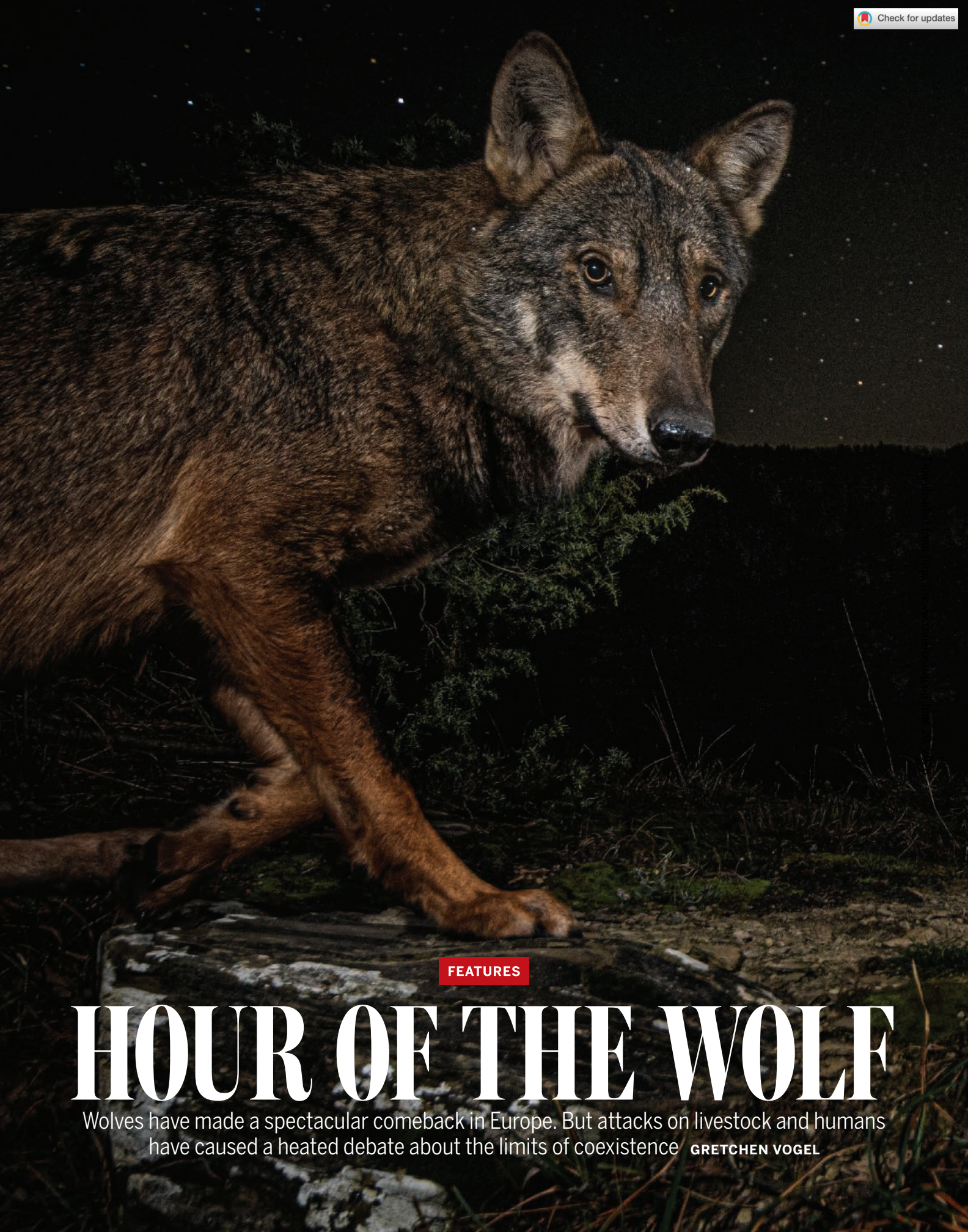




FEATURES

HOUR OF THE WOLF

Wolves have made a spectacular comeback in Europe. But attacks on livestock and humans have caused a heated debate about the limits of coexistence **GRETCHEN VOGEL**

Last summer, a woman walking in a nature park near Utrecht, Netherlands, saw what she thought was a big, playful dog hurtling toward her two young boys in the distance. Seconds later, she heard her older son, age 6, screaming loudly. The animal was dragging him into the woods; two other adults who happened to be nearby beat it with sticks to drive it off. The boy was taken to a hospital, with bite marks and nail scratches on his side and chest. His attacker was not a dog, but a wolf.

DNA found on the boy's bloody T-shirt confirmed the culprit was Bram, the Netherlands's most infamous wolf. He had bitten a woman in the leg 2 months earlier. The summer before, he had knocked over a child and was suspected of snapping at another. Before that, he had shown an unusual interest in dogs.

After Bram's first attacks, wolf experts recommended interventions, including trying to capture and fit him with a tracking collar, or shooting him with paintballs to encourage him to avoid people. But animal rights groups sued, and no action was taken. In May 2025, after Bram bit the woman, Utrecht province issued a permit to shoot him, but animal rights activists again sued to block it. A judge had ruled against them—clearing the way for Bram to be killed—just days before he attacked the young boy.

The new incident fueled an already polarized debate about the burgeoning wolf population in the Netherlands. Wolf attacks on people are very rare—most wolves fear and shun humans—but wolves are also killing an increasing number of sheep, and Dutch farmers have demanded control measures. Some politicians have said Western Europe's most densely populated country should simply be declared a "wolf-free zone." Wolf scientists are caught in the middle, criticized both by antiwolf campaigners and by animal rights activists who object to measures such as tracking collars. Some researchers have received death threats.

Similar debates have played out across Europe. Thanks to strict legal protections, the native gray wolf

(*Canis lupus*) has made a dramatic comeback since 2000, especially in Western Europe, where it was exterminated in the 19th century. That's "a major conservation achievement," says Joachim Mergeay, a conservation geneticist at the Research Institute for Nature and Forest in Belgium. But the growing, sometimes grisly toll on livestock and a handful of attacks on humans have strained the limits of coexistence. Some citizens have taken matters in their own hands: In Italy's Abruzzo, Lazio and Molise National Park, 18 wolves were found dead in late April, along with traces of bait poisoned with pesticides.

Last year, the European Commission loosened protections, allowing more hunting of the animals. Scientists have objected, saying genetic evidence shows their populations

Folk traditions reflect this ambivalent relationship. Romulus, the mythical founder of Rome, was said to be suckled by a wolf, but the Big Bad Wolf is a familiar character in fairy tales.

Deforestation, official eradication programs, and increased hunting of deer, the wolf's main prey, had eliminated the species from most of Western Europe by the mid-1800s. Small populations hung on in Italy, Spain, and Portugal, despite elimination efforts that continued into the 1970s.

Laws such as the 1979 Convention on the Conservation of European Wildlife and Natural Habitats, also known as the Bern Convention, strengthened wolves' protection across Europe and gave the species a new chance. Wolves from western Russia and Finland filtered into Sweden and Norway in the 1980s, establishing a handful of packs



are not as robust as they seem and that protecting livestock with electric fences and guardian dogs is more effective than culling.

Wolves' European success story now hinges on the mindset of societies that haven't seen these predators for a century and a half, says biologist Pepijn T'Hooft, who leads WWF-Belgium's wolf program. "If you want to keep this comeback alive," he says, "you need to look not at the number of wolves per country, but at the support for them."

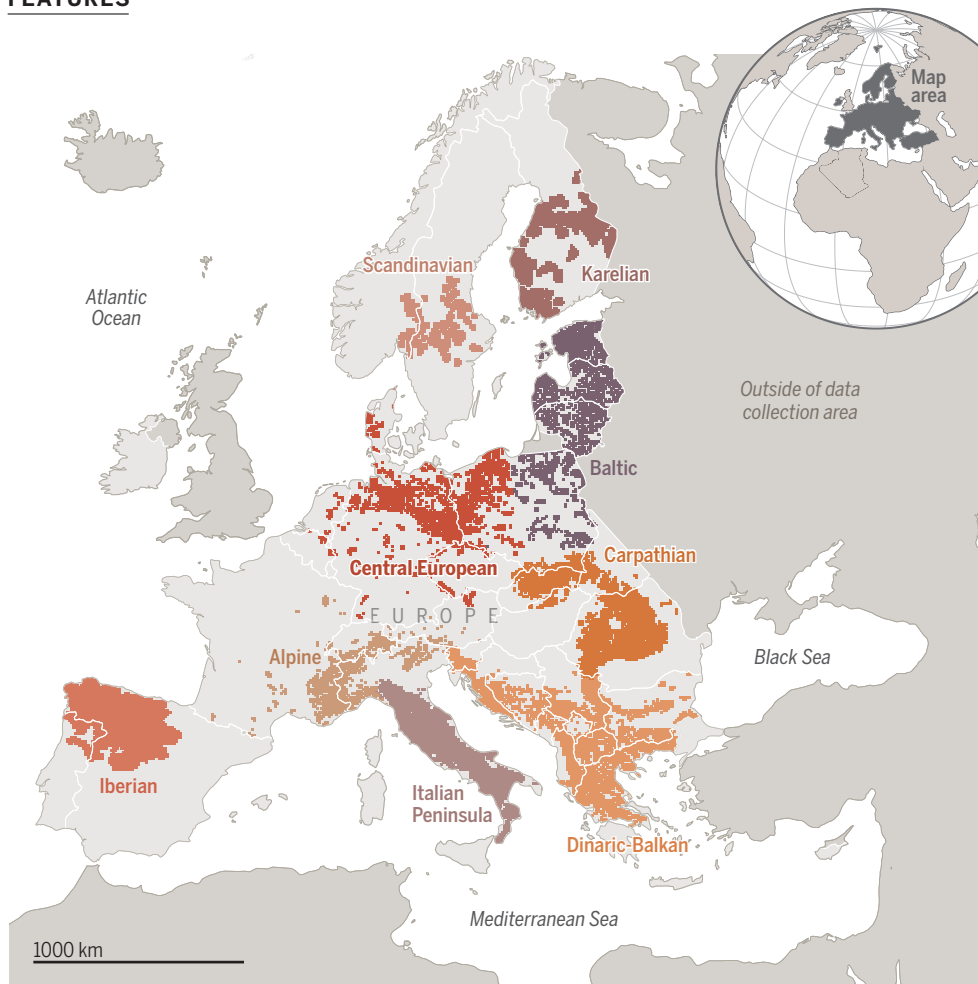
WOLVES HAVE A deep hold on the human psyche. Archaeological and genetic evidence suggests people tamed an ancestor of modern wolves at least 11,000 years ago, giving rise to today's dogs. Still, wolves remained a threat to humans and especially their livestock.

there. Central Europe saw the most dramatic increase. In the late 1990s, lone wolves from western Poland were occasionally spotted in eastern Germany. By 1999, a pair had settled in a military training area near the Polish-German border, and the first pups were born in 2000.

Since then, the population has grown to roughly 2000 wolves across eastern and northern Germany, Denmark, the Netherlands, Luxembourg, and Belgium, with a few in the Czech Republic and Austria as well (see graphic, p. 1235). Protected species status also allowed the remnant populations in Italy and the Iberian Peninsula to recover, and Italian wolves spread into Austria, Switzerland, and southern France. (A long-isolated population in southern Spain went extinct in 2017, however.)

The T-shirt of a boy attacked by a wolf in the Netherlands in 2025 yielded DNA from Bram, a wolf involved in several previous attacks.

To estimate wolves' numbers, scientists use genetic analyses of their scat and camera traps like the one that caught this wolf in Italy.



*The mapped range shows areas where wolf presence is considered permanent as of 2023, except for Italy, which reported data from one intensive monitoring period from 2020–21.

A species divided

Wolves now live in every country in continental Europe, but scientists caution that their recovery is still tenuous. Genetic studies show there are up to nine distinct populations with little mingling, and most are below the size considered necessary for long-term survival.

The shy, mostly nocturnal predators are hard to track and count. Scientists and conservation officials monitor them with camera traps, genetic analysis of hair and scat, and even microphones that can pick up the characteristic yaps of pups. Footprints and animals killed on roads—a main cause of wolf deaths—provide additional clues.

Wolves are territorial, so many census efforts count established territories, which can range from 50 square kilometers—a bit smaller than Manhattan—to more than 1000 square kilometers. A territory can host a single wolf, a pair, or a pack—a pair and its young, amounting to between four and 10 animals. (Cubs can remain in their pack for up to 2 years, helping raise younger siblings.)

All told, scientists estimate 23,000 wolves now roam in EU member states, up from about 12,000 in 2012. “Twenty-five years ago, I could not have imagined having wolves in every country on the European mainland,” Mergeay says. “We have

more wolves in Europe than in the United States.”

IN MARCH, a woman in a busy shopping area of Hamburg, Germany, saw what she thought was a dog running against a set of glass doors. She tried to open the doors, but the trapped wolf snapped at her and bit her in the face before escaping. It was spotted a few hours later close to the city’s red light district, then again near the convention center. Finally, the animal—a young male—was found trying to swim in the Binnenalster, the lake in Hamburg’s historical center. Officials fished it out and took it to a wildlife sanctuary.

Such incidents tend to attract massive media attention, but they are exceedingly rare. Most wolves that cross paths with humans do so accidentally. The one that visited Hamburg had apparently taken several wrong turns after leaving its pack to establish its own territory. After recovering from its misadventure, it was fitted with a tracking collar and released. It has avoided people since.

In Germany, the incident was the first time a person had been injured by a wolf since the return of the species a quarter-century ago. The Netherlands, which recorded six wolf attacks on humans between 2023 and ’25, “seems a special challenge, since there are so many people in the Netherlands, and they love to be outside,” says Gesa Kluth, a biologist and co-director of the LUPUS Institute for Wolf Monitoring and Research in Germany. But four of those attacks involved Bram.

What drove him remains a mystery. After a hunter finally shot him in December 2025, an autopsy revealed a healed fracture in his neck, and some speculated he might have had a painful pinched nerve after being hit by a car in late 2024. But Bram’s unusual behavior began earlier, notes Hugh Jansman, an ecologist at Wageningen Environmental Research (WENR). It’s possible people tried to feed him, Jansman says, which has led to problematic behavior in other wolves. He was still a successful hunter despite his injury—his stomach was full of deer meat when he was killed. His territory was soon taken over by another wolf that has so far avoided people.

Wolf attacks on livestock are a far bigger problem, however. An estimated 50,000 sheep and goats are killed by wolves each year in EU countries, a toll that drives much of the backlash against the predators’ comeback.

LAST YEAR, the European Union reclassified the wolf, lowering its status from “strictly protected” to just “protected” and opening the way for more wolf hunts. The change was a personal cause for European Commission President Ursula von der Leyen, whose family’s beloved pony, Dolly, was killed at their farm outside Hanover, Germany, in 2022.

Many scientists say the downlisting was premature, arguing that the wolf’s comeback is less impressive than it appears. To determine whether a population is sustainable—whether it’s butterflies, trees, or wolves—biologists calculate how many reproducing individuals are needed to preserve enough genetic diversity to stay resilient in the face of environmental challenges. For wolves, that number comes down to 500 packs, Mergeay says.

Two recent genetic studies make clear that European wolves are divided into at least seven distinct

populations that rarely mix, and few have 500 packs (see map, p. 1234). “The demographic recovery is impressive, but the genetic recovery hasn’t followed yet,” says Sara Ravagni, a conservation geneticist who helped lead an analysis of 200 wolf genomes from samples collected across several European populations.

That study found significant inbreeding in all populations, especially in Scandinavia, where hunting is still allowed, and on the Iberian Peninsula. A parallel study of 1001 wolf genomes from across Eurasia also found inbreeding in those regions. (Both studies were published as preprints in March.) Despite its recent expansion, the population in Germany also has limited genetic diversity because it was founded by just a handful of animals. Inbreeding can leave populations vulnerable to harmful recessive traits and also increases the chances that genes for potentially beneficial traits, such as disease resistance, are lost.

The healthiest population, in southeastern Europe, faces another threat: interbreeding with dogs, which can occur in regions with large numbers of feral dogs. Such mixing contributed to the extinction of southern Spain’s wolf population.

The wolf’s rebound could eventually counteract the effects of inbreeding by allowing previously separate populations to connect and share genes. In 2017, for example, a male from the Italian Alpine population mated with a female from the Central European population in a national park spanning the border between the Czech Republic and southern Germany. Their pups went on to found new packs across both countries. But if the new hunting measures interrupt the mixing, “we’ll go back to square one,” says Shyam Gopalakrishnan, a population geneticist at the University of Copenhagen who led the study of 1001 wolf genomes. “It’s a disservice to wolf conservation.”

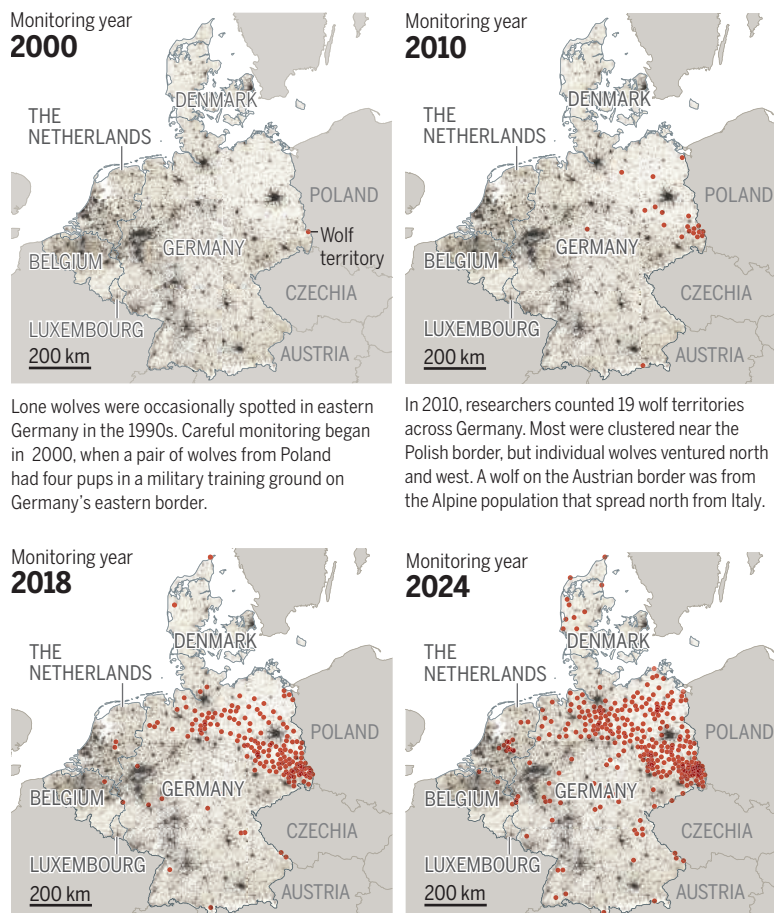
A DIFFERENT APPROACH WAS ON VIEW last month, when a dozen volunteers gathered at a farm owned by the von Cramer family south of Wolfsburg, Germany. The von Cramers stable 40 horses and raise chickens in the rolling hills of Lower Saxony, and over the past decade, they regularly saw wolves, sometimes as many as eight, from their living room windows. “I think it’s wonderful to see them,” Daniela von Cramer says.

A stunning recovery

Exterminated from Western Europe in the 19th century, wolves have made an impressive comeback the past quarter-century. Scientists have closely monitored the population as it spread across northern Germany and into Denmark, the Netherlands, and Belgium—some of the most densely populated regions in Europe. (Wolf territories can host a single wolf, a pair, or a pack, which is a pair and its offspring. Years are wolf “monitoring years,” which typically run from 1 May until 30 April the next year.)

Human population per square kilometer

Rural 0 people 1 300 Urban 301–1500 1501+ ● Wolf territory



Lone wolves were occasionally spotted in eastern Germany in the 1990s. Careful monitoring began in 2000, when a pair of wolves from Poland had four pups in a military training ground on Germany’s eastern border.

In 2010, researchers counted 19 wolf territories across Germany. Most were clustered near the Polish border, but individual wolves ventured north and west. A wolf on the Austrian border was from the Alpine population that spread north from Italy.

In 2018, pups were born in Denmark, the first in more than a century. Wolves also settled in the Netherlands and Belgium, where the first pups were born in 2019 and '20, respectively.

By 2025, the population had grown to an estimated 232 packs, 44 pairs, and 18 individuals across the region. Luxembourg has had regular wolf sightings but does not host any permanent territories.

*The maps show wolf territories of 200 square kilometers (km²) each for the Central European population. Actual territory sizes range from 50 to 500 km². Comparable data for Czechia, Poland, and Austria, where part of this population lives, were not available. Human population density categories use Copernicus’s population thresholds for degree of urbanization.

They assumed the animals posed little threat to their horses. But late one evening in August 2025, their son noticed the horses were unusually restless. Four wolves were eyeing the herd, and the horses, sensing danger, suddenly bolted. The family was able to drive the wolves off, but one horse was injured.

That’s when they decided to contact Livestock Protection Lower Saxony, a group that aims to help farms deter

wolves. Its leader, Peter Schütte, advised the von Cramers on fence design and materials and organized the volunteers to help install a 1.7-meter-high electric fence. Even with the volunteer labor, the project cost the family roughly €35,000, von Cramer says, and the fence will be costly to maintain. But that’s worth it, she adds: “We haven’t slept soundly since the attack.”

Fences don’t offer a 100% guarantee. In early May, wolves attacked a flock of



Guardian dogs, such as this Abruzzese mastiff in Italy, wearing a traditional spiked collar for protection (above), can keep livestock safe. Electric fences, such as one installed by a volunteer in Belgium (opposite page), also help keep wolves at bay.

400 sheep grazing in 1200 hectares of renatured moorland ringed by electric fences in northwestern Germany. At least 57 sheep were killed and more than 100 injured over 2 nights. Officials have issued a permit to shoot two wolves in the area. What went wrong is still unclear; the electric current may have faltered or the fence may have been damaged, Schütte says.

Still, fences help; a recent study in the Netherlands found that more than 90% of attacks were on unprotected livestock. Smaller farms with just a few animals remain a challenge, however. Belgium has fewer sheep than the Netherlands but “a lot of people have big gardens with a few sheep or ponies or alpacas,” that are vulnerable to wolf attacks, says Diemer Vercayie, a policy adviser at Natuurpunt. In Limburg province, for example, there are roughly 4000 animal owners in the territory of one wolf pack, he says.

Guardian dogs can add another layer of protection and are growing in popularity. Distinct from herding dogs, which make sure sheep don’t stray, guardian dogs watch out for and are prepared to fight off any threat to the herd. They have accompanied shepherds for millennia, a tradition that has continued in countries such as Romania and Italy where wolves were never exterminated. There are more than 30 types (called “land-

aces” instead of breeds when they have developed over generations in a particular region), including the Abruzzo sheep dog from Italy and the Romanian Carpathian shepherd dog.

The dogs can pose challenges in regions that are not used to wolves, says Ray Dorgelo, a shepherd and predation prevention specialist who advises livestock owners on how to work with guardian dogs. The sheep need to graze closer together than is typical in the Netherlands, he says, and guardian dogs have to learn that hikers and their dogs are not a threat. “It’s not always easy,” he says. The dogs cost roughly €2200 each per year in food and veterinary bills.

Jan Tüllmann, who works with guardian dogs to protect the 1000 sheep he grazes on the dikes along the Elbe River, says the dogs bark not only at wolves, but also at deer, hedgehogs, and passing cars. “People call and say they can’t sleep with the dogs barking all night,” he says.

But Tüllmann, who keeps 10 guardian dogs, including youngsters still learning the ropes, says the investment is worth it. Together with electric fences, the dogs have perfectly protected his sheep since wolves returned to the region 15 years ago. Five packs now live in the areas where his sheep graze. Tüllmann prefers living with wolves this way over attempts to es-

tablish wolf-free zones, which he says would be futile because wolves can travel hundreds of kilometers to find a new territory. “Personally, I feel more secure knowing there are wolves—and knowing my animals are protected—instead of leaving them unprotected and always having to wonder if a wolf might show up,” he says.

DECLARING WOLF-FREE ZONES in regions where they have returned will likely remain illegal despite last year’s changes to EU law, says Arie Trouwborst, a conservation law specialist at Tilburg University. The law still requires member countries to ensure “favorable conservation status” for wolves, and a recent court ruling said that means they must be allowed to play their role as top predators across their entire range, he says. But each county must decide how to adjust its policies—a process that is already proving contentious.

In March, German lawmakers voted to allow hunting of wolves nationwide, although each state is developing specific policies. The leading hunting organization is lobbying to allow 40% of pups to be shot each summer. One concrete change already in effect, Kluth notes, is that any dead wolf is now the property of whoever owns the local hunting rights, even animals hit by cars or that die natural



explained the genetic studies that showed the animals were not hybrids and that natural immigration from Germany was much more plausible. “Now, every time the hunter’s organization issues a public message about wolves, they ask us to fact check it,” he says. “They have become trustworthy allies in this whole debate.”

In Flanders, the Dutch-speaking part of Belgium, the spokesperson of the hunter’s guild goes wolf watching with the director of a group called Welkom Wolf, Mergeay says. “Their members may not agree, but there is a mutual respect,” he says. “And once you have this dialogue and common understanding, you can work toward solutions.”

Schütte, who leads the fence-building group, takes heart from conversations over lunch during the construction projects. Farmers and fence volunteers often strongly disagree in their views about wolves, and yet some of the projects have yielded long-term connections, he says. “My favorite comment was the livestock owner who said, ‘They’re quite nice, even if they’re wolf fans,’” he recalls.

IN THE END, accepting wolves requires accepting a certain level of unpredictability, says Martin Drenthen, an environmental philosopher at Radboud University who studies the ethical issues surrounding the return of the wolf. Societies need to “learn to live with the fact that some things cannot entirely be controlled ... and maybe learn to live again with the wildness of wolves,” he says.

The wolf in central Hamburg is one example, and Kluth says response to that incident was encouraging. “The police reacted very professionally” to de-escalate the situation, she says, and most media reports included comments from wolf experts explaining that the animal was young and lost. “Twenty-five years ago, nobody would have known enough about wolves to really understand what was going on. But all the work everyone has done really created this situation where people listen” to scientists, she says. “I find that a little bit hopeful.”

But as the great wolf comeback continues, she worries the climate will harden again. Over the past 25 years, “we have learned so much about wolves,” Kluth says. “I fear that we will lose the knowledge we have gained about them, and about how to live with them.” □

deaths. That limits scientists’ ability to collect valuable data on genetics, age, and health, she says.

The Dutch government in 2024 asked researchers at WENR to estimate how many wolves the country would have to host to meet the “favorable conservation status” requirement. Their report, published last year, concluded the Netherlands should allow between 23 and 56 packs, up from the 13 counted last year.

That recommendation is “not responsible and very dangerous,” says Harold Zoet, a member of the executive council in Gelderland, a mostly rural province in the eastern Netherlands that’s home to eight wolf packs. “We are already completely at the maximum ... maybe even over it,” says Zoet, a member of the Farmer-Citizen Movement, a party that primarily serves agricultural and rural interests. He worries more wolves will become like Bram.

“It’s easy to say, if you live in Amsterdam, ‘Oh it’s great the wolf is back,’” Zoet says. “I think people underestimate the impact it has on people’s daily lives.” While Bram was still at large, for example, families were warned not to let their children use a popular bicycle path. One village closed its school for a day when a wolf was spotted walking through town. The Dutch government has commis-

sioned a second study to estimate the country’s “political and social carrying capacity,” which will help shape the response to the EU’s reclassification.

Mergeay, who was a co-author of the WENR report, acknowledges the passions that wolves stir. In the heated public debates, “we see the extremes,” he says.

Those extremes include online rumors, some of them repeated by politicians, that activists trucked wolves into the Netherlands from Slovenia, or that the Dutch wolves are really wolf-dog hybrids that don’t deserve protection, which DNA research has shown is wrong. Hunting groups predict carnage among deer if wolves continue to proliferate and argue it’s more humane for deer to be shot.

At the other extreme, Mergeay says, are “Disney-fied nature lovers” who go to court to block any action, even against wolves like Bram. “They say, ‘Oh no, poor wolf! It’s not his fault. It’s the fault of the people.’”

But Mergeay sees a middle ground. He notes that a recent survey of 10,000 people across the EU found broad support for wolves, with little differences between countries or between rural and urban residents. Soon after the first wolves were spotted in his own country, Belgium, in 2018, he and his colleagues contacted farmer and hunter organizations. They



Hour of the wolf

Gretchen Vogel

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