

# The Pandemic Stilled Human Activity. What Did this ‘Anthropause’ Mean for Wildlife?

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*After the coronavirus pandemic exploded worldwide, Ari Friedlaender, a marine ecologist at the University of California (UC), Santa Cruz, had to abandon his fieldwork in Antarctica, where he was studying the effects of tourism and fishing on humpback whales. He was stressed, but after returning home Friedlaender realized the pandemic offered an unprecedented opportunity for similar studies of whales in nearby Monterey Bay. Lockdowns had dramatically reduced noisy boat traffic, which can stress marine life, and he and his colleagues were soon discussing how to investigate the whales’ response to the hiatus.*

The study, which received funding from the National Science Foundation (NSF) this week, is just one example of how wildlife scientists are [now working to understand the impacts](#) of what many are calling the “anthropause”—the dramatic slowdown in human activity caused by the pandemic. Some are tracking how fish, mammals, and even iguanas are reacting to steep declines in tourism. Others are pooling data on animal movement, gathered from GPS tracking devices and automated cameras, to probe large-scale responses to emptier roads and airports. In particular, the pause has [created unique natural experiments](#), allowing researchers to compare how animals behaved before, during, and after the pandemic.

“A lot of people are coming together to ask really big, complex questions,” says Nicola Koper, a conservation biologist at the University of Manitoba.

## Megastudies launch

The International Bio-Logging Society, for example, is coordinating [a large effort](#) to assess how reduced vehicle, ship, and aircraft traffic is affecting animal behavior. More than 300 researchers have indicated they have relevant animal tracking data from 180 species of birds, mammals, reptiles, fish, and sharks across almost 300 study populations from all continents and oceans. “There is a gold mine of data,” says Christian Rutz of the University of St. Andrews. Among other things, researchers will be investigating whether animals changed their movement patterns during the hiatus—crossing roads more frequently, for example, or venturing out at unusual times, such as during daylight rather than just at night.

Koper, who wasn’t able to get to her field sites this spring because of the pandemic, has brought together a separate team of 16 researchers to explore the same kinds of questions for 85 bird species in Canada and the United States. Working with data from eBird, a citizen science project run by Cornell University’s Lab of Ornithology, the researchers are examining bird communities in 95 U.S. and Canadian counties. One question they are asking

is whether species known to be less tolerant of noise, such as yellow-rumped warblers, became more abundant around airports. And they are checking whether low-flying species became more common near roads, which might imply fewer collisions with cars.

### Quick changes, and some surprises

The anthropause has prompted some researchers to quickly modify existing studies. In March, during the first week of Italy's strict lockdown, ecologist Francesca Cagnacci of the Edmund Mach Foundation's Research and Innovation Centre got special permission to visit field sites in the forests around Trentino, where she has been tracking deer and other animals with radio collars and a few camera traps. "I was very lucky because I was allowed to go out. My helpers could not," she recalls.

The forests usually bustle with activity, including mountain bikers, hunters, and quarry trucks rumbling along the roads. Then, "all of a sudden—silence," Cagnacci recalls. As she installed a few dozen additional automated cameras, Cagnacci saw something very unusual: deer and other animals wandering around during daylight. "I won't forget this for my entire life," she says.

Now that humans are again using the forests, Cagnacci is continuing to monitor her sites. One intriguing observation is that wildlife seems to be less active now than it was before the anthropause. This is the kind of hypothesis that could be tested with the larger database being assembled by the biologging society initiative, she says.

Other studies are also producing surprises, says Amanda Bates, an ecologist at Memorial University. She is helping [synthesize the results](#) of 50 studies of changing human activity conducted this year by more than 100 researchers. One observation that might not have been obvious: Reduced traffic doesn't always mean quieter roads, if the fewer remaining vehicles are traveling faster. And some benefits of the hiatus have been greater than expected. For example, a study in Florida found a sizable benefit to loggerhead turtles from beach closures. Females usually lay eggs about 50% of the time that they crawl onto shore, when they're not disturbed by people, dogs, bright lights, or other dangers. But during the beach closures the rate increased to 61%, says Justin Perrault, director of research for the Loggerhead Marinelife Center. Like other studies, this finding could help managers improve the outlook for wildlife, Bates says. "The lockdown has given us the capacity to find where we can optimize conservation."

In Chile, researchers have made novel sightings of rare species in cities. Conservation biologist Eduardo Silva-Rodríguez of the Austral University of Chile is part of a group that placed automated cameras in urban forests and university campuses. The snapshots included some surprises: a vulnerable wild cat called the güiña (*Leopardus guigna*) and endangered southern river otters (*Lontra provocax*) that had not previously been detected in urban areas. "This opens many questions," Silva-Rodríguez says. Have the animals always been there? Or were they just visiting, perhaps because stray dogs that once scared them away had moved away as food scraps became less available? They plan to continue to monitor for these species after the partial lockdowns are lifted.

### What happens when tourists disappear?

Many researchers are examining how the standstill in tourism is affecting wildlife at popular destinations, such as national parks and marine reserves. In Ecuador's Galápagos Marine

Reserve, Jon Witman of Brown University and colleagues have received a grant to study, among other things, whether the absence of tourists makes shy marine fish bolder, a behavioral change that could alter how the ecosystem functions. The reserve, where Witman has worked for 20 years, usually gets thousands of recreational divers each year. But the lockdown has caused a decline “unlike anything that would ever happen, short of a world war,” Witman says. He heads to the Galápagos next week—none too soon. “We’re chasing a fleeting moment,” he says. The team’s findings could eventually help reserve officials fine-tune management practices, Witman says, such as by figuring out how to best spread out divers to minimize disturbance to wildlife.

In the Bahamas, researchers are examining how the absence of tourists is affecting the diet and health of rock iguanas, a lizard. Visitors routinely feed the iguanas bread, meat, fruit, and vegetables, which had helped boost their population. But it’s not clear how the treats affected their health, and now the drop in “tourism feeding could have really profound effects,” says Susannah French, a physiological ecologist at Utah State University, Logan.

French has a new grant to work with a research team that hopes to sail to the Bahamas soon to join colleagues in studying the issue. They will assess iguana population numbers, weigh the animals, take blood samples, and check their gut microbiota. The data could help local officials better manage tourists once they return, says Chuck Knapp, a conservation biologist at the Shedd Aquarium who is on the team. “We are not looking to shut down this industry, we just want to ensure that it’s sustainable,” he says.

In the Society Islands of French Polynesia, researchers are trying to answer another complicated question: Are coral reefs facing more or fewer problems now that tourists aren’t around and hotels have gone dark? On one hand, local residents appear to be returning to subsistence fishing to make ends meet, note scientists working at the Moorea Coral Reef Long Term Ecological Research site. That could mean trouble for reefs, because the increased catches could include herbivorous fish that eat algae and help keep them from overgrowing and killing coral. At the same time, the lack of tourists in waterfront hotels could help the reefs if it means less nutrient pollution from wastewater, which stimulates algae growth. To clarify such trade-offs, a postdoc on the island has been gathering socioeconomic data and other researchers have just arrived, says ecologist Sally Holbrook of UC Santa Barbara. “The COVID-19 pandemic represents a once-in-a-lifetime opportunity to better understand the links between humans and coral reefs.”

In Zambia’s national parks, where tourism is still shut down, an NSF grant is enabling Scott Creel, a conservation biologist at Montana State University, to double the number of GPS collars his team is placing on carnivores. That should enable the researchers to test ideas about how dominant carnivores, such as lions, cope differently with human-altered landscapes from less dominant carnivores, such as hyenas and wild dogs.

In the United States, researchers at the Institute for Bird Populations are focusing on bird behavior in Yosemite National Park and several other federal parks in Western states. For years the institute has collected data on breeding bird diversity and abundance—and also estimated noise levels within the parks, which fell silent when they closed to visitors for several weeks in March. “It was quite astounding,” says Chris Ray of the University of Colorado, Boulder. “This is fantastic data.”

Crossbows and microphones

Marine researchers, meanwhile, are turning to crossbows and microphones to understand how the pandemic is affecting ocean life. In Monterey Bay, Friedlaender and his colleagues took to the water in March and early May, when boat traffic was minimal, equipped with a special crossbow that allowed them to collect blubber samples from 45 humpback whales. When they can return to the lab, they'll measure levels of cortisol, a stress hormone, in the samples. Then, they plan to collect new samples over the next year, when boat traffic is expected to pick up. By comparing the samples, they hope to find a clear signal of just how much additional stress—if any—the boat noise creates for whales.

A project called the International Quiet Ocean Experiment (IQOE) is hoping to answer that kind of question on a larger scale. IQOE, which began in 2015, has been compiling data on underwater noise from the groups that operate large arrays of hydrophones—underwater microphones—and other listening devices. One goal is to assess the quieter background “soundscape” of the ocean, in which animals evolved their communication strategies, by taking advantage of local changes in noise, such as modification of shipping lanes or installation of wind farms. COVID-19 created a much larger perturbation: a weekslong dip in international ship traffic.

Now, IQOE hopes to gather as big a picture as possible. “There has never before been a global network of hydrophones, so people will need to get accustomed to the idea of cooperating,” says Edward Urban, project director for IQOE, which will provide software for researchers to process data so that it can be compared in a global analysis later this year.

Scientists acknowledge that these unique scientific opportunities are coming at the expense of much human death and suffering. And they are hoping the anthropause really is a once-in-a-lifetime event. “It’s our sincere hope that no one ever gets a chance to study this again,” Witman says. “But incredible things are happening in natural ecosystems.”

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