Department of Conservation
Te Papa Atawhai

19-E-0711 – DOC 6104308

23 October 2019

Andy Blick
Via fyi.org

Dear Mr Blick

I refer to your official information request of 11 October 2019 regarding mice, cats and pigs on Auckland Island.

Abundance of mice, cats and pigs on Auckland Island

You asked:

> *1)Could you please provide information on the relative abundance indices of the populations of mice, cats and pigs on Auckland island, for the last 5 years?*

No long-term pest population monitoring has been undertaken on Auckland Island. However, we have estimated the following population metrics through research carried out in Summer 2018/19 and Winter 2019.

Pigs

Twenty pigs were detected on Falla Peninsula (a 953 hectare area) in Summer 2019. Extrapolating this figure across Auckland Island gives an estimated population of 917. Pigs are found across the whole of Auckland Island except for some inaccessible cliff areas.

Cats

Twenty cats were detected at Deas Head (1,300 ha) during a trail camera trial in Summer 2019. Taking into account variations in density across different habitat types, the estimated cat population of Auckland Island is 550-690. Cats are found across the whole of Auckland Island except from some inaccessible cliff areas.

Mice

The standard method of measuring rodent abundance in New Zealand is with tracking tunnels. More information on this method can be found at: https://www.doc.govt.nz/globalassets/documents/science-and-technical/inventory-monitoring/im-toolbox-animal-pests-tracking-tunnel-indices-of-small-mammal-abundance.pdf .

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Tracking tunnels for mice were run across Auckland Island in Summer 2019 and Winter 2019. The following table shows the percentage of tunnels where mice were recorded as present.

Site	January 2019	February 2019	August 2019
South West Cape - Tussock	5.3	25	95
Deas Head Head – Tussock	84.2	85	60
Falla Peninsula – Forest	85	95	95
Falla Peninsula - Scrub	95	100	85
Falla Peninsula – Tussock	90	100	100

Mouse trapping in February 2019 gave a density estimate of 26.4-105.6 mice per hectare (Russell et al. in press). This gives a population estimate of 1.2 million to 4.9 million mice for Auckland Island. Mice are found across the whole of Auckland Island.

Evidence of cat predation of birds on Auckland Island

You asked:

> *Recently a press release had the headline:"Cats decimate seabird populations".*
> *2)Can you please confirm this and and also provide the number of observations this finding is based on?*
> *3)what percentage of these observations are likely to be scavenging and not direct predation?*

We note that the headline for the Department's press release of 4th October 2019 was *"Winter life of Auckland Island pests revealed"*. The press release can be found at: www.doc.govt.nz/news/media-releases/2019/winter-life-of-auckland-island-pests-revealed/

Research shows that feral cats on islands are responsible for 14% of global bird, mammal & reptile extinctions and are the main threat to 8% of the world's critically endangered birds, mammals & reptiles (Medina et al, 2011).

Auckland Island is the only island in the Auckland islands archipelago that is not pest free. Of the 38 native bird species present in the archipelago, there is only evidence that 12 are still breeding on Auckland Island and only one of those is an endemic species. This is a direct result of the presence of pigs, cats and mice on Auckland Island.

Evidence of the impact of cats on seabird populations comes from observations as well as comparisons with neighbouring pest free islands.

Observations of predation by cats

The impact of cats on seabird populations on Auckland Island was first recorded by Coastwatchers (military intelligence officers) stationed at Ranui Cove and Tagua Bay between 1942 and 1945. Several observers reported the station cats killing 1-3 prions

per night around the station. Coastwatchers also recorded cats killing white-faced storm petrels, black-bellied storm petrels and sooty shearwaters. Coastwatcher and zoologist Robert Falla reported 40–50 white-faced storm petrels killed by cats at Crozier Point in January 1943, eight cat-killed Antarctic prions at Ranui Cove and numerous remains of prions at Erebus Cove in September to October 1943.

Since then, further observations have been made by conservationists. Brian Bell found many remains of cat-killed Antarctic prions along the track to Crozier Point in December 1962 and commented that their nesting was confined to cliff faces and inaccessible ledges as 'any bird landing above appears to fall an immediate prey to the feral cats'. (Russell et al. in press).

John Gardiner reported dozens of prions killed by cats at Deas Head in January 1976, and Phil Thomson found over 100 cat-killed prions between Erebus Cove and Grey Duck Creek in early 1983 (Gardiner 1986; Thomson 1986). Three years later, John Campbell estimated 100 freshly killed prions along 2.5 km on the south side of Laurie Harbour (Campbell 1986). Few prions now remain on Auckland Island (Miskelly et al. in press).

Away from the Coastwatcher stations, cats have also been observed preying on Auckland Island shags, red-billed gulls, sooty shearwaters, subantarctic diving petrels, and black-bellied storm petrels.

Birdlife comparison with cat-free islands in the same archipelago

Comparison with the bird species present on cat-free islands in the Auckland Islands archipelago reveals that, in conjunction with pigs, cats have impacted other vulnerable ground-nesting bird species including New Zealand falcon, Auckland Island teal, Auckland Island rail, Auckland Island snipe, Auckland Island banded dotterel. There is no evidence that these species still exist on the main Auckland Island but they do persist on the other pest-free islands.

Auckland Island pipit and yellow- and red-crowned parakeets populations are also affected (Miskelly et al. in press). Land birds still living on Auckland Island are warier than those on neighbouring cat-free islands and are less inclined to forage on the ground (Turbott 2002).

Estimated numbers of annually nesting seabirds on Auckland Island

You asked:

> *4a) Also what are the current estimated numbers of annually nesting seabirds on Auckland island? 4b) how many species of albatross etc. comprise this total?*

There is evidence of 12 native bird species, including seabirds, breeding on Auckland Island. The white-capped mollymawk breeding population was estimated at 4,741 pairs in 2016. The relative abundance measures for the other species are publicly

available by searching for the location "Auckland Islands" at nzbirdsonline.org.nz. We are therefore refusing this part of your request under section 18(d) of the OIA.

Seabird nesting season

You asked:

> *5) How long is the duration of seabird nesting season on this island?*

Seabirds are present on Auckland Island year-round. Most seabird species on the island complete their breeding between October and May, but other nesting activities occur outside of this period.

Gibson's albatross nest for 290 days on average. Shags, skuas, gulls, northern giant petrel, terns and yellow-eyed penguins nest & breed year-round.

Further information on the ecology of all the species present on Auckland Island can be found at nzbirdsonline.org.nz.

Diet of cats on Auckland Island

You asked:

> *6)What do cats eat when no seabirds are available?*

Seabirds are vulnerable to cat predation year-round. Analysis of cat gut contents and cat scats has shown that their diet includes seabirds such as prions and diving petrels, passerines such as tūī, blackbirds & bellbirds, as well as mice, squid, shellfish, seaweed and squat lobsters.

Home ranges of cats on Auckland Island

You asked:

> *7)What size home ranges do Auckland island cats maintain?*

Analysis of data from GPS tracking collars fitted to twenty cats on Auckland Island in Summer 2018/19 show home ranges between 115.8ha and 6,859.7ha.

Evidence of pig predation of seabirds on Auckland Island

You asked:

> *8)what evidence of pig predation of seabirds has been found and how is this differentiated from scavenging activity?*

Observations of predation by pigs

Depredation of burrowing petrels was first observed in 1874 (Krone 1900).

Coastwatchers at Ranui Cove observed pigs eating many eggs in the Auckland Island shag colony at Crozier Point (Turbott 2002). Pigs were observed digging into prion

burrows by the 1962-63 Cape Expedition, and during a 1972-73 expedition (Challies 1975a).

Pigs have been observed eating freshly killed whitecapped mollymawks and destroying nests at South West Cape (Flux 2002, De Roy et al. 2008). In 2007, it was observed that every white-capped mollymawk nest accessible to pigs at South West Cape was either empty, or partly or wholly destroyed (Thompson & Sagar 2008). There was zero breeding success from these nests in the years studied.

Birdlife comparison with pig-free islands in the same archipelago

Comparison with the bird species present on pig-free islands also provides evidence of the impact of pigs on seabird populations. Pest-free Disappointment Island, 5.7km off the West coast of Auckland Island, is 284ha and has an estimated 96,864 pairs of white-capped mollymawks. In contrast, the 46,000ha Auckland Island has only an estimated 4,741 pairs of white-capped mollymawks.

Comparison with the bird species present on pig-free islands in the Auckland Islands archipelago reveals that, in conjunction with cats, pigs have impacted other vulnerable ground-nesting bird species including New Zealand falcon, Auckland Island teal, Auckland Island rail, Auckland Island snipe, Auckland Island banded dotterel. There is no evidence that these species still exist on the main Auckland Island but they do persist on the other pest-free islands.

The observations described above are direct and indirect observations of pig predation on birds. Note that scavenging would not have the same impact on population size and distribution.

Auckland Island scientific papers

You also asked for references to scientific papers. In March 2020, the journal *Notornis* will publish a special edition focussing on Auckland Island. Two of the papers referenced in this letter (Russel et al. in press, Miskelly et al. in press) will be published as part of the special edition.

A search of the DOC website for "Auckland Island" brings up reports from the Department's various monitoring programmes up to the 2018-2019 season. Results from the research carried out on Auckland Island in Summer 2018/19 and Winter 2019 are yet to be published but will be available in future on the DOC website and in academic journals.

We have attached a list of other useful sources of information, some of which are cited in this response, as an appendix.

You have the right to seek an investigation and review by the Ombudsman of this decision. Information about how to make a complaint is available at www.ombudsman.parliament.nz or freephone 0800 802 602.

Please note that this letter (with your personal details removed) and enclosed documents may be published on the Department's website.

Yours sincerely

Hilary Aikman
Director, National Operations
For Director-General

Appendix – references to scientific papers

Bonnaud, Bourgeois & Vidal 2011 Cat impact and management on two Mediterranean sister islands: 'The French conservation touch'" Island Invasives: Eradication and Management pp3959-401

Campbell, D.J. 1986. Report on a visit to the Auckland Islands. Lands & Survey Department head office file 4/6/2 Vol. 2 (reports relating to visits to Auckland Islands). Dunedin, Archives New Zealand. 26 pp.

Challies, C.N. 1975a. Feral pigs (*Sus scrofa*) on Auckland Island: status, and effects on vegetation and nesting sea birds. *New Zealand Journal of Zoology* 2: 479–490.

Challies, C.N. 1975b. Summary report on the problem of pigs on the main Auckland Island, 1972-73. pp. 225–232 In: Yaldwyn, J. (ed.) 1975. Preliminary results of the Auckland Islands Expedition 1972-73. Wellington, New Zealand Department of Lands and Survey.

De Roy, T.; Jones, M.; Fitter, J. 2008. Albatross; their world, their ways. Auckland, David Bateman. 240 pp.

Flux, I.A. 2002. New Zealand white-capped mollymawk (*Diomedea cauta steadi*) chicks eaten by pigs (*Sus scrofa*). *Notornis* 49: 175–176.

Gardiner, M.J. 1986. General observations from Auckland Islands expedition, January 1976. pp. 211–214 In: Penniket, A.; Garrick, A.; Breese, E. (compilers) Preliminary reports of expeditions to the Auckland Islands Nature Reserve 1973–1984. Reserve Series. Wellington, New Zealand Department of Lands and Survey.

Harper 2010 Diet of feral cats on Subantarctic Auckland Island. *New Zealand Journal of Ecology* 34(2):259-61

Holmes et al 2019 Globally important islands where eradication invasive mammals will benefit highly threatened vertebrates. *PLoS ONE* 14(3):1-17

Krone, H. 1900. Vater und sohn auf der weltreise 1874, 1875 zur beobachtung des Venusdurchgangs 1874 Dezember 9, station Auckland-Inseln. [Father and son on a voyage round the world.] Vol. 2: 1–312; Vol. 3: 1–234. Halle a. d. Saale: Otto Hendel.

Medina et al, 2011 A global review of the impacts of invasive cats on island endangered vertebrates. *Global Change Biology* 17 3503-3510

Russel JC, Horn SR, Harper GA and McClelland P 2018 Survey of introduced mammals and invertebrates on Auckland Island, March – April 2015. *DOC Research and Development Series.*

Russell et al *in press* Mouse bait uptake and availability trials on Falla Peninsula, Auckland Island. *DOC Research and Development Series.*

Thomson, P. 1986 Bird observations, Auckland Islands February-March 1982. pp. 75–77 In: Penniket, A.; Garrick, A.; Breese, E. (compilers) Preliminary reports of expeditions to the Auckland Islands Nature Reserve 1973–1984. Reserve Series. Wellington, New Zealand Department of Lands and Survey.

Thompson, D.; Sagar, P. 2008. A population and distributional study of white-capped albatross (Auckland Islands); Contract number: POP 2005/02. Report prepared for the Conservation Services Programme, Department of Conservation. 17 pp.

Turbott, G. 2002. Year away; wartime Coastwatching on the Auckland Islands, 1944. Wellington, Department of Conservation. 153 pp.