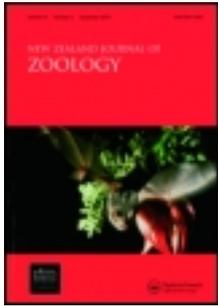


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New Zealand Journal of Zoology

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/tnzz20>

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Available online: 06 Oct 2011

To cite this article: S Clemens, R Boss, A Light & K A Stockin (2011): Attack on blue penguin by a New Zealand fur seal, New Zealand Journal of Zoology, DOI:10.1080/03014223.2011.595421

To link to this article: <http://dx.doi.org/10.1080/03014223.2011.595421>



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Attack on blue penguin by a New Zealand fur seal

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(Received 5 January 2011; final version received 1 June 2011)

A free-ranging New Zealand fur seal (*Actocephalus forsteri*), considered a sub-adult male based on size, was observed and photographed on 15 July 2010 in the Hauraki Gulf, New Zealand, attacking a blue penguin (*Eudyptula minor*), likely an adult. While fur seals of various species are known to feed on penguins, most published data originate from dietary analyses rather than direct observations. New Zealand fur seals are rarely encountered within the Hauraki Gulf and while marine birds are considered to form a minor part of their diet, this record acts as the first documented observation of an attack on a blue penguin within this region and only the second published record within New Zealand waters involving these two species. The carcass of the penguin was not consumed but instead manipulated before being subsequently abandoned. Injuries sustained by the penguin were consistent with those inflicted by terrestrial mammalian carnivores considered important predators of blue penguin.

Keywords: New Zealand fur seal; blue penguin; predation; diet; Hauraki Gulf

Introduction

Fur seals of various species are known to feed on penguins (see du Toit et al. 2004 for review of pinniped predation of penguins). However, most available data originate from dietary analyses (e.g. Carey 1992; Fea et al. 1999; Holborow 2000; Harcourt 2001; Harcourt et al. 2002) rather than behavioural observations (Notman 1985).

New Zealand fur seals (*Arctocephalus forsteri*, or kekeno) are a relatively small species that inhabit temperate latitudes around New Zealand and Australia (Marchant & Higgins 1990). *Actocephalus forsteri* breeds on offshore temperate and sub-Antarctic islands, around South and Stewart Island, with its range expanding up the north Island (e.g. Harcourt 2001; Bouma et al. 2008). Within the Hauraki Gulf, a coastal shallow sea situated to the north of Auckland City (36°51'S, 174°46'E), fur seal

sightings have historically been rare. However, during recent years, they have become more frequent (K. Stockin unpubl. data). This region is highly productive because of the influence of the East Auckland Current, which supports a variety of marine mammal (e.g. Stockin et al. 2008; Wiseman et al. 2011) and bird (e.g. Taylor and Tennyson 1999; Pierre & Norden 2006) species.

Blue penguins (*Eudyptula minor*) are the smallest of the penguin species and can frequently be observed in the Hauraki Gulf. Within New Zealand, the North Island subspecies, *E. m. iredalei*, breeds on Tiritiri Matangi Island (36°36'00"S, 174°53'24"E) in the Hauraki Gulf and is currently listed as Threatened under the New Zealand Threat Classification system (Hitchmough et al. 2007). While marine predators such as killer whale (*Orcinus orca*) and various shark species are known to feed on blue

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penguins, attacks by dogs (*Canis familiaris*) or mustelids (*Mustela* spp.) are thought to be more significant in terms of the species' decline. New Zealand fur seals primarily feed on squid and small mid-water fish, although they are also known to take larger species such as conger eel (*Conger verreauxi*), barracuda (*Thyrsites atun*), jack mackerel (*Trachurus declivis*) and hoki (*Macruronus novaezelandiae*) (e.g. Carey 1992; Fea et al. 1999; Holborow 2000; Harcourt 2001; Harcourt et al. 2002). Predation on blue penguins has not previously been described within this region. Indeed, only the study of Dix (1993), conducted to the south in Cook Strait, has reported sea birds within the diet of fur seals.

Observations

On 15 July 2010 at 13:54 h, we observed and photographed a New Zealand fur seal 10 km off Tiritiri Matangi Island in the Hauraki Gulf. The fur seal, assumed to be sub-adult based on size, was first observed by the skipper (AL) of *Dolphin Explorer*, a 20-m dolphin tour catamaran.

The observation occurred in water depth of 43.6 m, sea state BSS 2 and visibility +2 km.

The seal was observed swimming with a live, likely adult, blue penguin in its mouth. The seal appeared to have a firm grasp of the penguin just anterior to the tail. Despite sharp flinching movements by the penguin, it did not seem capable of freeing itself. As the observation progressed, the seal became more active in its manipulation of the bird, aggressively thrashing it from side to side (Fig. 1). During this thrashing, the seal would release its grip, throwing the bird across the surface of the water. The fur seal would then reacquire the debilitated penguin and continue its manipulation. Throughout the observation, the seal appeared to be unaffected by the presence of the observers' vessel. It continued to manipulate the penguin for several more minutes, after which it released the penguin, leaving it floating in the water. After releasing the penguin, the seal remained within the vicinity of the injured bird for approximately another 2 min prior to its departure from sight.

After its release by the fur seal, the penguin lifted its wings, indicating its apparent survival of the attack. However, as the observing vessel



Figure 1 Fur seal thrashing blue penguin violently from side to side post-capture in the Hauraki Gulf, New Zealand.



Figure 2 Fur seal grasping the severely injured penguin post-thrashing. There was extensive trauma and haemorrhaging along the penguin's right flank.

approached the debilitated bird, it became apparent that it had suffered extensive injuries. Severe trauma to its lower abdomen was evident (Fig. 2), with puncture wounds, haemorrhaging and some intestinal protrusion visible. After inspection of the bird, the observers' vessel left the vicinity so it is not possible to conclude whether the seal later returned to feed on the penguin.

Conclusion

While records of subadult male otariids attacking various marine fauna may occur within field notes, this paper represents the first documented attack on a blue penguin by a fur seal within Hauraki Gulf waters, and the very first in New Zealand to be supported with photographs. Injuries sustained by the penguin are consistent with those reported by Hocken (2005) as 'predation'. Hocken (2005), working with yellow-eyed penguin (*Megadyptes antipodes*) carcasses, listed predation injuries as 'the physical injuries characteristic of animal attack, such as that inflicted by a dog, mustelid, marine mammal or fish'. However, Hocken clarified

that by 'marine mammal' sea-lion (*Phocartos hookeri*) was implied, suggesting that attacks by fur seals may be possible, but very unlikely. While the observed attack did not result in the immediate consumption of the penguin, dietary studies in the eastern Cook Strait have indicated the presence of blue penguin remains within scats of fur seals (Dix 1993). As such, it is not possible to discount this as a potential predatory attack, even though in this instance the penguin was not ingested during the observation. It is possible that the fur seal returned to feed on the debilitated penguin following departure of the observers' boat. Of further interest are the similarities in injuries sustained by the penguin, compared with those described for a dog or mustelid attack. As depicted in Fig. 1, the vigorous thrashing of the penguin whilst in the jaws of the seal resembles closely how a dog would engage and manipulate its prey. Therefore, it is not surprising that the injuries sustained closely resemble those described by Hocken (2005). To what extent fur seal attacks on penguins go unreported because of misclassification of dog or mustelid predation remains unclear, since marine

mammal attacks are assumed typically to result in consumption of the entire carcass. Furthermore, to what extent blue penguins are under reported in the diet of fur seals within New Zealand waters, as a consequence of dietary methods currently applied to this species, also remains unclear.

Acknowledgements

The authors thank Laura Boren (New Zealand Department of Conservation) and Laureline Meynier (Massey University) for communications and for their initial review of this manuscript and two further anonymous reviewers, whose constructive feedback improved the final manuscript. Additional thanks to Carol Duffield for assistance with references and Will Goodfellow for providing access to the observing platform, *Dolphin Explorer*. This manuscript is dedicated to the late Keith Algie—a friend, skipper and lifelong advocate of marine conservation.

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