

The ripple effect

When 31 Canadian wolves
were relocated to Yellowstone National Park,
the impact was swift and surprising

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THE RAVEN does a double take, circles back and cranes its neck for a better look. For a long moment, it hangs over our heads, as if trying to

make sense of the strange spectacle on the trail below. This is what it sees. Half a dozen people are proceeding slowly down a narrow, stone-walled valley in Yellowstone National Park, our boots and skis chattering against the ice-glazed snow of mid-March. In the centre of our group, on an orange plastic sled, lies the body of a wolf. Big, once bold, still beautiful. Dead.

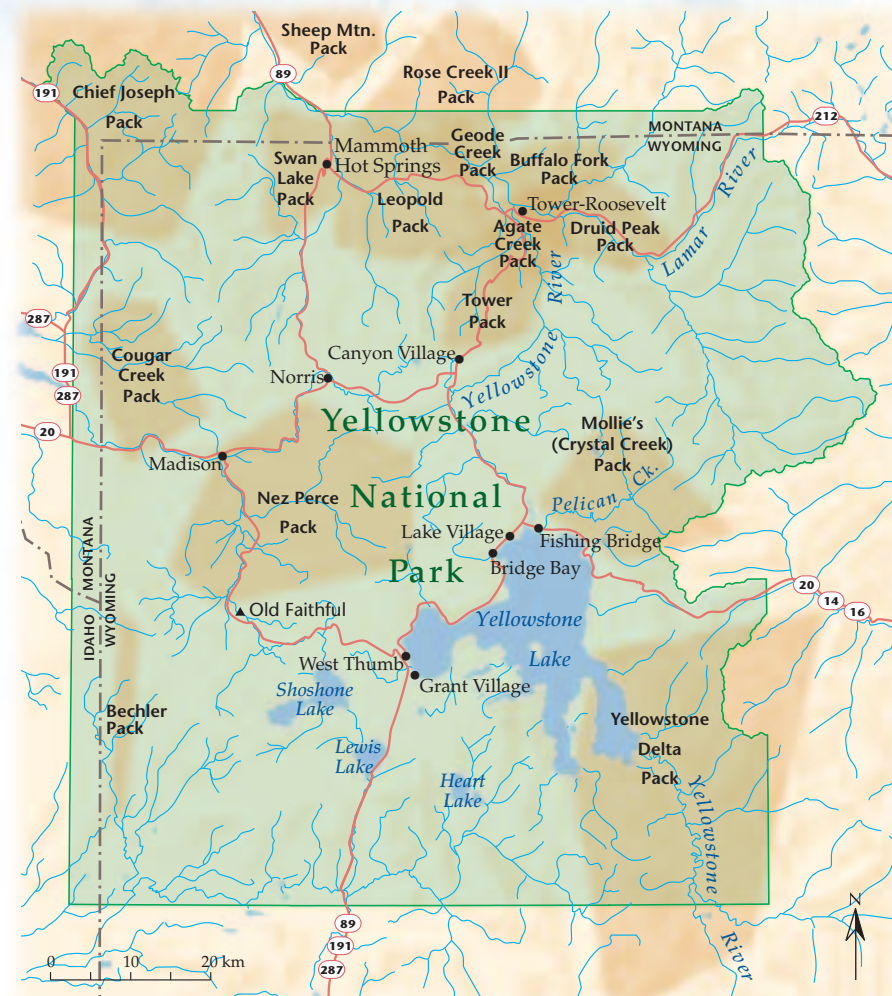
There was a time, not so very long ago, when humans hunted wolves to extinction not only here in Yellowstone, the world's first national park, but across much of the continent, from central Canada south through the United States to the Mexican highlands. As recently as the late 1920s, when the last of Yellowstone's native wolf population was eliminated from the Lamar River valley, just down the road, the sight of a dead wolf was a cause for raucous joy. In those days, the animals were reviled as bloodthirsty killers, nature red in tooth and claw, the enemies of progress and civilization. But the procession on the trail today is not jubilant. The laughter that ripples up from our conversations is quiet; our pace is respectful. A whole new conception of the wolf lies bundled on that sled, a vision of a species that not only takes life but also, unexpectedly, gives it.

Overhead, the raven is still hoping to claim that gift of life for itself. After feeding on wolf-killed elk all winter, will this be an opportunity to feed on the hunter as well? We pause to

watch as the would-be scavenger loops above us, stark against silver-grey clouds, and then drifts over a cliff and away from the threat of human presence. It will have another chance. Wolves are back in Yellowstone — to stay this time — and they have set the whole place buzzing with opportunity and surprise.

THE TASK OF OVERSEEING the reintroduction of wolves into Yellowstone — and of assessing the complex ways in which they are making their presence felt — has fallen to Douglas Smith, a tall, rangy biologist with a goofy handlebar moustache and chiselled good looks. It was Smith who first picked up the insistent beeping of the dead wolf's radio collar and then organized a crew to ski into the mountains and retrieve its

By travelling single file through deep snow in Yellowstone National Park's Pelican Valley, the Crystal Creek wolf pack (ABOVE) allows animals toward the back of the line to conserve energy while they flush quarry. The pack's original members were captured near Hinton, Alta., in 1995. The alpha male of the Chief Joseph pack (PRECEDING PAGE) from the Fort St. John, B.C., area wanders through Yellowstone's Lamar Valley in search of a mate. He finally found two but was lucky to survive an attack by five wolves in a rival pack.



There are now 31 wolf packs in the Greater Yellowstone Ecosystem — an area almost the size of New Brunswick (ABOVE). The territories of 15 of these are illustrated here (LEFT).



Yellowstone Wolf Project leader Douglas Smith (ABOVE, right) and wildlife technician Adam Bucki bring a tranquilized wolf involved in a sheep kill near Dillon, Montana, back to the park. On average, only 50 livestock a year are killed by Yellowstone wolves. Biologists are fitting a third of the animals in each of the 31 packs with radio collars so they can be tracked. This pup from the Leopold pack (OPPOSITE) was collared in January.

Truth and consequences

GIVEN THE CHOICE, research shows, wolves prefer to hunt wild animals rather than domesticated livestock. That helps explain why the reintroduction of the predators to Yellowstone National Park eight years ago has so far had a relatively minor impact on ranchers living just outside the protected area.

Before the Canadian wolves even arrived, however, the U.S. Fish and Wildlife Service secured the co-operation of many wary landowners by classifying the animals and their descendants as “experimental and non-essential.” This designation means a Yellowstone wolf caught in the act of killing livestock on private property can be legally shot. If there is evidence after the fact, wildlife officials will track the offending wolf and return it to the park. In the case of a second offence, the wolf will be killed or relocated to a zoo or other secure facility.

Ranchers are also compensated by the non-profit group Defenders of Wildlife for proven livestock losses due to wolves.

carcass. Later, with the wolf on its way for a post-mortem, he and I reconvene in his book-lined cubbyhole of an office at park headquarters, in Mammoth Hot Springs, Wyoming.

Now 43, with hair that is tending to wolf-grey at the temples, Smith has been with the Yellowstone Wolf Project since its inception in November 1994. That winter, 14 wolves from a flourishing population near Hinton, Alta., were trucked into the park, held briefly in acclimation pens, then sent forth to make a new life in a new land. That first release was followed a year later by the introduction of an additional 17 animals from Pink Mountain near Fort St. John, B.C., — the ancestors of the unfortunate wolf we dragged down the mountain. Turned loose into a carnivore’s paradise of bison and elk, with no resident wolf packs to hold them back, the pioneering population experienced such exuberant growth that planned introductions for succeeding years were cancelled. “We were ahead of schedule and under budget back then,” recalls Smith, cracking a grin. “Everybody liked that.”

The immediate goal of the program was to establish at least 10 resident packs of wolves in the park and its surrounding public and private lands, an area known as the Greater Yellowstone Ecosystem and, at 73,000 square kilometres, just slightly smaller than New Brunswick. By this spring, the objective was long surpassed, with a population that appears to be levelling out at about 31 packs, with 19 breeding pairs and more than 250 adults. In part because of this historic achievement, the U.S. Fish and Wildlife Service recently nudged grey wolves up one step on its list of species at risk, from “endangered” to merely “threatened” in most of the contiguous 48 states.



“The reintroduction of grey wolves into Yellowstone has to rank as one of the most important acts of wildlife conservation in the last century,” says Smith, his faded blue eyes suddenly intense. “This is an act of healing, the restoration of one of the last great ecosystems on the planet.”

Hold it right there. An act of healing? How can a killer such as the wolf heal anything? Consider, for example, what has happened to the wolf’s smaller cousin, the coyote, in the northern range of the park. Apparently scarce before wolves were wiped out, coyotes prospered mightily in their absence. In the mid-1990s, just before the wolf reintroduction program, no fewer than 80 coyotes in 12 packs — the densest population ever known — were roaming through the wide, flowing reaches of the Lamar River valley, where they feasted on rodents, winter-killed ungulates and elk calves. By 1998, this robust population had been reduced to 36 survivors in nine small packs. That’s a violent loss of more than 50 percent in just three years. Although the coyote population has since stabilized, as the underdogs learn how to keep out of harm’s way, they are still brutally excluded from the core-use

areas of wolf territories. Where’s the healing in that?

Smith would be the first to admit that wolves are killers — “good, effective killers.” But he hastens to add that killing, whether in the form of predation or dog-on-dog conflict, can be a natural and constructive force. In this case, for instance, the absence of a top predator for 60-odd years had allowed coyotes to rise to such extreme abundance that the entire ecosystem had been thrown out of whack. As evidence, he points to coyote research done by the husband-and-wife team of Bob Crabtree and Jennifer Sheldon, who found that at their peak, coyotes on Yellowstone’s northern range were taking an enormous bite out of the local rodent population. A quarter of all pocket gophers, a third of the ground squirrels and two-thirds of voles were disappearing into the coyotes’ jaws.

“What did that do to all the other rodent predators?” asks Smith, rhetorically. Although a study of rodent numbers has not yet been finalized, early results suggest that ground squirrels have increased explosively since wolves were reintroduced, particularly in the core areas where coyotes no



C. WERMTER/ZEEA

Fur trading

CANADA HAS BEEN EXPORTING wildlife for at least half a century with mixed results.

- In the late 1920s, the Canadian beaver was introduced to the aquatic ecosystems of Poland, Finland and Sweden, where it began spreading and competing for habitat with the European beaver, which rarely builds dams. In Russia alone, our national symbol now numbers an estimated 4,000, and its construction habits are changing the ecology of rivers.
- In 1974, Jean Chrétien overturned 10,000 years of natural history when, as Minister of Indian Affairs and Northern Development, he presented 10 Canadian muskox calves to the Soviet Union. Muskox had been extinct in Asia since they migrated across the Bering land bridge. Now, about 2,500 of the animals roam the Taimyr Peninsula of Russia, where they are valued for their meat and wool, although there is some evidence they are disrupting reindeer migration routes.
- Between 1973 and 1989, nearly 2,000 young puffins (ABOVE) were transported from Great Island, Nfld., to Eastern Egg

Rock and Seal Island in the Gulf of Maine after resident populations were decimated. Organized by the National Audubon Society, the Puffin Project was largely successful, with most of the chicks reaching fledgling age. By 2001, there were 37 puffin pairs on the first island and 145 pairs on the second.

- In 1997, British Columbia transferred 13 mountain caribou to the Selkirk Mountains of northeastern Washington. The state now aims to import more than 60 of the large mammals, considered the most endangered in the United States, from its northern neighbour. A 1963 program in which Maine traded 300 ruffed grouse with Newfoundland for 20 woodland caribou was considered a failure because the caribou herd scattered in all directions. When Ontario swapped moose from Algonquin Park for wild turkeys from Michigan in the late 1980s, however, both groups fared well.
- In 1999-2000, to counter low breeding rates, the San Juan Mountains of southwestern Colorado became home to 25 female and 13 male lynx from the Yukon. Two of the first five animals starved to death within weeks of their introduction. Wildlife biologists say a 50 percent mortality rate is to be expected in such programs. The export of Yukon lynx to New York’s Adirondack Mountains in the late 1980s failed in part because of the high mortality from road accidents.
- Bird success stories also include the transfer of whooping cranes from Wood Buffalo National Park to Florida starting in the 1960s; bald eagles from British Columbia and Nova Scotia to New York, Pennsylvania and California in the 1970s; and peregrine falcons from Quebec and Saskatchewan to the American Midwest in the 1970s and 1980s. Other winners were the Rocky Mountain bighorn and pronghorns sent from Alberta and B.C. to Montana in the 1970s.

Research by Jodi Di Menna



Inside a fenced pen in Yellowstone National Park, a grey wolf becomes accustomed to its surroundings before being released with several others into the wild. Each group was penned for 10 weeks and fed road-killed ungulates.

longer dare set foot. (Farley Mowat's *Never Cry Wolf* notwithstanding, Yellowstone wolves feed primarily on elk, not on rodents.) By trimming back the coyote population — and giving rodent numbers a chance to increase — wolves have almost certainly opened up opportunities for foxes, raptors and other rodent hunters.

And that's just the beginning. A group Smith calls the "scavenger guild," varied freeloaders that feed on wolf kills, is enjoying an even bigger bonanza. Smith's arithmetic is persuasive. Let's say, for example, that a pack of wolves takes down a cow elk, at an average weight of 200 to 225 kilograms. If a wolf's stomach can hold 10 kilograms of meat and there are 10 animals in the pack, that means they can chow down only half the carcass at a time. And when the hunters are bedded down, sleeping off their excess, in come the scavengers — bald and golden eagles, magpies, ravens, foxes, coyotes, black and grizzly bears — to steal as much of the banquet as they can.

"We've seen a grizzly emerge from hibernation in late winter and make a beeline straight to a wolf kill," Smith says. And ravens are even more spectacularly attentive. Smith's right-hand man on the wolf project, Dan Stahler, came to Yellowstone as a master's student in 1998, specifically to study the relationship between wolves and ravens. His conclusion: ravens are called "wolf-birds" for good reason. Of 29 wolf kills he observed in the course of his research, ravens not only found every

single one but found them fast — within four minutes of the time of death. By contrast, the birds located only a third of the carcasses that Stahler set out himself, and they didn't land and feed on any of them. It was obvious to him that the birds were purposefully following wolves and waiting for them to kill in order to be first in line to grab a bellyful. On one memorable occasion, Stahler counted 135 ravens at a wolf kill.

"Every year, I find new nests," says Stahler gleefully, "places I've never found them before. I can't prove it, but I'm pretty sure there are more ravens than there were before the wolves returned." And if more ravens, then more grizzlies? More eagles and magpies? Perhaps more wolverines? By inadvertently providing sustenance to meat-eaters large and small, wolves are sending a pulse of energy through the ecological web and bringing the Yellowstone landscape back to vibrant health.

SMITH IS KEENLY AWARE there are people who mistrust this line of sensitive New Age talk. They're the guys in ball caps and Stetsons who accost him at public meetings, call him a liar, threaten to kill his dog or sneer that he's "a government pig at the taxpayers' trough." Still deeply imbued with the old view of the wolf as a black-hearted fiend, these folks — who speak for a dominant, though by no means universal, segment of rural society — aren't easily impressed by arguments about ripple effects and biodiversity. For them, the matter is simple. True, wolves haven't killed as many cattle as people predicted at first, but they are carrying out a wholesale slaughter of Yellowstone's northern-range elk, and something has to be done about it.

At first glance, the numbers appear to speak for themselves. In the mid-1990s, before the reintroduction began, the northern Yellowstone elk herd stood at around 17,000 head, just down from an all-time high a year earlier of 19,000. Since then, with wolves back in action, the population has been wavering downward toward an average of 10,000 to 12,000 animals. "A lot of people who hate wolves, and I mean literally hate them, have said that the difference between those two numbers is wolves and only wolves," Smith laments. "It's my facts against their facts."

Unlike his opponents, Smith takes into account the dynamics of a free-ranging herd in a free and dynamic world. As he sees it, the population spike of the early 1990s probably represented an unhealthy extreme that pushed the elk beyond

coordinates from radio-collared elk, both pre- and post-wolf, Mao and Boyce have shown that the animals are now spending their summers higher in the mountains, on steeper slopes and in deeper forest than they did before the wolves returned. "This is consistent with the idea," says Boyce, "that the elk are moving away from the valley bottoms where the wolves have their dens."

Who really cares where elk spend their time? Doug Smith, for one. To him, this shift in elk behaviour signals the beginning of a process of change that will bring new life and variety to the entire northern range. If elk move out of the valleys, he reasons, this will give a breather to the stands of willow and aspen around low-lying wetlands and creeks, which are now being denuded by heavy browsing. If the trees have

The belief that wolves are unstoppable killing machines is just not true.

the carrying capacity of their range. "Being at a historic, all-time high, there wasn't much the elk could do except take a downturn." In addition, he points to the effects of a severe six-year drought that has reduced much of the northern range to the driest conditions this past century. "We're getting signs that a lack of food is starting to affect the elk," Smith says. So while wolves have undoubtedly played a role in the decline of the northern herd, they are only one small part of a large and complex picture.

But what really makes Smith's blood boil is the still-too-common belief that wolves are unstoppable, invincible killing machines. "It's just not true," he says. "All things being equal, wolves cannot kill healthy, mature elk. It just ain't gonna happen." Of 743 kills that Smith and his team have examined on the northern range, only 11 percent represented elk in the prime years of life, between ages one and nine. The remaining victims were all either young and defenceless or old and decrepit. Wolves are simply not able to run riot through the herd, taking down healthy animals at random.

Smith likens the relationship between wolves and elk to an evolutionary arms race in which the opposing forces advance, step-by-step, so that attack is always countered by defence. "What people overestimate is the ability of wolves to kill," he says. "What they underestimate is the tactical defence of elk." Some 300 wolves have so far been radio-collared by the wolf project, of which seven or eight have been killed by prey. The dead wolf we hauled down the mountain had bled from the mouth, as if it had suffered the same fate, but the post-mortem concluded that it died of an unspecified disease.

Although wolves are not going to decimate the elk population, they definitely affect the animals' behaviour in subtle, yet significant ways. Brand-new work by two researchers at the University of Alberta, graduate student Julie Mao and her supervisor Mark Boyce, strongly suggests that the elk are shifting away from areas within Yellowstone where wolves have the greatest presence. By comparing thousands of pinpoint

a chance to regenerate, they will provide habitat for animals and birds that are currently rare or missing from the local ecosystem. Birds such as yellow warblers and willow flycatchers. Animals like beavers.

"This is the hottest arena in science right now," Smith says happily. "I know of at least five teams of researchers who all hope to be first to prove that there are more willows in Yellowstone because there are wolves." Contenders for the willow crown include the University of Alberta's Mark Boyce, colleague Evelyn Merrill and student Nathan Varley, who are attacking the problem with high-tech, aerial video-imaging. Smith is certain that the transformation is already afoot. In 2000, in his secondary role as Yellowstone's beaver expert, he located four new colonies of the willow-chewing rodents in the northeastern corner of the park, in an area where willows were rare and beavers had long been absent.

"I always tell people, come back to Yellowstone in 25 or 30 years, and the place will look different," he says. "You might see ponds with luxurious willows and sapling aspens, with beavers and willow flycatchers, warblers, muskrats, mink — even otters, animals that are very rare now. And that difference will be due to wolves." Smith describes wolves as a keystone species, animals that, though comparatively rare themselves, bring diversity and richness and balance to the world around them. This is the lesson of the Yellowstone Wolf Project and a message that holds true on either side of the 49th parallel. In return for providing wolves for the reintroduction, Canadians have been offered a profound new vision of the relationship between life and death and a new conception of wolves, wherever we have the good fortune to find them. ♦

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