Wildlife Health Australia

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Wildlife Health Australia (WHA)[17] is the coordinating body for wildlife health in Australia. WHA was established as the Australian Wildlife Health Network in 2002 as an Australian Government initiative to coordinate wildlife health surveillance information across Australia, to support Australia's animal health industries, human health, biodiversity, trade and tourism. WHA collates information from multiple sources into a national database — the electronic Wildlife Health Information System (eWHIS)[18] — including submissions by WHA surveillance partner organisations; state and territory WHA coordinators and WHA environment representatives; veterinarians at zoo-based wildlife hospitals and sentinel wildlife clinics; university clinics and pathology departments; and researchers, other wildlife health professionals and WHA members.

During the quarter, 246 wildlife disease investigation events were reported in eWHIS (Table 4 and Figure 11), and samples were collected from 750 wild birds for avian influenza (AI) surveillance.

This report details some of the disease and mortality events in free-living wildlife recorded in eWHIS this quarter. WHA thanks all those who submitted information for this report.

Wild bird mortality event summary — Newcastle disease and avian influenza exclusion

WHA received 52 reports of wild bird mortality or morbidity investigations from around Australia during the quarter; investigations may involve a

Table 4 Number of disease investigations reported in eWHIS, 1 January to 31 March 2021[a]

Mammals					Birds[d,e]	Reptiles	Amphibians
Bats[b]	Marsupials	Monotremes	Marine mammals	Feral mammals[c]			
152	26	1	4	5	52	3	3

a Disease investigations may involve a single animal or multiple animals (e.g. mass mortality events).
b The majority of bat disease investigations are single bats submitted for Australian bat lyssavirus testing.
c Feral pigs (*Sus scrofa*), European rabbits (*Oryctolagus cuniculus*) and fallow deer (*Dama dama*).
d Additional sampling for targeted avian influenza surveillance is presented elsewhere in this report.
e Includes free-ranging birds (native or feral species) and a small number of events involving birds from zoological collections and captive breeding programs.

17 www.wildlifehealthaustralia.com.au/Home.aspx
18 www.wildlifehealthaustralia.com.au/ProgramsProjects/eWHIS-WildlifeHealthInformationSystem.aspx

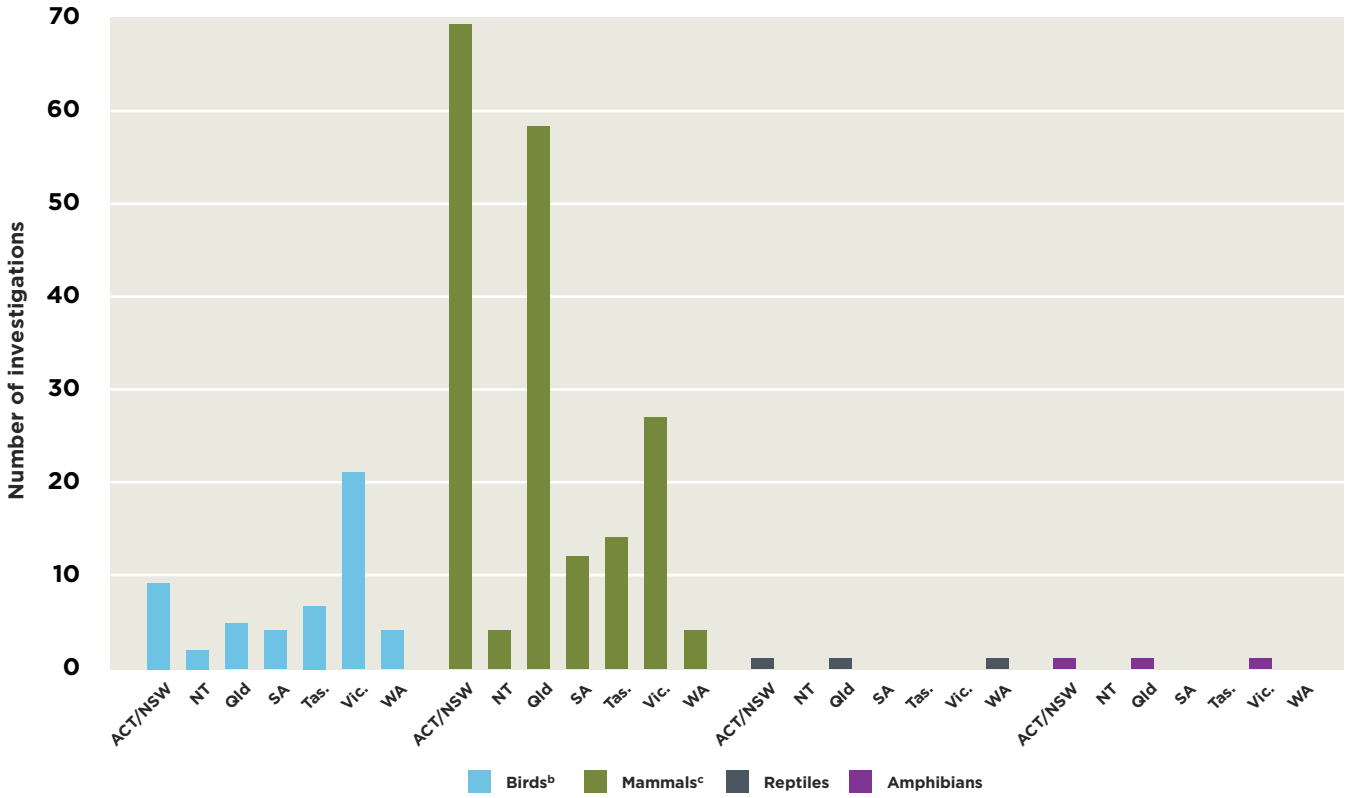

Figure 11 Number of disease investigations reported, by jurisdiction, in eWHIS, 1 January to 31 March 2021[a]

a The chart shows the number of disease investigation events reported in eWHIS. Each investigation may involve one or multiple animals.
b 'Birds' includes free-ranging birds (native or feral species) and a small number of events involving birds from zoological collections and captive breeding programs.
c Investigations involving mammals include individual bats submitted for Australian bat lyssavirus testing.

single animal or multiple animals (e.g. a mass mortality event). A breakdown of wild bird events by taxonomic order is given in Table 5. Reports and samples from sick and dead birds are received from members of the public, private practitioners, universities, zoo wildlife clinics and wildlife sanctuaries. Avian influenza virus (AIV) was excluded by polymerase chain reaction (PCR) testing for influenza A in 39 events as part of Australia's general (sick and dead bird) AI surveillance program. Disease caused by AIV was also excluded in the remaining 13 events, based on clinical signs, history, histopathology, prevailing environmental conditions or other diagnoses. Avian orthoavulavirus 1 (AOAV-1; also known as Newcastle disease virus or APMV-1) was excluded in 36 events by PCR testing specific for AOAV-1 and/or the pigeon paramyxovirus type 1 variant (PPMV-1).

Wild bird disease investigations this quarter also found aspergillosis, botulism, coccidiosis, *Clostridium perfringens* infection, *Escherichia coli* infection, *Macrorhabdus ornithogaster* infection, metabolic bone disease, parasitism, pesticide toxicity, protozoal infection, salmonella infection, trematodiasis and trichomoniasis.

Silver gull mortality events

This quarter, there were also two silver gull mass mortality events, which took place at closely located sites in Launceston, Tasmania. In the first event, approximately 80 silver gulls were reported sick and dead by members of the public in February. Following field assessment by a wildlife ranger from the Tasmanian Department of Primary Industries, Parks, Water and Environment (DPIPWE), four birds were collected for investigation (one moribund juvenile, one dead juvenile and two dead adults). Histopathology findings at the Tasmanian Animal Health Laboratory (AHL) were mild, and included myositis, hepatitis and enteritis. Microbiology testing did not find pathogens suggestive of an infectious disease process. Pooled cloacal and tracheal swabs from each of the four gulls were tested for AOAV-1 and AIV via PCR at AHL. All samples were negative for AOAV-1. The pooled sample from one of the juvenile gulls had indeterminate results in reverse transcriptase (RT) PCR for AIV M (matrix) gene detection. The individual cloacal and tracheal swabs from this bird were sent to CSIRO's Australian Centre of Disease Preparedness (ACDP) for confirmatory and further testing, which identified a relatively weak AIV-positive result. Specific quantitative RT-PCRs for H5, H7 and H9 were negative, and molecular subtyping was unsuccessful. The organophosphate pesticide

Table 5 Wild bird disease investigations, by taxonomic order, reported into eWHIS, 1 January to 31 March 2021

Bird order	Common name/s for bird order[a]	Events reported[b]
Accipitriformes	Osprey, hawks and eagles	3
Anseriformes	Magpie geese, ducks, geese and swans	11
Charadriiformes	Shorebirds	4
Columbiformes	Doves and pigeons	3
Coraciiformes	Bee-eaters and kingfishers	3
Gruiformes	Rails, gallinules, coots and cranes	2
Passeriformes	Passerines or perching birds	19
Pelecaniformes	Ibis, herons and pelicans	3
Psittaciformes	Parrots and cockatoos	13
Sphenisciformes	Penguins	1
Strigiformes	Typical owl and barn owls	3
Suliformes	Gannets, boobies and cormorants	1

a del Hoyo J, Collar NJ 2014. *Handbook of the birds of the world and BirdLife International illustrated checklist of the birds of the world*. Volume 1 — Non-passerines, Barcelona: Lynx Editions.

b Disease investigations may involve a single bird order or multiple orders (e.g. a mass mortality event). The number of events reported against each bird order does not equal the total number of investigations due to multi-species events. This quarter, seven wild bird events involved multiple bird orders. One event involved orders Anseriformes, Columbiformes, Passeriformes, Pelecaniformes and Psittaciformes, the second event involved Anseriformes, Passeriformes and Psittaciformes, the third event involved Columbiformes, Coraciiformes, Passeriformes, Pelecaniformes and Psittaciformes, the fourth event involved Gruiformes and Psittaciformes, the fifth event involved Passeriformes and Pelecaniformes and the sixth and seventh events involved Passeriformes and Psittaciformes.

fenthion was detected in pooled gizzard samples from two birds at the Analytical Services Tasmania (AST) laboratory and deemed the cause of the mortality event. Further investigations are ongoing to determine the circumstances of the poisoning.

In the second silver gull mortality event, approximately 130 silver gull carcasses were found on a vacant block in March. Site inspection by an RSPCA officer then a Biosecurity Tasmania veterinarian and wildlife officer revealed that 75% of the birds were juveniles. Six birds, including one carcass with blood on the cloaca and one very lethargic gull, were collected and submitted for investigation. On post-mortem examination at AHL, five birds showed evidence of diarrhoea. One bird also had haemorrhagic ventriculitis of the gizzard. Another bird had conjunctivitis and a firm focal mass on the tip of the beak. Histopathology findings from this bird suggest possible incidental pox infection. This bird also had cestodiasis, which didn't appear to be causing enteritis. AIV, AOAV-1 and *Chlamydia psittaci* were excluded by PCR on pooled tracheal and cloacal swabs from all six birds. Organophosphate pesticide screening conducted at AST on pooled liver, pooled gizzard and a corn cob found on-site was negative. Of four birds tested at Biosecurity Sciences Laboratory, Queensland, liver and gizzard samples from one gull and a liver sample from a second gull were positive for botulinum toxin types C and D via enzyme-linked immunosorbent assay (ELISA). Botulism was considered the likely cause of this mortality event and DPIPWE will continue to monitor the area and all bird species for further mortality events (see also WHA fact sheet[19]).

Further investigation was undertaken to verify the AIV status of the gulls in these events. Fifty-seven faecal environmental swabs were collected in pools of three during a second visit to the site where carcasses from the second mortality event were found, and from a location adjacent to the first mortality event. One pooled sample was positive for AIV at AHL and sent to ACDP for further testing, where it was confirmed as AIV-positive, but negative for the H5 and H7 subtypes. Further subtyping was unsuccessful. Avian influenza was not considered the cause of these silver gull mortality events, since clinical examination and pathology findings from both events were not consistent with avian influenza in any of the sampled birds. AIV detections in both events are therefore incidental, and not unusual given that Charadriiformes are an AIV reservoir species.

Waterfowl (Anseriformes) and shorebirds (Charadriiformes) are the main natural reservoirs of AIV and rarely show signs of the disease. Based on targeted wild bird surveillance in Australia, the proportion of birds that test positive for low pathogenicity avian influenza (LPAI) is

19 www.wildlifehealthaustralia.com.au/Portals/0/Documents/FactSheets/Avian/Botulism_in_Australian_Wild_Birds.pdf

significantly greater in Anseriformes than in Charadriiformes.[20]

Whilst AIV sequences from gulls are usually distinct from AIV sequences detected in wild bird AIV host species in the northern hemisphere (e.g. subtypes H13 and H16 are described as gull-specific), gulls are considered important hosts for AIV subtype reassortment and thus contribute to gene transfer between different geographic regions.[21] AIV has previously been detected in gulls in Australia (National Avian Influenza Wild Bird Surveillance Program and eWHIS), including LPAI H13 in seven silver gulls in Tasmania.[22] Despite gulls being a known reservoir species for AIV, investigation of significant mortality events should always include AIV exclusion. See also WHA fact sheet.[23]

Avian influenza surveillance

Australia's National Avian Influenza Wild Bird (NAIWB) Surveillance Program[24] comprises two sampling components. The first is pathogen-specific, risk-based surveillance, by sampling of apparently healthy wild birds, both live and hunter-shot (e.g. targeted wild bird surveillance). The second is general surveillance, by investigating significant unexplained morbidity and mortality events in wild birds, including captive and wild birds within zoo grounds (with a focus on exclusion-testing for AIV subtypes H5 and H7).

Samples from sick or dead birds were discussed earlier. Sources for targeted wild bird surveillance data include state and territory government laboratories, universities and samples collected through NAQS.[25]

During the quarter, pathogen-specific, risk-based surveillance occurred at sites in New South Wales, Tasmania, Victoria and Western Australia. All of the 750 faecal environmental and cloacal swabs collected from waterbirds were tested for AIVs. Based on results received to date, no high pathogenicity AIVs were identified. However, targeted surveillance activities this quarter continued to find evidence of LPAI viruses, including LPAI H5.

Molecular analyses of AIVs detected through the targeted surveillance activities:[20,22]

- contribute to the understanding of AIV dynamics in Australia
- help maintain the currency of diagnostic tests
- serve as a point of comparison when novel AIV strains of importance emerge overseas.

Between January and December 2020, pathogen-specific, risk-based surveillance occurred at sites across Australia. Anseriformes (waterfowl) were primarily targeted, and a few Charadriiformes (shorebirds) were sampled. Sampling focused on areas with known mixing of shorebirds and waterfowl, or those in close proximity to poultry and humans, or both. Of the 6579 cloacal, oropharyngeal and faecal environmental swabs collected from waterbirds, all 6579 were tested for AIV and 1476 were tested for AOAV-1. No high pathogenicity AIVs were identified. However, surveillance activities continued to find evidence of a wide range of LPAI virus subtypes, including H1, H2, H4, H5, H6, H7, H9 and H11. No strains of AOAV-1 were detected. These findings highlight the need for poultry producers to remain alert and to ensure that appropriate biosecurity arrangements and effective risk reduction measures for AI are in place at their premises.

Flying fox disease events

Two recent disease events in flying foxes are reported on pages 7 and 25, a cluster of Australian bat lyssavirus in little red flying foxes, and a paralysis event in Queensland and New South Wales.

20 Grillo VL, Arzey KE, Hansbro PM, Hurt AC, Warner S, Bergfeld J et al. 2015. Avian influenza in Australia: a summary of 5 years of wild bird surveillance. *Australian Veterinary Journal*; 93(11): 387–393.

21 Wille M, Robertson GJ, Whitney H, Bishop MA, Runstadler JA and Lang AS 2011. Extensive geographic mosaicism in avian influenza viruses from gulls in the northern hemisphere. *PloS one*; 6(6): e20664.

22 Haynes L, Arzey E, Bell C, Buchanan N, Burgess G, Cronan V et al. 2009. Australian surveillance for avian influenza viruses in wild birds between July 2005 and June 2007. *Australian Veterinary Journal*; 87(7): 266–272.

23 www.wildlifehealthaustralia.com.au/Portals/0/Documents/FactSheets/Avian/Avian_Influenza_in_Wild_Birds_in_Australia.pdf

24 www.wildlifehealthaustralia.com.au/ProgramsProjects/WildBirdSurveillance.aspx

25 www.agriculture.gov.au/biosecurity/australia/naqs