

# A frightening virus is killing a massive number of wild birds - Scientists have never seen anything like it.

By [Benji Jones@BenjiSJones](#) May 9, 2023, 6:30am EDT

[Bird flu is decimating wildlife - Vox](#)

In the past two years, a viral disease has swept across much of the planet — not Covid but a type of avian flu. It's devastated the poultry industry in the US, Europe, and elsewhere, sickening millions of farmed birds, which either die from infection or are killed by farmers seeking to stem the spread.

The poultry outbreak has become an animal welfare crisis. It's also one reason eggs have become so expensive; there are simply fewer hens to lay them.

But the virus is causing another major crisis that's drawn far less attention: the death of wild birds.

The ongoing outbreak of avian flu has killed hundreds of thousands — if not millions — of wild birds, including endangered species like the California condor. It's one of the worst wildlife disease outbreaks in history.

Having now spread across five continents and hundreds of wildlife species, scientists call the current outbreak a panzootic, meaning a pandemic among animals.

The number of dead birds in itself is historic, but so is the virus's biology. Typically, avian influenza viruses only cause severe disease and death in domestic birds like chickens and farmed ducks; they sweep through populations, killing upward of 90 percent of the flock. This virus, however, is different. It's hammering wild birds and other wildlife, including mammals. This is especially concerning because birds are already at risk across the world. North America alone has lost an astonishing 3 billion breeding birds in the last half-century, due to threats like climate change, predation by feral and pet cats, and the loss of grasslands and other habitats. This panzootic is only making an ongoing extinction crisis worse.

The virus could also pose a threat to us. While it doesn't readily (*easily*) infect and spread among people today, the avian virus could evolve traits that make it more dangerous to humans as it circulates among wild animals. That's another reason scientists are taking the outbreak among wild birds so seriously.

## An unusual avian flu

Viruses that cause avian flu are actually pretty common. They've been circulating for eons among wild birds — and especially waterfowl, such as ducks and geese — without causing them much harm. These mild forms of infection are called low-pathogenic avian influenza, or LPAI, which means they're typically not deadly.

On occasion, a low-pathogenic virus can jump from wild birds to poultry farms. As the virus replicates in densely packed warehouses of farmed birds, it can quickly evolve and pick up adaptations that make it highly deadly to poultry. At that point, it gets dubbed a highly pathogenic avian influenza virus, or HPAI virus. Historically, however, most of these HPAI viruses haven't killed large numbers of wild birds, even if they did spill out of the farm and back into wild populations.

Then came an avian flu outbreak on a goose farm in China. In the spring of 1996, influenza caused by a virus known as H5N1 (named for the kinds of proteins found on its surface) spread among the geese. It was highly

pathogenic and killed more than 40 percent of the farm birds it infected. Descendants of this virus have since triggered a new era for bird flu. They're not only adapted to spread disease among poultry, but — and this is key — some varieties are also capable of spreading and causing severe disease among wild birds. That's an important trait that separates this virus from past versions of avian flu.

The US first experienced one of these goose farm viruses in 2014. After spreading to North America for the first time, the virus killed or affected tens of millions of poultry and an unknown number of wild birds, across at least 13 US states. At the time, officials were able to control the outbreak by slaughtering a huge number of farm birds. The situation today is more dire — and much harder to control.

### **How bad is the current outbreak?**

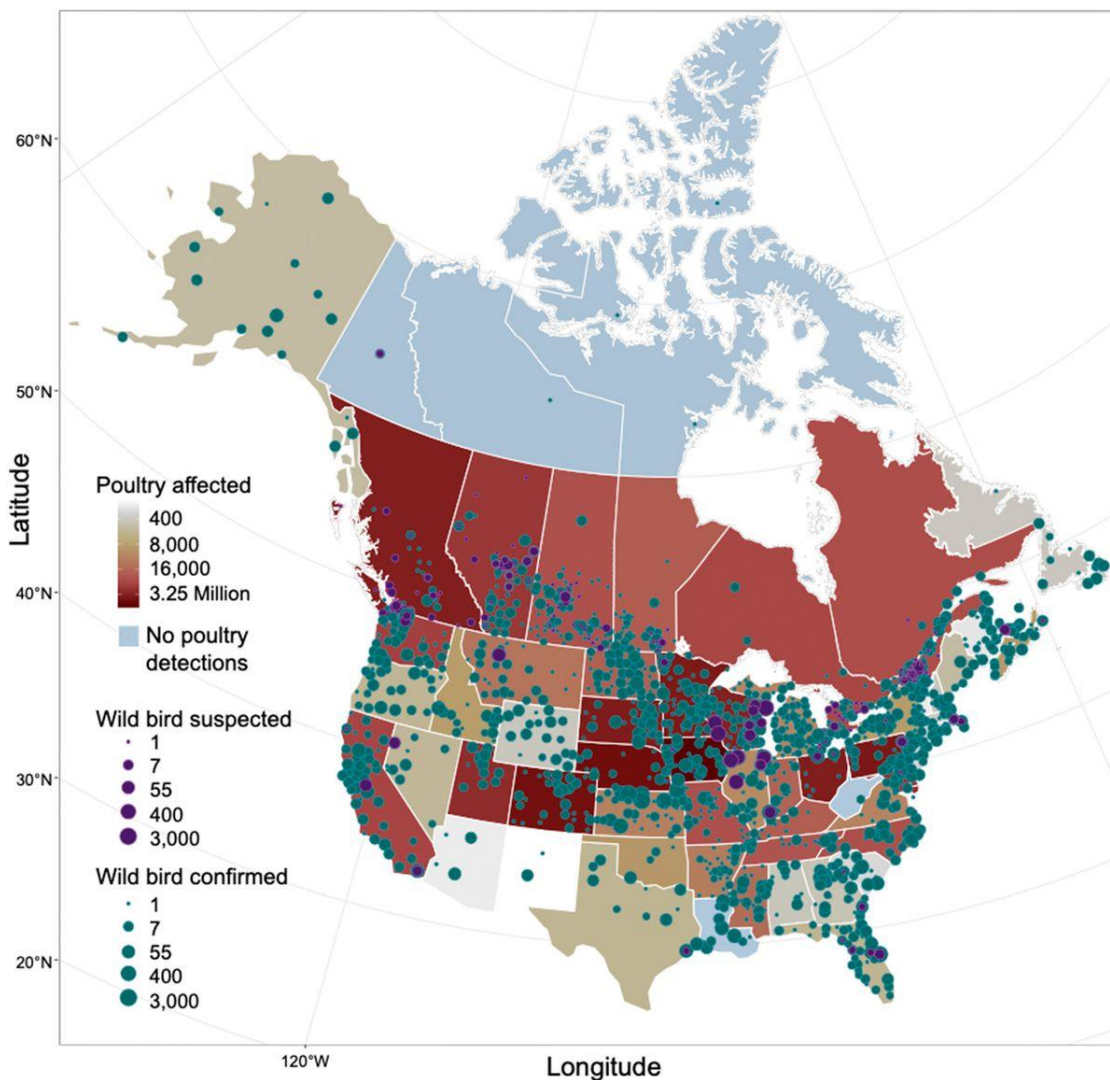
The world now faces a more frightening version of this goose farm virus that appears better equipped to infect wild birds. First detected on North American soil in the winter of 2021, the virus, which is also a form of H5N1, has since spread throughout the US, into Mexico, and down through Central and South America. It's infecting birds on every continent now other than Antarctica and Australia (where it almost certainly will arrive soon). The current outbreak has killed — or forced farmers to cull — more than half a billion poultry worldwide, a simply mind-boggling number of birds. It's much harder to estimate the toll the virus has taken on wild birds, but reported numbers are 50,000 dead wild birds in Canada.



*Two dead northern gannets in eastern Canada, on July 8, 2022. They likely died from avian flu. Lewnanny Richardson/iNaturalist*

This number is certainly an underestimate. Government agencies don't have the resources to test every dead bird. Plus, many individuals die out at sea, or in rural areas that lack any kind of surveillance.

So how big is the number really? It's likely in the millions globally, according to the paper by Klaassen and Wille. Scientists may never have an exact toll, but the spotty numbers they do have are ringing alarm bells. "We haven't seen these kinds of numbers with an influenza outbreak in wild birds previously, ever," said Puryear, of Tufts, who was not involved in that study.



A map showing where the H5N1 virus, a highly pathogenic type of avian influenza, has been detected in poultry and wild birds, between December 2021 and March 2023.

Johanna A. Harvey, et al./[Biological Conservation](#)

### What avian flu means for biodiversity

The virus that's killing birds today is infecting and causing disease in all kinds of species. Scientists have found it in everything from vultures and bald eagles to American white pelicans and snowy owls.

Birds that nest in colonies have been hit especially hard. These include things like snow geese, terns, and double-crested cormorants. Last summer, meanwhile, bird flu knocked out more than half of Lake Michigan's population of Caspian terns, a threatened species.

More troubling still is that avian influenza is also killing many mammals, including foxes, coyotes, mink, and seals. Earlier this year, officials reported that bird flu killed almost 3,500 seal lions in Peru. That's worrying on a whole different level — because humans are mammals. Could this avian flu become another pandemic?

### The frightening link between infected wild birds and human health

No, in its current form, avian influenza is not at all likely to cause a pandemic. While hundreds of humans have contracted H5N1 over the years — and many of them have died — those cases usually involve extremely high

exposure to infected poultry. Biologically speaking, the virus isn't well equipped to overtake our immune systems and spread quickly among human populations.

The problem for us is that viruses, and especially influenza viruses, evolve quickly. Not only do they mutate, but they can also swap entire portions of their genomes with other viruses if they infect the same hosts. Under the right circumstances, this evolution could give them the tools to replicate more easily in mammals, which would make them more threatening to humans.

The risk of the virus morphing into a human threat remain slim, yet the outbreak in wild birds may push it in that direction. During most past outbreaks, only poultry farms were badly infected, so countries could kill giant flocks of infected farm birds and exercise other biosecurity measures to stem the spread. That's what happened during the outbreak in 2014 and 2015. In this case, however, wild birds are also a reservoir for highly pathogenic influenza. So no matter how much culling farmers do, wild birds could still pass H5N1 over to domestic populations.

The other problem is that when flu viruses are widespread among wild birds, they have more opportunities to spill over directly into mammals. The virus has infected animals like foxes and seals that interact with birds. And as these microbes replicate within their cells, the flu viruses can pick up traits that make them more harmful to humans. A recent study found that some H5N1 viruses that infected seals in New England had genetic changes that have been shown to make them more efficient at replicating within the cells of mammals. Researchers have found similar adaptations in H5N1 viruses found in foxes and mink. All of these animals likely got sick from wild birds.

There is some reassuring news, however: Not only is the virus biologically ill-equipped to cause a pandemic, but the US government has also stockpiled vaccines, including those specifically for H5N1. "It's not Covid," Puryear said, referencing how there were no coronavirus vaccines stockpiled when the pandemic hit. "In theory, we should be able to respond quickly if this becomes an issue."

### **What to do for the birds**

In time, wild birds will likely develop some immunity to the current H5N1 virus, causing the panzootic to wane. It's not clear how long that will take. The public can be helpful in monitoring and recording dead birds. People are used to photographing beautiful wildlife on their phones and uploading it to platforms like [iNaturalist](#). But right now, it's more important that they document dead birds, she said. (iNaturalist actually [has a webpage](#) exactly for this purpose. If you find a dead wild bird and are not sure what to do, check out [this one-pager](#) from the USDA.)

Ultimately, protecting wild birds and reducing the risk of a pandemic will require that we make much bigger changes, such as to our food system. The normal way many companies raise birds for slaughter — in warehouses, packed tightly together — is a recipe for highly pathogenic viruses to emerge.