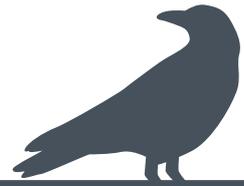


Wildlife Health Australia



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Wildlife Health Australia

Wildlife Health Australia (WHA)⁷ 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)⁸ – 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, 184 wildlife disease investigation events were reported in eWHIS (Table 2 and Figure 2), and samples were collected from 2754 wild birds for avian influenza (AI) surveillance.

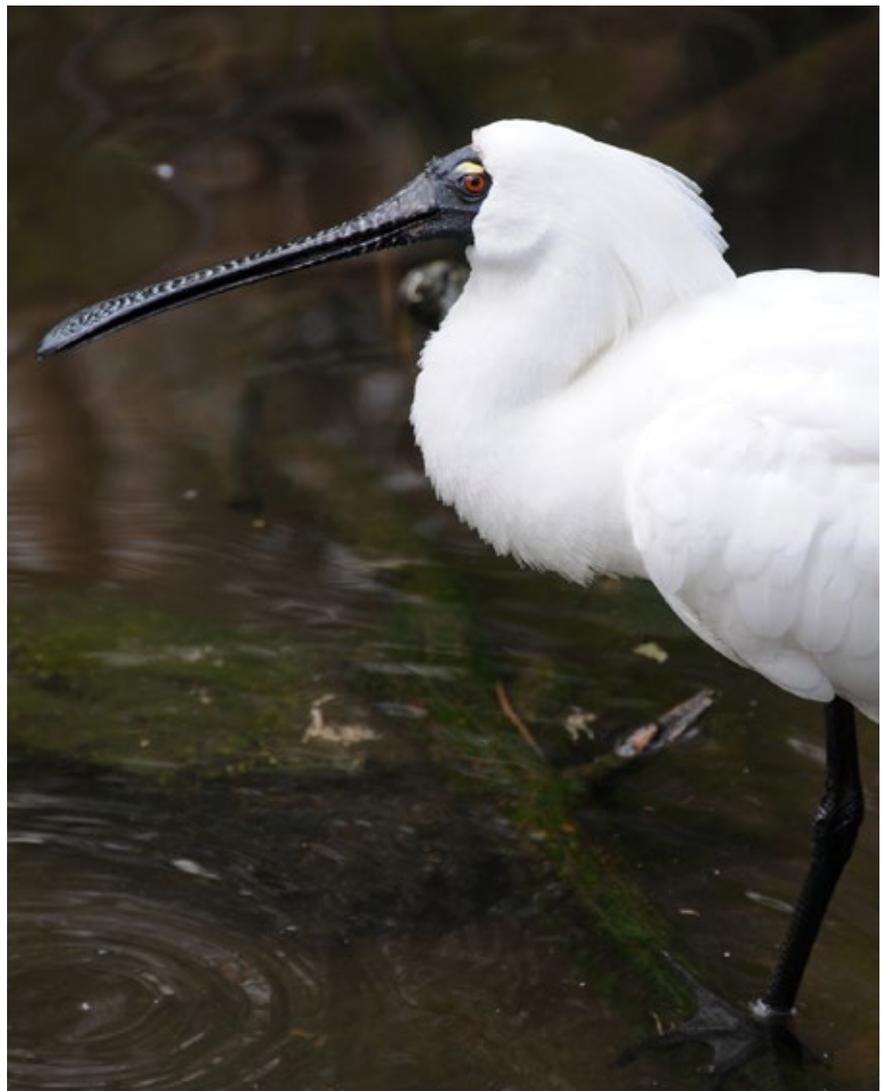


Table 2 Number of disease investigations reported into eWHIS, 1 October to 31 December 2020^a

| Bats ^b | Mammals | | | | Birds ^{d,e} | Reptiles |
|-------------------|------------|------------|----------------|----------------------------|----------------------|----------|
| | Marsupials | Monotremes | Marine mammals | Feral mammals ^c | | |
| 90 | 30 | 1 | 1 | 5 | 56 | 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*) and feral buffaloes (*Bubalus bubalis*)

^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.

⁷ www.wildlifehealthaustralia.com.au/Home.aspx

⁸ www.wildlifehealthaustralia.com.au/ProgramsProjects/eWHIS-WildlifeHealthInformationSystem.aspx

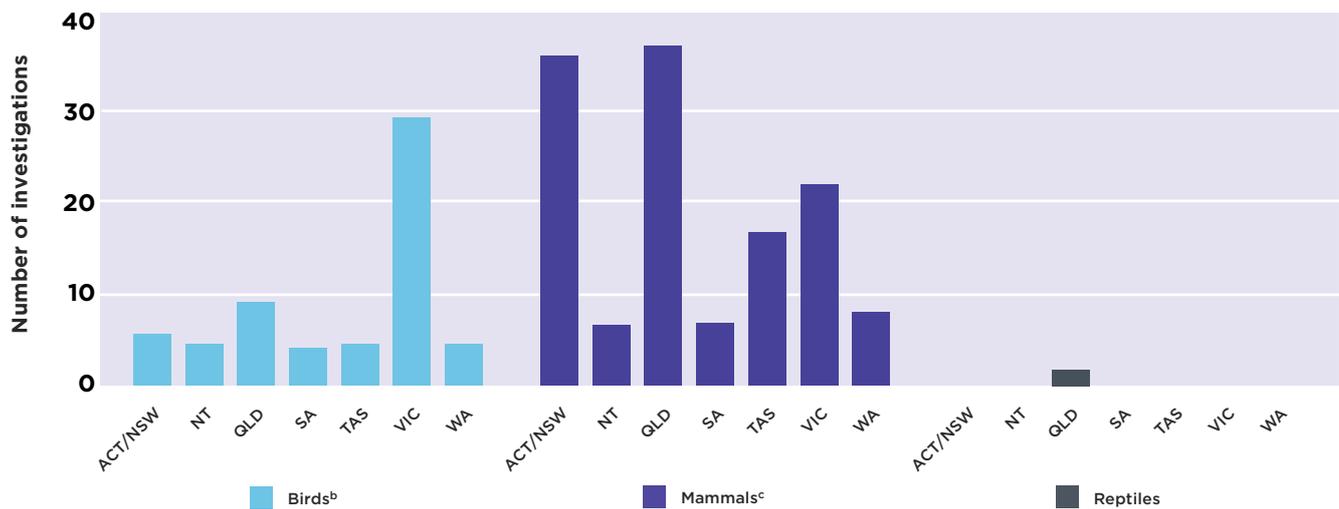


Figure 2 Number of disease investigations reported, by jurisdiction, in eWHIS, 1 October to 31 December 2020^a

- 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.

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 56 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 3. 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 34 events as part of Australia's general (sick and dead bird) AI surveillance program. Disease caused by AIV was also excluded in the remaining eight 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 31 events by PCR testing specific for AOAV-1 and/or the pigeon paramyxovirus type 1 variant (PPMV-1).

Also this quarter, during routine, targeted wild bird surveillance conducted as part of the [Northern Australia Quarantine Strategy](#) (NAQS) (see below) for AI in November at a cattle station about 30 km east of Darwin, Northern Territory, a royal spoonbill (*Platalea regia*) observed trapped in mud was submitted for euthanasia and investigation. The bird was weak, barely able to move but otherwise appeared alert and in good condition. Necropsy was performed at Berrimah Veterinary Laboratory, Northern Territory. On gross necropsy the bird was in excellent body condition with no abnormalities of internal tissues to suggest significant underlying disease. There was an extensive superficial cutaneous laceration with moderate associated haemorrhage, but the wound did not appear sufficiently severe to have resulted in the marked debilitation of the bird. Pooled

cloacal and tracheal swabs tested negative for AOAV-1, positive for reverse transcription PCR for AIV M (matrix) gene detection, but negative for specific reverse transcription PCR tests for influenza A H5 and H7 at Berrimah Veterinary Laboratory. Pooled cloacal and tracheal swabs, and lung, brain, kidney and liver tissues were sent to the CSIRO Australian Centre of Disease Preparedness (ACDP) for confirmatory and further testing. High-throughput sequencing on pooled tracheal and cloacal swabs at ACDP identified low-pathogenicity (LP) AI H1N1 virus. Histopathological findings of regionally extensive, severe, acute myocardial necrosis and haemorrhage with associated microvascular thrombosis (possibly stress related cardiomyopathy), and absence of other lesions suggestive of AI are supportive that the cardiac lesions were more likely due to the bird's entrapment. Therefore, this LPAI virus detection was an incidental finding.

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

Table 3 Wild bird disease investigations, by taxonomic order, reported into eWHIS, 1 October to 31 December 2020

| Bird order | Common name for bird order ^a | Events reported ^b |
|------------------|---|------------------------------|
| Accipitriformes | Osprey, hawks and eagles | 3 |
| Anseriformes | Magpie geese, ducks, geese and swans | 9 |
| Caprimulgiformes | Frogmouth, nightjars, owlet-nightjars, swifts | 1 |
| Charadriiformes | Shorebirds | 1 |
| Columbiformes | Doves and pigeons | 3 |
| Cuculiformes | Cuckoos and koels | 1 |
| Galliformes | Brush turkeys, scrubfowls and quail | 1 |
| Passeriformes | Passerines or perching birds | 20 |
| Pelecaniformes | Ibis, herons and pelicans | 5 |
| Psittaciformes | Parrots and cockatoos | 17 |
| Strigiformes | Typical owl and barn owls | 2 |

- 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, four wild bird events involved multiple bird orders. One event involved orders Accipitriformes, Columbiformes, Cuculiformes, Passeriformes, and Psittaciformes, the second event involved Anseriformes, Columbiformes and Psittaciformes, the third event involved Anseriformes and Passeriformes and the fourth event involved Passeriformes and Psittaciformes.

proportion of birds that test positive for LPAI is significantly greater in Anseriformes than in Charadriiformes.⁹ Other wild bird species are relatively unusual hosts for AI, with LPAI viruses identified in Australian Gruiformes, Pelecaniformes and Procellariiformes during targeted wild bird surveillance. While LPAI viruses are rarely detected in birds from the Threskiornithidae family, in which spoonbills are included, this finding is not unexpected.¹⁰

More information on AIV can be found in the [WHA fact sheet](#) and [Wild Bird News](#).

Wild bird disease investigations this quarter also found aspergillosis, botulism, *Macrorhabdus ornithogaster* infection, mange, mycobacteriosis, myiasis (non-warble, non-screw-worm), *Pseudomonas aeruginosa*

septicaemia, psittacine beak and feather disease, poisoning and trauma.

Avian influenza surveillance

Australia's [National Avian Influenza Wild Bird Surveillance Program](#)¹¹ comprises two sampling components. The first is pathogen-specific, risk-based surveillance, by sampling of apparently healthy wild birds, both live and hunter-shot (i.e. 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](#).¹²

During the quarter, pathogen-specific, risk-based surveillance occurred at sites in the New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria and Western Australia. All of the 2754 faecal environmental, cloacal and oropharyngeal swabs collected from waterbirds were tested for 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 H5 and LPAI H7.

Molecular analysis of AIVs detected through the targeted surveillance activities:^{9,13}

- 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.

9 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.

10 Tracey JP, Woods R, Roshier DA, West P, Saunders GR 2004. The role of wild birds in the transmission of avian influenza for Australia: an ecological perspective. *Emu*; 104: 109-124.

11 <https://www.wildlifehealthaustralia.com.au/ProgramsProjects/WildBirdSurveillance.aspx>

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

13 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.



Australian bat lyssavirus

Reports to WHA for the six months from 1 July to 31 December 2020 included 142 bats tested for Australian bat lyssavirus (ABLV) from all states and territories except the Australian Capital Territory and Tasmania. Some data from this period have not yet been reported due to delays with data submission caused by COVID-19.

Bat submissions were made for a variety of reasons:

- 26 submissions involved contact with the potential for ABLV transmission to humans; of these
 - 11 were also associated with trauma (e.g. entanglement in barbed-wire fence, fractures, torn wings)
 - One displayed non-neurological signs or presentations
 - Two also involved contact with a pet dog

- the remainder had no further signs reported
- 55 submissions involved contact with a pet dog (47), cat (7) or both (1)
- 21 bats displayed neurological signs (e.g. paresis, incoordination, inability to hang, protruding tongue, inability to swallow, repetitive head movements, seizures, abnormal vocalisation, aggression)
- 19 submissions were associated with trauma (e.g. entanglement in barbed-wire fence, shooting, crow attack, fractures, torn wings)
- 13 bats displayed other (non-neurological) signs (e.g. respiratory signs, musculoskeletal disease, moribund state)
- Seven bats were found dead
- One bat had no further signs reported.

In the second half of the year, six bats were confirmed positive for

ABLV by fluorescent antibody test and PCR testing for pteropid ABLV ribonucleic acid (RNA). There were four little red flying foxes (*Pteropus scapulatus*) and one spectacled flying fox (*P. conspicillatus*) from Queensland, and a grey-headed flying fox (*P. poliocephalus*) from NSW. The six bats showed neurological signs such as paresis, unusual vocalisation, aggression and inability to swallow. One of these cases is described in detail in the Queensland report on [page 7](#). Potentially infectious human contact was not reported for any of the cases.

More information on ABLV testing of bats in Australia is available in [ABLV Bat Stats](#).¹⁴ 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.

¹⁴ www.wildlifehealthaustralia.com.au/ProgramsProjects/BatHealthFocusGroup.aspx

Feral pig disease investigations event summary – notifiable disease exclusions

Feral pigs (*Sus scrofa*) are a widespread and destructive pest species that cause significant agricultural and environmental damage. They are found in all states and territories of Australia, with animals widely distributed in the Australian Capital Territory, New South Wales, the Northern Territory and Queensland, with more dispersed populations in Victoria, Western Australia, Flinders Island and Kangaroo Island.¹⁵ Feral pigs are known wild animal reservoirs of a range of endemic infectious diseases, all of which are transmissible to domestic pigs. A number of these endemic diseases are also transmissible to other species, including domestic animals and humans (e.g. *Brucella suis*).¹⁶ Feral pigs can also carry a range of exotic diseases that pose a serious risk to Australia's pork industry. Of specific concern is African swine fever (ASF), a highly contagious exotic pig disease that has been confirmed in countries close to Australia, including Timor-Leste and Papua New Guinea. Some swine diseases are included on the national list of notifiable diseases of terrestrial animals.¹⁷

Investigation of sick and dead feral pigs forms an important part of Australia's animal health surveillance system to ensure early detection of diseases of concern. Between January 2019 and December 2020, WHA received a total of 48 feral pig disease investigations from



around Australia; investigations may involve a single animal or multiple animals (e.g. a mass mortality event). Animals investigated include those found dead or exhibiting clinical signs or pathological lesions consistent with a nationally notifiable animal disease. Nationally notifiable animal diseases include a subset of emergency animal diseases.¹⁸ Table 4 lists the confirmed results of these disease investigations. Note that more than one disease may be investigated for a single disease event (an outbreak of morbidity or mortality). Investigations are undertaken by state and territory governments and/or the Northern Australia Quarantine Strategy. Nationally notifiable disease investigations of domestic pigs are presented elsewhere in this publication.

This quarter, a feral pig disease investigation was initiated by Queensland National Parks and Wildlife Service (NPWS) rangers in a National Park in north Queensland following a period of 12 months during which six individual feral pigs were found dead. In October 2020, samples were submitted from two subadult female feral pigs in poor body condition. One was reported to have wobbly back legs and the second was recumbent, weak, paddling while on the ground and

unable to stand due to marked paralysis of the back legs. This animal was noted to have a large burden of ectoparasites (ticks and lice). Oral and nasal swabs collected from the first pig tested negative via PCR for ASF, classical swine fever and foot and mouth disease at both the Queensland Biosecurity Sciences Laboratory (BSL) and the CSIRO Australian Centre for Disease Preparedness (ACDP). The second pig was euthanased and a post-mortem performed, with a range of fresh and fixed tissues submitted to BSL for further disease investigation. Histological findings included severe, focally extensive, chronic, pyogranulomatous interstitial nephritis (most likely from an earlier septic infarct), in addition to chronic verminous pneumonia (most likely associated with *Metastrongylus* spp. lungworms). Faecal flotation yielded low numbers of coccidial oocysts (*Eimeria* spp.) and low numbers of nematode eggs. Lice were identified as *Haematopinus suis*. Unpreserved lymph node and spleen collected at post-mortem tested negative for ASF, classical swine fever, foot and mouth disease, Aujeszky's disease, and vesicular stomatitis via PCR at both BSL and ACDP. The single tick submitted was confirmed as *Ixodes holocyclus*, and tick paralysis was considered the likely cause of recumbency and posterior paralysis.

15 National Feral Pig Action Plan Fact Sheet: feralpigs.com.au/wp-content/uploads/2020/11/NFPAP_FAQS_October-2020.pdf

16 Pearson HE, Toribio JL, Hernandez-Jover M, Marshall D, Lapidge SJ 2014. Pathogen presence in feral pigs and their movement around two commercial piggeries in Queensland, Australia. *Veterinary Record*; 174(13): 325.

17 National List of Notifiable Animal Diseases at www.agriculture.gov.au/pests-diseases-weeds/animal/notifiable.

18 Emergency Animal Disease Response Agreement, Schedule 3 at www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement

Table 4 Feral pig investigations for suspected nationally notifiable animal diseases, 1 January 2019 to 31 December 2020

| Disease | Jurisdiction | No. of investigations | No. positive | No. negative |
|--|--------------|-----------------------|--------------|--------------|
| Infection with African swine fever virus | Total | 24 | 0 | 24 |
| | NSW | 1 | 0 | 1 |
| | NT | 21 | 0 | 21 |
| | Qld | 2 | 0 | 2 |
| Infection with Aujeszky's disease virus (pseudorabies virus) | Total | 4 | 0 | 4 |
| | NT | 2 | 0 | 2 |
| | Qld | 1 | 0 | 1 |
| Infection with <i>Brucella suis</i> | Total | 13 | 0 | 13 |
| | NSW | 3 | 0 | 3 |
| | NT | 8 | 0 | 8 |
| Infection with classical swine fever virus | Total | 17 | 0 | 17 |
| | NSW | 1 | 0 | 1 |
| | NT | 14 | 0 | 14 |
| Infection with foot and mouth disease virus | Total | 2 | 0 | 2 |
| | Qld | 2 | 0 | 2 |
| Infection with porcine reproductive and respiratory syndrome virus | Total | 4 | 0 | 4 |
| NT | 4 | 0 | 4 | |
| Infection with swine vesicular disease virus | Total | 1 | 0 | 1 |
| | Qld | 1 | 0 | 1 |
| Infection with <i>Trypanosoma evansi</i> (Surra) | Total | 1 | 0 | 1 |
| NT | 1 | 0 | 1 | |

