Wild Bird News

National Avian Influenza Wild Bird Surveillance Newsletter - June 2022

Magpie geese - Image Courtesy of Guy Weerasinghe

National Avian Influenza Wild Bird Surveillance Program activities

The National Avian influenza wild bird (NAIWB) surveillance activities are conducted Australia-wide, with funding provided by the Australian Department of Agriculture, Fisheries and Forestry (DAFF) and significant in-kind support by the jurisdictional agencies, researchers, and representative's institutions. Activities comprises two sampling components:

- Targeted surveillance (pathogen-specific, risk-based surveillance) by collecting faecal environmental swabs and cloacal and/or oropharyngeal samples from apparently healthy, live and hunter-shot wild birds.
- General surveillance by investigating significant morbidity and mortality events in wild birds, including zoo bird population (with a focus on exclusion testing for AI virus subtypes H5 and H7).

Partner organisations include state and territory government animal biosecurity agencies, including laboratories, universities and samples collected through the Northern Australia Quarantine Strategy. Wildlife Health Australia provides support to the NAIWB Steering Group and collates avian influenza (AI) surveillance data from wild birds sampled across Australia.

Avian Influenza Virus

To date, 16 haemagglutinin (HA; H1-H16) and 9 neuraminidase (NA; N1-N9) subtypes are recognised in birds. **Waterfowl and shorebirds are the main natural reservoirs and rarely show signs of disease.** Avian Influenza Virus (AIV) can cause significant infectious disease in domestic poultry and can also infect and/or cause disease in a range of other species including other captive birds, wild birds, and humans[1,2].

Of global concern is the capacity of AIV subtypes H5 and H7 to mutate from Low Pathogenicity (LPAI) into **High Pathogenicity (HPAI) forms which can cause significant losses in both poultry and wildlife, and potentially human health issues.**

AIV in Australia

HPAI H5 viruses have not been detected in Australia. As of June 2022, there have been eight outbreaks due to HPAI H7 viruses in commercial Australian poultry operations between 1976 and 2020 in the states of Victoria, Queensland and New South Wales[3,4,5,6,7,8,9].

Mortality due to AIVs have not been reported in feral or native free-ranging birds[10]. However, **LPAI viruses have been detected in wild birds in Australia.**

Given Australia's geographic and ecological isolation, **it is important that assumptions about AIV epidemiology in Australia are not based entirely on studies from Asia, Europe or North America[11,12].**

More info: WHA FACT SHEET

NAIWB Steering Group Technical Issue Update 2022 Global High Pathogenicity Avian Influenza Events

Although HPAI H5 subtype viruses have been consistently present in different regions of Asia over the last twenty years, there has been a remarkable surge in the frequency of outbreaks in both wild birds and poultry overseas, particularly in Europe. In conjunction with this spike in outbreak occurrences, there has been a significant expansion of the affected geographical range, including reintroduction of Asian lineage HPAI H5 viruses into North America since northern hemisphere winter of 2014/15. The extensive and frequent identification of HPAI H5 viruses and ongoing success of lineage 2.3.4.4 in infecting avian populations, notably migratory waterbirds, have played a role in the intercontinental dissemination of the virus.

In light of the unprecedented number of outbreaks in wild birds and poultry and the dramatic increase in geographic coverage, an extraordinary meeting was held in January 2022 to discuss the AIV global situation, following a request by the Australian Chief Veterinary Officer, with a specific request for the NAIWB Steering Group to revise the technical assessment developed the previous year, in February 2021.

In February 2022, the NAIWB Steering Group published the Technical Issue Update on Global High Pathogenicity Avian Influenza Events. Key points included:

- The **likely increased level of risk to Australia** due to the emergence of novels strains and increased in frequency of outbreaks overseas.
- Migratory shorebirds are in the southern parts of their range including Australia as of February 2022, but the **risk will increase when migratory birds make their southward return to Australia from the northern hemisphere** between August and November.
- **Current strains also have the potential to cause substantial wild bird mortality events**, in addition to impacts on the poultry industry.

In advance of the Austral spring, when migratory birds start their return to Australia from the northern hemisphere, the following is recommended:

- **Continue current targeted surveillance activities in apparently healthy birds.**
- **Sequence analysis of AIVs detected ensures Australia virus sequence library allows for rapid comparison of Australian and overseas strains.**
- **Continue monitoring for AIV in sick and dead wild birds.**
- **Further strengthen linkages with neighbouring countries to ensure rapid exchange of poultry and wild bird avian influenza intelligence and wild bird movements information.**

AVIAN INFLUENZA IS A NATIONAL NOTIFIABLE DISEASE AND REQUIRES REPORTING TO THE CHIEF VETERINARY OFFICER (CVO) AT THE APPROPRIATE AUSTRALIAN STATE OR TERRITORY

If you would like information about Avian Influenza testing and sample collection, please seek advice from your local WHA Coordinator or call the Emergency Animal Disease Hotline (**1800 675 888**).

Data provided in this document should be considered preliminary and may be changed.

Targeted surveillance - Jan to Jun 2022

Between January and June 2022, AIV-specific, risk-based surveillance occurred at sites in New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria and Western Australia with cloacal and faecal environmental swabs collected from 2535 apparently healthy and hunter-shot waterbirds. Samples were tested using RT-PCR for AIV M (matrix) gene detection. Influenza A reactors (positives) to the influenza A matrix gene PCR were tested using specific qRT- PCRs for influenza A H5 and H7. Samples for which H5/H7 subtypes were detected by RT-PCR were dispatched to the CSIRO Australian Centre for Disease Preparedness (ACDP) for confirmatory and further testing.

Targeted surveillance - Influenza A virus detections (Jan - Jun 2022)

State / Territory	# Individual Swabs Collected[a]	# Positives[b]	H5 LPAI	H5 HPAI	H7 LPAI	H7 HPAI	Other LPAI HA Subtypes[c]
NSW	626	16	2	0	1	0	H3, H6
NT	150	1	0	0	0	0	H3
Qld	321	1	0	0	0	0	H4
SA	265	14	0	0	0	0	H2, H3, H4, H8, H9, H10
Tas	439	32	1	0	0	0	H2, H3, H4, H6, H9
Vic	174	9	0	0	1	0	H3, H4, H8, H9
WA	560	48	3	0	1	0	H1, H3, H4, H6, H8, H9, H10, H11
Total	**2535**	**121**	**6**	**0**	**3**	**0**	

[a] Swabs include faecal environmental and cloacal swabs.

[b] A number of swabs were tested as a pooled sample (up to 3 swabs in one pool). A positive pool represents one AIV positive. A sample is considered AIV positive if either: a) Positive at original lab; b) Indeterminate at original lab and subsequently tested positive; c) Indeterminate at original lab and subtyped at any lab.

[c] When positive AIV samples (not identified as H5 or H7) are submitted for subtyping and successful.

Between January and June 2022, no HPAI viruses were identified, but targeted surveillance continues[12,13] to find evidence of a wide range of low pathogenicity virus subtypes, including LPAI H5 and H7.

There were no detections of H5 lineage 2.3.4.4.

Molecular analysis of AIVs detected through targeted surveillance activities contribute to: tracking Australian virus evolution and dynamics, maintaining currency of diagnostic tests, maintaining a virus sequence library allowing comparison of Australian and overseas strains. This information informs risk to industry and response to detections in poultry.

From January to June 2022, species targeted for sampling were from orders Anseriformes and Charadriiformes.

Other bird orders may have been present during sample collections. The great majority of samples collected during this period were faecal environmental swabs. A small proportion of cloacal from hunter-shot birds were also collected.

General surveillance - Jan to Jun 2022

Wild bird morbidity and mortality investigation are reported into the Australia's wildlife health information system (eWHIS) via a network of state / territory WHA coordinators (appointed by their respective Chief Veterinary Officer), and WHA environment representatives, the Northern Australia Quarantine Strategy (NAQS), veterinarians at zoo-based wildlife hospitals and sentinel wildlife clinics, university clinics and pathology departments, researchers, other wildlife health professionals and WHA members. General surveillance summary tables (below) are drawn from data entered into eWHIS.

WHA received 81 reports of wild bird mortality or morbidity investigations from around Australia from January to June 2022, which were tested for AIV by PCR for influenza A. Investigations may involve a single animal or multiple animals (e.g. mass mortality event). Reports and samples from sick and dead birds are received from members of the public, private practitioners, universities, zoo wildlife clinics and wildlife sanctuaries.

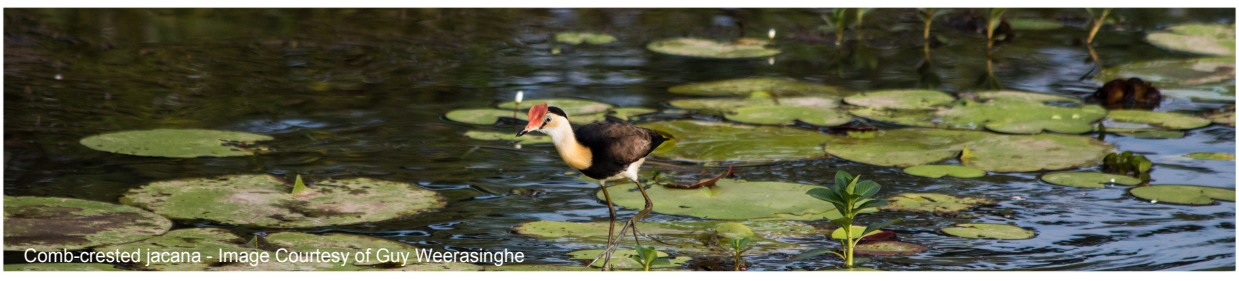
General surveillance - mortality and morbidity events in which birds were tested for Influenza A viruses (Jan - Jun 2022)

Bird Order	Common Names for Bird Order[14]	Number of Events AIV Tested via PCR[a]	Number of Events AIV Positive
Accipitriformes	Osprey, hawks and eagles	1	0
Anseriformes	Magpie Goose, ducks, geese and swans	16	4[b]
Charadriiformes	Shorebirds	5	0
Columbiformes	Doves and pigeons	9	0
Gruiformes	Rails, coots and cranes	2	0
Passeriformes	Passerines or perching birds	7	0
Pelecaniformes	Ibis, herons and pelicans	5	0
Podicipediformes	Grebes	1	0
Procellariiformes	Petrels or shearwaters	2	0
Psittaciformes	Parrots and cockatoos	24	0
Sphenisciformes	Penguins	7	0
Suliformes	Gannets and cormorants	4	0
Turniciformes	Button-quails	1	0

[a] Disease investigations may involve a single or multiple bird orders (e.g. mass mortality event). The number of events where AIV was tested via PCR against each bird order do not equal the total number of investigations due to multi-species events. During the semester, two wild bird events involved multiple bird orders tested for AIV. One event involved the orders Anseriformes, Gruiformes and Suliformes the second event involved Anseriformes and Charadriiformes.

[b] Incidental findings of AIV in four mortality events involving Anseriformes are described in the next page.

Avian influenza was not confirmed as the cause of any wild bird morbidity or mortality event between January and June 2022 reported to eWHIS.



Comb-crested jacana - Image Courtesy of Guy Weerasinghe

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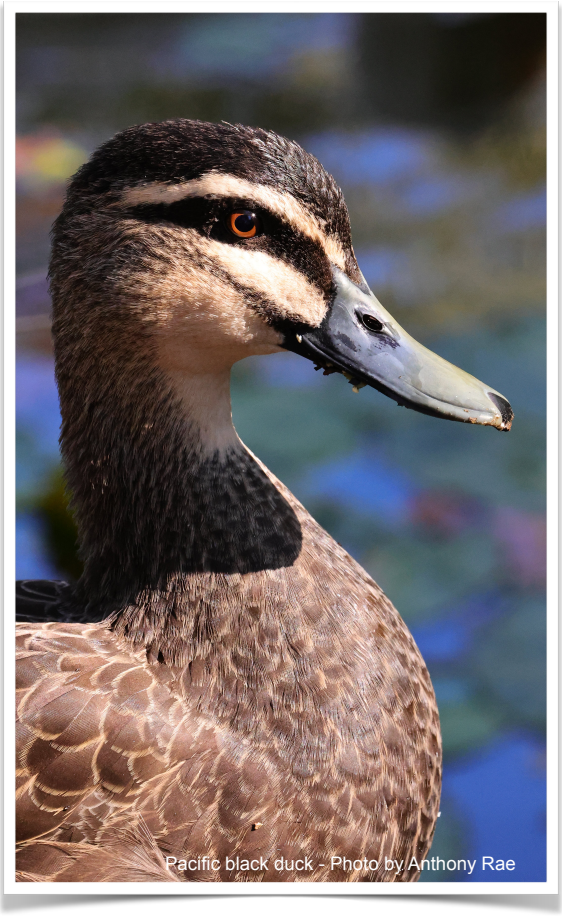
AIV incidental detections – Jan to Jun 2022

In the first event, approximately 18 ducks were found deceased in a pond in south-east Melbourne, Vic. Birds submitted for investigation were all in good condition with variable amounts of grain in the gastrointestinal tract. AIV was incidentally detected in one Pacific black duck in which further testing excluded H5, H7 and H9 subtypes, and pathology findings were not consistent with AIV. Based on history and lack of significant lesions in all birds examined, deaths are likely to be attributed to other factors. This AIV incidental finding is not unusual given waterfowl are AIV reservoir species.

In the second event, LPAI H9N2 was incidentally detected in one Pacific black duck from a mortality event of approximately 10 ducks in central western NSW. A duck submitted for investigation was observed falling from the sky. Post-mortem and histopathology examination findings in this bird included numerous nematodes parasites and associated lesions in the gastrointestinal tract, but no indication of viral infection or respiratory system inflammation, therefore AIV detection was an incidental finding. Avian orthoavulavirus 1 was excluded by PCR and there was severe trauma to the pectoral region, consistent with falling from the sky. Follow-up environmental faecal swabs and testing of another dead bird were negative for AIV by PCR.


Pacific black duck - Photo by Anthony Rae

The third event involved approximately 200 birds which have been reported sick and dead in a lake in central NSW. Sick birds had limp necks, incoordination, or paralysis. One Pacific black duck among nine birds of a variety of species were submitted for investigation. AIV was detected in one Pacific black duck, but histopathological findings were not consistent with AIV, and the detection was considered an incidental finding. Whole genome sequencing identified LPAI H5N1 virus with close matches to virus segments previously detected in Australian wild birds and not related to HPAI viruses circulating overseas. Avian orthoavulavirus 1 and West Nile virus were excluded by PCR from all birds. The cause of the mortality event is likely toxic blue-green algae based on history and findings, including structures suggestive of cyanobacteria (blue-green algae) in water samples stained with Lugol's iodine under light microscopy, and microcystin consistently recovered from both liver and stomach content samples collected from deceased birds.

In the fourth event, AIV was incidentally detected in one Pacific black duck from a mortality event in Esperance, WA in a public waterway involving approximately 30 ducks in a period of a month, in which ducks were observed with limber necks. Upon examination, no significant pathology lesions were found in any of the six birds submitted for investigation; avian orthoavulavirus 1 was excluded from all 6 birds and further testing on the one positive swab from 6 samples tested for AIV identified the virus as LPAI H1. Although botulinum toxin was not confirmed as the cause of death in six birds tested, four of them had indeterminate results for botulinum C and/or D toxins. Botulism is the likely cause of death based on history and absence pathology findings. AIV detection is incidental and not unusual given waterfowl are AIV reservoir species.

Avian Influenza incidental findings in Pacific black ducks are not unusual given waterfowl (Anseriformes) are an AIV reservoir species.

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Disclaimer

This document was developed and approved by the National Wild Bird Avian Influenza (NAIWB) Steering Group for information purposes only. NAIWB Steering Group was established to ensure national coordination and collaboration of wild bird avian influenza surveillance activities. Wildlife Health Australia provides support to the NAIWB Steering Group and collates avian influenza surveillance data from wild birds sampled across Australia. Information contained in it is drawn from a variety of sources external to Wildlife Health Australia. Data is provided on an "as is" basis and may be changed periodically; these changes may or may not be incorporated in any new version of the publication. Although reasonable care was taken in its preparation, Wildlife Health Australia does not guarantee or warrant the accuracy, reliability, completeness, or currency of the information or its usefulness in achieving any purpose. To the fullest extent permitted by law, Wildlife Health Australia will not be liable for any loss, damage, cost or expense incurred in or arising by reason of any person relying on information in this document. You may download, display, print and reproduce this material in unaltered form only for personal, non-commercial use or use within your organisation, provided due acknowledgement is made of its source. For any other use of the material contained in this document (including, but not limited to any text, illustration, table, or any other material), written permission must be obtained with Wildlife Health Australia and the NAIWB Steering Group.

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