Wolf family values

The exquisitely balanced social life of the wolf has implications far beyond the pack, says **Sharon Levy**

GORDON HABER was tracking a wolf pack he had known for over 40 years when his plane crashed on a remote stretch of the Toklat river in Denali national park, Alaska, last October. The fatal accident silenced one of the most outspoken and controversial advocates for wolf protection. Haber, an independent biologist, had spent a lifetime studying the behaviour and ecology of wolves and his passion for the animals was obvious. "I am still in awe of what I see out there," he wrote on his website. "Wolves enliven the northern mountains, forests, and tundra like no other creature, helping to enrich our stay on the planet simply by their presence as other highly advanced societies in our midst."

His opposition to hunting was equally intense. He excoriated the "heavy government-sanctioned killing" and "Mengele-like experiments" with wolf sterilisation in Alaska, which, as he saw it, threaten to transform the very nature of the wolf. And he did not pull his punches when identifying the enemy. "Perhaps worst of all, these problems originate primarily from biologists," he wrote on his website, referring to the fact that many wildlife managers work on the assumption that wolves can withstand heavy culling because they breed quickly.

In Alaska, up to 50 per cent of wolves are shot or trapped every year, with little effect on their numbers. But Haber argued that by focusing on population size, the establishment has ignored the fact that the hunting of wolves warps their social structure, ripping apart the family ties and traditions that define wolf society.

"Gordon was an aggressive personality, and he took on the scientific dogma about wolves," says Douglas Smith, leader of the Yellowstone Wolf Project. Despite many thousands of hours spent in the field, Haber published little peer-reviewed documentation of his work. Now, however, in the months following his sudden death, Smith and other wolf biologists have reported findings that support some of Haber's ideas.

Once upon a time, folklore shaped our thinking about wolves. It is only in the past two decades that biologists have started to build a clearer picture of wolf ecology (see "Beyond myth and legend", page 42). Instead of seeing rogue man-eaters and savage packs, we now understand that wolves have evolved to live in extended family groups that include a breeding pair – typically two strong, experienced individuals – along with several generations of their offspring.

Building on this insight, Haber argued that older wolves pass knowledge down to younger pack members, and that human hunting disrupts this natural order. Lone survivors or pairs without supporting family members behave more unpredictably and kill more large prey animals than wolves living in stable packs, so hunting is often a counterproductive way of trying to manage wolf populations. His claims have been difficult to prove, partly because few corners of the Earth hold undisturbed wolf habitat where they can be tested.

"Long viewed as a gang of competitive thugs, a wolf pack is actually an extended family"

Few places remain where wolves can live as nature intended

Yellowstone National Park, located primarily in Wyoming and also in parts of Idaho and Montana, is one of the exceptions. Grey wolves were reintroduced here in 1995, following a 70-year absence that resulted from intense predator control measures in the early 20th century. The population now thrives, and in recent years it has become clear that packs there are different from those in areas where wolves are regularly killed because of conflicts with people or their livestock. Outside the protective boundaries of the park, few wolves live more than three or four years, and a pack seldom includes more than five or six individuals. Within Yellowstone, wolves tend to live longer – some have survived to be more than 10 years old – and they sometimes stick with their natal pack into their fourth or fifth year, a phenomenon never before recorded. As a result, packs are multigenerational and typically include

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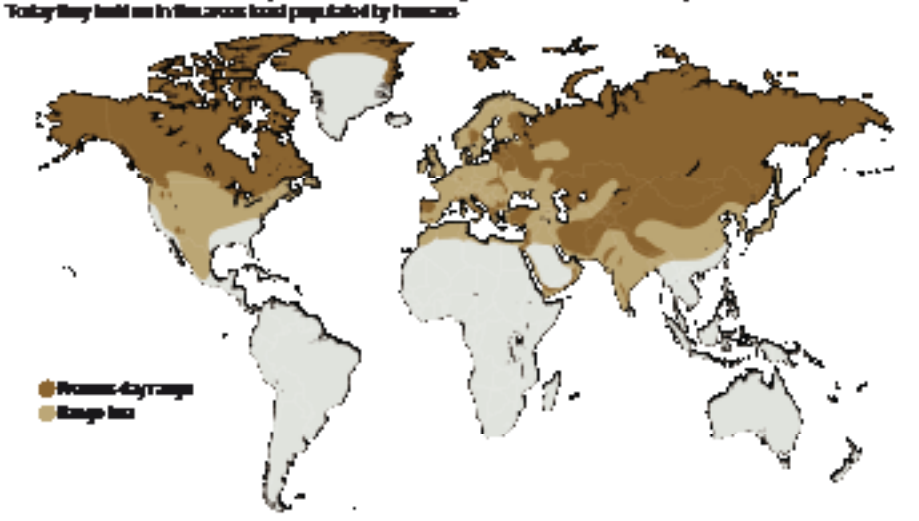
about 11 wolves, though the biggest have more than 20 (*Reintroduction of Top-order Predators*, edited by Matt W. Hayward and Michael Somers, Wiley-Blackwell, 2009).

"Such packs do things very differently than the much simpler packs found in human-dominated landscapes," says Smith. When it comes to hunting, for example, there is a division of labour between the sexes. The fleeter females test herds of elk by rushing them at high speed, to find the weakest targets. Then the heftier males attack and kill the prey. Such skills clearly require practice: during a decade of intense wolf-watching, Smith and his colleagues have documented a learning curve among young wolves (*Ecology Letters*, vol 12, p 1). Yearlings are already at 80 per cent of full size, but the ability to take down an elk peaks at age 2, while the ability to choose the right elk to go after – the greatest intellectual challenge for wolves on the ›

Where the wolf roams



"Allowing wolves to express their natural social behaviour benefits ecosystems"

hunt – doesn't peak until age 3. Smith believes hunting skills are learned by watching older pack members, and from experience.

Comparisons between Yellowstone and areas where wolves are not protected also support Haber's contention that smaller packs tend to kill more prey animals per wolf. A group of five or six wolves cannot eat an entire elk or moose in one sitting. They will fill their bellies and then rest and digest, leaving scavengers such as ravens, eagles, coyotes and grizzly bears to attack the carcass. "They only get one feeding on it," says Smith, "so they will go and kill another animal to feed themselves again at the same pace as a pack that's got twice as many animals."

A new order

The contrast in behaviour between hunted and protected wolves is emerging from studies in another area too. In Algonquin Provincial Park, Ontario, Canada, eastern wolves have been protected for more than a century. Nevertheless, hunting in the surrounding townships was causing around two-thirds of total wolf deaths, primarily in winter when their main prey, white-tailed deer, roamed outside the park in search of forage. Then in 2001, hunting on the outskirts of the park was banned. Since then, Linda Rutledge, a geneticist at Trent University in Peterborough, Ontario, has led a team tracking changes in the wolf population.

Their recently published results reveal that following the 2001 ban, the number of wolves in the park held steady as more animals died of natural causes (*Biological Conservation*, vol 143, p 332). The team also observed a rapid shift in wolf social structure. Before the ban, few animals survived to the age of 5 and a typical pack comprised a handful of unrelated animals. A decade on, packs are now made up of a breeding pair – an unrelated male and female – and two or three generations of their offspring, just as in Yellowstone.

This transition to more stable, family-based packs has been accompanied by a shift in diet. Before 2001, wolves would seldom attempt to take down a moose, even though moose are

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BEYOND MYTH AND LEGEND

Popular ideas about wolves are shaped more by fairy tales than reality. Humanity has persecuted the wolf so aggressively that survivors became elusive and near-impossible to observe. For decades, scientific understanding of wolf society was based on studies of captive animals, whose lives seemed ruled by a rigid pecking order. Wolves were thought to be born genetically programmed to fit into a role in an unbending hierarchy, in which the more dominant personalities – the alpha wolves – are the only ones destined to mate.

That vision shifted in the late 1980s, when David Mech of the US Geological Survey began to publish his studies of packs on Ellesmere Island in Canada's remote high Arctic. The Ellesmere wolves have never been hunted, and so are fearless enough to allow researchers into their midst. Based on decades of close observation on Ellesmere, Mech has transformed the popular vision of the wolf pack, long viewed as a gang of competitive thugs. He argues that the pack is actually an extended family.

Wolf families are as diverse and changeable as human ones, says ethologist Jane Packard at Texas A&M University in College Station, who has worked with

JURGEN & CHRISTINE SOHNS/FLPA

The wolves of Ellesmere Island have never been hunted

Mech. Packs are shaped by environment and chance: the established order can be shattered by a shortage of food or the death of a parent. In times of change, it is common for the classic pack structure to be disrupted. Monogamous packs are the norm only in areas where prey is abundant and humans do not hunt wolves. In other situations, all kinds of new family conformations have been observed, from polygamy to single mothers.

Packard also reinterprets wolf social behaviour. Rather than seeing it as a dance of dominance choreographed by successful bullies, she views it as a dramatic saga of intelligent creatures learning to coexist. So a socially submissive wolf may be more savvy than oppressed: often its behaviour successfully gains a share of meat, when being pushier would only bring on a fight. What's more, a submissive wolf may later grow to become a pack leader. In other words, the wolves that survive in a tough environment are those that possess the intelligence to know when to fight and when to defer to a companion. Such animals display emotional resilience – a skill also vital to humans in times of stress, and one that clinical psychologists say can be learned.

abundant in Algonquin and a single adult can provide as much meat as six deer. That has changed, to the extent that moose is now the primary food source for some packs. This suggests that younger wolves are learning sophisticated hunting strategies from their elders, just as Haber thought. "Taking larger prey likely requires more skill, experience and social learning on the part of the predators," says Rutledge's colleague Karen Loveless.

Protected from hunting, the Algonquin wolves have clearly altered their behaviour. Haber argued that allowing wolves to express their natural social behaviour benefits the wider ecosystem as well as the wolves themselves. Studies from Yellowstone and Banff national park in Alberta, Canada, have shown that intact wolf packs boost the diversity of plants and songbirds, and increase populations of beaver and amphibians, all by limiting the numbers and grazing patterns of elk and other large herbivores.

Bigger, family-based wolf packs take less prey per animal

Haber believed there was seldom a valid reason to kill wolves, and that managers make a serious mistake when they treat the deeply social wolf in the same way as elk or caribou, based solely on the numbers of animals. He wrote about a "gradient of sociality" that should be considered in wildlife management, pointing to a growing body of research on other social animals. Female red howler monkeys living with close kin, for example, raise more young than those living among unrelated animals (*Behavioral Ecology and Sociobiology*, vol 48, p 253). Breeding opportunities for orca whales depend on the social traditions passed down from their mothers (*Animal Behaviour*, vol 63, p 1103). And studies of African elephants reveal that when poaching is rife, families are disrupted and young males tend to run amok (*New Scientist*, 18 February 2006, p 39).

As wolf numbers in North America gradually grow and historical hunting bans are lifted, Haber's ideas will increasingly be tested. He had been a strong advocate for a buffer zone around Denali national park, but on 6 March, the Alaska Board of Game removed a ban on wolf trapping outside the park's eastern boundaries.

Meanwhile, an equally controversial situation has arisen around Yellowstone. Last year, grey wolves were removed from the federal endangered species lists in Idaho and Montana, and state officials authorised the first legal wolf hunts in decades. On 3 October, a Montana hunter shot a radio-collared wolf that had been tracked by Smith's team for five of her seven years. Wolf 527F, the alpha female of the Cottonwood pack, which had long occupied a remote northern corner of Yellowstone, died 2 kilometres outside the park boundary. Over the next four weeks, her mate and two other Cottonwood wolves were also shot. All the collared animals and some of the pack's most experienced wolves are now dead; the fate of the remaining members is unknown.

The reaction has been heated. "There should be a large buffer zone around Yellowstone so park wolves are not shot," says ecologist William Ripple of Oregon State University in Corvallis. "Reintroduced wolves are helping to rebalance the park's ecosystem. If park wolves are hunted at all, they are bound to change their behaviour."

Meanwhile, Rutledge and her team are now advocating that conservation policies should "look beyond numbers" and take into account the social dynamics of wild creatures. "The family-based wolf social structure evolved over millions of years," says Rutledge. The benefits of this behaviour to wolves and the world around them can be cryptic and difficult to track, but they are nonetheless an integral part of the natural wolf.

Haber would have approved. "Sophisticated family groups are what set wolves apart," he told a reporter for *Backpacker* magazine in an article published in January 2009. "Which is why it burns me up when people say it's the population, not individual wolves, that matter." ■

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