

The terrestrial vertebrates of Norfolk Island: Results of the Australian Museum Expedition, October 2022.

Mark D.B. Eldridge^{1*} , Rebecca Bray² , Emily M. Cave¹ , Greta J. Frankham¹ ,
Sandy Ingleby¹ , Matthew J. Lott¹ , Richard E. Major¹ , Harry E. Parnaby¹ ,
Glenn M. Shea^{1,3} , Dane F. Trembath¹ , Leah R. Tsang¹ , Jenny J.W. Wang¹ ,
and Kristofer M. Helgen^{1,4} 

1. Australian Museum Research Institute, Australian Museum, 1 William St, Sydney, NSW 2010, Australia

2. Natural Sciences, Auckland War Memorial Museum Tāmaki Paenga Hira,
Victoria Street West, Auckland 1142, New Zealand

3. Sydney School of Veterinary Science B01, University of Sydney, NSW 2006, Australia

4. Current address: Bernice Pauahi Bishop Museum, 1525 Bernice St, Honolulu, Hawai'i 96817, USA

ABSTRACT. The Australian Museum Research Institute Terrestrial Vertebrates team was on the Norfolk Island Group from 23 to 30 October 2022. The aims were to improve the Museum's specimen and tissue collection of native and introduced birds, mammals and reptiles from the Island Group and to search for evidence of the presence of microbats. Samples were collected from 97 individuals of 28 species of birds from the Norfolk Island Group. Blood and/or feather samples were collected from 32 individuals of eight native bird species that were subsequently released, including representatives of six endemic taxa. An additional 65 specimens of 20 bird species (10 native, 10 introduced), mostly either found dead by Island residents or obtained from pest management operations, were transported back to the Museum for curation as skins, skeletons and tissues. Samples were collected from 39 individuals of six species of reptiles and amphibians, including representatives of the two endemic taxa. A survey of Phillip Island resulted in tail-tip samples being collected from 29 individuals of the native skink, *Oligosoma lichenigerum* and gecko, *Christinus guentheri*. Two voucher specimens with genetic samples of each species were retained. No evidence of native lizards was found on Norfolk Island itself. Vouchers and tissue samples from three species of introduced herpetofauna were collected: Asian House Gecko, *Hemidactylus frenatus* (n = 3), Beach Scaly-toed Gecko, *Lepidodactylus pantai* (n = 1), and a Green Tree Frog, *Litoria caerulea* (n = 1). Significantly, the *Lepidodactylus* specimen is a new species record for Australia and its territories. A rehabilitating Green Sea Turtle, *Chelonia mydas* (n = 1) was also sampled. No acoustic evidence for the presence of any microbat species on Norfolk or Phillip Islands was detected during the survey, suggesting that the endemic population of Gould's Wattled Bat, *Chalinolobus cf. gouldii* is now extinct. Specimens and tissue samples were collected from all four of the island's introduced mammal species; House Mouse, *Mus musculus* (n = 1), Pacific Rat, *Rattus exulans* (n = 5), Black Rat, *Rattus rattus* (n = 3) and feral Cat, *Felis catus* (n = 7). These specimens and samples will provide a valuable record of the introduced mammals of Norfolk Island and enable future genetic studies. Tissue samples were also

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ORCID: Eldridge, 0000-0002-7109-0600; Bray, 0000-0003-4163-1549; Cave, 0000-0002-6554-8793; Frankham, 0000-0002-0585-6700; Ingleby, 0000-0003-2573-2622; Lott, 0000-0001-8685-8099; Major, 0000-0002-1334-9864; Parnaby, 0000-0003-2409-1632; Shea, 0000-0002-0052-4205; Trembath, 0000-0001-9526-5471; Tsang, 0000-0003-2732-848X; Wang, 0009-0009-8079-2450; Helgen, 0000-0002-8776-4040

Corresponding author: Mark Eldridge Email: mark.eldridge@austmus.gov.au

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obtained from a Blainville's Beaked Whale, *Mesoplodon densirostris* that stranded at Kingston in April 2016, the first recorded stranding of that species on Norfolk Island. Overall, these new specimens and tissue samples will significantly enhance the Australian Museum's collection and provide documentation of the contemporary bird, reptile and mammal fauna of Norfolk Island, as well as supporting current and future research projects.

Background

The subtropical Norfolk Island (NI) Group (29° 02' S, 167° 57' E) is situated on the Norfolk Ridge between New Zealand and New Caledonia, in the south-west Pacific Ocean. Lying ~1400 km from the eastern Australia coast, NI and the surrounding islets are the eroded remnants of a much larger island formed by volcanic activity approximately 2.5 million years ago (Mortimer *et al.*, 2021). With a long history of isolation, and a terrestrial biota initially derived by dispersal from surrounding landmasses, the NI Group has long been of scientific interest and conservation concern (DNP, 2010, 2018; CoA, 2025). The three largest islands in the group, Norfolk (3,455 ha), Phillip (190 ha) and Nepean (10 ha) Islands (Fig 1), were all originally forested but have been significantly impacted by anthropogenic vegetation clearing, degradation, and the introduction of pest species. On NI most (90%) native vegetation has been cleared, primarily for agriculture, with the largest remaining remnant of native forest now occurring in the north of the Island and protected as a National Park (460 ha) (DNP, 2018; CoA, 2025). Nepean Island, lying ~1 km south of NI (Fig. 1), originally supported over 200 Norfolk Island Pines, *Araucaria heterophylla* and a wide variety of native vegetation. However, it underwent major degradation following British settlement in 1788 through deforestation and calcarenite quarrying. Nepean Island now supports a grassland/shrubland habitat with the dominant flora including invasive Kikuyu and Buffalo grasses (Cogger *et al.*, 1983; Norfolk Island Parks and Forestry Service, 2003). Phillip Island, 6.5 km south of the main island (Fig. 1), was heavily impacted by introduced herbivores and became an eroded moonscape, almost completely devoid of vegetation (Cogger *et al.*, 1983). Eradication of these herbivores by the 1980s has led to significant and ongoing revegetation of the Island, which is now part of the Norfolk Island National Park (Coyne, 2009, 2010; CoA, 2025). The NI Group's high levels of endemism, ongoing conservation initiatives, and unique biogeographical relationships have made it a research focus for Australian Museum (AMS) staff for many decades (Millington *et al.*, 1888; North, 1889; Hedley & Basset Hull, 1912; Troughton, 1922; Iredale, 1929, 1945; Smithers & Disney, 1969; Cogger *et al.*, 1979, 1983, 2006; Hyman *et al.*, 2023).

Norfolk Island Group birds

The NI Group is famous for its unique and abundant birdlife, and their diversity and natural history since 1788 has been well reviewed (North, 1889; Basset Hull, 1909; de Ravin, 1975; Smithers & Disney, 1969; Schodde *et al.*, 1983; Hermes *et al.*, 1986; Christian, 2005; Priddel *et al.*, 2010). Less well known is the history of the NI Group's avifauna prior to the first European settlement in 1788 and the impact of the prior Polynesian settlement during the 13-14th centuries (Schodde *et al.*, 1983; Holdaway & Anderson, 2001; Christian, 2005). The bones of sea and land birds, including some now extinct species, have been detected in archaeological and natural deposits (Schodde *et al.*, 1983; Holdaway & Anderson, 2001). Since 1788, over fifteen species of seabirds have been recorded breeding in

the NI Group and at least another 15 species are regular non-breeding migrants (Christian, 2005). Of the native land birds, at least 29 species have been recorded breeding, and a further three species are regular non-breeding migrants or visitors (Christian, 2005). Habitat modification, especially clearing of forest to produce pasture, has created new open habitats that have enabled some relatively recently arrived species to become established, including the Nankeen Kestrel, *Falco cenchroides*, Masked Woodswallow, *Artamus personatus* and Welcome Swallow, *Hirundo neoxena*. Of the land birds, 15 are endemic species or subspecies, seven of which have become extinct since 1788: Norfolk Ground Dove, *Pampusana norfolkensis* (~1800), Norfolk Pigeon, *Hemiphaga novaeseelandiae spadicea* (~1900), Norfolk Kaka, *Nestor productus* (~1850s), Norfolk Starling, *Aplonis fusca fusca* (~1920s), Norfolk Island Thrush, *Turdus poliocephalus poliocephalus* (1970s), Long-tailed Triller, *Lalage leucopyga leucopyga* (1970s), and the White-breasted White-eye, *Zosterops albogularis* (~2000s) (Schodde *et al.*, 1983; Christian, 2005). Four endemic taxa are currently listed as threatened: Norfolk Parakeet, *Cyanoramphus cookii*, Norfolk Robin, *Petroica multicolor*, Norfolk Golden Whistler, *Pachycephala pectoralis xanthoprocta* and the Norfolk Morepork, *Ninox novaeseelandiae undulata* (EPBC, 1999). Eleven introduced species are now established on the NI Group including the Crimson Rosella, *Platycercus elegans*, California Quail, *Callipepla californica*, House Sparrow, *Passer domesticus* and Common Blackbird, *Turdus merula* (Christian, 2005). Additionally, over 78 species have been reported as vagrants or rare visitors to the NI Group (Christian, 2005).

Comparative DNA analyses of some NI Group bird populations have already significantly clarified their taxonomy, evolutionary history and informed management. This includes the Norfolk Robin by Kearns *et al.* (2015), white-eyes, *Zosterops* sp. by Clegg *et al.* (2002), Norfolk Golden Whistler by Jönsson *et al.* (2014), Norfolk Parakeet by Boon *et al.* (2001) and Providence Petrel, *Pterodroma solandri* by Lombal *et al.* (2017). However, many questions remain unaddressed and taxa unstudied. The collection and long-term storage of tissue and DNA samples of NI's endemic taxa (and introduced species) is important research infrastructure that the Australian Museum can provide to facilitate future studies to determining the evolutionary relationships, population history and genetic diversity of NI's avifauna. Unfortunately, the Australian Museum's historic collecting on the NI Group was prior to the establishment of the Museum's frozen tissue collection.

Australian Museum holdings of Norfolk Island Group birds

Prior to the recent Expedition, the Australian Museum Ornithology Collection held over 700 specimens of 41 bird species from the NI Group, collected between 1838 and 1978 (Table 1). This includes specimens of 12 of the endemic species/subspecies of land bird and five of the seven recently extinct species. The extinct Norfolk Ground Dove is only known from a ~1790 drawing by then-Captain (later Governor) John Hunter (1737–1821) and a few subfossil