

Shearwater mass mortalities

Fact sheet

Introductory statement

Mass mortalities of migrating seabirds are noticed and reported by the general public on a regular basis. The sight of hundreds to thousands of dead birds being washed ashore understandably causes alarm. However, reassurance and education are needed that these mass mortality events are considered natural deaths of generally abundant species.

Aetiology

Natural causes, possibly precipitated by factors associated with annual long-distance migration, including severe weather or not being able to locate sufficient fish stocks along the way.

Natural hosts

Predominantly short-tailed shearwaters (*Puffinus tenuirostris*), also known as muttonbirds, but other species such as wedge-tailed (*Puffinus pacificus*), flesh-footed (*Ardenna carneipes*) and fluttering (*Puffinus gavia*) shearwaters may also be involved.

World distribution

These shearwaters migrate annually from nesting areas in the southern hemisphere to the northern hemisphere, as far away as Alaska.

Occurrences in Australia

Dead birds, which may be thin, are washed up on beaches and vary in number from a dozen to several hundred or thousands depending on conditions. This is an expected annual natural mortality event. The numbers of birds washed up on shore vary depending on sea and wind conditions.

Epidemiology

Shearwaters breed in colonies in south-eastern Australia from September to April. At the end of the breeding season they fly north along the western Pacific Ocean to the Arctic. They then return southwards through the centre of the ocean, a distance of approximately 15,000 km one way.

Time spent at the breeding grounds increases each year until the birds are five years old, when they become involved in breeding. Shearwaters feed on krill, squid and fish. Natural mortality usually occurs during the first migration due to exhaustion and starvation. Average lifespan is 15 to 19 years but birds can live up to 38 years.

Clinical signs

Birds are found dead or may appear weak and unable to stand or fly.

Pathology

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.) (Ladds 2009, McLaughlin 2008, Yabsley 2008, Wobeser 1997).

Differential diagnoses

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

Laboratory diagnostic specimens

To exclude the above diseases a complete necropsy should be performed. Collect a range of tissues including any obvious lesions and submit them in formalin for histopathology. Fresh or frozen tissues can be submitted for botulism and toxin testing.

Large numbers of carcasses may need to be disposed of appropriately in populated areas.

Treatment

As large numbers of birds are usually affected treatment is generally not practical. Individual birds can be supported with fluids and supplemental nutrition but their survival rate is low and release prospects poor.

Surveillance and management

Wildlife disease surveillance in Australia is coordinated by the Wildlife Health Australia. The National Wildlife Health Information System (eWHIS) captures information from a variety of sources including Australian government agencies, zoo and wildlife parks, wildlife carers, universities and members of the public. Coordinators in each of Australia's States and Territories report monthly on significant wildlife cases identified in their jurisdictions.

No active surveillance / management identified. See Research below.

Statistics

Deaths of between 10-10,000 per event have been reported from all states with coastlines except for the Northern Territory with records dating back to 2001. Avian influenza, Newcastle disease and West Nile virus testing has been performed in some events with no positives detected, although avian influenza viruses have been detected historically at low levels in shearwaters (Mackenzie et al 1984).

Research

Bands on dead birds should be reported to the local wildlife department office or the Australian Bird and Bat Banding Scheme (<http://www.environment.gov.au/biodiversity/science/abbbs/recovery.html>).

Other research on effects of by-catch, fish stocks, toxins, oil spills, climate change etc. have been identified (Baduini, Lovvorn *et al.* 2001; Fry, Fefer *et al.* 1987; Gould, Ostrom *et al.* 2000; Hunter, Moller *et al.* 2000; Kristine M 2007; Mignucci-Giannoni 1999; Priddel, Carlile *et al.* 2006; Uhlmann, Fletcher *et al.* 2005; Uhlmann and Jeschke 2011).

Human health implications

There are no specific human health implications. Members of the public are advised to observe general hygiene precautions if handling dead birds.

Conclusions

Mass mortalities of these migrating seabirds, although possibly distressing to the general public, are considered a natural event. Passive and opportunistic surveillance has revealed that the number of mortality incidents and the numbers of birds involved may be increasing. For great shearwaters (*Puffinus gravis*) in the US mortality events increased from three events between 1993 and 2000 involving 296 birds to nine mortality events between 2001 and 2011 involving 4665 birds (Haman et al 2013). Ongoing research has been identified to provide reasons for increases above the baseline natural mortality rate such as the effects of human activity, pollution or climate change.

References and other information

Baduini CL, Lovvorn JR, Jr GLH (2001) Determining the body condition of short-tailed shearwaters: implications for migratory flight ranges and starvation events. *Marine Ecology Progress Series* **222**, 265-277.

Cohen S (2010) Dead birds on beaches natural. In. ' (Department of Environment and Climate Change - NSW Government)

Fry DM, Fefer SI, Sileo L (1987) Ingestion of plastic debris by Laysan Albatrosses and Wedge-tailed Shearwaters in the Hawaiian Islands. *Marine Pollution Bulletin* **18**(6, Supplement B), 339-343.

Gould P, Ostrom P, Walker W (2000) Foods, Trophic Relationships, and Migration of Sooty and Short-Tailed Shearwaters Associated with Squid and Large-Mesh Driftnet Fisheries in the North Pacific Ocean. *Waterbirds: The International Journal of Waterbird Biology* **23**(2), 165-186.

Haman KH, Norton TM, Ronconi RA, Nemeth NM, Thomas AC, Courchesne SJ, Segars A, Keel MK. (2013) Great shearwater (*Puffinus gravis*) mortality events along the eastern coast of the United States. *Journal of Wildlife Diseases* 49(2), 235-245.

Hunter CM, Moller H, Fletcher D (2000) Parameter uncertainty and elasticity analyses of a population model: setting research priorities for shearwaters. *Ecological Modelling* 134(2-3), 299-324.

Kristine M B (2007) Global human impacts or climate change?: explaining the Sooty Shearwater decline at the Minard site, Washington State, USA. *Journal of Archaeological Science* 34(7), 1087-1097.

Ladds P. (2009) Nutritional and metabolic diseases. In: *Pathology of Australian Native Wildlife*. CSIRO Publishing, Collingwood, 495-510.

Mackenzie, JS, Edwards EC, Holmes RM, Hinshaw VS (1984). Isolation of ortho- and paramyxoviruses from wild birds in Western Australia and the characterization of novel influenza A viruses. *Australian Journal of Experimental Biology and Medical Science* 62:89-99.

McLaughlin JD. Cestodes. (2008) In: Atkinson CT, Thomas NJ and Hunter DB, editors. *Parasitic Diseases of Wild Birds*. Wiley-Blackwell, Ames, 120-153.

Mignucci-Giannoni AA (1999) Assessment and rehabilitation of wildlife affected by an oil spill in Puerto Rico. *Environmental Pollution* 104(2), 323-333.

Priddel D, Carlile N, Fullagar P, Hutton I, O'Neill L (2006) Decline in the distribution and abundance of flesh-footed shearwaters (*Puffinus carneipes*) on Lord Howe Island, Australia. *Biological Conservation* 128(3), 412-424.

Uhlmann S, Fletcher D, Moller H (2005) Estimating incidental takes of shearwaters in driftnet fisheries: lessons for the conservation of seabirds. *Biological Conservation* 123(2), 151-163.

Uhlmann SS, Jeschke JM (2011) Comparing factors associated with total and dead sooty shearwater bycatch in New Zealand trawl fisheries. *Biological Conservation* 144(6), 1859-1865.

Wobeser GA. (1997) Miscellaneous diseases. In: *Diseases of Wild Waterfowl*, 2nd. edition. Plenum Press, New York, 211-224.

Yabsley MJ. (2008) Eimeria. . In: Atkinson CT, Thomas NJ and Hunter DB, editors. *Parasitic Diseases of Wild Birds*. Wiley-Blackwell, Ames, 162-180.

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To provide feedback on this fact sheet

We are interested in hearing from anyone with information on this condition in Australia, including 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.

Wildlife Health Australia would be very grateful for any feedback on this fact sheet. Please provide detailed comments or suggestions to admin@wildlifehealthaustralia.com.au. We would also like to hear from you if you have a particular area of expertise and would like to produce a fact sheet (or sheets) for the network (or update current sheets). A small amount of funding is available to facilitate this.

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