Wildlife Health Australia

Keren Cox-Witton, Silvia Ban and Tiggy Grillo
Wildlife Health Australia

Wildlife Health Australia (WHA)[23] 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 manage 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)[24] — including submissions by WHA subscribers, state and territory WHA coordinators, researchers, and university, zoo and sentinel clinic veterinarians.

During the quarter, 207 wildlife disease investigation events were reported in eWHIS (Table 6 and Figure 16), and samples were collected from 427 wild birds for avian influenza (AI) surveillance.

This report details some of the disease and mortality events in

Table 6 Number of disease investigations reported in eWHIS, January to March 2020[a]

Mammals						Birds[e,f]	Reptiles	Amphibians
Bats[b]	Marsupials	Monotremes	Marine mammals	Feral mammals[c]	Other mammals[d]			
136	14	3	1	9	2	36	5	1

a Disease investigations may involve a single animal or multiple animals (e.g. mass mortality event).
b The majority of bat disease investigations are single bats submitted for Australian bat lyssavirus testing.
c Feral pig (*Sus scrofa*), European rabbits (*Oryctolagus cuniculus*) and black rat (*Rattus rattus*).
d Dingo (*Canis familiaris dingo*) and smoky mouse (*Pseudomys fumeus*).
e Additional sampling for targeted avian influenza surveillance is presented elsewhere in this report.
f Includes free-ranging birds (native or feral species) and a small number of events involving birds from zoological collections and captive breeding programs.

23 www.wildlifehealthaustralia.com.au/Home.aspx

24 www.wildlifehealthaustralia.com.au/ProgramsProjects/eWHIS-WildlifeHealthInformationSystem.aspx

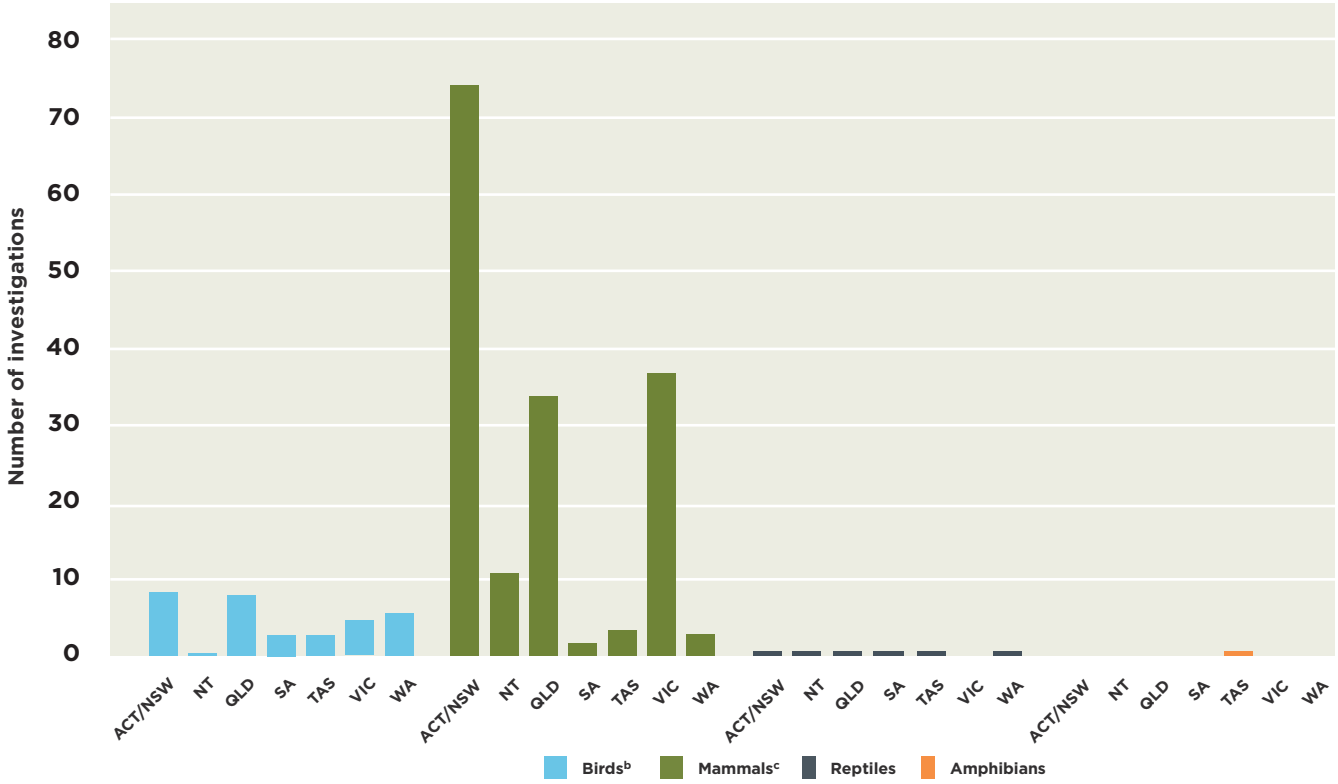

Figure 16 Number of disease investigations reported, by jurisdiction, in eWHIS, January to March 2020[a]

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.

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 36 reports of wild bird mortality or morbidity investigations from around Australia during the quarter; investigations may involve a single animal or multiple animals (e.g. a mass mortality event). A breakdown of wild bird events by taxonomic order is given in Table 7. 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 16 events as part of Australia's general (sick and dead bird) avian influenza (AI) surveillance program. Disease caused by AIV was also excluded in the remaining 20 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 avian paramyxovirus-1 [APMV-1]) was excluded in 13 events by PCR testing specific for AOaV-1 and/or the pigeon paramyxovirus type 1 variant (PPMV-1).

Also this quarter, an investigation into a wild duck botulism event involving over 40 birds in the City of Stirling wetlands, northeast of Perth was finalised. Testing resulted in the incidental detection of an avirulent strain of AOaV-1 in one of two ducks submitted to the Department of Primary Industries and Regional Development (DPIRD), Western Australia. Birds found at the wetland during the event were unable to hold their own bodies up and all birds taken into care subsequently died. Two moribund birds with flaccid paralysis were submitted to DPIRD Diagnostic Laboratory Services (DDLS) for diagnostic investigation. Both ducks were in good body condition. Gut content from one bird tested positive for botulinum C toxin gene by RT-PCR and enzyme-linked immunosorbent assay. AIV was excluded via PCR from cloacal and tracheal swabs in both birds. The incidental detection of AOaV-1 on a cloacal swab from one bird via PCR at DDLS was confirmed as a class II avirulent AOaV-1 strain based on subsequent testing of samples sent to the CSIRO Australian Centre for Disease Preparedness (formerly Australian Animal Health Laboratory), Geelong, Victoria.

The detection was deemed an incidental finding on the basis that there were no clinical or histological findings consistent with disease caused by AOaV-1. In addition, duck and other aquatic

Table 7 Wild bird disease investigations, by taxonomic order, reported into eWHIS, January to March 2020

Bird order	Common name for bird order[a]	Events reported[b]
Anseriformes	Magpie geese, ducks, geese and swans	12
Caprimulgiformes	Frogmouth, nightjars, owlet-nightjars, swifts	2
Charadriiformes	Shorebirds	2
Columbiformes	Doves and pigeons	2
Coraciiformes	Bee-eaters and kingfishers	1
Galliformes	Brush turkeys, scrubfowls and quail	1
Passeriformes	Passerines or perching birds	5
Pelecaniformes	Ibis, herons and pelicans	4
Phaethontiformes	Tropicbirds	1
Procellariiformes	Fulmars, petrels, prions and shearwaters	1
Psittaciformes	Parrots and cockatoos	7
Suliformes	Gannets, boobies and cormorants	1

a Common names adapted from: del Hoyo J, Collar NJ. *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, 2014. (Courtesy of the Australian Government Department of Agriculture, Water and the Environment.)

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, two wild bird events involved multiple bird orders. One event involved orders Anseriformes and Suliformes, and the second event involved Charadriiformes, Phaethontiformes and Procellariiformes.

species of the order Anseriformes are known reservoir species for AOaV-1 in Australia.[25]

Incidental findings of AOaV-1 class II with avirulent fusion proteins have previously been detected during general and targeted surveillance of wild birds in Australia, and the strain is considered to be present in the wild waterfowl populations of all states. Clinical disease caused by virulent (or highly pathogenic) strains of AOaV-1 has not been identified in Australian wild birds, and Australia was free of PPMV-1 until 2011, when it was first detected in domestic pigeons. PPMV-1 has since spread to feral pigeons and may be a risk for some Australian raptors. More information can be found in the WHA fact sheet.

Wild bird disease investigations this quarter also found botulism, parasitism, poisoning, psittacine beak and feather disease, and trauma.

Avian influenza surveillance

Australia's National Avian Influenza Wild Bird Surveillance Program[26] comprises two sampling components. The first is pathogen-specific, risk-based surveillance, by sampling of apparently healthy, live and hunter-shot wild birds. 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 AI virus 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 the Northern Australia Quarantine Strategy.

During the quarter, pathogen-specific, risk-based surveillance occurred at sites in New South Wales, Queensland and Tasmania. All of the 427 faecal environmental and cloacal swabs collected from waterbirds were tested for AI viruses (AIVs). Based on results received to date, no highly pathogenic AIVs were identified. However, targeted surveillance activities this quarter continued to find evidence of low pathogenicity avian influenza (LPAI) viruses, including LPAI H7.

Molecular analysis of AIVs detected through the targeted surveillance activities:[27]

- 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.

25 Hoque MA, Burgess GW, Karo-Karo D, Cheam AL, Skeratt LF 2012. Monitoring of wild birds for Newcastle disease virus in north Queensland, Australia. Preventive Veterinary Medicine; 103: 49–62; Peroulis I, O'Riley K 2004. Detection of avian paramyxoviruses and influenza viruses amongst wild bird populations in Victoria. *Australian Veterinary Journal*; 82: 79–82.

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

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

Between January and December 2019, pathogen-specific, risk-based surveillance occurred at sites in New South Wales, the Northern Territory, Queensland, South Australia, Tasmania, Victoria and Western 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 5425 cloacal, oropharyngeal and faecal environmental swabs collected from waterbirds, all 5425 were tested for AIV and 1610 were tested for AOaV-1. No highly pathogenic AIVs nor virulent strains of AOaV-1 were identified. However, surveillance activities continued to find evidence of a wide range of LPAI virus subtypes, including H1-11, H13 and H16, as well as avirulent strains of AOaV-1. The findings reiterate the need for poultry producers to remain alert and ensure that appropriate biosecurity arrangements and effective risk reduction measures for AI are in place at their premises.

Endemic Australian macropod leishmaniasis in an agile wallaby

A wild adult female agile wallaby (*Macropus agilis*) with skin disease was observed for several months in the vicinity of a captive wildlife park in the rural Darwin region where endemic Australian macropod leishmaniasis was originally discovered.[28] The wallaby deteriorated and was euthanased in February. On clinical examination the wallaby had multifocal ulcerated dermal swellings, 0.5–2 cm in diameter involving ear pinnae, tail and limb extremities, typical of cutaneous leishmaniasis of macropods. The wallaby had a pouch young that appeared unaffected.

Photo: Guy Weerasinghe.

The diagnosis of cutaneous leishmaniasis was confirmed at Berrimah Veterinary Laboratories. A polymerase chain reaction (PCR) test specific for Australian macropod *Leishmania* spp. was positive on ear and leg skin lesions, subcutaneous lymph node and spleen. Histopathology revealed typical intense dermal infiltration with macrophages containing abundant organisms consistent in morphology with *Leishmania* spp. Organisms were not seen in lymph nodes or internal organs, consistent with previous macropod cases in which visceral involvement has not been documented.

This is a locally acquired infection with the Australian macropod *Leishmania* spp., now described as *L. macropodum*.[29] It was first identified in 2003 in captive red kangaroos and has been observed sporadically in captive and wild macropods, including agile wallabies, since that time within the Darwin region.[30] Day-feeding midges are considered the likely vector. While leishmaniasis due to other *Leishmania* spp. is a significant human disease globally, *L. macropodum* is believed to be non-pathogenic to humans as there have been no reports of locally acquired human infections in Australia.[31]

In order to further understand the geographic range and potential vertebrate host species of Australian *L. macropodum*, a Griffith University research project is currently investigating the natural exposure to *L. macropodum* across areas of northern Australia with similar environmental and ecological conditions. Serological and immunological data will be analysed to determine the geographical distribution of the parasite *L. macropodum* and the level of human exposure to it, and to identify potential animal reservoirs.

Also, in February, leishmaniasis was excluded by a specific PCR and histopathology from a wild black-flanked rock wallaby (*Petrogale lateralis lateralis*). It was found dead in the Central Australian region of the Northern Territory and had eroded ear pinnae. Further investigation through gross necropsy and histology were indicative of bacterial peritonitis as the cause of death, suggesting that the ear pinnae lesions may have been due to ischaemia secondary to circulatory shock.

28 Rose K 2004. Cutaneous leishmaniasis in red kangaroos. *Australian Veterinary Journal*; 82: 440.

29 Rose K 2004. Cutaneous leishmaniasis in red kangaroos. *Australian Veterinary Journal*; 82: 440; Barratt J, Kaufer A, Peters B, Craig D, Lawrence A, Roberts T et al. 2017. Isolation of Novel Trypanosomatid, *Zelonia australiensis* sp. nov. (Kinetoplastida: Trypanosomatidae) provides support for a Gondwanan origin of dixenous parasitism in the Leishmaniinae. PLOS *Neglected Tropical Diseases*; 11(1): e0005215.

30 Grillo T 2011. Leishmania in a wild agile wallaby. *Animal Health Surveillance Quarterly Report*; 15.

31 Dougall A, Shilton C, Choy JL, Alexander B, Walton S 2009. New reports of Australian cutaneous leishmaniasis in northern Australian macropods. *Epidemiology and Infection*; 137: 1516–1520; Santos CS 2018. Comparative analysis of human and marsupial *Leishmania*: Characterisation of *Leishmania australiensis*, development of a potential human attenuated vaccine and assessment of vector competence. PhD thesis, The University of Western Australia, doi.org/10.26182/5b4c0ad4a6990