

SHORT NOTE

Pied shags (*Phalacrocorax varius*) devour ducklings and pursuit-dive after adult New Zealand scaup (*Aythya novaeseelandiae*)

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The New Zealand pied shag (kāruhiruhi, *Phalacrocorax varius*), a pursuit-diver of fish in shallow (<10 m) waters (Orta 1992; Harrison *et al.* 2021), is primarily a marine species, but also occurs at freshwater sites, including at Zealandia ecosanctuary/Te Māra a Tāne, Wellington (41°17'S, 174°45'E). There, it has become the dominant breeding shag species beside the lower lake (Bell 2015; Miskelly *et al.* 2023) and here we briefly

report on two of its interactions with waterfowl species at Zealandia – predation of ducklings and pursuit-diving after adult New Zealand scaup (pāpango, *Aythya novaeseelandiae*). On several occasions over recent years, pied shags were seen by CG capturing and devouring ducklings on the lower lake. Similar attacks there were reported to CG by other boat skippers. The pied shags attacked by swimming underwater (pursuit-diving) and coming up underneath each duckling, then seizing and devouring it (see Fig. 1).

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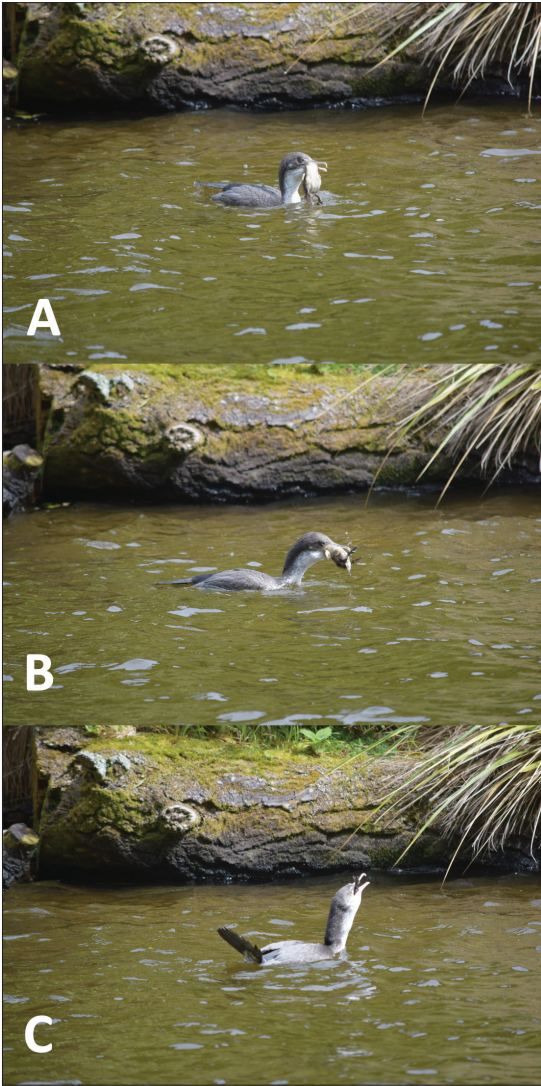


Figure 1. Sequence of photographs (A to C) of a pied shag capturing and devouring a duckling on the lower lake at Zealandia ecosanctuary, Wellington, 1022 h on 16 November 2017. (Photographs: Chris Gee).

During January–May 2023 pied shags were seen by BDB harassing adult New Zealand scaup at Zealandia. On 9 January 2023 at the north end of the lower lake, an adult pied shag swam towards, then pursuit-dived behind an adult female New Zealand scaup on repeated occasions. Each time, the pursuit caused the scaup to take-off and land again on the lake 10–15 m away. This recurring sequence of *shag chase – shag dive – scaup take-off* occurred over five minutes (1320–1325 h), until the New Zealand

scaup flew off to settle on the lake c. 40 m away, after which the pied shag left it alone. Again, at 0950 h on 28 April 2023, at the north end of the same lake, two pied shags pursued a pair of New Zealand scaup, then one of the pied shags, an adult, pursuit-dived behind the female scaup, both scaup then taking off before settling on the lake edge c. 50 m away. Later that day (1348 h) a juvenile pied shag approached, then pursuit-dived, behind a female New Zealand scaup at the south end of the lake, the duck again flying away c. 80 m towards the lake edge. Shortly afterwards (1355–1400 h), three pied shags were seen near another pair of New Zealand scaup at the north end of the lake, two of them swimming directly towards the two ducks, one again pursuit-diving behind the female scaup, causing both scaup to again take off and land c. 60 m further down the lake.

The predation of ducklings we report was mostly done by semi-mature juvenile pied shags yet to disperse from their Zealandia breeding site. They were able to fly, but possibly not strongly enough to head off to sea to fish for themselves, and it may simply be that they were the individuals around the lake, waiting for the adults to return with food. The duckling species involved in pied shag predation could not be confirmed, but brown teal (*pāteke*, *Anas chlorotis*), mallard (*rakiraki*, *Anas platyrhynchos*), New Zealand scaup, and paradise shelduck (*pūtangitangi*, *Tadorna variegata*) breed at Zealandia (Miskelly *et al.* 2023). It is of interest that pursuit-diving, a widely used behaviour when feeding at sea (Harrison *et al.* 2021), is employed in different contexts at Zealandia: duckling predation and harassment of adult ducks, that might incur injury even if not devoured. Furthermore, our observations on predation by pied shags need to be placed into a wider perspective, as opportunistic predation of ducklings occurs frequently, involving many types of predator. Ducklings run the gauntlet of a wide-range of challenges to survival, including predators and unfavourable weather, their number decreasing as the season advances. In most waterfowl species 40–60% of young that hatch die before they are fully grown (Carboneras 1992). At sites like Zealandia, more focussed study of such interactions between pied shags and other waterbird species would clarify the extent and significance of observations reported here, particularly the impact of pied shags on less common waterbirds, such as brown teal and New Zealand scaup.

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