact, that a stray ball often rolls into a fox's den.

How many red foxes make a living on Fire Island, and how do they do it? Based on a recent survey, Karpanty estimates that between Fire Island Inlet at the island's western end and Old Inlet at its eastern end, there are 39 adults and 57 kits. On the entire island, Karpanty has found between 2.37 adults and 3.51 kits in every one-third of a square mile, in a total available area of 6.25 square miles.

"In other words," she says, "a lot of foxes."

The numbers are similar to those of other fox-rich locales: Edinburgh in the U.K.; Melbourne, Australia; and Chicago in the U.S., according to *Urban Carnivores: Ecology, Conflict and Conservation*.

In suburban Islip's backyard, foxes are living high, although not always on the healthiest diets. "We've found take-out food wrappers and chip bags at dens," Karpanty says. The foxes have also left feathers and fish scales at den "doors." Local fishers often discard skates as trash fish. The dead skates then wash up on beaches, where foxes make off with the fish parts.

"These foxes are also into begging behavior like what you might see in your dog," says Karpanty. Red foxes haunt the main road running up and down Fire Island, stopping to look at cars passing by to see if people will offer handouts. As we watch, a car stops in the road. The occupants roll down the windows and toss a scrap to a waiting fox, which runs for it. "Obviously this isn't a good thing," Karpanty comments.

Accepting handouts can have disastrous results. In January, 2017, a fox that chased cars for food in Robert Moses State Park was fatally shot with a crossbow. The dead fox was a mature female and part of Karpanty's study. "We're asking visitors to the island not to feed the foxes, or any wildlife," says Karpanty. "If people like the foxes, the best thing they can do is place their leftovers in the nearest trash can—not on the road."

Some species fare better than others in cities and suburbs. Medium-sized canids such as coyotes and red foxes, also called mesopredators or mesocarnivores, are often "urban adapters." Much of their success stems from their diets; they're far from picky eaters.

Foxes on the campus of the University of Wisconsin-Madison.

Photos: Arfi Wulandari

Symbiotic urban canids?

If "waste management" is a challenge on Fire Island and across the U.S., it's no less so in Europe. But Dusko Cirovic of the University of Belgrade and his colleagues discovered a solution almost in front of their eyes. As they reported in a 2016 paper in *Biological Conservation*, golden jackals are serving as unpaid trash collectors.

The researchers estimate that in Serbia alone, golden jackals annually remove more than 3,700 tons of animal waste and 13.2 million rodents that are crop pests. The biologists found that the monetary value of the jackals' waste removal is greater than a half-million euros per year.

The results, says Cirovic, "are the first to demonstrate the value of ecosystem services provided by mesocarnivores as scavengers, and to show that these predators are of great value to human communities."

Can we coexist with wild canids? Often, unbeknownst to us, we already are. ■

Award-winning science journalist and ecologist Cheryl Lyn Dybas, a Fellow of the International League of Conservation Writers, writes on conservation biology for International Wolf *as well as* National Geographic, Ocean Geographic, National Wildlife, BBC Wildlife *and many other publications.*

Jacquelyn Fallon

Pros and Cons:

Recovering Mexican Wolves on a Solid Scientific Foundation

By JIM HEFFELFINGER

The wild Mexican wolf population in the United States has been growing, on average, 14 percent annually since 2009. This strong growth proves the inaccuracy of population models from the 2010-2013 recovery team on which I served (with individuals from Michigan Tech University, Turner Endangered Species Fund, the National Park Service and others) and suggests caution in basing conclusions on those models. The 2017 survey detected all-time, record minimum numbers of wolves (114), packs (22), potential breeding pairs (26) and adult Mexican wolves (88) in the wild. Widespread claims of agency mismanagement and genetic crisis—claims made by scientists, media, wildlife associations and members of the public—are being muted by the successful progress of recovery.

The 2010-2013 attempt to revise the recovery plan was based on what is now decade-old information and has been eclipsed by more current data. The 2017 Mexican Wolf Recovery Plan is based on analyses led by an independent, internationally known endangered species population-viability expert with a group that included some former recovery team members. This latest effort used a more advanced, customized viability model with access to an updated pedigree. For more than two years, scientists updated all available data to determine what is needed for recovery.

The team used wild Mexican wolf data to update: effects of inbreeding, mortality rates, catastrophe probability, percent of females breeding, pup production and historical range. Previous models were based on wolf mortality rates from the northern Rockies, but the current plan uses mortality rates from wild Mexican wolves in the recovery areas. Previous analyses lacked the 15-plus years of data on percent of females breeding in the wild, considered in the current plan. The last recovery team estimated the effects of inbreeding with data from only 39 litters, but the current plan is based on 89 wild Mexican wolf litters from 1998-2014 (50 more litters and eight more years of data). Importantly, overall inbreeding levels of wild-born pups are not increasing—data which conflicts with claims of a mounting genetic crisis.

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The 2017 Mexican Wolf Recovery Plan

AdobeStock / RbbrDckyBK

2017 Mexican Wolf Recovery Plan: Really Good on Anti-Wolf Politics, Really Bad on Pro-Wolf Science

BY MIKE PHILLIPS

The 2017 Mexican wolf *(Canis lupus baileyi)* recovery plan is a long overdue update of the original 1982 plan. It calls for the U.S. Fish and Wildlife Service (FWS) to establish two genetically diverse populations in the subspecies' core historical range. The southwestern United States is targeted for a population of ≥320 wolves and northern Mexico for a population of ≥200. FWS predicts that 25 to 35 years and $260 million will be required to establish those populations.

Selection of habitat for the population in Mexico is not based on the best—or even good—science, but rather on political pressure. This was made clear in the following reaction by Utah to an early draft of the plan, which indicated that, because suitable habitat in Mexico was lacking, the recovery region needed to be extended north to areas outside the subspecies' historical range: *Identification of areas outside the historic range of the sub-species as part of the recovery area…will be vigorously opposed (legally and politically) by the Utah Division of Wildlife Resources and the State of Utah.*

Notably, Utah did not indicate that opposition would be based on scientific grounds. Arizona, New Mexico and Colorado adopted similar positions.

The dogged press of political considerations by Arizona, New Mexico, Utah and Colorado ensured that the FWS would finalize the 2017 plan with undue reliance on

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Heffelfinger

continued from page 12

The newest plan also takes into account the gradual phase-out of feeding wolves to divert them from livestock and includes realistic estimates of connectivity between populations. Genetic diversity retention is addressed with objective, measurable and achievable criteria—not ambiguous references to measurements of genetic diversity that will only lead to endless litigation about delisting. To date, human intolerance has been limiting Mexican wolf recovery, not inbreeding depression.

Members of the last Mexican wolf recovery team asserted that recovery will require three populations of 250 Mexican wolves, but this was based on theoretical genetic principles, and on the outdated, obsolete model from 2010-2013. Despite these shortcomings, it is often misrepresented as a threshold for successful recovery. The plan's foundation is an accurate depiction of historical range based on detailed skull and body measurements, historical records, genetic differences and measures of ecological differentiation.

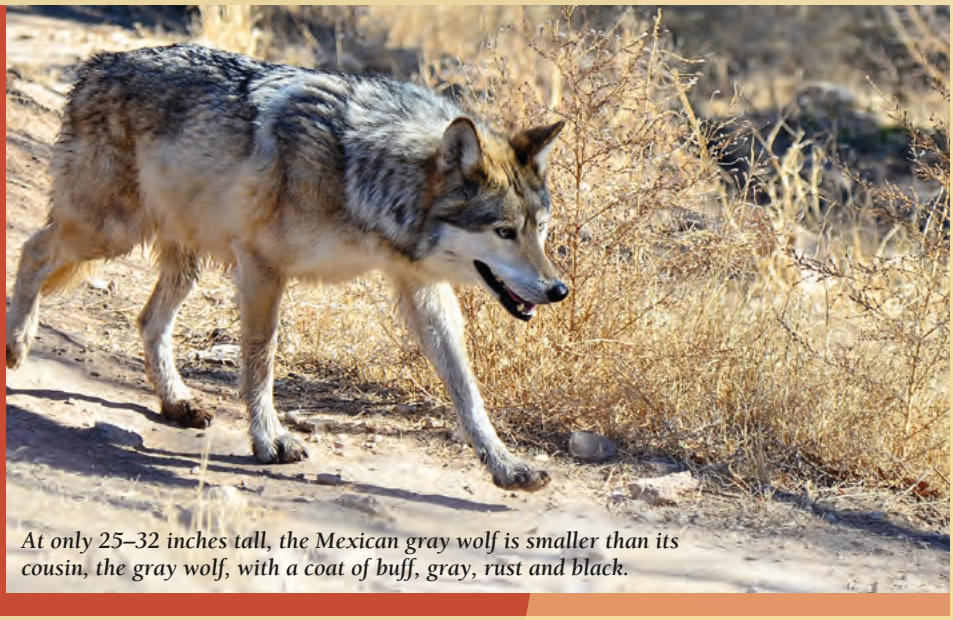
Federal regulations require that Mexican wolves be recovered in their historical range unless it is "*unsuitably and irreversibly altered or destroyed*." Earlier teams chose to ignore tens of thousands of square miles of suitable habitat in Mexico, inappropriately insisting recovery occur mostly outside Mexico. Some advocates with little knowledge of Mexico contradict the best available science and first-hand knowledge of Mexican experts. A state-of-the-art analysis by a binational team identified 28,635 square miles of high quality wolf habitat in Mexico; clearly Mexico will play a vital role in recovery. The same two large recovery areas of suitable habitat in Mexico were independently identified in a jaguar recovery plan. Discounting that information would contradict the Endangered Species Act requirement to use best available data in recovery planning.

This updated habitat analysis includes two measures of human-caused mortality (road density and towns). Adding information on livestock distribution and protected areas would stack four redundant layers representing the same issue. Large tracts of private land with restricted access in Mexico have the same function as official land designations in the U.S. No other carnivore recovery plan has a better representation of relative distribution of prey on the landscape; past efforts simply used a satellite image of green vegetation as a substitute. Criticism that the analysis lacks a measure of livestock density is a red herring, as no accurate records exist on either side of the border.

Wolves have adapted to environments from the Arctic to Arabia, and climate change is not going to alter, destroy or make unsuitable the historical range of the Mexican wolf in a relevant timeframe. Quality wolf habitat exists north of the Arctic Circle, but we must decide how to restore the historical, ecological role of Mexican wolves. Scientists have recently warned of the perils of pushing recovery north of historical range because of genetic swamping by large wolves of Canadian origin that disperse from the Rocky Mountains. (A Yellowstone wolf already visited Arizona).

We have binational recovery plans for ocelot, jaguar, Sonoran pronghorn, thick-billed parrot, condor, masked bobwhite, Kemps-Ridley sea turtle and more; why shouldn't the Mexican wolf also benefit from expansion across borders? This recovery plan, based on updated analyses far more complex and realistic than all previous versions, provides for successful Mexican wolf recovery in its historical range.

Efforts are now appropriately focused on returning this small wolf subspecies to its ecological role in the American Southwest and Mexico. ■



Larry Lamsa

At only 25–32 inches tall, the Mexican gray wolf is smaller than its cousin, the gray wolf, with a coat of buff, gray, rust and black.

Supporting Literature
(with links to full manuscripts)

Harding, L. E., J. Heffelfinger, D. Paetkau, E. Rubin, J. Dolphin, A. Aoude. 2016. Genetic management and setting recovery goals for Mexican wolves (*Canis lupus baileyi*) in the wild. Biological Conservation 203:151-159. https://www.sciencedirect.com/science/article/pii/S0006320716304256

Heffelfinger, J. R., R.M. Nowak, and D. Paetkau. 2017. Clarifying historical range to aid recovery of the Mexican wolf. Journal of Wildlife Management 81:766-777. https://onlinelibrary.wiley.com/doi/full/10.1002/jwmg.21252

Odell, E.A. Heffelfinger, J.R. Rosenstock, S.S., Bishop C.J., Liley, S., González-Bernal, A., Velasco, J.A., Martínez-Meyer, E. 2018. Perils of recovering the Mexican wolf outside of its historical range. Biological Conservation 220:290-298. https://doi.org/10.1016/j.biocon.2018.01.020

Jim Heffelfinger is the Wildlife Science Coordinator for the Arizona Game and Fish Department.

Phillips

continued from page 13

a woefully inadequate habitat-suitability model.

The model relies on correlation between climatic and vegetative factors, and locations where Mexican wolves were collected historically to identify suitable habitat for recovery. FWS and the states justify this reliance by opining that Mexican wolves evolved to be precisely adapted to the narrow range of habitat present within the subspecies' core historical range in Mexico. That opinion, however, is undermined by 1) good science which indicates that wolves are broadly adaptable to climatic and vegetative conditions, and 2) the FWS's longstanding effort to restore the subspecies to Arizona and New Mexico where such conditions differ from those in Mexico.

More important, the model is woefully inadequate because of its disregard for aspects of wolf habitat that good science deems essential to recovery: limited density of livestock, adequate density of wild prey, and large tracts of public land where human-caused mortality is typically low.

Based on the flawed habitat model, the 2017 plan targets 38 percent of recovery on an area in Mexico dominated by small tracts of private property with abundant livestock and unknown numbers of native prey, and where wildlife protection laws are irregularly enforced and access and safety for field personnel are concerns. The FWS would never target such an area in the U.S. for wolf recovery.

Reliance on the model is already proving problematic. Free-ranging Mexican wolves in Mexico are routinely fed artificially to promote survival by minimizing conflicts with livestock. Such "diversionary feeding" is required because of abundant livestock and relatively scarce wild prey, suggesting that the area is not suitable despite being identified as such by the habitat model. The shortcomings of the model will become even more apparent as biologists strive to expand recovery in Mexico, completing a record number of initial releases and monitoring and managing wolves across millions of acres of private land necessary to support ≥200 animals.


Jacquelyn Fallon

Although the U.S. public supports wolf recovery, anti-wolf groups hold immense political influence in Colorado, Arizona, New Mexico, and Utah. These groups were well served by the scientific gloss the habitat model gives to the recovery plan, and by the disastrous decision to exclude from it the high-quality habitat of the Grand Canyon and Southern Rockies ecoregions of northern Arizona/southern Utah and northern New Mexico/southern Colorado, respectively.

If politics demanded that FWS initially focus on marginal habitat in Mexico by adopting a habitat suitability model that discounts the importance of livestock and land ownership, then the agency should at least have defined a recovery region that also included these two ecoregions. Such an approach would have facilitated progress once the inevitable shortcomings of habitat in Mexico became undeniable to even the most ardent opponents to recovery. Failure to advance such a common-sense approach to recovery represents a failure of science-informed planning and leadership by FWS simply for the sake of political expediency.

Much of the 2017 Mexican wolf recovery plan is based on the state's desire to assign to Mexico as much of the burden of Mexican wolf recovery as possible—not the best available science. It is worse than a poor replacement for the 1982 plan. Deeply discounting the cardinal role of wolf-livestock interactions and importance of land ownership ensures that FWS will waste precious time and millions of dollars, all the while failing to recover *Canis lupus baileyi*. ■

Mike Phillips has served as the executive director of the Turner Endangered Species Fund and senior advisor to the Turner Biodiversity Divisions since he co-founded both with Ted Turner in 1997. Before that Mike worked for the U.S. Fish and Wildlife Service and National Park Service leading efforts to restore red wolves to the southeastern U.S. and gray wolves to the Yellowstone Park. Mike has served in the Montana legislature since 2006, and will hold his Senate seat through 2020.

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MIKE PHILLIPS

THE LAST GREAT WOLF RESTORATION – COLORADO

A presentation on the concept of reintroducing wolves to Colorado, focusing on attributes and challenges.

Attributes may include:
- Prey base
- Amount of public land available
- Varying eco-regions (high deserts, mountains, etc.)

Challenges include factors such as:
- Livestock grazing interests/public grazing allotments
- Conflicting positions among special-interest groups, politicians and USFWS
- Legislatively sanctioned, nationwide delisting of wolves as endangered

PLENARY SESSIONS

PANELS

Wolves of the World

Speakers from regions around the world, including Asia, Europe, Canada, the Canadian Arctic and the United States and Mexico, will cover topics that include progress of recovery in each region, politics in place to ensure a viable population, issues and problems that may need to be addressed.

Ellesmere

A series of speakers will discuss the wolves inhabiting Ellesmere Island and the Canadian Arctic Archipelago, focusing on observations at dens and other aspects of pack life, and including a historical summary of Dr. L. David Mech's two-decade study.

Michipicoten Island

An overview of geography, species history, human disturbances and recent studies of caribou, wolves and beaver.

Isle Royale

A panel of four will present a summary of ups and downs, and changing conditions affecting wolves and trophic systems over 56-plus years of research on Isle Royale. They will also address the ways in which reintroduction of wolves would benefit a future Isle Royale ecosystem, given the uncertainties of future contributions by ice bridges, weather patterns, random population events, herbivory and other factors that influence this island system.

Wolf Depredation Control on Livestock

A panel of experts representing various viewpoints will discuss wolf depredation conflict management. Agencies, field agents, a wolf advocate and a livestock producer will discuss key problems and the latest news, and find areas of agreement and disagreement.

Red Wolves, Eastern Wolves and other Canis Mixes in Eastern North America: Taxonomic validity and challenges to recovery

A panel of five will discuss topics related to eastern canids, including implications for the U.S. Fish and Wildlife Service if science reorganizes North American canid species and declares the red wolf synonymous with eastern wolves, or declares it a variant of gray wolves.

SPECIAL PRESENTATION

20-Plus Years of Wolves in Yellowstone

Doug Smith, project leader for the Wolf Restoration Project in Yellowstone and Emmy Award winning cinematographer Bob Landis will present the history of wolves in Yellowstone since their reintroduction in 1995.

DEBATE

Mexican Wolf Recovery Plan

A debate between Mike Phillips, who will discuss and challenge the current Mexican Wolf Recovery Plan and Jim deVos, who will defend it.

SAMPLING OF PRESENTATIONS

Gray wolves in Mongolia: changing attitudes and current research

PRESENTER **Uuganbayar Ganbold,**
biologist and anti-poaching protection manager, Hustai Nuruu National Park, Mongolia

Gray wolves in Estonia: an overview of population genetics and hybridization with domestic dogs

PRESENTER **Liivi Plumer,**
Department of Zoology, Institute of Ecology and Earth Sciences, University of Tartu, Harjumaa, Estonia

Quantifying the diet of the Alexander Archipelago wolf in southeast Alaska using molecular methods

PRESENTER **Aimee Massey,**
Oregon State University, Corvallis, Oregon; Alaska Department of Fish and Game

Through the eyes of a wolf: quantifying and classifying the complexities of facial signaling in wolves

PRESENTER **Elana Hobkirk,**
Durham University, Durham, United Kingdom

Risk effects of wolves on free-ranging livestock: Can prey-gut microbiome predict stress response in predator–prey interactions?

PRESENTER **Azzurra Valerio,**
Washington State University, Olympia, Washington

Adaptive use of nonlethal strategies for minimizing wolf–livestock conflict

PRESENTER **Suzanne Stone,**
Northwest Senior Field Representative, Defenders of Wildlife, Boise, Idaho

Challenges in wolf management in Croatia

PRESENTER **Djuro Huber,**
Faculty of Veterinary Medicine, University of Zagreb, Zagreb, Croatia

The future of wolf poisoning programs in Canada

PRESENTER **Hannah Barron,**
Wolf Awareness, Inc., Golder, British Columbia, Canada

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Functional response of wolves to human development across boreal Canada

PRESENTER **Marco Musiani,**
Department of Biological Sciences, Faculty of Science and Faculty of Veterinary Medicine, University of Calgary, Calgary, Alberta, Canada

Wolf tracks at the doorstep: A 1-year cycle of wolf behavior close to houses in Scandinavia

PRESENTER **Barbara Zimmermann,**
Scandinavian Wolf Research Project, Inland Norway University of Applied Sciences, Koppang, Norway

An 18-year spatial and temporal analysis of colonizing gray wolves *(Canis lupus)* in disjunct population

PRESENTER **Theresa Simpson,**
University of Wisconsin-La Crosse, La Crosse, Wisconsin

Shooting wolves: photographs and the reconfiguration of the wolf in nonfiction for children

PRESENTER **Debra Mitts-Smith,**
School of Information Sciences faculty member at the University of Illinois

Wolves at Our Door: results of 4-year Minnesota education program initiative

PRESENTER **Misi Stine,**
Project Coordinator, Wolves at our Door, International Wolf Center, Minneapolis, Minnesota

Are livestock-guarding dogs a viable tool for preventing damages in open-range livestock? A case study from Portugal

PRESENTER **Francisco Petrucci-Fonseco,**
Groupo Lobo, Lisbon, Portugal

Patterns of niche partitioning and overlap between sympatric wolves and snow leopards in the mountains of central Asia

PRESENTER **Shannon Kachel,**
University of Washington, Seattle, Washington

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Dietary niche overlap between wolves, coyotes, and hybrids in a 3-species hybrid zone

PRESENTER **John Benson,**
University of Nebraska-Lincoln, Lincoln, Nebraska

Ecology of the Indian gray wolf *(Canis lupus pallipes)* in the Suleman Range, South Waziristan, Pakistan

PRESENTER **Abdul Hamid,**
Department of Wildlife Management, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, Pakistan

Competition on two legs and four: Impacts of wolf-cougar co-occurrence on resource selection and survival across an anthropogenic gradient

PRESENTER **Lauren Satterfield,**
University of Washington, Seattle, Washington

Individuality in habitat use of Scandinavian wolves in relation to anthropogenic infrastructure

PRESENTER **David Carricondo-Sanches,**
Inland Norway University of Applied Sciences, Koppang,Norway

Winter predation patterns of wolves in northwestern Wyoming

PRESENTER **Susannah Woodruff,**
Regional research coordinator, Alaska Department of Fish and Game

Humans and their role in shaping the ecological functions of wolves

PRESENTER **Thomas Newsome,**
University of Sydney, Sydney, Australia

Challenging the wildlife decision-making infrastructure

PRESENTER **Walter Medwid,**
Vermont Wildlife Coalition, Newport, Vermont

Scent-marking and biometeorology: An analysis of behavior across canid species Gray Wolf *(Canis lupus)*, Red Wolf *(Canis rufus)*, and Coyote *(Canis latrans)*

PRESENTER **Hannah Jones,**
Hardin-Simmons University, Abilene, Texas

Do novel scavenging opportunities or risk of interspecific killing by wolves influence occupancy and activity patterns of smaller carnivores?

PRESENTER **David Keiter,**
University of Nebraska, School of Natural Resources

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Don Gossett

Aidan (right) and Denali shared a strong bond as yearling littermates.

Kelly Godfrey

Axel (rear) and Grayson showed a close connection as yearlings, sleeping together often.

Don Gossett

Boltz (left) didn't have a similar social bonding experience with his pup mate, Luna. As Luna's medical condition became more apparent, we developed a better understanding of her preemptive dominance that kept pack members at bay.

The Power of Social Bonding—as Littermates, and Beyond

By Lori Schmidt

The winter of 2017-18 included some tense moments as the 2016 International Wolf Center litter matured and began testing for status over our pack leader, Aidan. Testing behavior was not a constant pattern, but more a combination of behavioral occurrences that built over time, significantly influenced by seasonal hormones and cooler ambient temperatures.

Wolves can go from testing dominance to "nose-to-nose" greetings within a short time, depending on their social alliances. Confidence is bolstered by supporting pack members, and we typically see the strongest social bonds between littermates—except in the current Exhibit Pack.

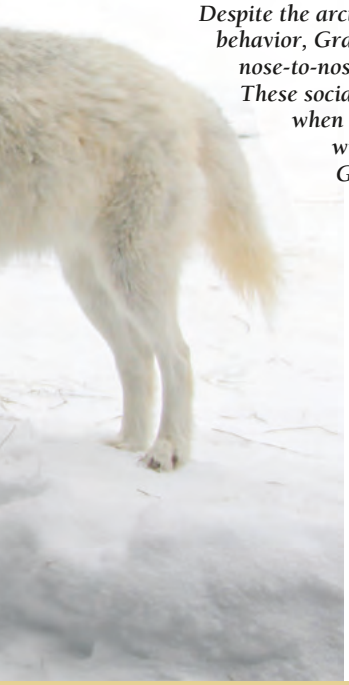
As predicted, littermates Aidan and Denali had a strong bond and very little conflict, but the wolf that seemed to have the strongest alliance with Aidan was Grayson. If you recall the 2016 introduction, Grayson gravitated toward Aidan, and that bond between a vulnerable pup and a pack leader has continued into Grayson's adulthood; this may be why Aidan remains an Exhibit Pack member, although his confidence to lead the pack is clearly diminished.

Interpreting wolf behavior requires us to look at interactions based on wolf social rules, which can be challenging for humans, as we tend to react, and empathize, emotionally. The wolf is a species that communicates by body language, which includes the energy that emanates during pack interactions. As Aidan ages and shows less leadership, the lower-ranking wolves posture with high tails

and take opportunities to become leaders, even temporarily. Aidan's change in confidence started in September 2017, and our wolf care team has been prepared to retire Aidan since testing began—but retirement needs to be what *Aidan* wants. That's a challenge for staff to determine, but one our team takes very seriously.

How is that determination made? It requires daily assessments of pack interactions, social alliances and, most importantly, resting behaviors—records of which wolf chooses to approach and rest with other pack members, especially non-littermates. During the winter season, Grayson was many times observed approaching Aidan, resting with him on the hay beds, or entering den sites where Aidan was seeking refuge from other pack members. The essential question is: What's right for Aidan? Right now, it seems the pack is going about the business of posturing for a new leader while allowing Aidan to maintain a presence.

For more on the ongoing assessment of pack dynamics, go to the Center's YouTube channel at www.wolf.org. ■



Despite the arctic yearlings' testing behavior, Grayson still displays a nose-to-nose greeting to Aidan. These social bonds, established when Grayson was a pup, will likely extend into Grayson's adulthood.

Jessica Katzenberger

K-9 Queens

By Madison McHugh

Photo courtesy of Joan Silaco

If you strike up a conversation with this friendly woman from New York City, one of the first qualities you'll notice is her strong Brooklyn accent. Joan Silaco is a collector of anything and everything with a wolf on it. The loyal New York Mets fan currently lives in Queens with her sister and a 13-year-old German shepherd named Wolfie, and she'll admit that every inch of her own room is covered with wolves.

Mary Ortiz, former director of the International Wolf Center, introduced Joan to the Center. They met on a bus while Joan was volunteering for another animal organization, and since that day in the early 1990s, Joan has been all-in for wolves.

Joan's love for animals has taken her all over the world. She has been to India, Africa, Puerto Rico and the Galapagos Islands in search of the unique animals that live there. One of her most memorable experiences took place when Joan watched wolves from the sky as she flew over the Superior National Forest in winter. The wolves, she said, were easy to spot on the snow-covered ground.

These days, she does not travel quite as far, but she is still committed to doing what she loves. In October 2017, she met some International Wolf Center staff members at the Wolf and Carnivore Conference in Thompson, Manitoba. She also booked her rooms far in advance for the 2018 International Wolf Symposium. (Another of her passions, Sherlock Holmes, occasionally brings her to Minnesota for a gathering with other Arthur Conan Doyle fans.)

Joan has supported several animal welfare organizations, but personal connections have bolstered her enthusiasm for the International Wolf Center. Her first exposure to the Wolf Center and its staff was at the International Wolf Symposium in 2005. She loves meeting other wolf fans and connecting with experts at this event; her only complaint is that it doesn't happen more frequently.

Joan demonstrates her love for wolves with her International Wolf Center "Wolf Tracker" membership, anxiously awaiting the arrival of her next set of Ambassador Wolf Coins and her International Wolf Center pen. She stays in touch with staff members throughout the year to check on progress, chat about relevant news and get details on what is happening at the Center.

Joan strongly believes that science is the best way to support the recovery of wolves. When she looks at her favorite picture of our Ambassador Wolf, Luna, she is struck by the golden eyes that stare back at her and the complex social structure and behaviors of the species Luna represents.

Joan Silaco has a huge heart for animals of all kinds, so she is grateful that the Ambassador Pack can help so many people, young and old, to better understand these fascinating animals. ■

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Thank You!

Wolf Folklore

By Connor Hager

Folklore, Folk Tales, Legends and Myths

Folklore is the word for the traditions, customs and beliefs found within a culture. Folklore is passed on by telling stories, sharing superstitions, creating music and art, and teaching by word-of-mouth. A folk tale, or story, may contain important lessons, tell a joke or reveal the moral values of the culture it came from. Cultures may also have mythology—a whole collection of stories passed on through generations, as if they were true, that are used to explain mysteries like the origin of the world, or the behavior of humans and animals. In myths and folklore, wolves have been used as characters to discuss social issues—human issues—when in fact, real wolves are focused only on their own survival.

"Romulus and Remus" is a Roman myth in which two baby brothers are raised by a mother wolf until they are adopted by a peasant family, and Romulus grows up to become the founder of Rome. In that myth, the mother wolf is described as kind and nurturing, though many modern myths and folk tales depict wolves in negative ways. Giving human characteristics (such a "kind" and "nurturing") to non-human creatures is called anthropomorphism. Cartoon animals are a good example of anthropomorphism; they look like animals, but they act like people.

Over time, most people and cultures have changed their attitudes toward wolves because of human activities like agriculture (farming), wildlife management and environmental studies. Changing attitudes can alter the way wolves are depicted by humans—and that can affect human tolerance for wolves, depending on whether the depictions are positive or negative.

Aesop's Fables: The Wolf and the Crane

One ancient example of a myth, or fable, comes from a Greek slave named Aesop. Many of his fables used human-like animals to explain human morals and life lessons. One of his fables, *The Wolf and the Crane*, goes like this: A wolf got a bone stuck in his throat, so he went to a crane and begged her to put her long bill down his throat and pull it out. "I'll make it worth your while," he added. The crane did as she was asked and got the bone out quite easily.

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The wolf thanked her warmly and was turning away when she cried, "What about that fee of mine?"

"Well, what about it?" snapped the wolf, baring his teeth as he spoke. "You can go about boasting that you once put your head into a wolf's mouth and didn't get it bitten off. What more do you want?"

European Fairy Tales and the Brothers Grimm

Popular European folk tales were written down during the 19th century. In 1812, a number of them were published by two brothers with the last name of Grimm, under a title still familiar to many young readers: *Grimm's Fairy Tales*.

The brothers Grimm were lawyers who became interested in folklore as a way to study the German culture and system of laws. They collected these stories from people they knew, friends of

Adobe Sotck/ carlacastagno

friends, and peasants and farmers, revising them to be appropriate for an upper-class audience. In many of the stories, the wolf character symbolizes a villain or an enemy, rather than representing a real wolf. One famous fairy tale from the brothers Grimm is *Little Red Cap*, now more commonly called *Little Red Riding Hood*. The story's villain is the Big Bad Wolf, an evil character that shows up in storytelling even today.

Most of these fairy tales were created during a time when people were afraid that wolves would eat them or their livestock. They remembered old, false ideas about wolves' magical powers and human characteristics—storytellers made the wolf characters clever, devious and dangerous. These stories continue to provide material for books, movies and television—and even today, many people use "wolf-like" to mean hungry, deceitful, vicious and dangerous. ■

Start Your Own Story

Every myth, every story, starts with an author's idea. Try your hand at telling your own story by continuing the sentence below.

Once upon a time, there was a wolf that lived in a mysterious forest. The wolf was walking through the trees, searching for…

Word Jumble

Unscramble the letters to form the correct words. Use the highlighted words above to help you out!

1 WVLEOS

— — — — — —

2 GMRIM

— — — — —

3 FLRKOOLE

— — — — — — — —

4 FLOK TLEAS

— — — — — — — — —

5 IGB ADB WLOF

— — — — — — — — — —

6 MTOYLGOHY

— — — — — — — — —

7 ACUGRITRULE

— — — — — — — — — — —

Answers: 1- WOLVES 2- GRIMM 3- FOLKLORE 4- FOLK TALES 5- BIG BAD WOLF 6- MYTHOLOGY 7- AGRICULTURE

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Wolves, Bison Enact Ancient Ritual in Remote Canadian Wilderness

By Lu Carbyn

Ed. Note: In the last issue (Summer 2018) of International Wolf, *Canadian environmental scientist Lu Carbyn described his observations of an aging wolf he dubbed "Ole Gimpy." Here, he recalls an autumn hunt he observed years ago in Alberta's Wood Buffalo National Park, where young, powerful wolves—including, possibly, a much younger Ole Gimpy—took on a bison herd. These remembrances and many more are from his submissions to a collection of stories called* Wild Wolves We Have Known, *which can be purchased at shop.wolf.org.*

The trail led to my favorite lookout. As the sun's rays began to penetrate the mist I could make out a herd of bison—thirty of them, mostly lying down. In the distance, I saw a faint, long line of black—a larger herd of bison joining the ones lying down. It was coming my way, possibly two hundred head. Then I noticed a shorter, white line moving briskly toward the herd—wolves!

The bison began to run, and the wolves picked up their pace; as they closed in, the black line split in two. Calves, the prime targets for wolves in summer, usually move to the center when wolves are in pursuit. The wolves had succeeded in exposing the calves. I saw the black and white streaks intermingling. Meanwhile, the herd in front of me appeared oblivious to the drama unfolding in the background. A few minutes later they, too, became embroiled in the melee.

With wolves pressing hard, the large herd stampeded directly toward me. First came the lead cow, thundering at full speed, with the rest following. Then, dashing in and out came the wolves. Except for the muffled rumble of hooves, predator and prey were so eerily silent that it all seemed surrealistically mechanical. I saw wolves attempting to tear at the hindquarters of bison, bison wheeling about to face the wolves and then running again in panic. I could feel my heart pounding in my throat. The closer the action, the more engrossed I became. It was primeval, cruel, and very real. There was no escape, no cover if I were to be surrounded. Nothing to do but wait and see!

Lu Carbyn

The wolves isolated a large calf. Within minutes they were slashing and tearing at its hind end. In their frenzy they also attacked its front and middle. Most of the adult bison moved on, but three cows made a vain rescue attempt. Soon they left the calf, as well. It seemed the victim's fate was sealed. The wolves and calf formed a single, moving mass. As the calf's stomach was ripped open, warm air from the body cavity mingled with the cold air around it, forming a halo of condensation around the wolves and the calf. That image was burned into my mind. A large wolf braced its hind legs firmly on the ground and clawed itself up onto the calf, gripping the calf's back with its teeth. Suddenly the action stopped. Inexplicably, the wolves slunk off, abandoning the injured calf, which now lay hunched. What prompted the wolves to relinquish their meal, now so imminent?

Faintly at first came the answer—motorboats. Every fall and spring, native hunters from Fort Chipewyan travel rivers and creeks, shooting ducks and geese. The wolves dispersed over the meadow, some lying down, others moving about restlessly, but unwilling to finish off the wounded calf. One wolf was licking blood from its front paw, the white fur around its muzzle smeared red.

I could count the wolves: seventeen, all light colored. After some time, four returned to the injured calf which had remained, exhausted, abandoned by the herd. The foursome grabbed at the victim, which once more stood in an attempt to defend itself. As they toyed with their quarry, the bison herd returned.

The four attackers seemed to lose interest in the dying calf. The drone of the still-approaching motorboat became too threatening. A single cow deliberately and rapidly advanced, then sniffed the calf. Then the most heartrending sight unfolded. The calf began to follow the cow. It could only move very slowly, head bent to the ground. A few remaining wolves watched from a distance. The cow and calf moved off into the aspen forest.

I sat in a daze. How tough and stoic the calf was. I tried to master my feelings of pity. I would have been happy to help end its misery, but in a national park nature must be allowed to run its course unimpeded.

On that long-ago October morning I so vividly recall, the bison calf had suffered the vicissitudes of nature. But years later, as I reflect on that hunt while warming myself with tea in the early-morning February cold, I realize it is now, perhaps, Ol' Gimpy's turn to suffer. This once-healthy, dominant male wolf I am observing—possibly a participant in that years-ago bison hunt—has been reduced by time and nature to a scavenger trying to survive one more harsh, northern winter, which will likely be his last. As I watch him maneuver through the deep snow and disappear from view in the distance, I hear a wolf pack howling. ■

Lu Carbyn is an adjunct professor in the Department of Renewable Resources, University of Alberta and retired research scientist with the Department of the Environment, Ottawa, Canada. He has worked on wolf studies for 42 years, including studies in in Poland and Portugal. He is a member of the International Union for the Conservation of Nature (IUCN) Canid Specialist Group.

Majority of Eurasian Wolves Carry Dog Genes; Urban Wolf Safaris Let Humans Get "Wolfy"

By Tracy O'Connell

Mating between domesticated dogs and wild wolves in Europe and Asia over hundreds of years has left a genetic mark on the Eurasian wolf gene pool, new research has shown. The international study reported by Eurekalert.org, an online source for global science news, indicates that around 60 percent of Eurasian gray wolf genomes carry small blocks of DNA from domestic dogs, suggesting that wolves cross-bred with dogs in generations past.

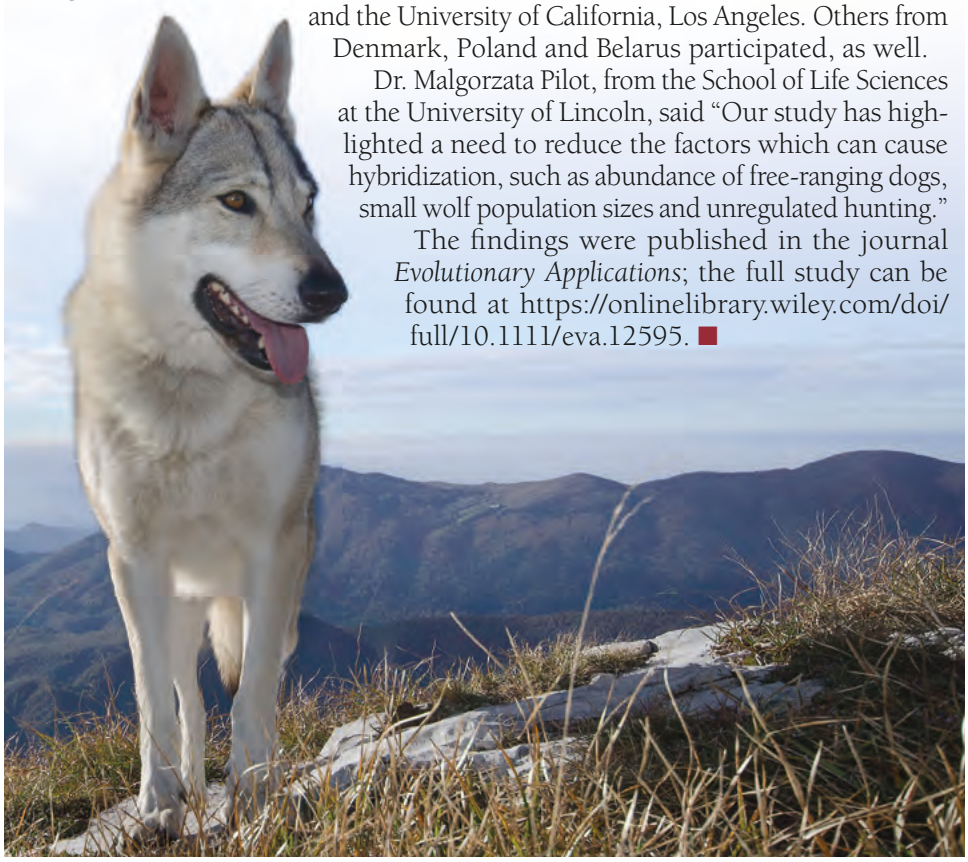
The results indicate that wolf-dog hybridization has been occurring for centuries across a large part of Europe and Asia. The phenomenon is seen less frequently in North American wild wolf populations.

Despite the evidence of hybridization, wolf populations have remained genetically distinct from dogs, suggesting that such cross-breeding at low levels does not diminish distinctiveness of the wolf gene pool.

The study was led by researchers from the University of Lincoln in the United Kingdom, the Italian National Institute for Environmental Protection and Research, and the University of California, Los Angeles. Others from Denmark, Poland and Belarus participated, as well.

Dr. Malgorzata Pilot, from the School of Life Sciences at the University of Lincoln, said "Our study has highlighted a need to reduce the factors which can cause hybridization, such as abundance of free-ranging dogs, small wolf population sizes and unregulated hunting."

The findings were published in the journal *Evolutionary Applications*; the full study can be found at https://onlinelibrary.wiley.com/doi/full/10.1111/eva.12595. ■



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CHINA

Because of her love for the animals, a young woman is dedicating her life to raising wolf pups for a center in China's Inner Mongolia Autonomous Region. According to the *Yangtse Evening News,* 25-year-old Yang Wenjing left a job in tourism to volunteer at the center, where 36 wolves, on average, are cared for. The article notes that the job is tough, but rewarding. It also states that she "finds it hard to gain their trust during the early stages. In order to get close with the animals, Yang puts herself in the cage with the young wolves." She plays with them as would an adult wolf, which has led to her being bitten and scratched countless times, and the constant crouching over the year she has worked with the pups has resulted in spinal degeneration. Yang's parents initially opposed, but now support her work, the article continued. Wolves are a nationally protected species in China. The center's manager hopes his facility will become a scientific research and protection center.

DENMARK

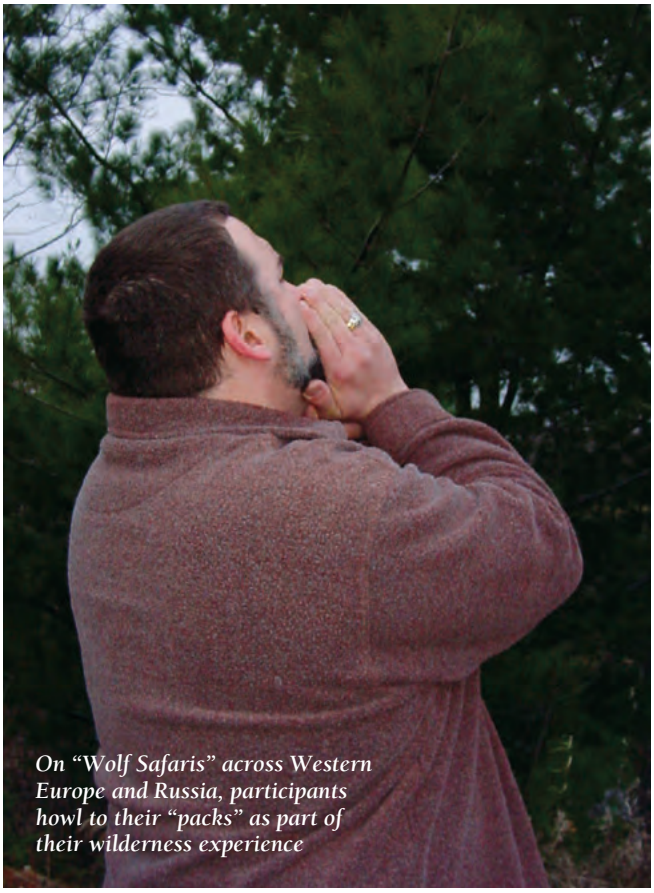
As wolves move closer to urban areas of Europe, "wolf safaris," hosted by a Finnish art collective the name of which means "Other Spaces," are being held across Western Europe and Russia to build understanding of the wild canids. Other Spaces producer Timo Jokitalo told the online media outlet CityLab.com that the idea was an offshoot of a performance in which the public was invited to learn about and act like reindeer.

Jokitalo said one of the artistic goals is for people to have a "non-human" experience. "We hope that the participants will, at least momentarily, feel that they actually become a wolf," he said. "We think that this transformation is a key to a deeper understanding of the animal, and it also transforms the character of our humanity."

One Copenhagen participant interviewed for the article said the workshop did make her feel different. "Maybe I didn't think or feel exactly like a wolf; I don't know if that's possible. But I did feel more wild and free. I think it's very valuable to look at your city from behind an animal's eyes. It can help you understand and hopefully respect them a little more. "

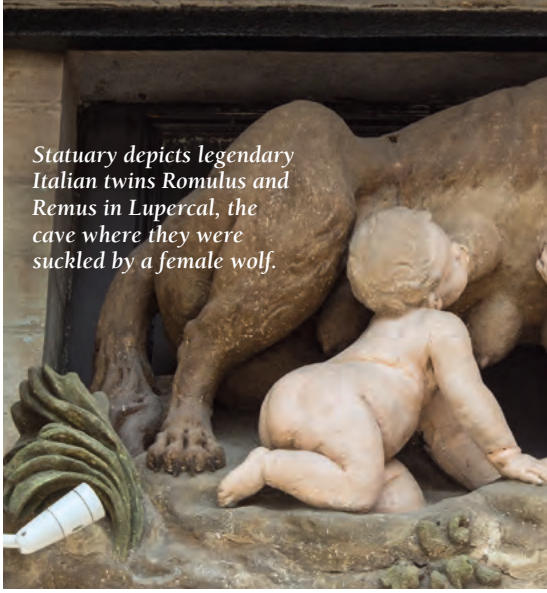
Others described the event by saying, "Instructors taught us all about wolves' natural and social lives, how they are threatened by people, and how wolves communicate with sounds and body language. Then, when they thought we were wolfy enough, they set us off on the streets."

"I howled and howled, and ran around exhausted, trying to find my pack, and it was completely exhilarating," one said. "I got strange looks from people on the streets. That was challenging, because I couldn't tell them what I was doing. I was supposed to be a wolf, after all."



On "Wolf Safaris" across Western Europe and Russia, participants howl to their "packs" as part of their wilderness experience

Lisa Hall



Statuary depicts legendary Italian twins Romulus and Remus in Lupercal, the cave where they were suckled by a female wolf.

ITALY

The exact location of Lupercal, the cave where twins Romulus and Remus, believed to have been Rome's founders, were according to legend suckled by a she-wolf, is a subject of academic inquiry. The city's creation story gave rise to an epic festival each February 15 called Lupercalia, named for the twin "wolf-men," or Luperci. Goats were sacrificed and their skins cut into strips with which scantily-clad young men flailed at women while running through the city in a practice believed to enhance fertility—which the women encouraged.

Portrayed in the film *Gladiator,* Lupercalia was also referenced in Shakespeare's play *Julius Caesar* as the event in which Mark Antony three times offered to Caesar a crown which was three times rejected. The rejection was meant to convey that Caesar was not interested in overstepping his bounds despite the great power he had amassed, which had been a source of concern to the Roman senate.

Despite the importance of the Lupercalia festival, the actual location of the Lupercal is proving difficult to determine. Krešimir Vukovi, an academic who studied the location of this cave for a thesis, wrote for *The Guardian*, "…the Lupercal would be the find of a century: the cave of Romulus and Remus, with their she-wolf stepmother, an icon of Rome wherever its empire spread."

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ETHIOPIA

Ethiopian wolves (*Canis simensis*), which while not true wolves, are related to them, are threatened by a trifecta of rabies, canine distemper and habitat reduction. An effort to vaccinate wild populations against rabies has, in some cases, only seen the animals die of distemper months later. Members of the Ethiopian Wolf Conservation Program have spent 30 years tracking the animals across harsh terrain in difficult weather to carry out the inoculations, witnessing during that time four major outbreaks of rabies alone, each reducing some populations by as much as 75 percent.

Hope lies in a new, oral vaccine which would be hidden in goat meat left out for the animals every two years to bolster immunity. But the March 31 issue of *Science News* addresses from several angles the larger issue of vaccinating wild populations, pointing to opposition by some who claim disease plays a role in the management of a species; that vaccinating can prevent the development of immunity later, should the vaccines fail to prevent the disease; and that the cost of benefitting one population comes at the expense of other goals. Further, they believe that vaccinating one species could give it an unnatural advantage over its competitors; trapping animals to administer injections carries risks for both animals and human trappers; and doses administered in bait might be consumed by species for which it is not intended, with lethal effects.

Projects that don't go well can have lasting repercussions, the article notes. In 1990, researchers tried to vaccinate some packs of endangered African wild dogs (*Lycaon pictus*) in Tanzania and Kenya against rabies. Every dog in the study died, for reasons never proven, causing increased skepticism about vaccines and leading some African countries to tighten vaccine regulations.

Aiding the decision to go forward in Ethiopia is a "One Health" conservation belief that in cases such as this, efforts to help one species also benefit others, including humans. The article notes researchers in Ethiopia who point to one success and to its One Health benefits: From 1978 to 2010, oral vaccines sprinkled across parts of Europe to eradicate rabies in red foxes saw a near-parallel decrease of European rabies cases in humans and other animals. Worldwide, more than 59,000 people die each year from rabies in places where it is still prevalent.

Rabies in Ethiopian wolves is a human-caused problem, the article maintains, citing the introduction of domestic dogs (the region's primary carriers of rabies and distemper, according to a September, 2016 article in *Science News*) by shepherds and farmers bringing their livestock farther each year into the wolves' territory. In one area, wolf habitat shrank by 34 percent from 1985 to 2003. Islands of wolf populations persist surrounded by oceans of free-ranging dogs.

The Ethiopian effort will be the first mass, oral vaccination program to target an endangered species in the wild. In the United States, an indirect effort to save the endangered black-footed ferret of the Great Plains, was executed by orally vaccinating the ferret's prey—the prairie dog—against the plague in order to maintain the population on which the ferret depended for survival.

The article concludes, "Greater awareness about the overlap of human, livestock and wildlife health on shared lands underlies many of these projects. Ethiopia has one of the highest rabies death rates among humans in the world, and lowering the disease prevalence in any animals that humans come in contact with has benefits." ■

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

A new vaccine may save the endangered Ethiopian wolf.

Martin Harvey

Rebuild the Red Wolf Recovery Effort

By Christian Hunt

The world mourned in March as the last male northern white rhino, Sudan, passed away.

Guarded continuously by armed patrols, Sudan was euthanized and laid to rest as the last male of its kind—a clan of rhino that lived for millions of years, withstanding every challenge except humanity. With only two females remaining, the northern white rhino is staring down the barrel of certain extinction and represents, as Sudan's caretakers put it, "a cautionary tale for humanity."

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If we're to prevent another human failure of this kind, we must be inspired by it to speak not only for globally imperiled species, but for those in our own backyards. For North Carolinians, that means raising our voices on behalf of the red wolf.

Like the northern white rhino, the red wolf is the rarest of its kind. Having lost 99.7 percent of its range, today's red wolf clings to life in one small, eastern North Carolina holdout—and even that is in danger of being lost forever. Last year, The U.S. Fish and Wildlife Service (FWS) proposed shrinking what remains of the red wolf's territory by about 90 percent and forcing most of the last wolves into zoos.

This would spell extinction for North Carolina's red wolf in the wild and waste decades of conservation progress and cutting-edge research. A small handful of anti-wolf landowners have applauded this calamitous proposal. In their view, the red wolf's disappearance would benefit private landowners in the recovery area. The science, however, suggests the opposite.

Since the red wolf makes regular meals of nest predators like raccoons, it's believed that turkey and quail populations are higher in the Red Wolf Recovery Area than elsewhere. The red wolf also preys upon invasive nutria that otherwise damage crops and, as the larger of the two species, the red wolves, when in healthy numbers, will suppress coyotes. As for deer, the annual harvest has increased in the Red Wolf Recovery Area for the past 30 years.

All the evidence suggests that the Red Wolf Recovery Area is, in fact, one of the state's richest hunting locales.

Yet, what is ultimately at issue here is not ecology or annual harvests. The real issue before us is one of commitment. The FWS is entrusted with protecting and recovering our nation's most imperiled wildlife.

In the 1980s, critics thought the red wolf was a lost cause. Back then, according to FWS, the species was already "99 miles down a 100-mile-long road to extinction," and to some, the recovery effort seemed hopeless. After only two decades, however, heroic FWS biologists proved the skeptics wrong and accomplished the impossible; with 151 wild wolves, as well as a strong captive population, the species was placed on the road to long-term recovery.

Beginning in the early 2010s, though, FWS experienced dramatic shifts within its senior leadership. Rather than leaving the program in the hands of recovery biologists, agency administrators in Atlanta, under pressure from the state of North Carolina (supporting documents below) brought the program to its knees, ending essential management efforts that had sustained wolves in the wild. The red wolf population predictably collapsed, and today fewer than 45 likely remain in the wild with only 23 known wolves on the landscape.

If the agency moves forward with its latest plan, the wild recovery effort will be drastically curtailed, and the red wolf could become nothing more than a zoo curiosity—a prospect that, for virtually all North Carolinians, is simply unacceptable.

Last year's public comment period on FWS-proposed changes to the recovery program generated more than 55,000 comments from all 50 states, 99.8 percent of which were opposed to the

FWS plan. Only 25 comments were anti-wolf; only 10 backed FWS. Within the recovery area itself, 68.4 percent of land-owners voiced their support for the species. Scientists have publicly urged the agency to reconsider, warning that its plan is not supported by science and is a sure-fire recipe for extinction.

In eastern North Carolina, we are blessed with an abundance of wildlife. Home to black bears, alligators, huge flocks of game birds, deer and turkey, it is a wildlife paradise. There are few comparable places left on the East Coast. It is also the last holdout of the red wolf's historical territory, which once spread throughout the Southeast. As a proud North Carolinian, I find that inspiring. We need only drive 30 minutes from the beach to discover, hidden among the pine forests and swamps, the world's most endangered wolf.

Just as it took courage to pull the red wolf from the jaws of extinction, it will again take courage for the Fish and Wildlife Service to honor the public trust. It will also require the voices of people who understand and believe in the FWS mission of protecting wildlife. Without support from the public, we can expect that the species will, like the northern white rhino, become a memory of our wilder past. ■

Christian Hunt is the Southeast program associate for Defenders of Wildlife, a national conservation organization founded in 1947 and focused on wildlife and habitat conservation and the safeguarding of biodiversity. Based in Charlotte, NC, he is responsible for promoting the organization's red wolf campaign efforts through grassroots outreach, community organizing and communications.

Supporting Documentation

North Carolina Wildlife Resources Commission. 2015.

Resolution Requesting that the United States Fish and Wildlife Service Declare the Red Wolf (Canis rufus) *Extinct in the Wild and Terminate the Red Wolf Reintroduction Program in Beaufort, Dare, Hyde, Tyrrell, and Washington Counties, North Carolina*

http://www.ncwildlife.org/Portals/0/About/documents/2015-01-29-NCWRC-Resolution-Asking-USFWS-Declare-Red-Wolf-Extinct-in-Wild-Terminate-Program.pdf

Adobe Sotck/ Mark Kostich

Red wolf pups—offspring of the rarest wolves of their kind—now appear only in eastern North Carolina. A recent proposal by the U.S. Fish and Wildlife Service would shrink the red wolf's territory and force the last ones into zoos, effectively assuring their extinction.

How to Tame a Fox (and Build a Dog)

Book Review by Debra Mitts-Smith

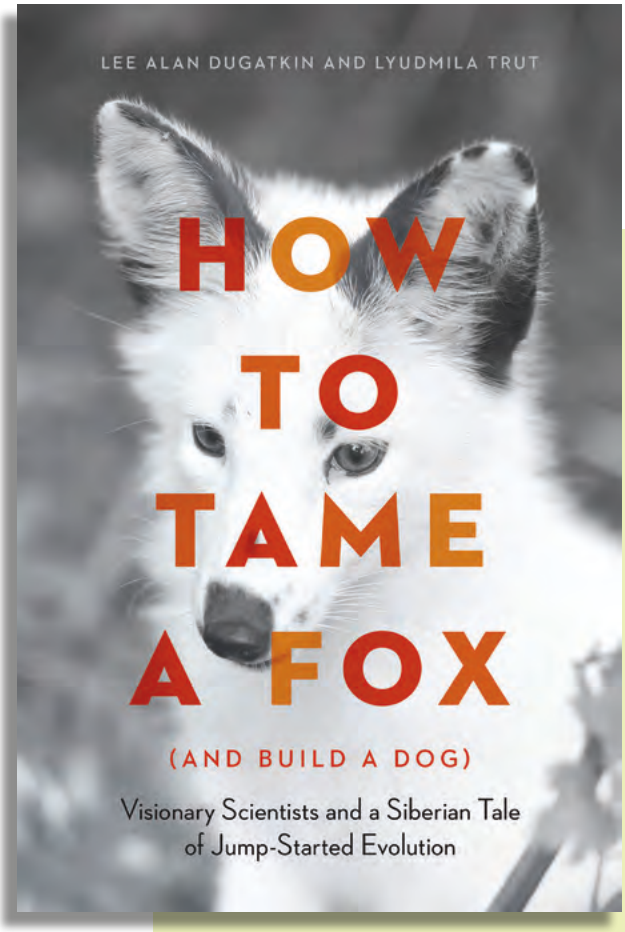
In 1952, Soviet geneticist Dmitri Belyaev boarded a train to Tallin, Estonia to meet his friend and colleague, Nina Sorokina, chief breeder at a fox farm outside Tallin. Under the guise of breeding more luxurious pelts, Belyaev made a peculiar request; he asked Sorokina to identify and breed silver foxes based not on the quality of their fur, but on their behavior around humans. Most silver foxes responded to humans either aggressively or fearfully. A few seemed to respond more calmly. For Belyaev, these calmer foxes might hold answers to his questions about the domestication of the wolf into the dog. Under Belyaev's direction, Sorokina (and later, Lyudmila Trut) began to select and breed foxes based on their reaction to humans. Within 20 years, Belyaev and Trut's experiment showed that breeding for one quality—tameness—also triggered doglike traits such as floppy ears, rounded faces and wagging tails.

In *How to Tame a Fox (and Build a Dog)*, Lee Alan Dugatkin and Lyudmila Trut provide an engaging account of these fox experiments. Against a backdrop of the post-World War II Soviet Union, Stalin's purges and the Cold War, Belyaev's work also tells a cautionary tale about the dangers of letting politics dictate scientific inquiry. He notes that even prior to the fall of the U.S.S.R., it became clear that international cooperation and free exchange of information between scientists was key to scientific advancement. As time passed, scientists from other countries and fields studied these foxes to better understand the origins and effects of domestication.

Some scientists theorized that wolves were first attracted to human settlements by food dumps. Belyaev reasoned that only wolves that could tolerate the presence of humans would have succeeded in feeding and living near them. He theorized that a tendency toward tameness, like aggression or fearfulness, must be an attribute already present in the wolf's genes. This would mean that tameness was not a mutation caused by domestication, but instead a genetic trait amplified by domestication. At the waste sites, calmer wolves would breed with each other. Each new generation would become tamer and more tolerant of humans—and food dumps, by offering a more consistent food supply, would make tameness an evolutionary advantage.

Further, despite Darwin's position that evolutionary change happens over long periods, Belyaev and Trut's domestication of the fox occurred within 20 years, suggesting that the domestication of the wolf into dog could have happened over a relatively short time span.

As the fox experiment moves toward its 70th year, Trut's remaining goal is to protect the domesticated foxes by getting them recognized as pets. After all, as the Fox tells the Little Prince in Trut's favorite book, Antoine de Saint-Exupery's *The Little Prince*, "you become responsible forever for what you tame." ■



How to Tame a Fox (and Build a Dog)

Authors:
Lee Alan Dugatkin and Lyudmila Trut
Publisher: University of Chicago Press
216 pages

Debra Mitts-Smith is a School of Information Sciences faculty member at the University of Illinois. Her research and teaching focus on visual culture, children's literature, history of the book and storytelling. Her book, Picturing the Wolf in Children's Literature, *was published by Routledge in 2010.*

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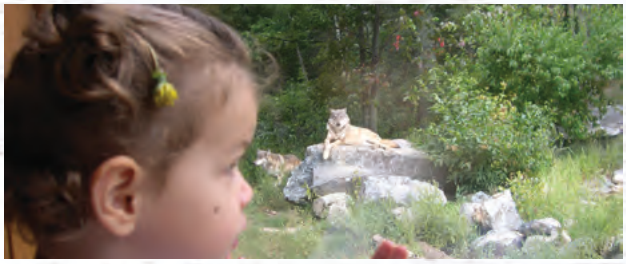

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