Whitaker's skink *Cyclodina whitakeri* eaten by a weasel *Mustela nivalis*

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1. Investigation

A rodent index trap line was established at Pukerua Bay on 8 August 1995 to identify the species and relative abundance of rodents present, and to determine whether any of the rodent species present were consuming lizards. Fifty pairs of rat and mouse snap-traps were spaced at 25 metre intervals and totally surrounded the only area where Whitaker's skink *Cyclodina whitakeri* is known to have survived on the mainland (see Towns 1992a). The traps were baited with a mixture of peanut butter and rolled oats, and were set for three consecutive nights through to 11 August.

A total of 71 house mice *Mus musculus* (30.4/100 corrected trap-nights) and no rats were caught during the trapping session. The only non-target captures were two immature female weasels *Mustela nivalis* caught in rat traps 50 metres apart, about 100 metres from the 0.5 ha area where Whitaker's skinks are known to occur.

Stomach contents of 67 mice and the two weasels were examined. None of the mice had lizard remains in its stomach, but one of the weasels had its stomach crammed with pieces of skinks. The other weasel had an empty stomach.

At first glance the food mass in the weasel's stomach appeared blackish with numerous tiny yellow flecks. This proved to be the remains of a juvenile Whitaker's skink, which made up about 70% of the stomach contents. The rest of the stomach's contents were comprised of the remains of a juvenile brown skink *Leiolopisma zelandicum* and three tiny invertebrates (a spider, an isopod and a fly) that may have come from the skinks' stomachs.

The skinks were in fresh condition and retained their diagnostic patterns and colours. The Whitaker's skink was identified by its stocky black legs with numerous yellow spots (see colour photograph on cover of Towns 1988). The brown skink was identified by the continuous pale stripe down the outside of its foreleg (only the right foreleg was present along with both hindlegs). The identifications were confirmed by comparison with preserved specimens at the Museum of New Zealand, where comparisons were made with all eight skink species known to survive in the Wellington region: copper skink *Cyclodina aenea,* McGregor's skink *C. macgregori,* ornate skink *C. ornata,* Whitaker's skink, brown skink, common skink *Leiolopisma nigriplantare polychroma,* speckled skink *L. infrapunctatum* and spotted skink *L. lineoocellatum*.

The brown skink legs were slightly larger than those of a preserved specimen of 30 mm SVL (snout-vent length), suggesting a size of about 40 mm SVL for the animal consumed by the weasel (cf. 60 mm SVL for an adult; Towns 1992b). There were no juvenile Whitaker's skinks in the museum collection, but the Whitaker's skink from the weasel stomach was not much larger than the brown skink, and was unlikely to have been more than 50 mm SVL (cf. 90+ mm SVL for an adult from Pukerua Bay; Towns 1992b).

2. Discussion

Whitaker's skinks are extremely rare at Pukerua Bay. Towns (1992b) caught 2655 skinks at Pukerua Bay during 23,667 trap-days at a relative frequency of 57.4% for common skinks, 25.4% for copper skinks, 14.2% for brown skinks and 3.0% for Whitaker's skinks, i.e. about three skinks in every hundred caught were Whitaker's skinks. Waikanae Field Centre staff have continued pit-trap monitoring of Whitaker's skinks at Pukerua Bay since 1990-91, and have caught four Whitaker's skinks during 665 trap-nights (Ian Cooksley pers. comm.). No Whitaker's skinks were caught during 243 trap-nights between January and March 1995, therefore the record reported here is the only confirmed presence of Whitaker's skinks at Pukerua Bay since March 1994. The animal found in the weasel's stomach was a small juvenile likely to have been born in early 1995 (the smallest Whitaker's skink caught by Towns was 47 mm SVL; see Fig. 5 in Towns 1994) and so at least provides evidence that breeding adults were present in 1994-95.

Large *Cyclodina* skinks are widely regarded as being extremely vulnerable to rodent predation (Ogle 1987; Towns & Daugherty 1994; Towns 1994). The only sites where any of marbled skink *C. oliveri*, Mokohinau skink *Cyclodina* sp., McGregor's skink, robust skink *C. alani* or Whitaker's skink have survived in the presence of rodents are on Little Barrier Island (marbled skinks in the presence of kiore *Rattus exulans*), Great Barrier Island (marbled skinks in the presence of ship rats *Rattus rattus*, kiore and mice), Mana Island (McGregor's skinks formerly in the presence of mice) and Pukerua Bay. At all four sites the skinks have survived among deep boulder banks or rock screes that are presumed to give some protection from rodents and other predators (Newman & Towns 1985; Ogle 1987; Towns & Daugherty 1994; Newman 1994). There are no records yet of rat presence or rat predation on Whitaker's skinks at Pukerua Bay, but Towns (1992b) recorded a Whitaker's skink in a pitfall trap that had been killed by mice.

Pukerua Bay is the only site where any large species of *Cyclodina* is exposed to potential mustelid predation. Several stoats *Mustela erminea* have been seen in the vicinity of the Whitaker's skink colony (Ian Cooksley and Colin Ogle pers. comm.) and this study confirms both the presence of weasels and their predation on Whitaker's skinks at Pukerua Bay.

Weasels are rarely caught during trapping programmes for mustelids in New Zealand, and only two previous studies have reported predation on lizards by weasels. B.M. Fitzgerald (1964 and pers. comm.) examined 32 weasel guts: ten were empty and three (14%) contained skink remains. The only lizard species identified was one "Leiolopisma zelandicum" (now *L. nigriplantare polychroma)*. King & Moody (1982) examined 40 weasel guts: ten were empty, seven (23%) contained gecko remains and one (3%) contained skink remains. Weasels are undoubtedly frequent predators on lizards, as there are many records of lizard predation for the larger and more abundant stoat (see King 1990).

A single observation of predation cannot prove that weasel predation is a causal factor in the extreme rarity of Whitaker's skinks at Pukerua Bay. However, the fact that one of only two weasels caught at the site had recently eaten a Whitaker's skink shows that impacts of both rodents and mustelids must be considered during management to enhance the survival and recovery of Whitaker's skinks at Pukerua Bay.

In future, Fenn traps will be set concurrently with the rodent index line at Pukerua Bay to provide further information on the suite of predatory mammals present, and the extent of their predation on the lizard species present.

3. Acknowledgements

Ian Cooksley provided unpublished information on capture rates of Whitaker's skinks at Pukerua Bay, and Mike Fitzgerald provided unpublished information on weasel diet. Ian Cooksley, Dave Towns and Tony Whitaker commented on an earlier draft of this report.

4. References

Fitzgerald, B.M. 1964. Ecology of mustelids in New Zealand. Unpublished MSc thesis, University of Canterbury.

King, C.M 1990 Stoat. Pp 288-312 in King, C.M. (ed.) *The handbook of New Zealand mammals.* Oxford University Press,Auckland.

King, C.M., Moody, J.E. 1982. The biology of the stoat (Mustela erminea) in the national parks of New Zealand II. Food habits. *NZ Journal of Zoology 9:* 57-80.

Newman, D.G. 1994. Effects of a mouse, *Mus musculus,* eradication programme and habitat change on lizard populations of Mana Island, New Zealand, with special reference to McGregor's skink, *Cyclodina macgregori. NZ Journal of Zoology 21:* 443-456.

Newman, D.G.; Towns, D.R. 1985.A survey of the herpetofauna of the northern and southern blocks, Great Barrier Island, New Zealand. *Journal of the Royal Society of NZ 15*: 279-287.

Ogle, C.C. 1987. The incidence and conservation of animal and plant species in remnants of native vegetation within New Zealand. Pp 79-87 in Saunders, D.A.;Arnold, G.W.; Burbidge,A.A.; Hopkins,AJ.M. (eds) *Nature conservation: the role of remnants of native vegetation.* Surrey Beatty, Chipping Norton (Aust.).

Towns, D.R. 1988. *A field guide to the lizards of New Zealand.* 2nd cdn. New Zealand Wildlife Service Occasional Publication No. 7. Department of Conservation, Wellington.

Towns, 13.11. 1992a. *Recovery plan for Whitaker's skink and robust skink*. Threatened Species Unit recovery plan series 3. Department of Conservation, Wellington.

Towns, D. 1992b. Distribution and abundance of lizards at Pukerua Bay, Wellington: implications for reserve management. Science & Research Internal Report No. 125. Department of Conservation, Wellington.

Towns, D.R. 1994. The role of ecological restoration in the conservation of Whitaker's skink (*Cyclodina whitakeri*), a rare New Zealand lizard (Lacertilia: Scincidae). *NZ Journal of Zoology 21:* 457-471.

Towns, D.R.; Daugherty, C.H. 1994. Patterns of range contractions and extinctions in the New Zealand herpetofauna following human colonisation. *NZ Journal of Zoology 21:* 325-339.