

Wild Bird News

National Avian Influenza Wild Bird Surveillance Newsletter - June 2020



Radjah shelducks - Image Courtesy of Guy Weerasinghe

National Avian Influenza Wild Bird Special Projects

The National Avian Influenza Wild Bird (NAIWB) Steering Group ensures national coordination and collaboration of wild bird avian influenza virus (AIV) surveillance activities conducted Australia-wide. As part of the targeted surveillance component of the NAIWB surveillance program, faecal environmental swabs and cloacal and/or oropharyngeal samples are collected from apparently 'healthy' wild birds and hunter-shot wild birds of known AIV reservoir species (including waterfowl and shorebirds) at key locations across Australia and tested for avian influenza viruses (AIVs). Activities are funded by the [Australian Government Department of Agriculture, Water and the Environment](#) (DAWE), in addition to in-kind support provided by the jurisdictional agencies, researchers and representative's institutions. Further background on the NAIWB surveillance program can be found in [Wild Bird News - December 2018](#).

Data generated by the NAIWB program is used to monitor and understand distribution of AIV infection in wild birds. Subsequent sequence analysis of the AIVs detected in wild birds further contributes to tracking Australian virus evolution and dynamics, maintaining currency of diagnostic tests, and maintaining a virus sequence library allowing comparison of Australian and overseas strains.

In addition to the above activities, wild bird AIV data generated through the NAIWB surveillance program is being utilised in the following three special projects. The first two projects are being

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 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.**

AIV in Australia

HPAI H5 viruses have not been detected in Australia. As of June 2020, there have been seven outbreaks due to HPAI H7 viruses in commercial Australian poultry operations between 1976 and 2013 in Victoria, Queensland and, most recently, New South Wales^{3,4,5,6,7,8}.

Mortality due to AIVs have not been reported in feral or native free-ranging birds⁹. 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^{10,11}.**

More info: [WHA FACT SHEET](#)

undertaken in collaboration with the NAIWB Steering Group with special funding provided by DAWE as part of the NAIWB surveillance program.

Descriptive analysis of historic NAIWB surveillance data: This project will analyse patterns of avian influenza virus and subtype detections obtained from the targeted surveillance activities between July 2011 and December 2020. Using the detailed results and the associated metadata from the program, the analysis will explore time, space and species patterns in light of the current [NAIWB program objectives](#). The aims of the project are:

- To provide information to help guide and optimise future approaches for targeted surveillance sampling, and
- To derive new insights into the epidemiology and ecology of avian influenza viruses in wild bird populations in Australia.

The project team includes [DAWE](#), [Wildlife Health Australia](#) (WHA) and [Marcel Klaassen](#), an avian disease epidemiologist and ecologist from [Deakin University](#). An advisory group has also been formed with members of the NAIWB Steering Group to ensure input and guidance from participants with practical knowledge of both field sampling and laboratory testing. Preliminary results have already led to a number of recommendations for future wild bird AIV targeted surveillance sampling.

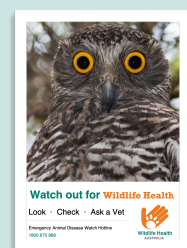
Placing Australia in the global avian influenza phylogeography: This project utilises all available Australian wild bird AIV sequence data generated by the [CSIRO Australian Centre for Disease Preparedness](#) (ACDP), [World Health Organisation Collaborating Centre for Reference and Research on Influenza](#) (WHOCRI), [Deakin University](#), and a number of participating state and territory government and university laboratories; incorporating all associated metadata. The project is being led by a partnership between WHO Collaborating Centre for Reference and Research on Influenza (Michelle Wille), Deakin University (Marcel Klaassen), [University of Sydney](#) ([Michelle Wille](#), [Edward Holmes](#)) and CSIRO ACDP ([Frank Wong](#)). Specific aims of this project include:

- To generate full genome sequences of AIVs recently detected/isolated from wild birds in Australia,
- To address specific hypotheses on how Australian wild bird AIVs fit into both regional and global AIV dynamics,
- To use Australian wild bird AIV data to better understand global AIV dynamics, and
- To facilitate AIV data sharing within Australia.

Nextstrain project: This project aims to utilise the [Nextstrain tool](#) to track pathogen evolution in real-time, combining visuals of temporal evolution and geographical distribution. The tool is being developed by CSIRO ACDP with project leads [Mathew Naeve](#) and Frank Wong and hosted in a secure server. It will provide state and territory agencies a visual tool to use and communicate with Chief Veterinary Officers in an outbreak situation, allowing patterns and likely routes of AIV viruses movement to be easily explored and hence assisting government preparedness. This project is being undertaken in collaboration with the NAIWB Steering Group and it is funded by DAWE's [Biosecurity Innovation Program](#).

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 Watch Hotline](#) (1800 675 888).



Targeted surveillance - Jan to Jun 2020

Between January and June 2020, AIV-specific, risk-based surveillance occurred at sites in New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria and Western Australia with cloacal or faecal environmental swabs collected from 2261 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 2020)

State / Territory	# Individual Swabs Collected**	# Positives***	H5 LPAI	H5 HPAI	H7 LPAI	H7 HPAI	Other LPAI HA Subtypes****
NSW	458	0					
NT	299	0					
Qld	336	1	0	0	0	0	
SA	300	0					
TAS	318	8	0	0	4	0	H1, H4
VIC*	38	0					
WA	512	0					
Total	2261	9	0	0	4	0	

* Victorian targeted surveillance was impacted by COVID-19 restrictions during this period.

** Swabs include faecal environmental and cloacal (and/or oropharyngeal) swabs.

*** 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.

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

Between January and June 2020, no HPAI viruses were identified, however targeted surveillance continues^{11,12} to find evidence of a wide range of low pathogenicity virus subtypes, including LPAI H7.

Molecular analysis of AIVs detected through the 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 2020, species targeted for sampling were from the order Anseriformes.

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 samples from hunter-shot birds were also collected.

General surveillance - Jan to Jun 2020

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

WHA received 43 reports of wild bird mortality or morbidity investigations from around Australia from January to June 2020, 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 2020)

Bird Order	Common Names for Bird Order ¹³	Number of Events AIV Tested via PCR*	Number of Events AIV Positive
Accipitriformes	Osprey, hawks and eagles	3	0
Anseriformes	Magpie Goose, ducks, geese and swans	10	0
Charadriiformes	Shorebirds	1	0
Ciconiiformes	Storks	1	0
Columbiformes	Doves and pigeons	1	0
Galliformes	Brush turkeys, scrubowls and quail	3	0
Gruiformes	Rails, gallinules, coots and cranes	1	0
Passeriformes	Passerines or perching birds	7	0
Procellariiformes	Fulmars, petrels, prions and shearwaters	1	0
Psittaciformes	Parrots and cockatoos	17	0
Suliformes	Gannets, boobies and cormorants	1	0

* 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, three wild bird events involved multiple bird orders tested for AIV. One event involved the orders Anseriformes and Suliformes, the second event involved Anseriformes and Gruiformes, and the third event involved Galliformes and Psittaciformes.

Avian influenza was not the cause of any wild bird morbidity or mortality event between January and June 2020 reported to eWHIS.

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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