

# “Black and white” bird neurological syndrome

## Fact Sheet

August 2022

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### Introductory statement

A syndrome of unknown aetiology has been reported in “black and white” birds (mainly in Australian magpies and pied currawongs) on the east coast of Australia, primarily in the Sydney region. Birds present with signs of paralysis and paresis and, in most cases, death follows within 24 hours of presentation. Outbreaks of the syndrome occurred in 2003 and in 2005-2006, with as many as several hundred birds reportedly affected. Actual numbers may have been significantly higher. Small numbers of cases with a similar presentation continue to be reported on a sporadic basis, including a cluster of presentations in magpies and Australian ravens on the South Coast of NSW in 2015.

### Aetiology

The syndrome is thought to have a viral or parasitic aetiology, but no agent has been able to be grown in culture from swabs and tissue samples of affected birds <sup>[1]</sup>.

### Natural hosts

The syndrome is primarily seen in:

- Australian magpies (*Cracticus tibicen*) (about 70% of reported cases in 2005-2006 outbreak)
- Pied currawongs (*Strepera graculina*) (about 15% of reported cases in 2005-2006 outbreak)
- Australian ravens (*Corvus coronoides*)
- Small numbers of other related species; common koel (*Eudnamys scolopacea*) and magpie lark (*Gallina cyanoleuca*) also fit the case definition (see below) at the time of the 2005-2006 outbreak.

### World distribution

There are no known reports of a similar syndrome overseas.

### Occurrence in Australia

The syndrome has only been reported on the east coast of Australia, primarily in and around the Sydney region. Outbreaks were reported in 2003 and 2005-2006. Sporadic cases meeting the case definition continue to occur in the greater Sydney region and adjacent areas. A cluster of cases of

similar presentation was reported in magpies and a small number of Australian ravens on the South Coast of NSW in May 2015, from a very specific location in the suburb of Oak Flats <sup>[2]</sup>. A small number of reported cases from Healesville, Victoria and Central Queensland also meet the case definition.

## Epidemiology

In the 2005-2006 outbreak, reported cases appeared to follow a temporal and spatial spread consistent with an infectious agent. Reported cases progressed spatially in a south and westerly direction from the Central Coast of NSW to various regions of Sydney. Cases were more frequently reported from coastal suburbs than inland suburbs. The affected area within the Central Coast was bound by Mannering Park (north), Ettalong/ Hawkesbury River (south), Bateau Bay/coast (east), Central Mangrove/ Somersby (west). Within Sydney, the affected area was bound by Matraville/ Kingsford (south), Eastern Suburbs (east), northern beaches (north) and Blue Mountains (west). No suspicious deaths were reported west of the Great Dividing Range.

The number of cases reported weekly during the 2005-2006 outbreak followed a typical epidemic curve, from December 2005 when recording began. It is unclear whether the observed 'peak' in case numbers represented a true peak in clinical cases or if it was reflective of a change in reporting rate (mainly from wildlife carers) due to increased awareness of the outbreak.

Over a five-week period during February and March 2006, a large number of wild bird deaths in Australian magpies and pied currawongs were reported in the Sydney and Central Coast areas of eastern NSW. Cases were first reported in December 2005, however anecdotal reports suggest cases may have occurred from September 2005. From early December 2005, around three to six reports were received each day until the last week of April 2006. The reporting rate then dropped to about three reports each week until the middle of May 2006.

Male and female, adult and sub adult birds were all represented. More male birds were necropsied than females. Deaths typically occurred in clusters (from one to 15 birds; most clusters two to six birds). Only Australian magpies, pied currawongs, Australian ravens, magpie larks and possibly common koels showed signs consistent with the case definition. It is likely that the deaths observed in the other species were unrelated to the syndrome seen in the "black and white" birds.

Deaths were also reported during this period in:

- Kingfishers (*Todiramphus* spp.)
- Laughing kookaburra (*Dacelo novaeguinea*)
- Magpie lark (*Gallina cyanoleuca*)
- Crested pigeon (*Ocyphaps lophotes*)
- Silver gull (*Larus novaehollandiae*)
- Australian raven (*Corvus* spp.)
- Channel-billed cuckoo (*Scythrops novaehollandiae*)
- Common koel (*Eudnamys scolopacea*).

There were isolated, anecdotal reports of bird deaths with similar presenting signs from other regions of NSW including Ballina, Lismore, Coffs Harbour, the Illawarra region, Batemans Bay, Young and Scone, however none of these individuals met the case definition for the syndrome. Only reports from Healesville, Victoria (Australian ravens, n=3) and Central Queensland (common koels, n=2) met the case definition.

A similar outbreak is believed to have occurred in July and August 2003 with the first cases reported at Budgewoi, NSW. Cases were subsequently reported from the Central Coast to the Northern Beaches of Sydney over the following 2–3-week period.

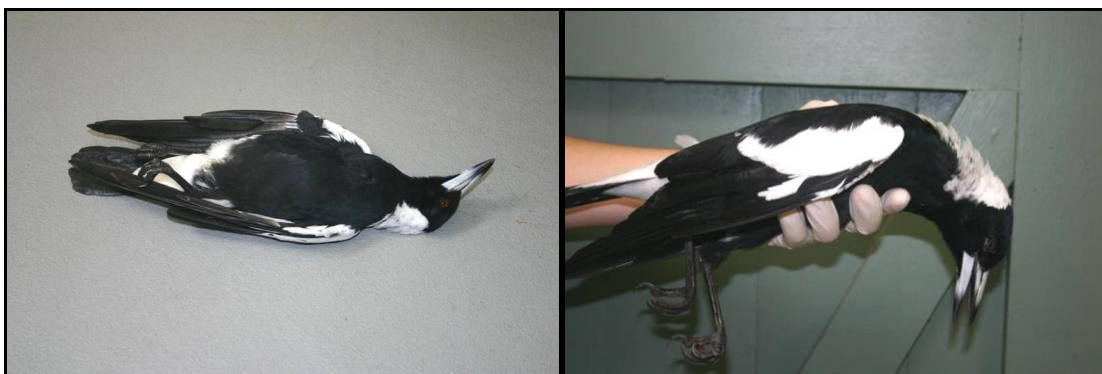
The apparent outbreak in Oak Flats in May 2015 affected at least 17 birds, all found in or around one tree, over the course of two days [2].

A suggested **case definition** for the syndrome is:

“Birds of the species Australian magpie (*Cracticus tibicen*), pied currawong (*Strepera graculina*) or Australian raven (*Corvus coronoides*) from the coastal areas of NSW (and possibly other regions) with neurological signs (inability to fly, paresis, retaining mental alertness) progressing rapidly to death and with histopathological findings of non-suppurative encephalitis.”

### Clinical signs

Birds are found dead (alone or in groups), or alive with neurological signs including severe paresis. Affected birds lack a righting reflex, but have normal cloacal tone, peripheral light reflexes and withdrawal reflexes, and are otherwise bright and alert (Figure 1). Many birds can flap their wings and stand for brief periods or move about awkwardly using their legs when stimulated. Some birds are dyspnoeic, showing open-mouth breathing, tail bobbing and tachypnoea, and a small number have diarrhoea.



**Figure 1.** An Australian magpie unable to right itself (left). The second bird (right) had neurological signs and was unable to raise its head (Images courtesy of Australian Registry of Wildlife Health).

Clinical progression appears to progress through the following steps:

- Inability to fly
- Inability to stand (paresis, ventral recumbency), but maintain alertness

- Acute respiratory problems
- Death.

Most cases progress to death within 12 to 24 hours, once identified, although there some cases have been reported to survive 10 days or more and some cases reportedly recover after intensive treatment. Four cases in the 2015 Oak Flats event were treated with supportive care, with rapid improvement in clinical signs, being released to the wild 7 days after rehabilitation began <sup>[2]</sup>.

## Diagnosis

Clinical signs are supportive of the diagnosis, as are the characteristic histopathological changes. As there is no confirmed aetiology, diagnosis cannot currently be confirmed. We are not aware of any reports of clinical pathology changes associated with this syndrome.

## Pathology

**Gross pathology:** Most birds are dehydrated, in either slightly poor or normal body condition, with empty gastrointestinal tracts. Some birds show gross evidence of epicardial and gastrointestinal tract haemorrhage. A smaller number of birds show evidence of hydropericardium.

**Histological changes** vary, but most commonly consist of multisystemic perivascular inflammation, particularly within the coelomic membranes, heart and skeletal muscle. Non-suppurative encephalitis is a feature of some cases, especially in corvids, where the lesions can be very similar to those seen in West Nile virus infection.

Details of histological findings in a typical case are available in the Australian Registry of Wildlife Health Case Blog TARZ-9586.1 ([www.arwh.org/pied-currawong-strepera-versicolour-with-black-and-white-bird-disease](http://www.arwh.org/pied-currawong-strepera-versicolour-with-black-and-white-bird-disease)) <sup>[1]</sup>.

## Differential diagnoses

Laboratory investigation has ruled out the following diseases and intoxications as being involved in the syndrome:

- Avian influenza
- Avian paramyxovirus
- West Nile virus and/ or Kunjin virus
- Murray Valley encephalitis
- Japanese encephalitis
- Other flaviviruses
- Enteroviruses
- Organophosphate, carbamate, pyrethroid, neonicotinoid or organochlorine intoxication.

## Laboratory diagnostic specimens

Representative samples of tissues should be submitted for histopathological investigation, including heart, brain, liver, spleen, bursa of Fabricius, thymus and intestine. Duplicate tissue samples should be frozen for potential viral investigation.

## Laboratory procedures

Laboratory investigation includes histopathological investigation and exclusion of other disease and intoxications (listed under Differential diagnoses). Additional attempts to determine an aetiological agent may include viral culture, pan-family viral PCR and other molecular techniques.

## Prevention and control

As there is no confirmed aetiological agent and no information about potential transmission pathways, disease prevention and control is not possible at this stage. The epidemiological curve suggests an infectious agent.

## Surveillance and management

Wildlife Health Australia administers Australia's general wildlife health surveillance system, in partnership with government and non-government agencies. Wildlife health data is collected into a national database, the electronic Wildlife Health Information System (eWHIS). Information is reported by a variety of sources including government agencies, zoo based wildlife hospitals, sentinel veterinary clinics, universities, wildlife rehabilitators, and a range of other organisations and individuals. Targeted surveillance data is also collected by WHA. See the WHA website for more information <https://wildlifehealthaustralia.com.au/Our-Work/Surveillance> and <https://wildlifehealthaustralia.com.au/Our-Work/Surveillance/eWHIS-Wildlife-Health-Information-System>.

## Treatment

Most cases progress to death within 12 to 24 hours despite attempts at treatment. A small number of cases may recover after intensive care including the use of thiamine, activated charcoal and anti-inflammatory doses of corticosteroids.

## Research

Further work is recommended in the following areas:

- Aetiology of the syndrome
- Basic epidemiology, including risk factors, causation and characteristics of the outbreaks
- Risk assessment, and if indicated, mitigation measures for other wildlife, human and domestic animal health.

## Human health implications

Due to the unknown aetiology, appropriate biosecurity precautions should be adopted when treatment or post-mortem investigation of affected birds is undertaken. The syndrome does not appear to be associated with human health risk, however, until an aetiology can be determined, this cannot be ruled out.

## Conclusions

Further work is required to determine the aetiology and improve understanding of the risk factors contributing to this syndrome. Suspect cases should be reported to your state or territory WHA Coordinator.

## Acknowledgements

We are grateful to the many people who had input into this fact sheet and would like to recognise the NSW Department of Primary Industries (including Ian Roth and Therese Wright), the NSW Wildlife Information, Rescue and Education Service (WIRES) and Karrie Rose and Jane Hall from the Australian Registry of Wildlife Health.

*Wildlife Health Australia recognises the Traditional Custodians of Country throughout Australia. We respectfully acknowledge Aboriginal and Torres Strait Islander peoples' continuing connection to land, sea, wildlife and community. We pay our respects to them and their cultures, and to their Elders past and present.*

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## References and other information

1. Australian Registry of Wildlife Health (2014) Pied Currawong (*Strepera versicolour*) with Black and White Bird Disease. [cited 2022 24 Oct 2022]; Available from: <https://www.arwh.org/pied-currawong-strepera-versicolour-with-black-and-white-bird-disease/>
2. Jarratt C and Rose K (2016) Mass Mortality Event in Australian Magpies (*Cracticus tibicen*) and Australian Ravens (*Corvus coronoides*) in NSW, 2015, in Association of Avian Veterinarians Australasian Committee (AAVAC): Brisbane

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