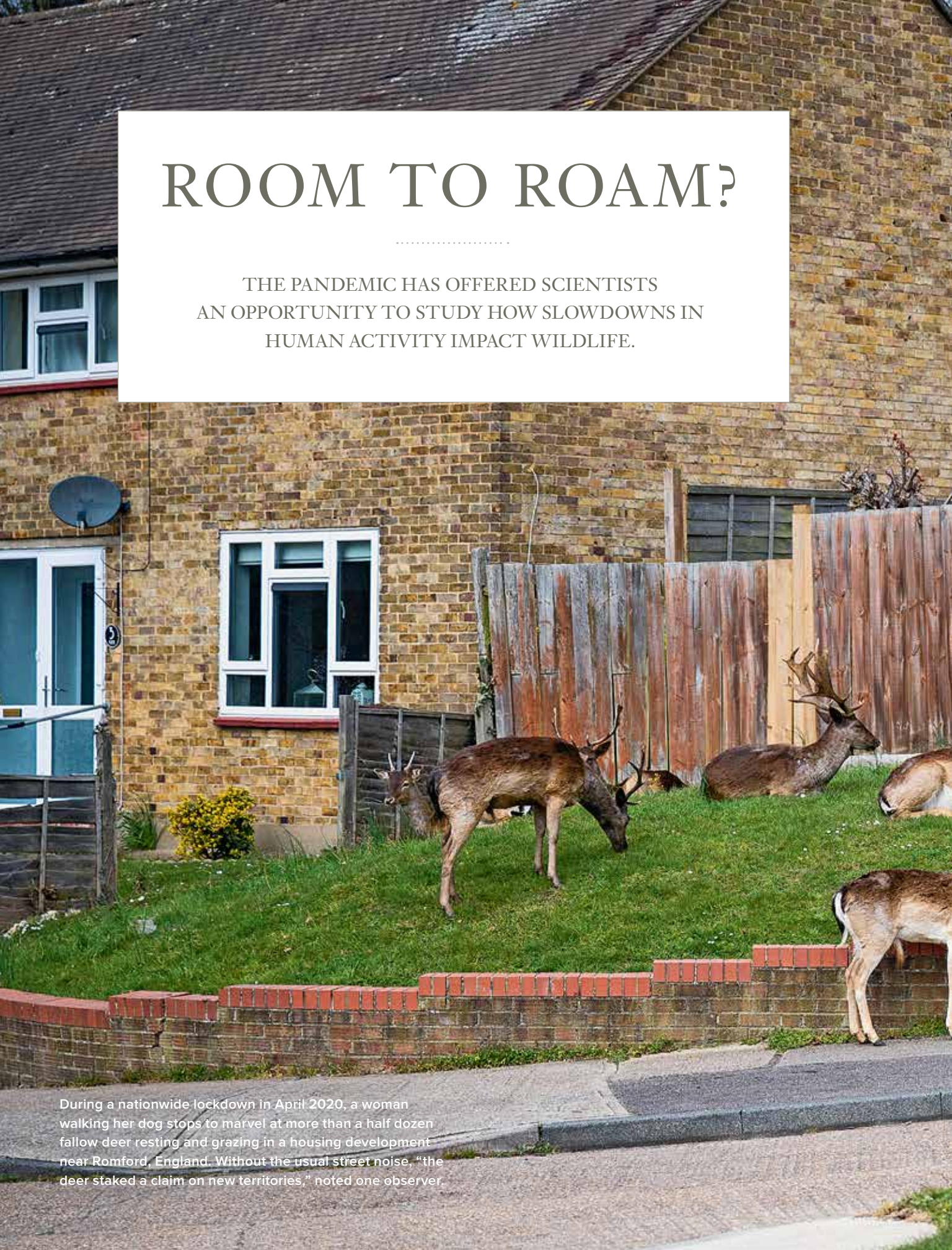


ROOM TO ROAM?

THE PANDEMIC HAS OFFERED SCIENTISTS
AN OPPORTUNITY TO STUDY HOW SLOWDOWNS IN
HUMAN ACTIVITY IMPACT WILDLIFE.



During a nationwide lockdown in April 2020, a woman walking her dog stops to marvel at more than a half dozen fallow deer resting and grazing in a housing development near Romford, England. Without the usual street noise, “the deer staked a claim on new territories,” noted one observer.



REDRUTH
WALK

By Barry Yeoman

When the novel coronavirus first caged us into our homes, some of the sweetest relief came from images of wildlife taking over our streets. The internet filled with reports of howling coyotes in San Francisco, wild goats wandering a Welsh town and even a pizza-eating groundhog in Philadelphia. The creatures seemed to revel in our absence, reminding us that our dominion here is tenuous.

The outbreak's impact on wildlife, of course, has been far more complicated than *Goats Gone Wild*. COVID-19 froze people in place as countries sealed their borders and workers began telecommuting. This slowdown in human activity—which researchers call the “anthropause”—has triggered a massive unplanned scientific experiment.

With more than 1.7 million human deaths as of December 2020, “this pandemic is a tragedy,” says Richard Primack, a professor of biology at Boston University. “But it’s also providing an incredible opportunity to look at how human activity impacts natural systems—and what the potential is, for the future, if we want to reduce human impact.”

Primack co-leads a global collaboration, called PAN-Environment, to study the pandemic's effects on wildlife and natural ecosystems. His group has cooperated with a parallel international effort to learn from tracking devices how the anthropause has altered wild animal movements and behaviors. Still another team focuses on North American birds.

Some of the lockdown's benefits are now evident. Carbon dioxide emissions decreased globally, as did particulate pollution in cities from New York to Mumbai. Up to 45 percent fewer large wild animals—including moose, mountain lions and elk—were hit by cars, according to a University of California–Davis survey of three U.S. states. With traffic noise reverting to 1950s levels, white-crowned sparrows in the San Francisco Bay area could sing softer and, in one ecologist's words, “sexier.”

The anthropause also inflicted harm. Groups that rely on ecotourism dollars—including private conservancies that protect more than one-tenth of Kenya's land—saw their income evaporate, leading to a reduced capacity to protect wildlife. Economic desperation led to illegal fishing in India, logging in Brazil's Amazon and renewed hunting of species such as giraffes in Uganda and gazelles in Morocco.

A pod of killer whales hunts for herring off northern Norway. Because these mammals use echolocation to find prey, the noise from large ships can reduce their foraging success. In early 2020, when COVID-19 dramatically slowed shipping off North America's Pacific Northwest coast, scientists say the endangered Southern Resident killer whales that ply those waters benefited from the resulting quieter seas.



In the United States, a spike in outdoor recreation led to mountain bikers carving new trails in Massachusetts' Webster Woods and Hammond Pond conservation areas, potentially fragmenting the landscape. And reckless boating in Florida imperiled turtles and endangered manatees. Meanwhile, more findings are rolling in from around the world.

Reclaiming the daytime

The first Western nation overwhelmed by the virus was Italy, which responded with a national stay-at-home order. With limited exceptions such as grocery shopping, “we were completely forbidden from leaving our houses,” says Francesca Cagnacci, an ecologist at Fondazione Edmund Mach, an environmental, food and agricultural research center.



TONY WU (NATUREPL.COM)

Since 2016, Cagnacci has been using motion-activated cameras to study mammals such as roe deer in the woods near Trento, part of the Dolomite mountain range. In the past, her cameras captured the animals occasionally and mostly at night. But with people sequestered at home, her memory card filled rapidly with daytime images. In one photo, taken at an experimental feeding station, two bucks with hefty antlers spar while a doe eats nearby. In another, a red fox carries what looks like a deer leg in its mouth.

From a 2018 analysis, scientists already knew that human activity forces some diurnal creatures—sable antelopes, wild boars, coyotes, tigers—to become artificially nocturnal. Cagnacci's photos suggest that, absent human activity, some animals will quickly reclaim the daylight

hours. This knowledge, she says, could guide policymakers toward wildlife-friendly decisions. They might limit off-trail recreation, for example, or step up environmental education. “No one is saying that we shouldn't go hiking in the mountains,” she says. “But we should be aware that we are not the only ones on the planet, thank God.”

Unusual mammal sightings in the Trento region weren't limited to the forest. At least two brown bears crossed the highway connecting Italy and Austria, a normally busy thoroughfare that had quieted during the lockdown. Their path followed a habitat-connectivity corridor that Cagnacci had mapped before the pandemic. (One bear, a yearling, garnered headlines when a resident videotaped it climbing an apartment balcony in the nearby town of Calliano.)



Confirming the predators' preferred corridor could help guide planning decisions—for example, whether to build protected wildlife crossings. “They’re not a perfect solution,” Cagnacci says, “but they can be a mitigation.”

When seas grow silent

Early on in the outbreak, global trade slowed as Chinese factories shuttered and then resumed at reduced capacity. By one industry estimate, ocean shipping was expected to fall 25 percent in the first half of 2020. Off the West Coast of the United States and Canada, cruise ships stopped sailing, and ferry service also was scaled back.

David Barclay, an oceanographer at Canada's Dalhousie University, wondered what this could mean for marine

mammals that are affected by underwater noise. He knew that, after the 9/11 terrorist attacks, the lull in ship traffic reduced stress-hormone levels in endangered North Atlantic right whales. Might 2020's shipping slowdown have a similar impact on the Pacific Northwest's most charismatic marine mammals, Southern Resident killer whales?

The whales, whose numbers have fallen to double digits, use a complex system of vocalizations to communicate and navigate. They also locate prey through echolocation. Past research has shown that excessive vessel noise can prevent Southern Resident whales from foraging. In 2017, ships passing through Washington state's Salish Sea agreed to slow down, which quieted the waters. The whales' “potential lost foraging time” dropped by 22 percent.



MARCO SECCHI (GETTY IMAGES)



BRUNO D'AMICIS (NPL/MINDEN PICTURES)

In Italy, the first Western country hit hard by COVID-19, a nationwide lockdown triggered marked behavioral changes in mammals of the Dolomite mountain range. Ordinarily nocturnal, red foxes (above) became diurnal in the absence of humans. Brown bears (left) began traversing a normally busy highway, a discovery that could lead to new protected wildlife crossings there.

Because killer whales' hearing range overlaps the frequencies of ship noise, "I think it's pretty safe to say that the communication space was probably a little bit larger for the Southern Resident killer whales," the oceanographer says. "Or at least there's a good chance that they were having a little easier time communicating."

The anthropause's impacts on wildlife have hardly been uniform, of course, and in some places, they've depended on the cultures, economies and education levels of the people living there. On the coast of Florida, Justin Perrault monitors some of the most densely nested stretches of sea turtle beach in the world, extending 9.5 miles along the Atlantic coast from Juno Beach to Tequesta Beach. As research director for the nonprofit Loggerhead Marinelife Center, he wondered how the turtles would fare when COVID-19 shut down public access to beaches last spring.

Sometimes, when a female turtle comes ashore, she gets spooked by something and returns to sea without laying eggs. This is called a "false crawl." Repeated false crawls harm turtles by wasting energy, Perrault says, and "energy is a luxury in the animal kingdom." Surveying Florida's nesting beaches, he found fewer false crawls during a month of their spring closure: 60 percent of arriving loggerheads successfully nested compared to 48 percent after the beaches reopened in mid-May. Neither weather nor artificial lighting accounted for this difference. The only variable Perrault could pinpoint was human foot traffic.

"We see a lot of beach fires, and that might scare or distract a nesting female," he says. "There are a ton of people

To investigate possible effects of the recent shipping slowdown, Barclay turned to the University of Victoria's Ocean Networks Canada, which maintains a system of hydrophones that record and digitize ocean sounds and share the information over the internet. He identified one frequency where he could isolate ship sounds from, say, breaking waves. Barclay chose two specific ocean regions and compared their noise levels over time.

What he found was a steep drop in sound intensity, especially in waters near Vancouver, during the start of the pandemic. Moreover, the quietest times—when there wasn't a ship in the immediate vicinity—got *much* quieter. "There are still lots of loud ships," Barclay says. "But the dull roar of ships always being around was dramatically reduced."



PRATIK CHARGE (HINDUSTAN TIMES VIA GETTY IMAGES)

out there that use flashlights at night. There are a lot of people that don't know you're not supposed to go directly up to a wild animal and mess with her." With the beaches closed, "the turtles really had a chance to nest undisturbed, like they're supposed to." He hopes officials will use this information to modify beach-access rules, perhaps with nighttime closures during the peak nesting season. "Conservation," he says, "is a fine-tuned marriage between what humans need and want and what wildlife need."

But elsewhere in the Americas, including Grenada, Nicaragua and Costa Rica, the pandemic has caused such a collapse in ecotourism that unemployed residents have turned to killing turtles and harvesting their eggs. And because of the downturn, there often are fewer guards to stop them.

"I hear from my staff that when they're out on the beach, they can see the drag marks where a turtle has been dragged into the woods," says David Godfrey, executive director of the Sea Turtle Conservancy, which runs a research-and-conservation program focused on green sea turtles in Tortuguero, Costa Rica. "All a would-be poacher has to do is avoid our small ragtag crews, and the beach is theirs."

Thirty miles south, the nonprofit Ecology Project International (EPI) runs Pacuare Reserve, which has a

large leatherback nesting population and is popular with school groups from Costa Rica and the United States. When the pandemic shut down tourism, Claudio Quesada Rodríguez, EPI's research and conservation coordinator, feared a significant uptick in egg thefts. His worst short-term fears didn't materialize, however. The number of plundered nests last season went from 0.7 to 3.8 percent, far short of the 50 percent he had feared, even though one end of Pacuare Reserve remained unguarded.

Quesada says the only plausible explanation is EPI's extensive environmental education efforts. "We received phone calls from local people telling us, 'I am next to this side of the reserve. I'm going to take care that nobody enters my property to enter the reserve,'" he says.

Therein lies the anthropause's complexity. Humans are a part of the ecosystems we inhabit, and our behavioral changes have cascading effects that are difficult to predict. Our presence might help or harm. So might our absence. While scientists are starting to get a handle on some data, and publishing their initial findings, it will take years before they fully understand the long-term impacts of this giant unplanned experiment. [W](#)

North Carolina writer Barry Yeoman is a frequent contributor.

In Mumbai, India, more than 150,000 flamingos (left) painted the city pink in April 2020, a 25 percent increase above 2019's numbers that scientists attribute to the country's coronavirus lockdown. On Florida's Juno Beach, loggerhead sea turtle hatchlings (below) prospered as fewer people walked the beaches last spring during the species' annual nesting season.

