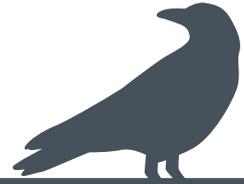


Wildlife Health Australia



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

Wildlife Health Australia (WHA)⁸ is the peak 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 Wildlife Health Information System (eWHIS)⁹ – including submissions by WHA subscribers, state and territory WHA coordinators, researchers, and university, zoo and sentinel clinic veterinarians.

During the quarter, 114 wildlife disease investigation events were reported in eWHIS (Table 1 and Figure 4), and samples were collected from 1164 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.



Table 1 Number of disease investigations reported into eWHIS, July to September 2018^a

| Mammals | | | Birds ^{d,e} | Reptiles | Fish |
|-------------------|------------|----------------------------|----------------------|----------|------|
| Bats ^b | Marsupials | Feral mammals ^c | | | |
| 29 | 23 | 5 | 51 | 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 pigs (*Sus scrofa*), European rabbits (*Oryctolagus cuniculus*), house mouse (*Mus musculus*),
 d Additional sampling for targeted AI 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.

⁸ www.wildlifehealthaustralia.com.au/Home.aspx

⁹ www.wildlifehealthaustralia.com.au/ProgramsProjects/eWHISWildlifeHealthInformationSystem.aspx

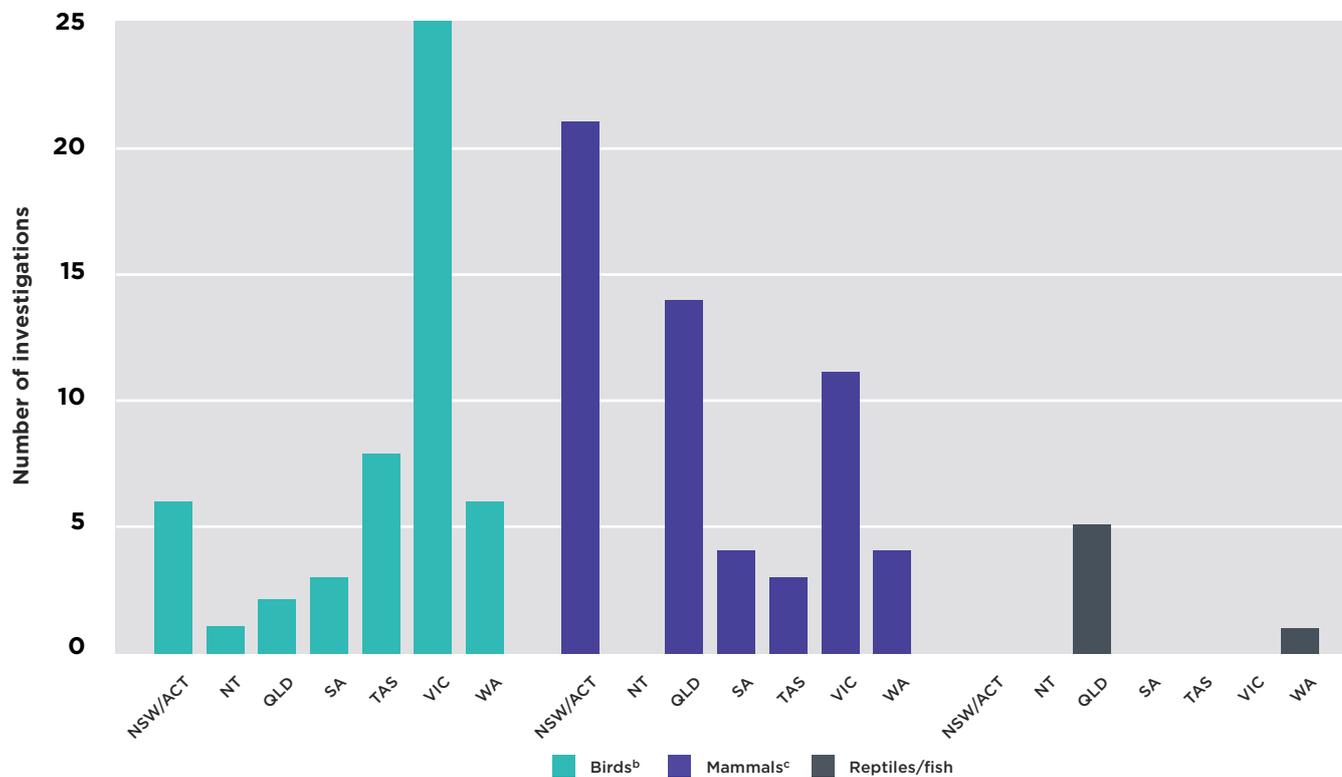


Figure 4 Number of disease investigations reported, by jurisdiction, into eWHIS, July to September 2018^a

- a The chart shows the number of disease investigations or events reported into eWHIS. Each disease 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.

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

WHA received 51 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. mass mortality event). A breakdown of wild bird events by taxonomic order is given in Table 2. Reports and samples from sick and dead birds are received from members of the public, private practitioners, universities, zoo wildlife clinics and wildlife sanctuaries. AI was excluded by polymerase chain reaction (PCR) testing for influenza A in 26 of the events as part of Australia's general (sick and dead bird) AI surveillance program. Disease caused by AI was excluded in the remaining 25 events, based on clinical signs, history, histopathology, prevailing environmental conditions or other diagnoses. Avian paramyxovirus

(APMV) was excluded in 21 events by PCR testing specifically for Newcastle disease (ND) virus or pigeon paramyxovirus type 1, or both.

Avian influenza surveillance

Australia's National Avian Influenza Wild Bird (NAIWB) Surveillance Program¹⁰ comprises two sampling components: pathogen-specific risk-based surveillance by sampling of apparently healthy, live and hunter-killed wild birds and; 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, South Australia and Tasmania. Cloacal and faecal environmental swabs were collected from 1164 waterbirds, with 1164 tested for avian influenza viruses (AIVs). Based on results to date, no highly pathogenic AI viruses were identified. This quarter targeted surveillance activities continued^{11,12} to find evidence of a wide range of low pathogenicity avian influenza (LPAI) viruses, including LPAI H7. Molecular analysis of AIVs detected through the targeted surveillance activities contribute to the understanding

¹⁰ www.wildlifehealthaustralia.com.au/ProgramsProjects/WildBirdSurveillance.aspx

¹¹ Haynes et al. (2009). Australian surveillance for avian influenza viruses in wild birds (July 2005 to June 2007). *Australian Veterinary Journal* 87 (7): 266-272

¹² Grillo et al. (2015). Avian influenza in Australia: a summary of 5 years of wild bird surveillance. *Australian Veterinary Journal* 93 (11): 387-393

Table 2 Wild bird disease investigations, by taxonomic order, reported into eWHIS, July to September 2018

| Bird order | Common name for bird order ^a | Events reported ^b |
|------------------|------------------------------------------------|------------------------------|
| Anseriformes | Magpie geese, ducks, geese and swans | 2 |
| Caprimulgiformes | Frogmouths, nightjars, owlet-nightjars, swifts | 4 |
| Charadriiformes | Shorebirds | 4 |
| Columbiformes | Doves and pigeons | 1 |
| Coraciformes | Bee-eaters and kingfishers | 1 |
| Falconiformes | Falcons | 5 |
| Passeriformes | Passerines or perching birds | 4 |
| Psittaciformes | Parrots and cockatoos | 15 |
| Strigiformes | Typical owls and barn owls | 20 ^c |

- a Common names adapted from: del Hoyo and Collar, 2014, *HBW and BirdLife International Illustrated Checklist of the Birds of the World. Volume 1 – Non-passerines*, Lynx Editions, Barcelona. (Courtesy of the Australian Government Department of the Environment and Energy.)
- b Disease investigations may involve a single or multiple bird orders (e.g. mass mortality event). This quarter, five wild bird events involved multiple bird orders. Three events involved the bird orders Falconiformes and Strigiformes, the fourth event involved Columbiformes and Psittaciformes, and the fifth involved Anseriformes and Psittaciformes.
- c The higher number of events this quarter is primarily due to a mortality of barn owls (*Tyto alba*) in New South Wales and Victoria.

of AIV dynamics in Australia, help maintain currency of diagnostic tests, and serve as a point of comparison when novel AI virus strains of importance emerge overseas.

Between July 2017 and June 2018, pathogen-specific, risk-based surveillance occurred at sites in New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria and Western Australia. Anseriformes (waterfowl) were primarily targeted, and a small number of 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. Cloacal and faecal environmental swabs were collected from 5686 waterbirds, with 5689 tested for AI and 2468 tested for APMV-1. No highly pathogenic AI viruses nor virulent strains of APMV-1 were identified. However, surveillance activities continued to find evidence of a wide range of subtypes of low pathogenic AI viruses, including low pathogenic H5 and H7, as well as H1-H4, H6, H8-H11, and avirulent strains of APMV-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.

Neoplasia in wildlife

There were some cases of neoplasia (cancer) reported in free-ranging and captive native wildlife in the past quarter.

A wild female Tasmanian pademelon (*Thylogale billardierii*) from south-east Tasmania was found emaciated and blind and was euthanased. The lymph nodes around the pouch and axillary area were bilaterally enlarged. A necropsy showed speckled and enlarged kidneys, mottled liver and lungs, an abscess in the pouch, and corneal opacity in both eyes. Histopathology identified multicentric lymphoma (ocular, lymph node, renal, dermal and pulmonary).

A brushtail possum (*Trichosurus vulpecula*) from a property in south-west Western Australia presented with enlarged, thickened upper and lower lips, and was euthanased. There was no sign of injury to the surrounding skin or whiskers. Necropsy revealed severe,

symmetrical thickening of the upper and lower lip extending along the hard palate and discoloured sinuses. There was no sign of bony involvement on radiography. Squamous cell carcinoma of the lip was diagnosed on histopathology. Papillomavirus testing was conducted because of the link with this type of tumour in other species.¹³ Immunohistochemistry for papillomavirus was inconclusive, but there were no viral particles in tumour cells and no viral particles detected on electron microscopy of the lip tissue.

A brushtail possum was found in Melbourne moribund and emaciated and died soon after. Gross necropsy revealed a large uterine tumour destroying the normal architecture of the urogenital tract and suppurative peritonitis with adhesions between viscera. Based on histopathology and the location of the tumour in the uterine wall, a leiomyosarcoma was considered most likely. Chronic metritis, pericarditis, splenitis and pancreatitis were present, and *Pseudomonas aeruginosa* was

¹³ Campo MS (2003). Papillomavirus and disease in humans and animals. *Veterinary and Comparative Oncology* 1(1): 3-14

isolated by culture from a swab of the abdominal cavity.

Two cases of neoplasia were reported in captive marsupials at Perth Zoo. An adult female red kangaroo (*Macropus rufus*) had a focal subpleural adenocarcinoma, as well as bronchopneumonia, pleuritis and embolic encephalitis. The adenocarcinoma was considered incidental, with bacterial encephalitis the likely cause of clinical signs seen in this animal. An aged female bilby (*Macrotis lagotis*) had a cavitated perianal mass with a bleeding central sinus that was identified on histopathology as a squamous cell carcinoma.

A splenic mixed sarcoma was an incidental finding on necropsy in an eastern grey kangaroo (*Macropus giganteus*) from north-east Victoria. The kangaroo was euthanased due to blindness caused by chronic ocular trauma.

In the period from January 2017 to September 2018, 47 cases of neoplasia in wildlife were reported into eWHIS. Lymphoma was most commonly reported (15 cases), of which close to half were in koalas (*Phascolarctos cinereus*) from Queensland. The next most common were sarcomas (6 cases), squamous cell carcinomas (5 cases) and devil facial tumour disease (3 cases).¹⁴ Other reported cancers included adenoma/adenocarcinoma, haemangiosarcoma, leiomyoma/leiomyosarcoma, teratoma, chondroma, fibropapillomatosis and islet cell carcinoma. WHA has previously reported on neoplasia of free-ranging wildlife reported through the Zoo Based Wildlife Disease Surveillance Program.¹⁵

¹⁴ DFTD cases are recorded in a database managed by the Tasmanian Department of Primary Industries, Water and Environment. A small number of cases are seen by participants of the WHA Sentinel Clinic Wildlife Disease Surveillance Program and are reported into eWHIS.

¹⁵ Cox-Witton K, Reiss A, Woods R, Grillo V, Baker RT, Blyde DJ, et al. (2014). Emerging Infectious Diseases in Free-Ranging Wildlife—Australian Zoo Based Wildlife Hospitals Contribute to National Surveillance. *PLoS ONE* 9(5): e9512.



Neoplasia is increasingly recognised as a threat to wildlife populations. Significant Australian examples include Tasmanian devil facial tumour disease, a nationally notifiable animal disease, and lymphoid neoplasia in the koala. A recent publication highlighted the importance of monitoring neoplasia in wildlife for the dual purpose of conservation and as sentinels for human health.¹⁶

Australian bat lyssavirus

Reports to WHA for the quarter included 29 bats tested for Australian bat lyssavirus (ABLV) from New South Wales, Queensland, South Australia and Victoria.

Bat submissions were made for a variety of reasons:

- 8 cases involved contact with a pet dog (7) or cat (1)
- 6 cases involved contact with the potential for ABLV transmission to humans; of these
 - 1 was also associated with trauma (caught in fence palings)
 - 1 displayed other (non-neurological) signs
 - the remainder had no further history reported
- 3 cases were associated with trauma (e.g. injuries due to barbed wire fence entanglement)

¹⁶ Pesavento PA, Agnew D, Keel MK & Woolard KD (2018). Cancer in wildlife: patterns of emergence. *Nature Reviews Cancer* 18: 646–661.

- 1 bat displayed neurological signs (nystagmus, stifles tensely flexed, excessive curvature of lumbar vertebrae, retained food in cheeks)
- 1 bat displayed other (non-neurological) signs (sudden death)
- 10 bats had no history reported.

Of those described above, two insectivorous bats had been submitted by Queensland bat carers as part of an ongoing surveillance project conducted by the Queensland Department of Agriculture and Fisheries. Both tested negative for ABLV.

During the quarter, one grey-headed flying-fox (*P. poliocephalus*) from New South Wales was confirmed positive for ABLV by fluorescent antibody test and PCR assay for pteropid ABLV ribonucleic acid. It was found hanging low on a fence, unresponsive and unwilling to hang. It displayed progressive paralysis and nerve twitching and was euthanased. No potentially infectious human contact was reported in this case.

More information on ABLV testing of bats in Australia is available in ABLV Bat Stats.¹⁷ ABLV is a nationally notifiable disease in Australia. Cases of suspect ABLV infection or exposure should be reported to the Emergency Animal Disease Watch Hotline on 1800 675 888.

¹⁷ www.wildlifehealthaustralia.com.au/ProgramsProjects/BatHealthFocusGroup.aspx