

Shearwater mass mortalities

Fact Sheet

November 2023

Key points

- Mass mortalities or “wrecks” of migrating seabirds occur regularly, generally in spring, along the coastlines of Australia.
- These mass mortalities are considered natural events; a by-product of long migration, starvation and exhaustion, exacerbated by severe weather conditions. Climate change and ingestion of marine debris may play a role in some events.
- The numbers of carcasses visible may vary from small numbers to hundreds or even thousands of birds, and may be influenced by prevailing sea and weather conditions.
- Short-tailed shearwaters (mutton birds) are most commonly affected, but other species of shearwater may also be involved.

Exclusion of other causes of death, including viral infections, is warranted, especially when concern around circulating infectious diseases is heightened.

Affected species

Events in Australia mainly involve short-tailed shearwaters (*Ardenna [Puffinus] tenuirostris*), also known as mutton birds. Other species such as wedge-tailed (*A. pacificus*), flesh-footed (*A. carneipes*) and fluttering (*Puffinus gavia*) shearwaters may also be involved. Shearwaters are reported to be similarly affected in other parts of the world e.g. great shearwater (*A. gravis*) mortality events along the eastern coast of the United States ^[1] and short-tailed shearwater mortalities in Japan and the Bering Sea ^[2, 3].

Aetiology and epidemiology

Short-tailed shearwaters breed in colonies in south-eastern Australia during spring and summer. They migrate annually, at the end of the breeding season, from their nesting areas to the northern hemisphere, flying north along the western Pacific Ocean to the Arctic. They return southwards in the Austral spring through the centre of the ocean or west coast USA, a distance of approximately 15,000 km one way. Shearwaters feed on krill, squid and fish. The average lifespan is 15 to 19 years but birds can live up to 38 years ^[4].

Natural mortality usually occurs during the first migration due to exhaustion and starvation ^[2]. Deaths of between 10-10,000 per event have been reported from all states in Australia (excluding ACT and NT) with events reported in the 1800's ^[5] and records dating back to at least 1955 ^[6, 7]. Larger mortality events are reported on a recurrent, although irregular basis, perhaps every 10

years or so ^[5, 8]. Dead birds are generally found on Australian shores at the end of the southern migration, with September to November being the most common months for reports. The numbers of birds washed up on shore vary depending on sea and wind conditions ^[5].

Mass mortality events in migrating shearwaters are generally due to natural causes, precipitated by factors associated with annual long-distance migration, including severe weather, exhaustion and not being able to locate sufficient fish stocks during migration ^[5, 8]. There are some indications that the number and size of reported shearwater mass mortality events is increasing globally ^[1], although the causes for this are not clear and may include increased observation and reporting. Climate change, specifically ocean warming resulting in reduced fish stocks, and ingestion of plastic pollution have been suggested as possible contributing factors to seabird mortality events ^[2, 3, 5, 9-11].

One Health implications

Wildlife and the environment: the short-tailed shearwater is considered the most numerous of the world's 37 shearwater species, with an estimated global population of 23 million birds ^[4]. Annual mortalities, mainly of young-of-the-year, are considered a natural event and part of natural population management ^[2]. Ongoing monitoring of mortality events is recommended, to gain more information on possible changes in size or frequency of events, and better understand factors contributing to them.

Domestic animals: dogs should not be allowed to scavenge on dead bird carcasses, due to general risks of ingesting rotting flesh, or contracting infectious diseases.

Humans: there are no specific human health implications. People are advised to observe general hygiene precautions if handling sick or dead birds.

Clinical signs and diagnosis

Birds are found on shorelines dead or if alive, may be weak, thin and unable to stand or fly. Diagnosis is generally based on presentation and time of year, however investigation and exclusion of other possible causes of mass mortality should be considered (see *Differential diagnosis* below).

Laboratory diagnostic specimens

A complete necropsy should be performed on as fresh a carcass as possible. Multiple fresh carcasses should be examined and sampled. A range of tissues including any obvious lesions should be collected in formalin for histopathology. Fresh or frozen tissues can be submitted for botulism and toxin testing. Swabs may be collected for viral testing. Serum from live and dead birds can be collected and stored for diagnostic tests such as viral serology or biochemistry. See "*Sick and dead bird health surveillance – sample collection protocol*" https://3.104.156.86/wp-content/uploads/2021/05/SickDead-Bird-Surveillance_with-images.pdf for more information.

Pathology

At post-mortem examination, birds are in poor condition with empty stomachs, no fat reserves and atrophy of the musculature and liver. The gall bladder is enlarged. They are often secondarily

infected with multiple parasites such as renal coccidia (*Eimeria serventyi*) and cestodes (*Tetrabothrius* spp.)^[12-15].

Differential diagnoses

As starvation is essentially a diagnosis by exclusion, other possible causes of mortality should be ruled out, including botulism, trauma, poisoning, viral and other infectious diseases and parasitism.

Treatment, prevention and control

Due to the large numbers of birds affected, treatment is generally not practical. Individual birds can be supported with fluids and supplemental nutrition but their survival rate is often low and release prospects may be poor.

Prevention and control is not generally considered, as this is a natural event. If large numbers of carcasses are present on shorelines in populated areas, they may need to be disposed of appropriately.

Research

Ongoing research is recommended to gather further information on the influence of human activities, by-catch, fish stocks, plastics, toxins, oil spills, parasitism, other infectious diseases and climate change on shearwater mass mortality events^[16-24], and to further assess the long-term impacts of mass mortalities on population viability.

A framework for reporting mass mortality events of seabirds has been proposed, to better capture data on both small and large scale events^[25].

Bands on dead birds should be reported to the local wildlife department office or the Australian Bird and Bat Banding Scheme (www.dcceew.gov.au/science-research/bird-bat-banding/get-involved/report-band-sightings).

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>. WHA is interested in hearing from anyone with laboratory reports, historical datasets or survey results that could be added to the National Wildlife Health Information System. If you can help, please contact us at admin@wildlifehealthaustralia.com.au.

Avian influenza, Newcastle disease (avian paramyxovirus) and West Nile virus testing has been performed in some mortality events with no positives detected, although low pathogenicity avian

influenza viruses have been detected historically at low levels in live, apparently healthy, shearwaters ^[26].

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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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