INTERNATIONAL WOLF

NEW 2006–2007 RETAIL CATALOG INSIDE!

A PUBLICATION OF THE INTERNATIONAL WOLF CENTER
FALL 2006

INTERNATIONAL
WOLF
THE QUARTERLY PUBLICATION OF THE INTERNATIONAL WOLF CENTER
VOLUME 16, NO. 3 FALL 2006

Features

"If You Watch the Ravens for Awhile . . ." Mary Roberson, www.maryroberson.com

Jacquelyn Fallon

Departments

On The Cover

Huichol Mexican Wolf Mask
Photographed by Bryan Winget, Richard Scales Advertising
Read more about the mask on page 17.

Steve Lokker

International Wolf Center™

INTERNATIONAL
WOLF

Publications Director
Mary Ortiz

Magazine Coordinator
Terri Ellman

Consulting Editor
Mary Keirstead

Technical Editor
L. David Mech

Graphic Designer
Tricia Austin

International Wolf (1089-683X) is published quarterly and copyrighted, 2006, by the International Wolf Center, 12615 Co. Road 9, Minneapolis, MN 55441, USA. e-mail: mplspack@wolf.org. All rights reserved.

Publications agreement no. 1536338

Membership in the International Wolf Center includes a subscription to *International Wolf* magazine, free admission to the Center, and discounts on programs and merchandise. • Lone Wolf memberships are U.S. $35 • Wolf Pack $60 • Wolf Associate $125 • Wolf Sponsor $500 • Alpha Wolf $1000. Canada and other countries, add U.S. $15 per year for airmail postage, $7 for surface postage. Contact the International Wolf Center, 1396 Highway 169, Ely, MN 55731-8129, USA; e-mail: mplspack@wolf.org; phone: 1-800-ELY-WOLF

International Wolf is a forum for airing facts, ideas and attitudes about wolf-related issues. Articles and materials printed in *International Wolf* do not necessarily reflect the viewpoint of the International Wolf Center or its board of directors.

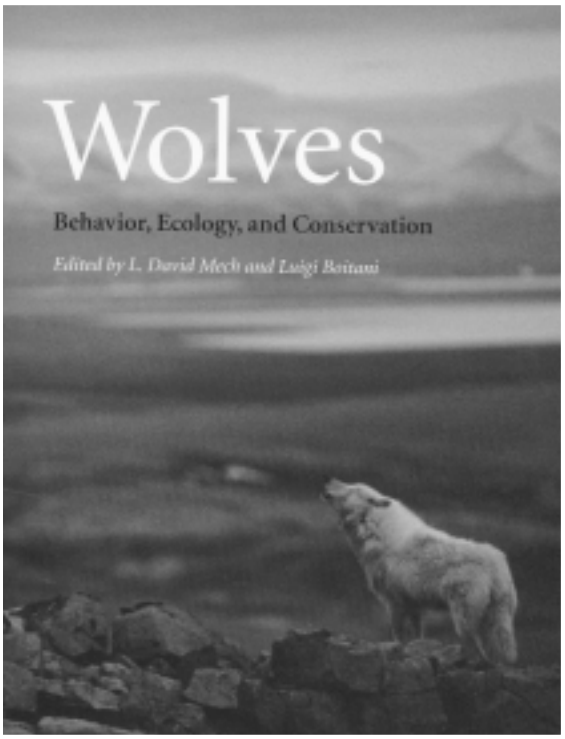
International Wolf welcomes submissions of personal adventures with wolves and wolf photographs. Prior to submission of other types of manuscripts, address queries to Mary Ortiz, publications director.

International Wolf is printed entirely with soy ink on recycled and recyclable paper (text pages contain 20% post-consumer waste, cover paper contains 10% post-consumer waste). We encourage you to recycle this magazine.

PHOTOS: Unless otherwise noted, or obvious from the caption or article text, photos are of captive wolves.

As A Matter Of Fact

Question: What is the most recent technical book published about wolves?



Answer: The most recent technical book published about wolves is *Wolves: Behavior, Ecology, and Conservation* edited by L. David Mech and Luigi Boitani, published in 2003 by the University of Chicago Press and soon available in paperback. ■

New Question

What is the intermediate host of the wolf tapeworm *Echinococcus granulosus*?

West Gate

From the Executive Director

Of Generations and Pendulum Swings

While the persecution of the wolf in America had gone on decade after decade, it was a generation early in the 20th century that truly left its mark. Official government policy endorsed the idea that the only good wolf was a dead wolf, and a brutally effective campaign of poisoning, trapping and shooting took care of the rest.

The pendulum swings to the right.

A new generation began in the 1970s that would flip government policy on its head and bring the scant remaining population of wolves in the lower 48 states under the mantle of the Endangered Species Act. Its protections coupled with recovery programs by the U.S. Fish and Wildlife Service and with the remarkable resiliency of the wolf itself brought the wolf back to some slices of its former range.

Walter Medwid

The pendulum swings to the left.

Another generation will soon begin as the shift from federal protection to state management looms around the corner. This generation will likely not be a quiet one, as the individual state management plans become reality and the knowns and relative comfort levels of federal protections become the unknowns, discomforts and distrust of what will really happen under state jurisdictions. This next generation of time will require profound adjustments to what we currently think about how wolves are managed. The flashpoint may center on the establishment of sustainable hunting/trapping regulations similar to those for other species.

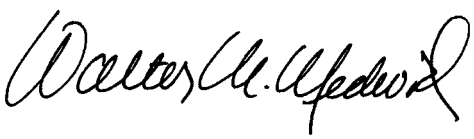
The pendulum swings to the middle.

Just what is the right balance in our relationship to wolves? We know beyond a doubt that we can destroy wolves. And we know we can restore them. We also know that living with wolves will never be without some measure of controversy.

What remains to be seen is how we will live with wolves in the future as human impacts on the earth intensify. The next generation will answer that question and determine where the pendulum swings.

This makes our jobs today so critically important and causes us to reaffirm the commitment to our mission: The International Wolf Center advances the survival of wolf populations by teaching about wolves, their relationship to wild lands and the human role in their future.

There's no time to rest. ■



MISSION

The International Wolf Center advances the survival of wolf populations by teaching about wolves, their relationship to wild lands and the human role in their future.

Educational services and informational resources are available at:

1396 Highway 169
Ely, MN 55731-8129, USA
1-800-ELY-WOLF
1-218-365-4695

e-mail address:
mplspack@wolf.org

Web site: http://www.wolf.org

Brother Wolf, Brother Raven

"Midnight Dreary" Karla Morreira, www. whalebonewatercolors.com

A Bird and Mammal Might Have Coevolved

by STEVE GROOMS

To understand an animal like the wolf, we need to see it not as an isolated species but as an animal intimately and complexly connected to all the species in its world. To me, the most fascinating relationship in the world of the wolf is the one it has with the raven.

Wolves and ravens share a great deal of range. The raven is considered the most widespread bird species in the northern hemisphere. The wolf historically had the same kind of range before persecution and habitat destruction reduced it. Wolves and ravens currently cohabit vast stretches of northern forested lands in Eurasia and North America.

Wolves and ravens have much in common. Both are highly social, with complex social structures and many different vocalizations. The wolf and the raven are also some of the most intelligent species in their shared habitat.

In tests, ravens show remarkable ability to solve challenges, use tools and even to modify objects to make them function better as tools. Ravens have learned to put heavy nuts in streets, where passing cars will smash them open. In Scandinavia, a man fishing with an unattended line began to experience thefts of his fish. The thief turned out to be a raven that would pull the line in, using its beak and foot, and steal the fish.

Wolves are similarly intelligent. There is even a story of wolves stealing fish from set lines just like the raven story above. Wolves have demonstrated great ingenuity in finding ways of escaping enclosures. Observers have watched wolves solve problems using intelligence and analytical powers (see *International Wolf*, Winter 2002, "A Pack Solves a Problem").

Wolves and ravens also have in common the fact that they are playful. Wolves play all sorts of games with each other, such as tag and keep-away. Ravens perform aerial maneuvers that seem playful, and they do such things as roll down hills, apparently for the fun of it.

There are many observations of wolves and ravens playing with each other. Ravens tease wolves, dive-bombing them, pecking them and landing on their backs. Wolves often threaten and snap at ravens, and there is one record of a wolf feigning death in order to lure a raven close enough to grab it. While it all looks like a game, now and then a raven goofs by getting too close, and then it pays with its life. However, ravens are adept at staying just out of reach.

The time of the most intense interaction is when both species are attempting to feed at a kill site. These interactions vary. At times wolves and ravens share a kill while paying little attention to each other. At other times wolves drive ravens away, at least until the wolves have gorged themselves.

Ravens use wolves to find food. A study in Yellowstone proved that ravens often failed to discover randomly placed carcasses but always were on the scene after wolves made a kill, suggesting that ravens critically count upon wolves as a food source. Ravens also use wolves as a way of confirming that an animal is truly dead and thus safe to approach. Many observers have witnessed ravens following wolf packs, waiting for them to make a kill. There is one report—often cited but not necessarily true—of ravens flying ahead of a wolf pack, leading wolves to possible prey.

It might work the other way around, too. Wolves can locate carrion by moving toward the ruckus ravens make around a carcass. It is somewhat easier to show that ravens find food with the help of wolves than the other way around, but some observers feel the benefit works both ways.

Wolves and ravens travel together so much that a standard way of locating wolves is to look under ravens. Biologists can often find wolf kills and even spot wolves by snowshoeing into areas where ravens are feeding with their typical raucous din.

Wolves and ravens also share table manners. Wolves are known to "wolf" their food, gobbling down large quantities of food before curling up to sleep in a condition Native Americans called being "meat drunk." Ravens are downright "ravenous" as

they eat. A single raven can gather up to five pounds of food from a kill in a day, which is astonishing. Ravens and wolves both cache food at times.

Ravens steal food from wolves. Wolves could afford to lose a few pounds of meat from a moose to a single raven, but ravens always come to a kill, and they come in bunches. A kill typically attracts six to twenty-five ravens, and there is documentation of groups as large as a hundred ravens. The impact of so many ravenous ravens adds up. Ravens once consumed half of a 600-pound moose in a single day.

Ravens tease wolves, dive-bombing them, pecking them and landing on their backs. **Wolves often threaten** and snap at ravens, and there is one record of a wolf feigning death in order to lure a raven close enough to grab it.

"The Ravens and the Wolves are Partners" Mary Roberson, www.maryroberson.com

Recently researchers have suggested that the presence of ravens might explain one of the oldest mysteries about wolves, namely why they hunt in packs. Large carnivores typically hunt alone. Given the scarcity of prey, hunting in large packs might seem counterproductive for individual wolves, for the food must be shared with many pack members.

People previously explained pack size by hypothesizing that it is useful to have many hunters to help take down dangerous prey. This speculation was encouraged by the fact that wolf packs that rely on big and dangerous prey, like moose, are larger than packs that mainly feed on deer. And wolves in desert regions that feed on smaller prey have the smallest pack sizes of all.

One problem with this explanation is that it just isn't true. Even when wolves hunt in large packs, most of the killing is usually done by a few expert hunters in the pack. And in a recent study on Isle Royale, researchers observed a single wolf killing a moose on eleven occasions. The most effective and efficient killing team would be a pair of wolves, not a pack of 16.

Hunting in packs seemed like a losing strategy until researchers factored in the impact of raven flocks. Moose are large prey. A single wolf or pair of wolves could only eat a small portion of a moose and then would need to sleep off the meal before resuming feeding. Ravens would use that time to strip the carcass if there were not more wolves working on the carcass.

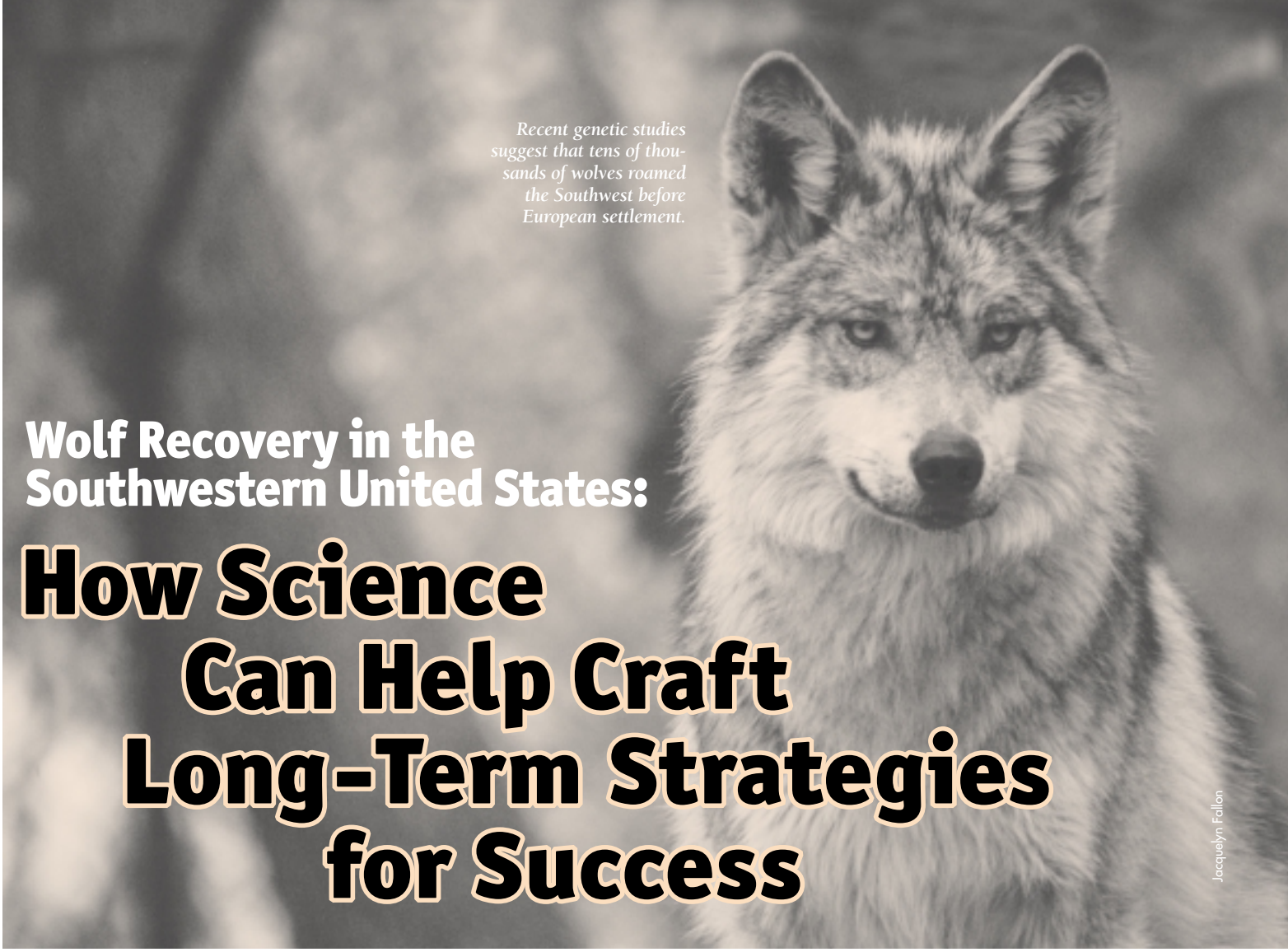
According to calculations from the Isle Royale study, a pair of wolves might lose 37 percent of a moose kill to ravens, whereas a pack of six wolves would lose only 17 percent. Living and hunting in large packs doesn't make sense unless the wolf-raven relationship is considered, but in that context it is clear that wolves can make the most efficient use of their prey if they hunt and eat in groups.

This is just another example of the intricate and fascinating relationship between the wolf and the raven. Because there is increasing evidence that wolves and ravens may have coevolved, their complex symbiotic relationship may yield more surprises for us in the future. ■

Steve Grooms has recently rewritten his best-selling book, The Return of the Wolf.

For further study, read Bernd Heinrich's *The Mind of the Raven.*

For details on the study of the impact of ravens on wolf pack size, see "Raven scavenging favours group foraging in wolves," by John Vucetich, Rolf Peterson and Thomas Waite at http://www.isleroyalewolf.org/pdf_files/V%20et%20al%202004%20raven.pdf.



Recent genetic studies suggest that tens of thousands of wolves roamed the Southwest before European settlement.

Jacquelyn Fallon

Wolf Recovery in the Southwestern United States:

How Science Can Help Craft Long-Term Strategies for Success

by CARLOS CARROLL

Today, a decade after wolf reintroduction, about 1,000 wolves roam the Northern Rocky Mountains. In contrast, seven years after the Mexican wolf was reintroduced to the Blue Range in Arizona and New Mexico, less than 50 animals occur in the wild. Wolf reintroduction in the southwestern United States faced a number of challenges from the start. Since no wild population of Mexican wolves remained, the reintroduction had to use inexperienced captive-born animals. Prey is scarcer and of more patchy distribution in the semiarid landscapes of the Southwest, and there are no areas of secure habitat as large as found in Yellowstone and central Idaho. But experience with endangered species reintroductions suggests that several smaller areas in the Southwest, if they can be recolonized and then linked by dispersing wolves, might together provide a more secure future for wolves there than could any one reintroduction site.

The recent research described here (Carroll et al. 2005; Carroll et al. 2006) helps lay the groundwork for such a plan, by using computer models to evaluate wolf habitat throughout the region, to identify threats to recovery, and to predict which additional reintroduction sites are the most promising. The two characteristics of an area that make it suitable for wolves are security from killing by humans (that is, places distant from roads, towns and livestock) and abundance of prey. To assess these factors, my colleagues and I collected a variety of data across the southwestern United States and northern Mexico such as the number and distribution of humans, roads and livestock, as well as satellite images that mapped vegetation. We then compared this information with historical data on the distribution of Mexican wolves and with field studies of habitat use by wolves in other parts of North America. For example, previous studies have estimated the number of wolves that can persist in an area at a certain level of prey abundance, and have recorded thresholds in the number of roads beyond which wolf mortality from humans increases. All these data were then input into a model, PATCH, that simulates how wolf populations persist on the landscape by filling suitable habitat with wolf home ranges and then tallying the births and deaths in each pack and where dispersing animals move to establish new packs.

Many parts of the West are experiencing rapid human population growth. Increasingly, this growth occurs in rural areas near public lands with opportunities for outdoor recre-

ation. To assess the effect of development on wolf recovery, we compared our predictions based on current habitat with "future" scenarios that projected trends from census data forward to 2025, and assumed a 1 percent increase per year in road density. Based on initial model predictions, we identified four potential reintroduction sites in the southwestern United States: the Grand Canyon and Mogollon Rim in Arizona, Colorado's San Juan Mountains, and the Carson National Forest in northern New Mexico. The Blue Range site on the Arizona–New Mexico border was also included to allow us to compare predictions with current recovery program results.

We found that southwestern wolves were vulnerable to future development. PATCH predicted a 40 percent decline regionally in carrying capacity by 2025, with two-thirds of this due to development on private lands. Habitat in New Mexico and Colorado was most vulnerable, due to habitat fragmentation and rapid human population growth. Other areas had threat levels similar to the Northern Rockies, about a 25 percent decline in carrying capacity over 25 years. Rather than foretelling failure for southwestern wolf recovery, these findings can help land managers and conservation groups target restoration and protection (for example, efforts by land trusts) toward areas that can secure wolf habitat from development.

Although all four candidate U.S. sites have high enough potential to be included in further wolf recovery planning, the vulnerability of the Mogollon Rim and San Juan Mountains to landscape change and the relative isolation of the Carson National Forest from the bulk of wolf habitat in the region suggest pairing any of these with a second site to ensure the establishment of a well-distributed, viable population. The Grand Canyon site has higher potential, similar to that of the Blue Range. This is because northern Arizona and southern Utah hold large areas with a low threat of development; the national park itself, like Yellowstone, excludes livestock and firearms; and sufficient prey inhabit the less arid portions of the area, such as the Kaibab plateau. The Grand Canyon forms a key link in a "Southwest Crescent" of habitat stretching across Utah and Arizona from the Wasatch Range to the Blue Range, and southward to the Sierra Madre of Mexico. Reintroduction there would thus be a key step toward fulfilling the goal of reestablishing a connected population of wolves from Canada to Mexico. To achieve this broader goal, however, it is also important to focus conservation efforts on key linkage areas such as the U.S.-Mexico border region.

The Mexican wolf recovery program has never set a formal recovery goal, but the initial plan suggested establishment of a population of 100 wolves at a single site. A quarter century later, we realize that such a small and isolated population would have too low a chance of long-term survival to be considered recovered. In addition, recent genetic studies suggest that tens of thousands of wolves roamed the Southwest before European settlement, a figure vastly larger than 100 wolves. Current regulations, however, are still based on this goal and thus, unlike in Yellowstone, require that wolves dispersing outside of the Blue Range be recaptured. In contrast, our results suggest that to achieve long-term recovery of wolves in the Southwest, we should first establish strong source populations through several well-distributed reintroductions and then allow wolves to disperse naturally and establish peripheral populations in poorer habitat and link the initial reintroduction sites. Reestablishing a connected metapopulation by allowing more wolves in more places would not only increase the population's chances of persistence but would also begin to restore the ecological role wolves once played as a keystone species in the Southwest through predation on wild ungulates. The Endangered Species Act (ESA) recognized the importance of such ecosystem influences and called for the restoration of endangered species across large portions of historic range.

This year the Mexican wolf recovery oversight committee completed a review of the program and recommended several modifications, in part based on our studies. The review suggests allowing wolves to disperse beyond the current Blue Range Wolf Recovery Area to facilitate establishment of a metapopulation. However, it suggests coupling this with an expansion of the "experimental non-essential population area," where wolves are managed under rules that allow more frequent removal and lethal control. Once the wolf population in this larger area reached 125 animals, wolves could be killed in a wide variety of situations (livestock depredation, attacks on pets, desire to increase game herds) where nonlethal means are currently being used. As southwestern wolf populations grow, it makes sense for protections to be decreased. However, especially if the experimental population area is expanded to encompass a large portion of Arizona and New Mexico, the population goal of 125 is far too low to trigger an increase in lethal control. This recommendation is thus inconsistent with conservation biology principles regarding threats to small populations and with the results of our study that highlight the vulnerability of southwestern wolf populations due to fragmented habitat.

The two characteristics of an area that make it suitable for wolves are security from killing by humans (that is, places distant from roads, towns and livestock) and abundance of prey.

Although more management responsibility should shift to the

states as wolf populations grow, the role of federal or multistate coordination may remain larger for wolves than for less mobile ESA species. Federal oversight under the ESA is often seen as an "emergency room" stage, followed by additional recovery and conservation efforts by the states following delisting. However, the antipathy of some influential western interest groups toward large carnivores such as wolves and grizzly bears may turn this assumption on its head, as post-delisting management by states seeks to reduce populations back to minimal recovery goals. The experience with wolf recovery in Minnesota suggests instead that, given time and sufficient habitat, wolf populations can grow to levels where appropriate state-level management does not conflict with recovery. ■

Carlos Carroll is Conservation Science Advisor to the Wilburforce Foundation (Seattle) and director of the Klamath Center for Conservation Research (Orleans, California). He received his Ph.D. in Forest Science from Oregon State University in 2000. His research focuses on the use of habitat models to aid conservation planning for carnivores and other threatened species throughout North America.

References:

Carroll, C., M. K. Phillips, and C. A. Lopez-Gonzalez. 2005. Spatial analysis of restoration potential and population viability of the wolf *(Canis lupus)* in the southwestern United States and northern Mexico. Klamath Center for Conservation Research, Orleans, CA (available at www.klamathconservation.org).

Carroll, C., M. K. Phillips, C. A. Lopez-Gonzalez, and N. H. Schumaker. 2006. Defining recovery goals and strategies for endangered species: The wolf as a case study. *Bioscience* 56: 25–37.

Computer modeling identified four potential reintroduction sites in the southwestern United States.

Kim Crunbo

Grand Canyon

Kim Crunbo

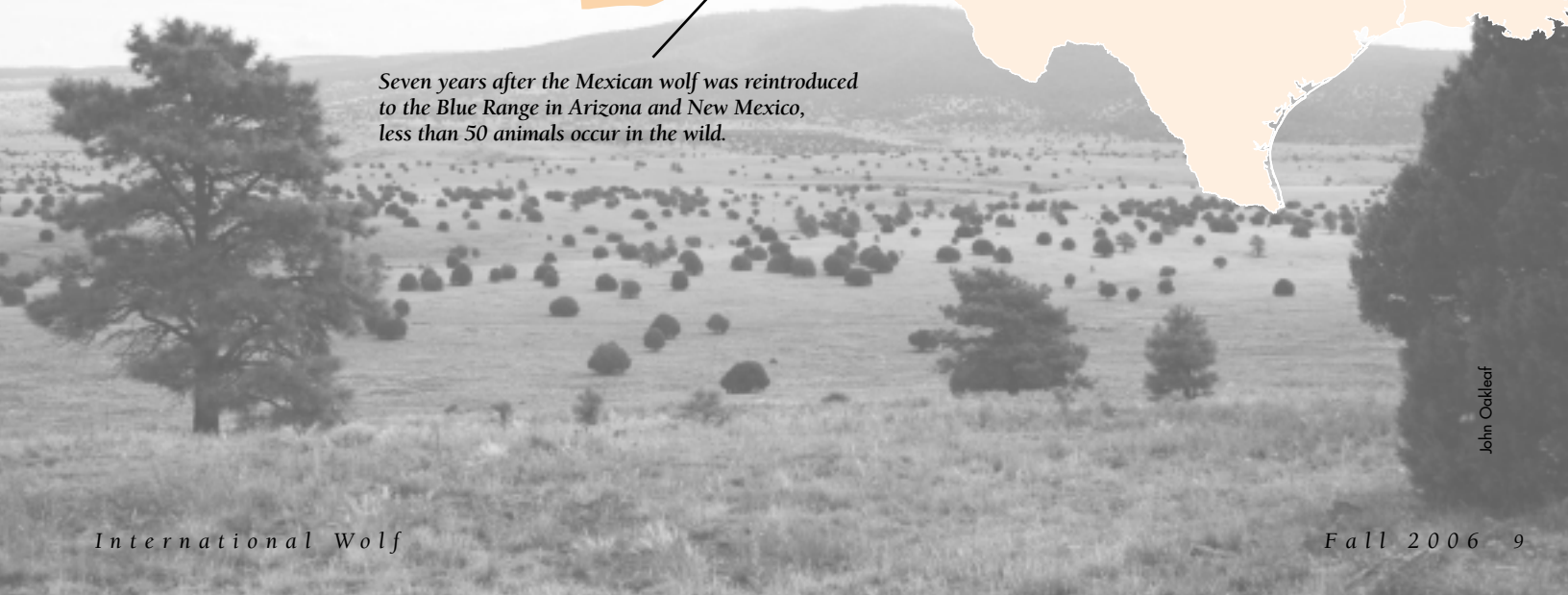
Mogollon Rim in Arizona

Phil Gavenda

San Juan Mountains in Colorado

Mike Phillips

Carson National Forest in northern New Mexico



John Oakleaf

Seven years after the Mexican wolf was reintroduced to the Blue Range in Arizona and New Mexico, less than 50 animals occur in the wild.

Group Effort Creates Exciting New Exhibit

The International Wolf Center's newest exhibit was created through a shared effort to provide current information about the status of wolves across North America. *Wolves and Wild Lands in the 21st Century* was developed and produced by the Center in collaboration with the Science Museum of Minnesota through the Community Partnerships Serving Science project. The exhibit explores the uncertain future of wolves in a world increasingly dominated by humans.

"People restored wolves to many areas of the lower 48 states, but it is not a foregone conclusion that they will still be here 20, 50 or 100 years from now," says Andrea Lorek Strauss, National Information and Education Director at the Center. "*Wolves and Wild Lands in the 21st Century* explores the challenges we must face if wolves are to survive not only tomorrow and next year, but forever."

Challenges such as habitat destruction, wolves killing livestock and wolves interbreeding with coyotes are illustrated through mounts of wolf specimens from across North America accompanied by panels with pictures, maps and text.

The exhibit made its debut at the Science Museum of Minnesota in St. Paul in March and moved to the Center's flagship educational facility in Ely, Minnesota, in late April for a summer display. It is now available for rent to museums, zoos, nature centers and other educational organizations, allowing new audiences to be reached with this important information. For rental information, contact Strauss at 800-ELY-WOLF, ext. 31, or edudir@wolf.org. ■

Steve Lokker

The exhibit Wolves and Wild Lands in the 21st Century made its debut at the Science Museum of Minnesota in St. Paul in March.

Sherry Jokinen

LUCAS
1993-2006

Gone But Not Forgotten

On July 11, 2006, Lucas, one of the International Wolf Center's ambassador wolves, was euthanized at the Center in Ely, Minnesota. After several days of observation and consultation by wolf care staff and area veterinarians, it was determined Lucas would not recover from a chronic, degenerative spinal condition and other age-related issues.

"We are saddened by Lucas' death, but it was very apparent by the amount of pain he was in that it was his time to go," said Wolf Curator Lori Schmidt.

Born in the Center's opening year of 1993, Lucas educated and entertained 600,000 visitors during his life. Lucas was a calm wolf known for his relatively non-aggressive behavior.

Alpha Legacy Profile

Susan Johnson's home in Montana puts her right in the middle of wolf controversies. Given what she has seen, Susan wants to en-sure that education about wolves continues, in the hope that the minds of people who come from generations of wolf haters will slowly change. So she has included the International Wolf Center in her will.

Courtesy of Susan Johnson

Susan Johnson (left) and friend Eileen Fitzgerald

Susan has seen the entrenched "wolf haters" first-hand. She heard them when she testified at the wolf reintroduction hearings, and she sees them daily, wearing T-shirts with the saying, "The only good wolf is a dead wolf." Susan says, "This is the type of person that the International Wolf Center's work will affect in time. It doesn't do any good to fight with them. Education is the key to turning attitudes around, and the International Wolf Center provides that education."

As a current and Alpha Legacy member, Susan supports the Center's work now and in the future. "As the U.S. population grows and develops our wild lands, we are going to need more education about how people and wolves can coexist. The Center's work through the Ely interpretive center and distance learning [see the Summer 2006 issue of *International Wolf*] is the key to reaching those who have the potential to embrace new ways of addressing problems—the young people," she says. "I know that by including the International Wolf Center in my will, I've at least been able to make a contribution. Truly, I don't think I can do enough." ■

INTERNATIONAL WOLF CENTER

Contributors

MARCH–MAY 2006

Major Donors

Toxie Beavers

John Cain & Tanya Reiss Cain

Robert Carlson

Jolie Chermey

Lammot Copeland Jr.

Cynthia Pet-Dante & Peter Dante

Michael & Doreen Deutsch

Dolores Gaska

Marilyn & Ansel Gower

Neil Hutt

Jayne Kalk

Jeanie & Murray Kilgour

Kay Latona

Seamus Metress

Patricia Meyer

Dorothy Donnelly Moller

Sarah Morris

Patricia Pettis

Robert & Janice Roseman

Jerry Sanders

Lori Schmidt

Bob Schroeder & Karen Brooks

Tobin Sobaski & Kari Koehler

Ted & Barbara Spaulding

Fran Stofflet

Amber Tamblyn

John & Donna Virr

Kathryn Vizas

Keith & Kathleen Williams

Margaret Wyllie

Dr. James Zins & Dr. Cynthia Kavouksorian

Royalties

Dave Mech and the Minnesota Forestry Association

Rykodisc, Inc.

In-Kind Donations

Tricia Austin

Nancy Gibson

Google

Neil Hutt

ReDirect Guide

Travelhost Northland/Duluth

Nancy jo Tubbs

Honorary

In honor of April Bender:

Matthew Snelling

In honor of Jodee Chizever:

Jennifer Engstler

In honor of Breiana Strand:

Terry Kelly

In honor of Dana Wilson:

The Peel Family

Memorials

In Memory of Ken:

Renee Chester

In Memory of Leonard Buell Tubbs:

John & E. Ann Conzemius

Jerry & Joann Hale

David & Gertrude Juncker

Mike & Anne Schulte

Marnie Sims

In Memory of Nyssa:

Terri McClure

In Memory of Mrs. Eva Mae Gear:

Jean V. Ruth

In Memory of Ryan Rocheleau:

Hilary & Jeffrey Hatch

S. D. Ireland Brothers Corp.

In Memory of Marian Sanders:

Nancy Gibson

Neil Hutt

Dean Johnson

L. David Mech

Nancy jo Tubbs

Walter Medwid

In Memory of Gene Schuler:

Norm & Marcia McKalvey

Matching Gifts & Foundations

Wayne Cadden and the Corning Incorporated Foundation Matching Gifts Program

Michael Carpenter and the Community Solutions Fund

Henry Crosby and the Terra et Educare Foundation

A. Dorene Eklund and the General Mills Foundation Gift Matching Program

Judith K. Fech and the Wells Fargo Community Support Campaign

Jewish Community Federation of Cleveland

Daniel Kiefer and the Midland National Life Insurance Company

Kari Koehler and the Red Wing Shoe Company Matching Gift Program

Richard Krueger and the General Mills Foundation Gift Matching Program

Kirsten Langohr and the General Mills Foundation Gift Matching Program

Lois Nichols and the Pfizer Foundation Matching Gifts Program

Piragis Northwood Company, Inc.

Deborah Reynolds and the May Department Stores Company Foundation

Corey Roeder and the Prudential Foundation Matching Gifts Program

R. D. Salz and the IBM Matching Gifts Program

TCF Foundation

Leslye Teuber and the REI Workplace Giving Campaign

Debra Thurlo and the May Department Stores Company Foundation

Cristina Uribe and the Benevolink Foundation

J. T. Wallace and the IBM Matching Gifts Program

Cynthia Wong and the Gerson Bakar Foundation

Thank You

Monty Sloan

Tracking the Pack

Captive versus Wild: The Nature versus Nurture Discussion

by Lori Schmidt, Wolf Curator, International Wolf Center

When visitors arrive at the International Wolf Center's captive wolf observation windows, they are thrilled to get a close look at the ambassador wolves that serve as representatives of their wild counterparts. But how representative is a captive wolf pack of a free-ranging pack formed in a wild habitat?

Physical body structure: Wolves born in captivity have the same genetic makeup as their wild counterparts. The body size, coat condition and physical condition of captive wolves may be affected by nutritional supplements and parasite control. At the Center, the wolves are fed a daily multivitamin and a monthly heartworm preventative and are treated for tapeworm, hookworm and roundworm as needed. This type of care during a pup's growing years can result in a larger body. At Maya's 2005 medical exam, she weighed 75 pounds, while the average female wolf radio-collared in a U.S. Geological Survey (USGS) study weighed approximately 65 pounds. Whereas the males in the Center's Exhibit Pack all top 85 pounds, the average male wolf radio-collared by the USGS weighed about 75 pounds. Some of this difference could be caused by the fact that the Center's ambassador wolves are members of a larger strain of wolves than lives in Minnesota. However, a captive life, where food is brought in on a wheelbarrow, versus a wild life, where food is brought down by the strength of the paws and the grip of the teeth, can result in quite a difference in weight.

Behavior: When you ask a local resident to describe typical wolf behavior in the wild lands surrounding Ely, Minnesota, the usual response is "elusive." A wolf is there one minute and gone the next, unless, of course, it is a human-habituated wolf, or people are feeding deer and drawing in wolves. The elusive behavior described is representative of fear-avoidance behavior or the flight-versus-fight response. In captivity, wolves display this behavior at a very young age. Grizzer displayed this behavior at 13 days of age, when he startled at a loud noise, tucked his tail and ran (as best as you can at 13 days of age). Wolves in captivity do have fear-avoidance behavior. If you visit a traditional zoo, you may see wolves hide from visitors or pace in an expression of anxiety about humans. At the Center, this behavior is calmed some by socialization. A socialized wolf is raised with humans from the young age of 12 to 14 days to expose them to the sights, sounds and smells of a human-dominated captive world, but even a socialized wolf is timid about new sights and sounds and would rather retreat than fight.

Stay tuned for the next issue of *International Wolf*, where I will discuss the differences between captive and wild wolves related to breeding status, pack dynamics, dispersal and old-age mortality. ■

Below: A captive life for wolves, with nutritional supplements, parasite control and food brought in on a wheelbarrow, results in their weighing on average 10 pounds more than wild wolves. This wild wolf has a leaner body than the Center's ambassador wolves.

Lori Schmidt

Lori Schmidt

Most wild wolves avoid humans, and even captive, socialized wolves would rather retreat than fight.

Wolves of the World

WOLVES IN BELARUS

Researchers Begin Study of Wolves in Remote Country

by John Griffiths

Sandwiched between Poland to the west, Latvia and Lithuania to the north, Russia to the east and Ukraine to the south, the little-known former Soviet republic of Belarus is a small country, about the size of the United Kingdom. Despite its size, Belarus is rich in wildlife and landscape diversity. The northern portion, known as the Lake District, is dominated by almost continuous coniferous forests running along the border with Russia. The rough terrain is crisscrossed by a dense network of rivers and streams. Numerous lakes, bogs and marshes dot this wild region. The southern part of Belarus is characterized by a landscape of broadleaf forests and rivers with vast waterlogged floodplains containing important bird and mammal species.

Belarus has suffered terrible hardships since a nuclear reactor at Chernobyl in Ukraine exploded in 1986, spreading radiation (Belarus received 70 percent of the fallout) and leaving many areas too contaminated for human habitation. The exclusion zone, established in the chaotic aftermath of the accident, is supposed to be off-limits to people. Although a few residents have returned to their homes, the absence of humans has allowed wildlife, including wolves, moose, roe deer and wild boars, to flourish. The northern and central regions of Belarus are home to perhaps 1,500 to 1,800 wolves. However, recent studies in neighboring Russian and Poland show that wolf populations regularly cross back and forth across national borders. That phenomenon combined with a lack of data make population estimates unreliable.

Wolves in Belarus prey on large ungulates (elk and deer) and on wild boars. Wolves occasionally kill livestock on farms in areas where wild prey species are scarce, as they were from 1990 to 1996, according to a study by zoologist Dr. Vadim Sidorovich. During the years between 1997 and 2000, however, ungulates began to recover, and the frequency of predation on domestic animals was reduced.

John Griffiths

Above: Dr. Vadim Sidorovich was fortunate to witness the denning behavior of the breeding female of a wolf pack in Rossony. She dug her dens in hills of sand or peat.

John Griffiths

Right: Dr. Vadim Sidorovich entered one of the dens very briefly to check the number and sexes of the pups remaining inside. He counted three females and four males.

Nevertheless, as in other countries around the world, wolves in Belarus have long been persecuted because of fear and misunderstanding. The wolf in Belarus is largely unprotected except in nature reserves. It is designated a game species, and bounties ranging between 60 and 70 Euros are paid to hunters for each wolf killed. This is big money in a country where the average monthly wage is 230 Euros.

In 2005, Sidorovich assigned a research group made up of a small number of his Ph.D. students to carry out a wolf population study in three areas of the country. The main study areas are in Rossony and Poozerre, forested areas along the border with Russia. Although still in its infancy, the main purpose of the study is to compare the movements and numbers of wolves in these border areas to those of two stable packs located in Naliboki Forest in the center of the country.

As part of this work, Sidorovich plans to carry out an annual wolf population census, which will begin in November and continue periodically throughout the winter months, ending in late spring. In early summer, the research group will observe the movements of wolves as well as their hunting behavior and pack dynamics.

While working on data collection, Sidorovich was fortunate to witness the denning behavior of the breeding female of a wolf pack in Rossony. She used not one den but several, up to a kilometer apart. Deep in the forest and close to water, she dug her dens in hills of sand or peat. Sidorovich observed that she often moved the pups one by one between the den sites. Whether or not the wolf knew she was being observed remains a mystery, but it could explain her behavior.

During one of the wolf's regular outings to move the pups, Sidorovich entered one of the dens very briefly to check the number and sexes of the pups remaining inside. He counted a total of three females and four males. After taking photographs of the pups and the inside of the den, Sidorovich quickly retreated to a safe distance. Upon her return, the female checked the area around the den and continued her routine of moving the pups.

Sidorovich will continue his work for as long as funds will allow, hoping to establish links with other scientists in the world of wolf research. His goal is to establish a wolf management and education program promoting protection of the wolf and its habitats and to teach the people of Belarus about the role it plays in the natural world. ■

John Griffiths has worked with wolf scientists at the Central Forest Biosphere Reserve in Russia for the past ten years. He recently worked in Belarus with Dr. Vadim Sidorovich. He lives in Liverpool, England.

WOLVES IN INDIA

Desert Wolves of India

by Cornelia Hutt

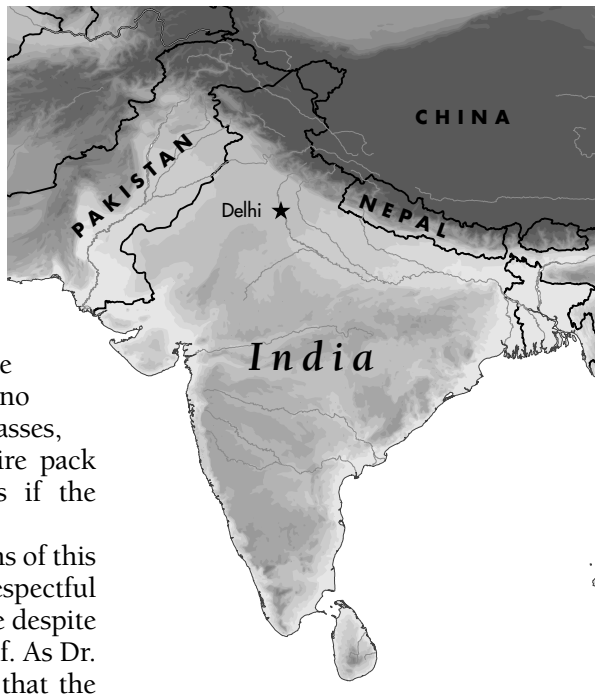
I wish everyone could see the good side of the wolf like Rudyard Kipling did in The Jungle Book.

—Dr. Yadvendradev Jhala

If asked to identify a major predator in India, most people would probably name the tiger. We think of Shere Khan, the menacing jungle cat in Kipling's mythical story about a child raised by a wolf family. In fact, wolves are also major predators that live in several regions of India, but they are often viewed as dangerous to people. For this reason and because of economic competition, coexistence between wolves and humans is difficult.

Dr. Yadvendradev Jhala, a member of the World Conservation Union (IUCN) Wolf Specialist Group, has devoted 15 years to studying wolves in India. In the beautifully filmed and eloquently narrated BBC documentary *Desert Wolves of India,* Dr. Jhala takes the viewer with him and his research assistant, Kartikeya Singh Chauhan, as they search for signs of an ancient race of wolf whose home is the arid region of western India near the border of Pakistan. Little wild prey exist in this virtual desert. Therefore, wolves are sustained by feeding on domestic animals, thus fueling deep-rooted hatred among the local people.

In addition to supporting wild animals such as wolves, jackals, hyenas and honey badgers, western India is home to the Ribari, a pastoral



people whose only wealth is their livestock. Day and night, shepherds stay close to the treasured sheep, goats and cattle that are the Ribari's currency. Dogs wearing spiked protective collars also guard the domestic animals. Despite constant vigilance, however, wolves regularly prey on the Ribari's precious livestock.

The Ribari find it hard to understand why anyone would want to study the wolf, let alone respect it as Dr. Jhala does. Since these nomadic people use little modern technology, they have only sticks and their guard dogs to ward off wolves that attack sheep and goats. Thus, the Ribari's main tactic against the wolf is to locate a den and kill the pups while they are still young and vulnerable.

Therefore, wolf packs often have two or three alternative dens, and the adults typically move their pups when the Ribari come too close. But the wolves are no match for poison-laced carcasses, which can wipe out an entire pack including the nursing pups if the mother dies.

One of the several strengths of this documentary film is its respectful depiction of the Ribari people despite their declared war on the wolf. As Dr. Jhala points out, it is ironic that the Ribari's traditional way of life is both a threat to the wolf and the reason it survives in this harsh and unforgiving land where droughts can last for years. When rain does come, it brings an explosion of wildlife along with a flood of Ribari families to exploit the lush grass for their grazing livestock. More humans with sheep and goats mean more food for the wolves, but along with the food source comes more pressure from competition with people.

Dr. Jhala concludes his narration of the film on a note of determination that is consistent with the World Conservation Union (IUCN) Wolf Specialist Group's "Manifesto on Wolf Conservation," which states that wolves, like all other wildlife, "have a right to coexist with man as a part of natural ecosystems."

"There must be," Dr. Jhala says, "a way we can live alongside these wonderful animals without killing them. I hope to convince my fellow countrymen that, like the elephant and the tiger, the wolf is just as worthy of respect."

Yadvendradev Jhala

Wolves live in several regions of India including the arid western region near the border of Pakistan.

Desert Wolves of India
A 2004 BBC production – Natural World Series; produced for the BBC by Mike Birkhead Associates

Neil Hutt is an educator and International Wolf Center board member who lives in Purcellville, Virginia.

Huichol Mexican Wolf Mask

by Jorge Servín

At the international meeting "Frontiers of Wolf Recovery" in October 2005 in Colorado Springs, Colorado, I presented Dave Mech with a special present, a Huichol wolf mask, handcrafted by Huicholes, who inhabit small, remote communities in the mountains of the western Sierra Madre in the Mexican states of Jalisco, Zacatecas, Nayarit and Durango.

Huicholes have great knowledge of, and a strong relationship with, nature. They nurture an inner vision of the place occupied by Huicholes in the natural and magical world of their gods. This world is expressed artistically, and the sacred animals, jaguars *(Panthera onca)* and wolves *(Canis lupus),* have masks crafted in wood and/or paper maché.

Mech's mask is made out of paper maché and beautifully ornamented with thousands of multicolored seed beads, each one "glued" to the surface with beeswax to produce symbols of sacred elements. On the forehead of the wolf mask is a Huichol sacred peyote symbolizing the universe and life without beginning or end. Peyote is chewed in traditional rituals to transport the Huichol's mind to the chaman's world, where reality is different from ours, and to receive knowledge that can be applied in this world. Art is the physical translation of images visualized in a state of wide consciousness induced by the sacred peyote. Art is a tangible manifestation of experiences in the gods' kingdom.

Huicholes have magical healers, wolf chamanes, which are able to take virtues from the wolves to heal people's souls. Huicholes recognize wolves' qualities as solidarity, group work, loyalty, family life and especially intelligence and cleverness. These are the qualities Mech has displayed in his intense life as scientist and enthusiastic student of wolves. A Huichol chaman would say: Dave Mech was a wolf in another life; now, as human, his spirit is part wolf, teaching humans to respect nature and making it possible for his brother wolves to return forever to the forests. ■

Jorge Servín (servinj@ujed.mx) is a researcher for the Universidad Juárez del Estado de Durango (UJED), Mexico. He has been involved with the Mexican Wolf Conservation Program since 1983 and represents Mexico as a member of the Wolf Specialist Group of the World Conservation Union, and for the Mexican Wolf Species Survival Plan. Currently, he is advisor to the Mexican government in the selection of the appropriate areas to reintroduce wolves in Mexico.

Personal Encounter

Walking on the Wild Side with Wolves

by Tom Wharton

Monty Sloan/WolfPhotography.com

This article originally appeared in the Salt Lake Tribune.

YELLOWSTONE NATIONAL PARK

The wolves were gone. But we knew they had been there. Blood-soaked snow surrounded by ravens revealed a recent kill.

Even Yellowstone Association Institute instructor George Bumann and a plethora of veteran, scope-wielding wolf watchers could not spot one of the newest stars of Yellowstone's wildlife galaxy.

There were times when the gray and black rocks on snow-covered hills seemed to move. Distant bison and elk caught our attention. Bumann spotted what he affectionately called wolf rocks—wolf-shaped boulders wildlife watchers desperately wished were the real thing.

Still, we scanned, listened and waited on a quiet and clear January afternoon.

There are an estimated 118 wolves inside Yellowstone, Bumann explained. Their average age is 3.8 years.

Jerry Myra, a houndsman from Oregon, sleeps in the back of his ancient pickup in Cooke City each night so he can drive this road, the only one in the park open to cars in the winter.

"I like to watch wildlife," he said. "Anything four-legged is fun… I am interested in wolves. They may be bringing them back into Oregon. You want to know as much as you can."

Lois Lyman moved to the Yellowstone area from Southern California, where she taught school. She says a bit of wildness lives in everyone and the wolf represents that feeling she has inside.

At times gray and black objects on snow-covered hills are wolves, as in this photo, but sometimes they are "wolf rocks," wolf-shaped boulders that wildlife watchers desperately wish were the real thing.

Bumann, an artist and a naturalist, talks fondly of Wolf No. 21. He has sculpted the charismatic animal—now dead—of the original Rose Creek pack introduced in 1995, a wolf believed to be the father of Druid Peak Wolf 253 that has ventured into northern Utah's Cache Valley.

The sun was getting low in the sky. No one spotted a wolf.

Then, following a gut instinct, Bumann took us back to a spot where we spent time earlier in the day. I expected to see more *Canis mineralis*. Instead, the naturalist spotted a single black wolf, appearing and disappearing like a ghost.

Soon, as if on cue, we saw five other members of the Slough Creek wolf pack, one light gray. My heart pounded as I watched them in the scope—another of my life's goals now a reality.

There was more drama to come.

The wolf pack suddenly organized itself. With five of the animals in front and another in back, the wolves stalked a huge, six-point bull elk. I gasped, not knowing whether to watch what appeared to be a sure kill. The elk resisted and the wolves, perhaps wary of being kicked, quickly gave up and faded into the trees.

I returned to the area the next morning with Bumann and others.

The Yellowstone sky at dawn was "ice cream colored," as one companion described it. A large bull elk lounged in the snow, its antlers covered with frost. Bison, their huge brown bodies dusted with snow, woke and began searching for food.

In the distance, the distinct sound of a howling wolf pierced the morning silence. Coyotes joined in the chorus, offering a more high-pitched yip to a symphony of wildness.

"My friend has a theory," said Bumann. "The coyotes start howling at dawn and the sound goes all the way across the country."

Wolves remain a controversial addition to Yellowstone and surrounding areas where the animals have migrated. Elk numbers are down, making more than a few hunters unhappy. Ranchers watch the big predators nervously. The restoration of a predator eliminated in the early 1900s has changed the dynamics of life for wild creatures and humans.

Yet, the sighting of the Slough Creek Pack and the howling of wolves and coyotes gave me the sense that Yellowstone remains wild and whole. A Yellowstone ecosystem missing wolves would be like a Beethoven symphony without violins.

Tom Wharton has worked for the Salt Lake Tribune *since 1970, covering sports, the outdoors and travel, and writing columns. He is past president of the Outdoor Writers Association of America and has co-authored numerous books on Utah subjects.*

Packs in Yellowstone make frequent kills.

Monty Sloan/WolfPhotography.com

Wolf Tracks

Buffalo Bullies in Yellowstone

by Jay Hutchinson

The old joke that goes *"Where does a 400-pound gorilla sleep?—"Anywhere he wants to!"* could likely be applied to that majestic icon of the American West, the bison, which is imposing not only in size and weight but also in its herding instincts. Observations of bison behavior in Yellowstone National Park during the past decade show a peculiar in-your-face aggressiveness not only toward their arch predator the gray wolf, reintroduced to the ecosystem in 1995 and 1996, but also toward elk, which have shared Yellowstone range with bison for many years.

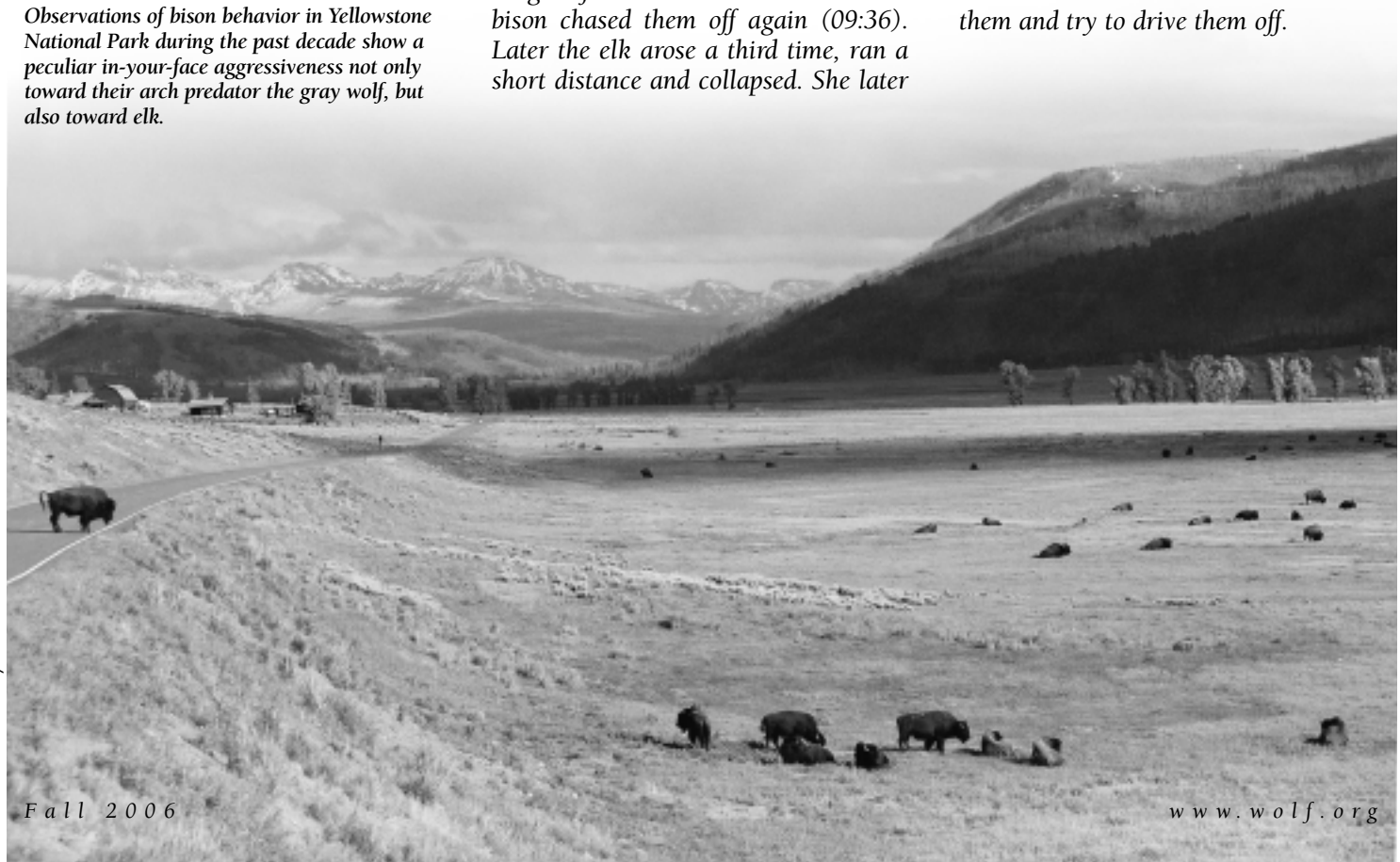
The most commonly observed aggressive actions of bison have been toward wolves that are attacking or feeding on elk carcasses the wolves have downed. Three times in the past five years bison were seen chasing wolves from a kill. Here is one observer's graphic description of the action:

At 09:31 11 wolves [of the same pack] targeted a single cow elk and pulled her down. A herd of 39 bison rushed to the downed elk, chased the wolves off, and surrounded the elk tightly (09:33). Suddenly the elk leaped up. Two wolves approached the elk and nipped at it. The elk ran through the bison herd, and the two wolves pursued it. After about 30 meters the elk fell. The wolves were on it again for about 30 seconds when the bison chased them off again (09:36). Later the elk arose a third time, ran a short distance and collapsed. She later tried to stand again but could only get up on her hind legs. A bison butted the elk's rear end and knocked her down, and the bison herd surrounded the elk again and kept the wolves away. Each time a wolf approached, a bison would chase it 15–30 meters. After a few minutes the wolves headed away up a hill and bedded (09:36).

The elk, while surrounded by bison, kept raising her head and trying to get up. . . . The bison remained tightly around the elk from about 09:39 on. By about 11:35, the elk's head was no longer up and her body lay flat; she seemed dead. Ravens landed on or next to her, although the bison still surrounded her closely. Bison licked or sniffed the carcass intermittently for several minutes.

The wolves had returned at 09:55 and hung around 15–60 meters from the bison herd, and at . . . times . . . tried to reach the downed elk. Each time, one or more bison would skirmish with them and try to drive them off.

Observations of bison behavior in Yellowstone National Park during the past decade show a peculiar in-your-face aggressiveness not only toward their arch predator the gray wolf, but also toward elk.



Kathie Lynch

Monty Sloan/WolfPhotography.com

Researchers have concluded that bison are aggressive toward various intruders, including wolves trying to feed on carcasses near the bison herd.

About 12:53, the bison started moving away…and by 13:05 wolves moved in. Several times, the bison quickly returned and ran the wolves off.… Eventually, however, the bison all grouped east of the elk, and the 11 wolves began to feed. The bison then charged the wolves and ran them off.… [Later] the wolves returned and chased the bison away.… There were two additional standoffs at the carcass, and both times the bison chased the wolves away.

Such skirmishes continued [for awhile]…but gradually the bison began to [leave]…and the wolves became bolder. By 13:13, the wolves controlled the carcass…and fed, while the bison drifted off.… By 13:50 most of the wolves were done feeding and slept on a hill above the carcass.…

But the bison were not yet through harassing this wolf pack. Two days later they rousted the wolves from their sleep:

At 09:09 6 bison leading a larger herd [probably including the same 39 seen there two days earlier] approached…the wolves.…[They] arose, moved 100 meters, and lay down again. Two minutes later, the bison approached…to within 3 meters, and the wolves again moved off 100 meters and lay down. At 09:18, a bison approached one of the wolves.… [The wolf] confronted it; the other wolves joined in harassing the bison for 30 seconds.

The wolves then left at 9:20 and moved…a few hundred meters and lay down on a rocky ridge.…Several more times the bison followed the wolves and rousted them out of their beds.

Even more unusual than bison harassing a possible predator were observations of bison attacking a newborn elk calf and a wounded elk calf.

Newborn elk calf: The newborn got separated from its mother and mixed up in the middle of a bison herd, where a bison knocked it down and repeatedly butted it to the ground. Several bison licked and sniffed it. As it got up and tried to walk off, several bison chased it, and one butted the calf in the side and knocked it down. Twelve more came over to sniff it. The calf got up and ran off but was again chased and knocked down by the bison.

As long as the calf stayed down or stood still, the bison just sniffed and licked it, but whenever it ran, they chased and knocked it down. This sequence happened at least four times. A cow bison later butted the calf several times as it lay on the ground. The herd then walked

away as the calf lay motionless on the ground, possibly dead from all the butting.

Wounded elk calf: Several coyotes were spotted near a 9-month-old elk calf that had blood on its neck. The bison herd gathered near the calf and over a 4-hour period, sniffed, licked, chased and butted the young one as it tried to seek refuge from the coyotes by running into the bison herd. During 40 minutes of videotaping by the observer, the bison butted the calf 21 times, usually in the rear or side, and once knocked it into the air. At times the calf was bedded or lying on its side when the bison butted it.

The elk's abdomen was obviously wounded, and an organ was protruding. Apparently a bison charged the calf at full speed and hit it hard in the side. The bison herd then blocked the view while the calf stayed down for 20 minutes. When it arose, its abdomen had been ripped open.

After 4 hours, the bison drifted away from the wounded and bedded calf. Five coyotes killed the calf as it weakened.

These unusual observations have led researchers to wonder why bison would be so aggressive toward non-attacking wolves and toward elk. The common element in most of these observations was a weakened or downed elk and the butting, sniffing and mobbing of it. When the elk incidents also involved wolves, perhaps the predators' presence was only incidental, which made the aggressiveness of the bison seem to be directed at keeping wolves away from the carcasses or injured animals.

Researchers concluded that bison might show two types of "hyper-aggressive" behavior: (1) a general antipredator aggressiveness toward various intruders, regardless of species; and (2) continued aggressiveness toward intruders that do not flee, such as wounded animals or animals seeking refuge in the bison herd. This includes wolves trying to feed on carcasses near the bison herd. Bison are so large and powerful that when a herd acts aggressively, it can charge and attack both wolves and grizzly bears with impunity, so it is perhaps advantageous for bison to advertise this ability by persistently harassing intruders of any kind, even the weak ones. ■

Jay Hutchinson is a writer and editor, retired from the U.S. Forest Service's North Central Research Station, in St. Paul, Minnesota. Between travels, he enjoys writing about various natural history subjects, including wolves.

Reference

Mech, L. D., R. T. McIntyre, and D. W. Smith. 2004. Unusual behavior by bison, *Bison bison*, toward elk, *Cervus elaphus*, and wolves, *Canis lupus*. *Canadian Field Naturalist* 118: 115–18.

The bison is imposing not only in size and weight but also in its herding instincts.

Monty Sloan/WolfPhotography.com

Homecomings Mean Big Changes in Yellowstone

Wolves Mean More Willows, and More Willows Mean More Wildlife!

by Kirsten Galloway

Do you know what wolves and willows have in common? In Yellowstone National Park, some scientists think that wolves and willows are the reason more animal species are returning to America's oldest national park after years of being gone.

In 1995, wolves were reintroduced to Yellowstone. Since then, biologists and wolf watchers have noticed some big changes. Before the wolves returned, giant elk hung out in the low-lying streambeds, munching away on tasty willow plants. But now the elk are heading to the rockier hillside, leaving the willows for other species, like beavers and birds. This may be because the elk are anxious to be unobserved by the watchful eyes of the hunting wolf. Or it could be because of other changing factors like less snow, which allows elk to frequent the slopes.

Willows make a good meal for beavers, which build their dams close by. The dams create pools of water that serve as habitat for otters, muskrats and bird species. Willows are also wonderful places for birds like yellow warblers and willow flycatchers to nest.

While there is still much unknown about the results of reintroduction of wolves to the area, the impact on wildlife may be very positive. Scientists continue to watch carefully the changes taking place and hope to see balance returned to this beautiful wildlife setting.

You can read more about the reintroduction of wolves in Yellowstone and the amazing impact it has had on the ecosystem at http://www.nps.gov/yell/nature/animals/wolf/wolfrest.html. ■

Kirsten Galloway writes articles and short stories for kids and grown-ups from her home in Corcoran, Minnesota.

Source:

Nicholas Thompson, "Wolves' Return Restores Balance to Yellowstone National Park," *Duluth News Tribune*, 5 October 2003.

Field Journal Activity

An ecosystem is a community of animals and plants interacting with one another and their physical environment. Yellowstone National Park is an incredible example of an ecosystem that has been brought into better balance because of wolves being returned to the area. This can be called "ecological restoration."

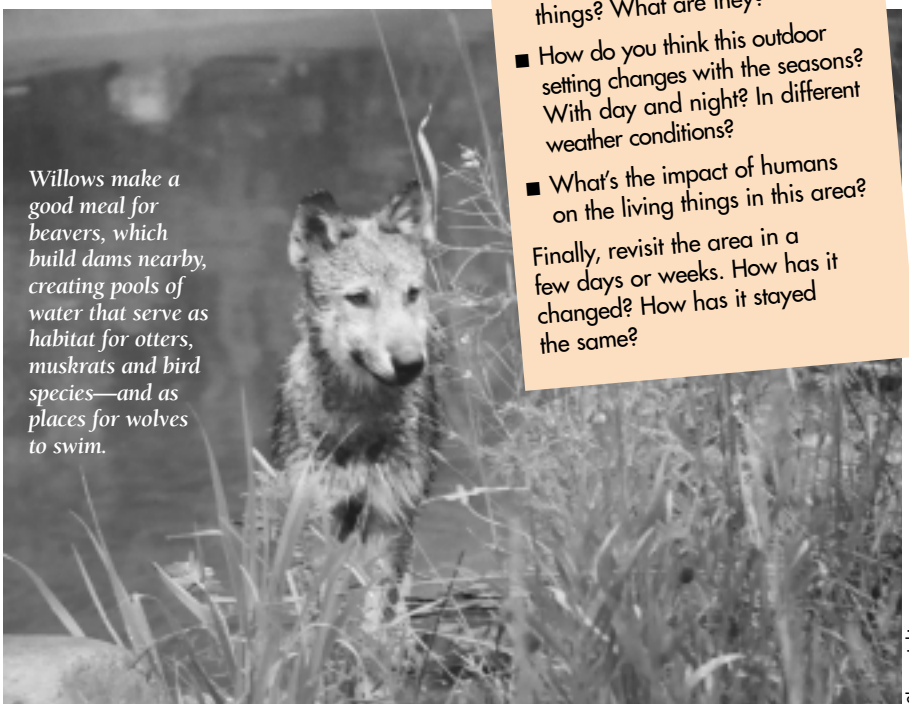
Here's an activity that will give you a chance to observe an ecosystem of your own.

First, choose a place you can observe. It can be your backyard, a park, a schoolyard or any outdoor setting.

Next, record what you see with words or pictures. Here are some questions to get you started:

- What's living? What makes something a living thing?
- What do the living things need to stay alive?
- Are there threats to the living things? What are they?
- How do you think this outdoor setting changes with the seasons? With day and night? In different weather conditions?
- What's the impact of humans on the living things in this area?

Finally, revisit the area in a few days or weeks. How has it changed? How has it stayed the same?



Willows make a good meal for beavers, which build dams nearby, creating pools of water that serve as habitat for otters, muskrats and bird species—and as places for wolves to swim.

Sherry Jokinen

A Look Beyond

Artificial Insemination and Wolf Recovery

by Cheryl Asa

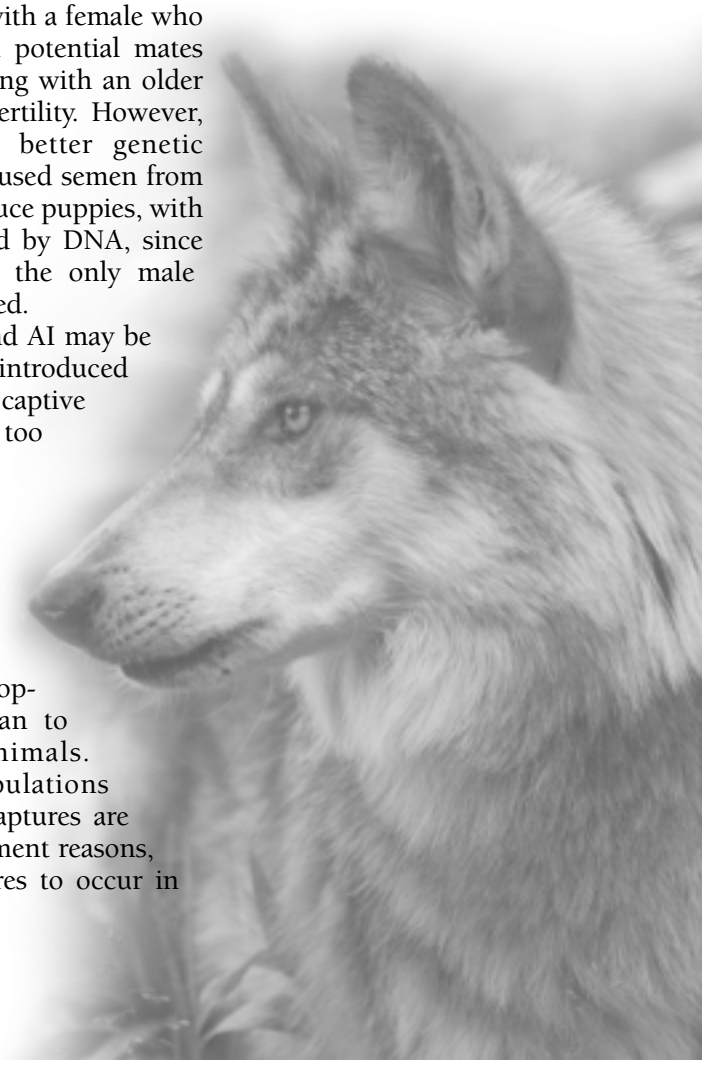
Recovery of both Mexican gray wolves *(Canis lupus baileyi)* and red wolves *(C. rufus)* has been possible because of captive breeding programs. But captive breeding is not as simple as just putting males and females together and waiting for the appearance of pups. Modern zoos carefully manage reproduction to maintain the genetic health of these small populations. Sophisticated "computer dating systems" recommend which animals should be paired based on how closely related they are to each other, to prevent inbreeding; and how related they are to others in the population, to equalize the genes from founder animals throughout the population. Artificial insemination (AI) using frozen semen from a gene bank can help achieve these genetic goals.

An obvious reason to have a gene bank is to preserve genes from animals beyond their natural life spans. But even within an animal's lifetime, recommended pairings that would otherwise require shipment of the wolves around the country or, in the case of Mexican wolves, between the United States and Mexico can be accomplished by shipping semen. AI is also an answer to the problem of individual animals that don't agree with these "arranged marriages" and refuse to accept a mate. A problem also results when a compatible pair is too prolific, swamping the population with their puppies (i.e., packages of their genes). The recommended solution may be to split up the pair to mix their genes with others, but wolves' pair bonds can be very strong, so separation may be stressful. Again, AI with the semen of the genetically preferred male can accomplish the genetic goal without disrupting pair bonds.

Now that the techniques have been modified to work in both red wolves and Mexican gray wolves, the breeding recommendations formulated each year for the captive populations can include AI as an option when moving individual animals may be difficult or when genetically important pairs prove incompatible. Our first successful AI with a Mexican wolf was with a female who had refused several potential mates before finally bonding with an older male of declining fertility. However, other males were better genetic matches. Thus, we used semen from those males to produce puppies, with parentage confirmed by DNA, since she remained with the only male she had ever accepted.

Gene banking and AI may be as important for reintroduced wolves as for their captive cousins, since they too have genetically restricted populations. We anticipate situations in which it will be simpler to introduce new genes into free-ranging populations via AI than to introduce new animals. Especially in populations where occasional captures are needed for management reasons, timing those captures to occur in the breeding season offers opportunities to bank semen from males for future use and to expand the population's gene pool through AI. Semen collections from free-ranging males also allows moving genes back into the captive population, which can be critical to its long-term viability. Small or fragmented populations remain at risk of extinction, and infusion of new genes via AI is one of the tools available to us to maintain these populations. ■

Dr. Cheryl Asa is Director of Research at the Saint Louis Zoo.



Jacquelyn Fallon