

SHORT NOTE

Plague skinks (*Lampropholis delicata*) as a significant dietary component for an Australasian bittern (matuku-hūrepo, *Botaurus poiciloptilus*)

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The Australasian bittern or matuku-hūrepo (*Botaurus poiciloptilus*) is a cryptic wetland bird belonging to the family Ardeidae (herons) and is native to New Zealand, Australia, and New Caledonia (Williams 2013; Williams 2024). The Australasian bittern is considered ‘vulnerable’ on the IUCN red list of threatened species, and classified as ‘Nationally Critical’ in New Zealand, defined as only 250–1000 mature individuals remaining with a high forecast decline (Robertson *et al.* 2021; BirdLife International 2022). In New Zealand, Australasian bitterns are found in wetlands of both the North and South Islands, particularly in Northland, Auckland and the Waikato (Williams 2024).

Numbers in New Zealand have declined considerably since the 1970s, due primarily to a loss of around 90% of native wetland, with the species existing within less than 50% of its former range (Williams 2024).

Few studies exist regarding the diet and foraging behaviours of Australasian bittern; however, it is considered to be an opportunistic forager, consuming small to medium-sized fish, crayfish, frogs, terrestrial vertebrates (e.g. rodents), and a variety of arthropods (Whiteside 1989; Marchant & Higgins 1990; Menkhorst 2012). This report briefly outlines a case of an Australasian bittern that presented to the Massey University Wildlife Pathology Service following a fatal vehicular strike. It includes an analysis of the bird’s dietary intake prior to death, determined through examination of stomach contents, and reveals a diet almost entirely composed of introduced plague or rainbow skinks (*Lampropholis delicata*).

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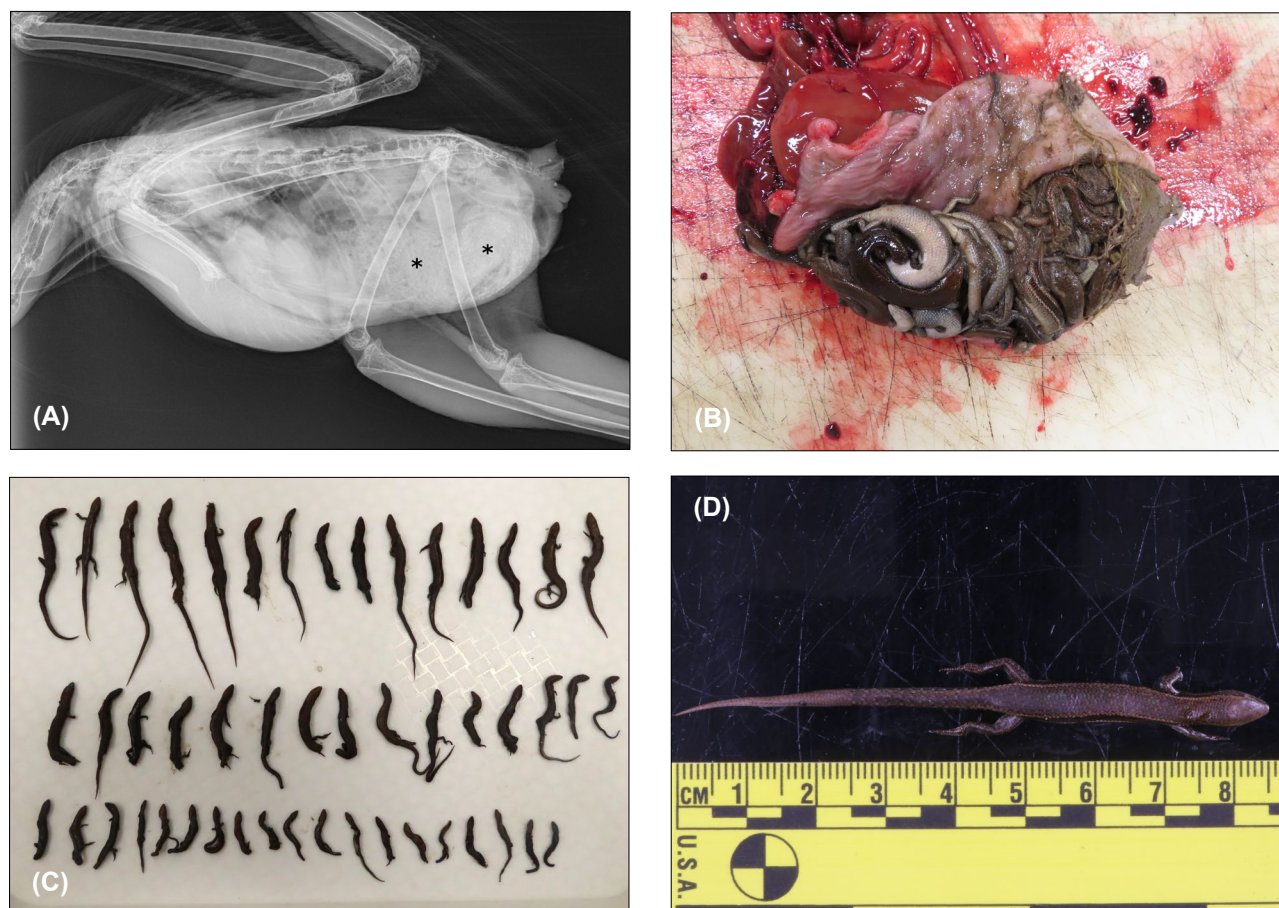


Figure 1. (A) Right lateral radiograph of the Australasian bittern (*Botaurus poiciloptilus*) excluding distal extremities. Note the distended proventriculus with radiopaque ingesta that extends to the very caudal coelom (asterisks). (B) The proventriculus opened to expose the large mass of skinks within it. There was also a small amount of fibrous plant material present. (C) Forty-nine of the fifty skinks that were in the proventriculus, demonstrating the variation in skink size. Note that many have autotomised tails. (D) One of the larger plague skinks (*Lampropholis delicata*), total length 85 mm, found in the proventriculus.

An adult female Australasian bittern was presented to the Wildbase Pathology Service on 30 Aug 2024. The bird had been found dead on a road near the Kauri Coast in Northland, and was suspected to have been hit by a vehicle. Radiographs taken before post-mortem revealed a right humeral fracture and a greatly distended proventriculus with grainy radiopaque ingesta (Fig. 1a).

On gross post-mortem, the bird was in moderate body condition with adequate pectoral muscle mass and subcutaneous fat reserves. There were several fractures of the right wing and pelvis, with multiple skin grazes and severe bruising. The liver was markedly traumatised, with associated haemorrhage. The gross findings indicated severe blunt force trauma as the cause of death, consistent with vehicular strike.

During post-mortem, the proventriculus was found to be distended with ingesta, and contained 50 skinks, ranging from 41 mm to 117 mm in total length (Fig. 1b–d). Many had autotomised tails, with the smallest only 24 mm in snout-vent length. Forty-five of the 50 skinks (90%) were identified as plague skinks, based on the presence of a single frontoparietal scale (van Winkel *et al.* 2018). The five remaining skinks were unable to be identified due to damage to the head. No other prey items were present in the proventriculus at the time of death, although a small amount of fibrous plant material was present (Fig. 1b).

We are unaware of previous examples of lizards being consumed in large numbers by Australasian bitterns in New Zealand. Williams (2024) noted that the largest component of bittern diet in New Zealand was medium-sized fish, particularly eels (*Anguilla* spp.), although this could be locationally and seasonally dependent. Menkhorst (2012) reported that a single Australasian bittern foraging during autumn and winter south-west of Melbourne, Australia, fed predominantly on southern bell frogs (*Ranoidea raniformis*), with hunting observed primarily along river edges where frogs would shelter and likely remain motionless during the cooler months. Menkhorst (2012) reported that few fishing attempts were made during these cooler months. Other prey items including rodents have also been observed as part of the diet (Menkhorst & Silcocks 2004). The ingestion of plague skinks in this case occurred in late August, when temperatures are relatively cool, suggesting a possible preferential selection of plague skinks as prey while they are at a lower level of activity. These hunting observations demonstrate the Australasian bittern's opportunistic behaviour and adaptability in response to seasonal fluctuations and shifts in prey availability.

Scattered populations of the Australasian bittern occur throughout all regions of the South Island although their distribution is predominantly centred in the West Coast and Canterbury (O'Donnell & Robertson 2016). The plague skink is yet to fill its potential distribution within

New Zealand; however, much of the South Island, excluding parts of Nelson-Marlborough and Canterbury, does not offer a suitable environment for this species (Chapple *et al.* 2016). Thus, plague skinks are unlikely to feature prominently in the diet of Australasian bitterns in the South Island. Research into the prevalence of native lizards in the diet of Australasian bitterns, especially in areas of the South Island where native skinks are abundant, would be of interest. Furthermore, research into the diet of Australasian bitterns both in areas supporting plague skinks and those where plague skinks are absent would be valuable for understanding the significance of this introduced lizard species to the diet of a highly threatened native bird species.

Plague skinks are the only introduced reptile species to become established in New Zealand (Chapple *et al.* 2016). Since their initial detection in Auckland in the 1960s, they have spread rapidly across most of the North Island and more recently to islands within the Hauraki Gulf and parts of the South Island (Chapple *et al.* 2016; Harris *et al.* 2021). Plague skinks continue to spread within New Zealand, and often occur at high density (Chapple *et al.* 2016). Although a decline in prey species is not reported as a major driver for the decline in bittern (Williams 2024), invasive plague skinks have the potential to provide an abundant food source to sustain opportunistically foraging bird species such as the 'Nationally Critical' Australasian bittern. This could be increasingly important given the ongoing loss of natural wetland habitat, where bittern typically forage for tuna (eels) and other aquatic and wetland prey items. Further research into the foraging behaviour and diet of the Australian bittern in New Zealand, including seasonal variability and adaptability in the face of wetland habitat loss, would help in the conservation management of this cryptic species.

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