Wild Bird News

National Avian Influenza Wild Bird Surveillance Newsletter - Dec 2023

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 December 2023, 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 [3-9].

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

National Avian Influenza Wild Bird Surveillance Program

In 2006, the National Avian Influenza Wild Bird (NAIWB) Steering Group was formed with the aim of facilitating nationwide coordination and cooperation of surveillance efforts related to avian influenza in wild birds. Wildlife Health Australia takes on the role of overseeing the wild bird surveillance program. The NAIWB surveillance initiatives encompass the entire country and activities are funded by the Australian Department of Agriculture, Fisheries, and Forestry (DAFF). Substantial in-kind support is provided by local governmental bodies, researchers, and various representative institutions.

Surveillance activities include two sampling components: firstly, targeted surveillance, in which environmental faecal swabs, as well as cloaca and/or oropharyngeal swabs, are collected from wild or hunter-shot birds of known avian influenza virus (AIV) reservoir species (e.g. waterfowl, shorebirds) that are apparently healthy. These samples undergo testing to identify the presence of AIVs. The collection of samples is done by diverse initiatives, including programs run by state and territorial government agencies, university research projects, and the Northern Australia Quarantine Strategy.

The second component is the general surveillance, with investigation of significant morbidity and mortality events of wild birds, including captive avian populations within zoos. Reports and samples from sick or dead dead birds are submitted by private veterinary practitioners, universities, zoo wildlife clinics, wildlife sanctuaries and members of the public.

Cape Barren goose - Image Courtesy of Shana Ahmed

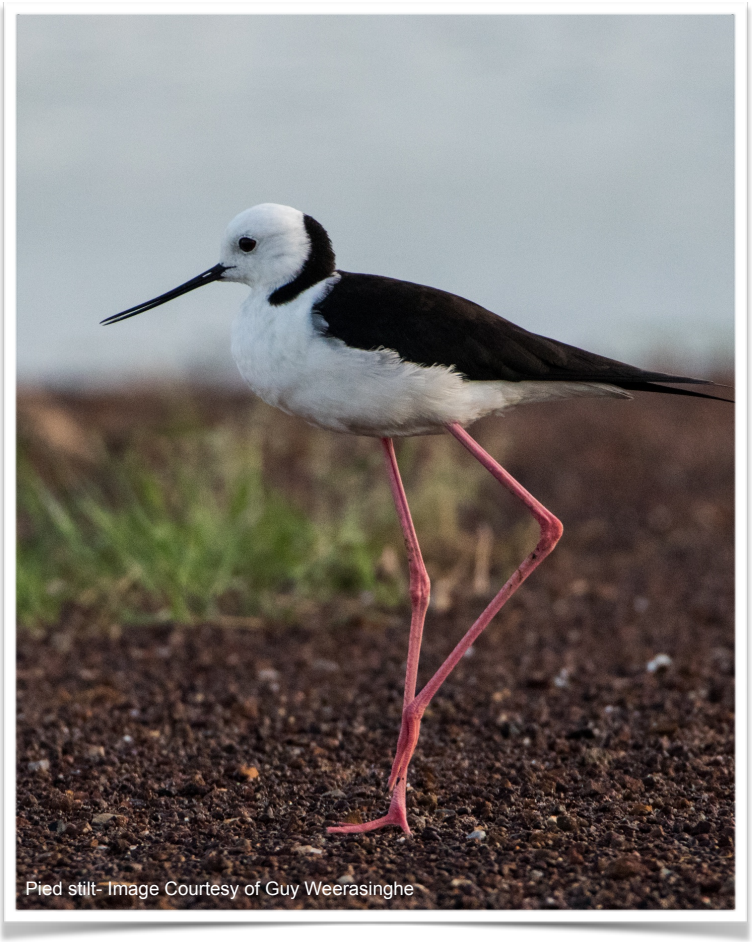
Data provided in this document should be considered preliminary and may be changed.

Global High Pathogenicity Avian Influenza Update and Preparedness in Australia

HPAI H5Nx 2.3.4.4b continued to spread rapidly and widely through South America in the second half of 2023, eventually arriving in the sub-Antarctic island territories off South America in October 2023 and heightening concerns regarding incursion to the Antarctic mainland [13]. Large scale mortality events were reported for species such as cormorants (~242,000 deaths), Humboldt penguins (~4,000 deaths), and Peruvian pelicans (~62,000 deaths) [13]. The population of Southern elephant seals in Peninsula Valdés, Argentina, was heavily impacted, with an estimated loss of 97.4% of pups born in that breeding season and risking the long term viability of this population [14]. These events demonstrate the potential of severe conservation impacts for wildlife species affected by this virus.

In response to these and other global HPAI events and help guide preparedness efforts, the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF) commissioned work to assess Australia's vulnerability to this disease, including a risk assessment focussed on the likelihood of the incursion of HPAI H5Nx clade 2.3.4.4b into Australia via wild birds, with subsequent establishment in and consequence for wild birds, poultry or wild mammals.

The **risk assessment report** identified the overall risk to Australia has increased compared to previous risk assessments, both as a result of elevated entry risk from long-distance and regional migratory birds introducing virus and the potential severity of impacts from clade 2.3.4.4b compared to previous strains of HPAI, based on experiences reported on wild birds and wild mammals in other parts of the world.



Pied stilt- Image Courtesy of Guy Weerasinghe

This risk assessment was based on information available as of the 20 July 2023. The global avian influenza situation is highly dynamic and, since this report was commissioned, HPAI emerged in the sub-Antarctic, thousands more wild birds and marine mammals have been infected, and a considerable number of scientific studies have been published addressing the ecology, evolution, virology, and pathogenicity of this virus. As remaining knowledge gaps and uncertainties are being steadily addressed, sections of the risk assessment will be revised in due course. Key updates are noted in the document.

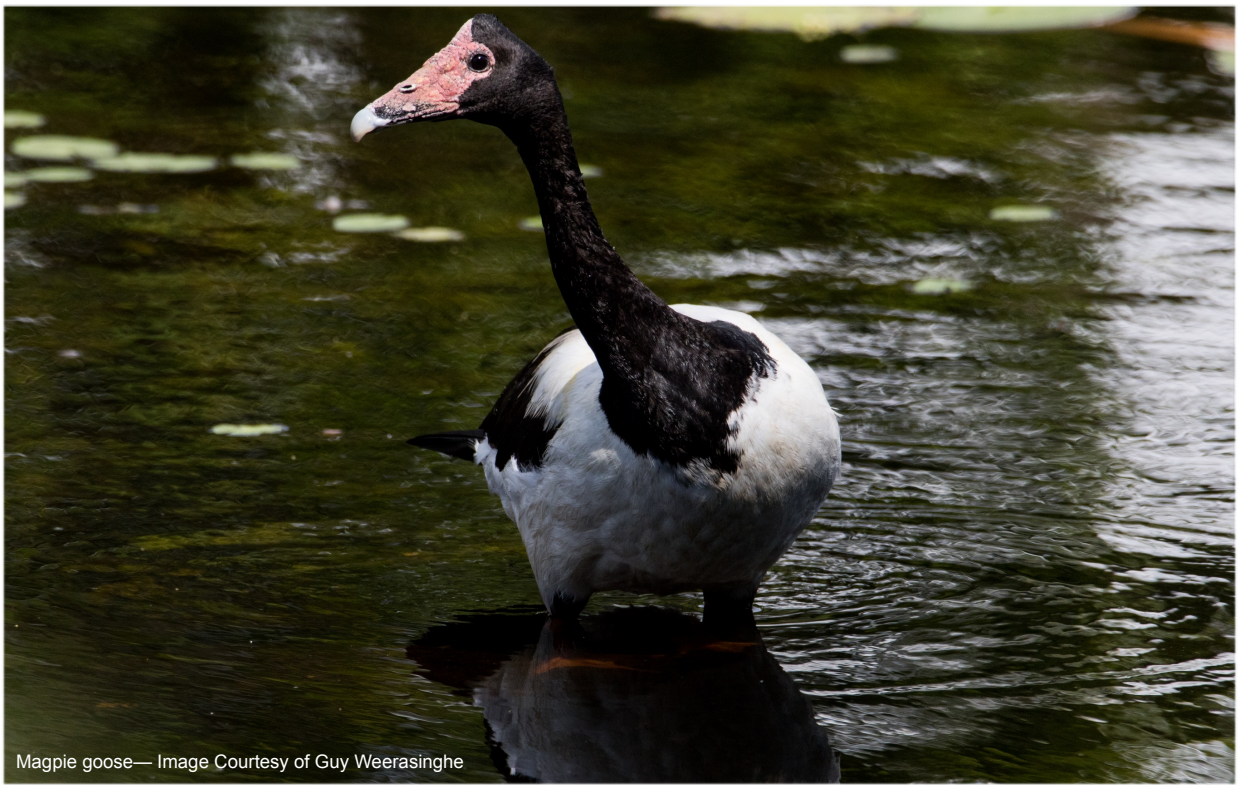
There is no way to prevent HPAI entering Australia through migratory movements of wild birds into Australia. It is important that individuals or groups who may observe or handle wild birds are aware of HPAI, to ensure appropriate reporting and investigation is undertaken and to ensure risks to themselves and other animals are minimised.

Wildlife Health Australia has developed a range of resources to assist those working with and managing wild bird populations:

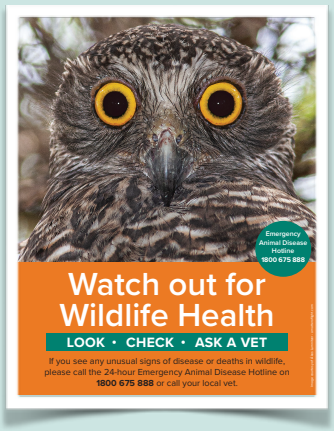
- Advice documents for bird banders, wildlife rangers and researchers; for people who encounter sick or dead wild birds; for veterinarians and other animal health professionals
- Risk mitigation toolbox for wildlife managers
- Updated Technical Document on global HPAI events

These and other documents are available on the **WHA website - HPAI Information**. The NAIWB Surveillance Program also continued to coordinate nationwide surveillance for all avian influenza viruses which contributed to monitoring for potential incursion of HPAI H5Nx 2.3.4.4b.

WHA would like to acknowledge the significant expertise and comprehensive assessments undertaken by **Dr Marcel Klaassen** (Deakin University) and **Dr Michelle Wille** (The University of Melbourne) in addition to critical contributions and feedback from members of the NAIWB Steering Group in development of the risk assessment. See also Marcel and Michelle article: **The plight and role of wild birds in the current bird flu panzootic** [15].



Magpie goose— Image Courtesy of Guy Weerasinghe



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**).

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Targeted surveillance - Jul to Dec 2023

Between July and December 2023, 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 3310 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 (Jul - Dec 2023)

State / Territory	# Individual Swabs Collected[a]	# Positives[b]	H5 LPAI	H5 HPAI	H7 LPAI	H7 HPAI	Other LPAI HA Subtypes[c]
NSW	159	6	0	0	1	0	H6, H8
NT	225	6	0	0	0	0	H3, H9
Qld	916	15	1	0	1	0	H3, H10
SA	627	33	3	0	3	0	H1, H6, H8, H9, H10, H11
Tas	207	1	0	0	0	0	H6
Vic	400	12	0	0	0	0	H1, H2, H3, H6, H10
WA	776	79	0	0	1	0	H4, H6, H8, H9, H10
Total	**3310**	**152**	**4**	**0**	**6**	**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 July and December 2023, no HPAI viruses were identified, but targeted surveillance continues [12, 16] 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 July to December 2023, 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.

In addition to the above sampling, long-standing members of NAIWB Steering Group, **Marcel Klaassen** and **Michelle Wille**, conducted targeted high pathogenicity avian influenza (HPAI) surveillance on priority species (shorebirds and seabirds) during the 2023 Spring migratory period for a second year. Sampling of more than 1000 birds did not reveal any detections of HPAI, including HPAI H5 2.3.4.4b. This information has been published: '**Long-Distance Avian Migrants Fail to Bring 2.3.4.4b HPAI H5N1 Into Australia for a Second Year in a Row**' [17].

Samples were collected in collaboration with the **Northern Australia Quarantine Strategy**, the **Australasian Wader Studies Group**, the **Victorian Wader Study Group** and the **Victorian Ornithological Research Group**. Funding was provided through the Department of Agriculture, Fisheries, and Forestry One Health Investigation Fund (administered by Wildlife Health Australia), ARC Discovery Project grant.

General surveillance - Jul to Dec 2023

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 93 reports of wild bird mortality or morbidity investigations from around Australia from July to December 2023, 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 (Jul - Dec 2023)

Bird Order	Common Names for Bird Orders[a]	Number of Events AIV Tested via PCR[b]	Number of Events AIV Positive
Accipitriformes	Osprey, hawks and eagles	2	0
Anseriformes	Magpie Goose, ducks, geese and swans	11	1[c]
Caprimulfiformes	Frogmouth and nightjars	2	0
Charadriiformes	Shorebirds	5	0
Columbiformes	Doves and pigeons	10	0
Coraciiformes	Bee-eater and kingfishers	1	0
Galliformes	Brush turkeys and quails	1	0
Passeriformes	Passerines or perching birds	14	0
Pelecaniformes	Ibis, herons and pelicans	10	0
Procellariformes	Petrels and shearwaters	15	0
Psittaciformes	Parrots and cockatoo	11	0
Sphenisciformes	Penguins	12	0
Strigiformes	Owls	1	0
Suliformes	Gannets and cormorants	5	0

[a] del Hoyo J, Collar NJ. HBW and BirdLife International Illustrated Checklist of the Birds of the World Volume 1: Non-passerines. Barcelona, Spain and Cambridge, UK: Lynx Edicions and Birdlife International; 2014.

[b] Disease investigations may involve a single or multiple bird orders (e.g. mass mortality event). Some events may be recorded in multiple lines in this table due to the involvement and testing of multiple species from different Orders. During the reporting period, seven events involved AIV testing of birds from multiple Orders – the first event involved Charadriiformes and Sphenisciformes, the second event involved Columbiformes and Passeriformes, the third event involved Columbiformes and Galliformes, the fourth event involved Passeriformes and Procellariiformes, the fifth event involved Procellariiformes and Suliformes, the sixth event involved Anseriformes and Pellecaniformes and the seventh involved Passeriformes and Psittaciformes.

[c] Incidental findings of AIV in one mortality event involving Anseriformes is described in the next page.

Avian influenza was not confirmed as the cause of any wild bird morbidity or mortality event between July and December 2023 reported to eWHIS.

AIV incidental detection – Jul to Dec 2023

During a NAQS visit to sewage ponds in Darwin, Northern Territory for targeted avian influenza faecal environmental sampling in October 2023, a few moribund ducks were observed. Some Radjah shelducks exhibited weakness and paralysis, and approximately 10 dead ducks (primarily Pacific black ducks and Radjah shelducks) were seen, some being scavenged by kites.

A single Radjah shelduck was captured for investigation. Avian influenza virus was excluded by PCR. Avian orthoavulavirus 1 (also known as avian paramyxovirus 1) PCR was positive and further sequencing at CSIRO's Australian Centre for Disease Preparedness (ACDP) identified a non-virulent strain of Class I virus closely related to avian orthoavulavirus 1 previously detected in Australia. Twenty-five faecal environmental samples from the site were negative for avian influenza and avian orthoavulavirus 1.


Radjah shelduck - Photo by David Clode on Unsplash

Further bird deaths were reported in the following days and a total of 19 ducks, including moribund and dead birds were submitted for investigation. Three of these ducks were also positive for avian orthoavulavirus 1. High throughput sequencing at ACDP identified low pathogenicity avian influenza H9N2 virus in one duck sample, and low pathogenicity avian influenza H5N1 virus in another (not related to the H5 high pathogenicity avian influenza virus clade 2.3.4.4b circulating overseas). In all cases, histopathology findings were not consistent with disease caused by avian influenza virus or avian orthoavulavirus 1, and botulism was suspected based on clinical signs and history. A presumptive diagnosis of botulism is based on a combination of clinical signs, species affected, a lack of significant lesions upon necropsy, and the prevailing environmental conditions. Avirulent avian orthoavulavirus 1 and other strains are considered widespread in Australian native birds, and other than pigeon paramyxovirus type 1, avian orthoavulavirus 1 has not been reported to cause disease in wild birds in Australia. Avian influenza virus detections in wild ducks are not unusual given that waterfowl (Anseriformes) are a reservoir species for the virus.

Incidental findings of LPAI in Radjah shelducks are not unusual given waterfowl (Anseriformes) are an AIV reservoir species.


Brolga - Image Courtesy of Guy Weerasinghe

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

Disclaimer

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