

Avian influenza:

A new chapter in an old book

Background

Our view of avian influenza shifted dramatically in spring 2022 as Mother Nature provided something never seen before in North America. There was a change in the ancient relationship between avian influenza virus (AIV) and the birds in which it lives. The final outcome is still being written.

Avian influenza virus coevolved naturally in wild waterfowl over many 1000s of years. But as we saw with COVID19, viruses change A LOT! Influenza genes in wild birds constantly reassort in a genetic melting pot around the world.

Given their ancient existence, variation in AIV genetics is extensive, and can differ at continental, flyway, regional, and local levels. Data collected by Canadian Wildlife Service (CWS) from waterfowl across the prairies in the 1970s & 80s also revealed differences in the virus from month to month, species to species, week to week, and pond to pond.

What changed in 2022?

Normally AIV occurs in wild waterfowl and shorebirds without mortality. However, in spring 2022 the virus killed migrating geese and ducks on all four North American flyways! It killed LOTS of waterfowl and quite a few other birds, and some mammals, that ate live or dead infected waterfowl.

The AIV wave arrived in Alberta in early April. Within a few days, phone lines lit up with sick and dead bird reports – largely snow geese in southern AB. But very quickly most of central and eastcentral Alberta was awash with sick and dead snow geese and a few Canada geese, then secondarily raptors and corvids. Dead geese were a bonanza for avian scavengers but the free food came with a high price. We received many many reports of sick or dead hawks, owls, crows, magpies, and a few falcons.

At the same time, strange neurologic behaviour occurred in striped skunks and a few young foxes. In April and May 2022, more than 80 sick or dead skunks were reported from the same area where dead snow geese littered the landscape in central Alberta.

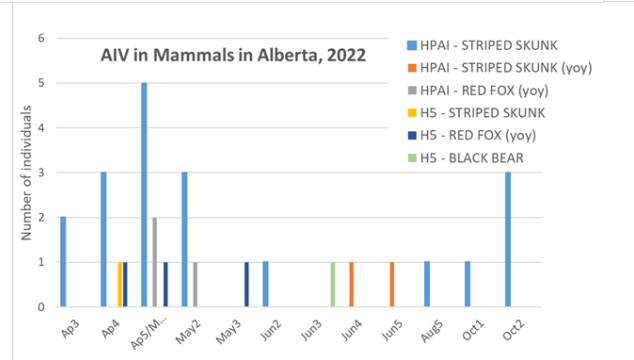
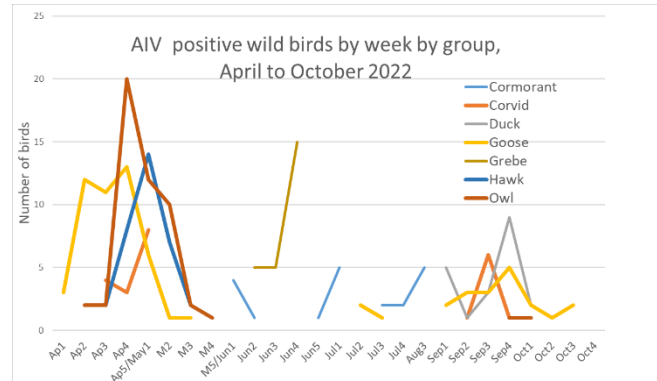
Affected birds and mammals displayed severe neurologic signs, including head tremors, weak neck, incoordination, and clouded eyes. Many raptors and corvids just fell out of a tree and died. Many of the skunks had severe seizures and convulsions before they died.

Overview of 2022

Overall, we detected AIV (specifically North American HPAI H5N1) in multiple wild bird species, skunks, and a few young foxes. Mortality was greatest in snow geese, great horned owls (adults and youngsters), red-tailed hawks, and crows. Many many owl and hawk nests were empty in 2022. The same virus was detected in commercial and backyard poultry flocks involving approx. 1.4 million birds across Alberta. It was a widespread and very hot form of AIV. Mortality continued through winter 2022/23 in pockets of Canada geese that used open water reaches in parts of southern Alberta.

It was expected that H5N1 would return as migrating ducks and geese flooded back into Alberta in April 2023. We anticipated some mortality in wild birds but hoped the virus would change again and the mortality would be less than in 2022.

Stay tuned and we will all see what Mother Nature has in store for 2023.



Spring and summer 2023

In an avian influenza context, spring and summer came and went in 2023 with very few reports of sick or dead wild birds or mammals. Similarly there was only one outbreak of HPAI in domestic birds in Alberta this spring. In fact, these patterns were similar across Canada and USA . It seems the virus had returned to a normal relationship with wild waterfowl and was not killing wild birds or mammals. It is likely AIV modified over the winter to be less pathogenic (AIV is designed to live in harmony in wild ecosystems). And no doubt the immune systems in wild ducks and geese also adapted in order to suppress the virulent new subtype seen in 2022.



Fall 2023

Then came the fall. The first H5 in a wild bird was detected in mid Aug. Things were fairly quiet through early Sept but detections picked up through late Sept to November 1. Similarly HPAI was detected in a few poultry this fall in Alberta. Other than multiple Canada geese, the outbreak involved a smattering of individuals in various wild bird species, and six skunks. Numbers of affected birds were small relative to 2022, but certainly more than we saw all through spring and summer 2023. The fall infections almost all presented with neurologic clinical signs, including head tremors, cloudy eyes, weak neck, and inability to fly or walk.

