A NOTE ON THE DEPUCH ISLAND ROCK-WALLABY EXTINCTION: ROLE OF THE FOX

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During the early stages of a study on rock-wallaby population dynamics (*Petrogale lateralis*; Kinnear *et al.* 1988), we began to suspect that fox predation was a significant cause of mortality. This early impression was reinforced by some observations on rock-wallaby (*P. rothschildi*) abundance in the Dampier Archipelago in the North-West of Western Australia (Kinnear *et al.* submitted). Here we found that rock-wallabies were extremely rare on an island infested with foxes whereas on a nearby island free of foxes, the wallabies were conspicuously abundant. These observations stimulated our interest in another rock-wallaby population (*P. lateralis*) recorded from Depuch Island approximately 100 km east of the Dampier Archipelago in the vicinity of Whim Creek (20° 37'S lat.).

In August 1982, we paid a exploratory visit to Depuch Island only to depart forty eight hours later without encountering any evidence of an extant rock-wallaby population. At daybreak one morning, we woke to the noise of a fox scavenging amongst our camp stores.

A more extensive visit was organized, and in May 1983, two of us (M.O. & R.B.) returned to Depuch via a helicopter to continue the search. A

low-level 20 minute helicopter flight yielded no sightings. Five days of foot surveys (26 hrs) covering the whole of the island also failed to uncover any fresh signs of rock-wallabies. Fox scats were encountered throughout the island and foxes were observed foraging on tidal mudflats; a fox was shot while investigating the camp site.

On the basis of these findings, we have concluded that the Depuch Island rock-wallaby population is extinct.

Purpose

The purpose of this communication is to place on record the Depuch Island rock-wallaby extinction, and to discuss the circumstances surrounding the extinction and the possible role of the fox. We believe that it is relevant to do so in the light of recent evidence regarding fox predation on native mammals (see Kinnear *et al.* 1988; and especially, Kinnear *et al.* submitted). We hope this note will serve to emphasize the importance of maintaining island refugia free of foxes.

Historical Background

Much of the background to this note is based on a report by Ride *et al.* (1964). This report was the outcome of an expedition led by W.D.L. Ride to Depuch Island in 1962. Their objectives were to assess the impact of a proposed iron ore port on the island environment. During the course of this expedition, Ride recorded some observations regarding fox depredations on the then extant rock-wallaby population. For emphasis and accuracy, passages from the report will be quoted where relevant,

and additionally, we have included some comments and interpretations based on our extensive experience with rock-wallabies in this region.

Depuch Island (approx.1500 ha) is separated from the mainland by 3.2 km of water and tidal mudflats. The island was visited by members of the Baudin Expedition in 1801 during which a dingo was sighted as well as a small kangaroo—presumably a rock-wallaby. The next recorded visit was by Commander Stokes (H.M.S. Beagle) in 1840. A rock-wallaby was collected on the summit, and identified as *P. lateralis,* a species which had been collected earlier from the Swan River and described by Gould.

Historical Abundance

From Stokes' account Ride writes: "*The kangaroo I had myself the good fortune to knock over on the summit of the Island; it was the only one shot during many an excursion made over that dreary heap of desolation, the metallic sound the rocks yielded to our step giving ample warning of our approach to their quick ears.*"

In our experience the fact that Stokes was able to collect a specimen of *P. lateralis* during the day is indicative that the wallabies were abundant. Moreover, the fact that he made "...*many an excursion...*" in an effort to collect a specimen, implies to us that the rock-wallabies were numerous, but that they were flushing out of range of the firearms in use at that time. Given the nature of the very rugged terrain ("...*a dreary heap of desolation*..."), there would have been little incentive to persist with the hunt if the rock-wallabies had been rare. At low densities, we have found that rock-wallabies are rarely sighted even at night (see Kinnear *et al.* submitted).

Recent Abundance

Ride's own account is somewhat ambiguous with regard to rock-wallaby density—to quote (p.77): "*Judging from the vast quantities of their droppings which lay everywhere among the rocks, the rock-wallabies were plentiful on the Island, at the time of our visit, yet very few animals were seen.*" An abundance of droppings signifies to us the rock-wallabies were abundant, but it is surprising that the sightings were so few.

From discussions and correspondence with Dr. Ride, it was confirmed that only one rock-wallaby was sighted during the expedition. Dr Ride referred us to a letter by A.H. Allison (May 24, 1962; W.A. Museum files) who resided on Depuch for 5½ months during 1917. The writer stated that wallabies and rats (no modern records or sightings) were plentiful and that wallabies were shot for meat. This implies that the rock-wallabies were visibly abundant. It is therefore possible that the fox could have only relatively recently colonized the island prior to the 1962 expedition as this would explain the abundance of droppings, but also the lack of sightings–caused by fox depredations.

Evidence of Depredations by Foxes

On recording the presence of the fox Ride says (p.75):" *The fox first became evident in the Roebourne District in 1930 (first bounties paid) and is now widespread. It is now well established on Depuch and is clearly a permanent member of the modern fauna. We obtained no specimens but the tracks of foxes are numerous; deserted earths occur in sandhills behind Beagle Beach; fox droppings contain fur, bone*

fragments, and arthropod remains are common; and the remains of rock-wallabies that had clearly been eaten by a carnivore were to be found in many of the valleys near fresh water and behind the beaches."

Summarizing the situation, Ride writes (p. 20): "*Today foxes are common on the island. Their tracks are everywhere on the sandy beaches and in parts of the lower valleys wherever the ground is not too rough to record their impressions. Their droppings are common and the many eaten-out carcasses of rock-wallabies all over the Island clearly show the part that they play in the economy of the wallaby population. However, in spite of this, it would seem that the wallabies are holding their own among the tumbled rocks and it is possible that they fall victims to the foxes only when they stray out of this cover, to which they are magnificently adapted, into the dunes or places with soil in order to obtain food.*"

In the appendix (p. 78), Ride concludes: "*Today, rock-wallabies seem to be present on the Island in large numbers and it seems that foxes have not been successful in reducing the population to a low level. However, there are obvious signs of predation both by foxes and birds of prey and we cannot be certain that the relatively recent introduction of the fox will not have some long-term effect on the wallaby population...*"

Summary

It would appear that Ride was correct in surmising that the fox could pose a long-term threat to the viability of the Depuch Island rock-wallaby population. That the fox was a major cause rests on evidence that is entirely circumstantial, but the evidence is also entirely consistent with data that has emerged from mainland and other island studies (Kinnear,

et al. 1988; Kinnear *et al.* submitted; and unpublished works). From these studies, one can infer that the fox is capable of regulating rock-wallaby populations at levels well below the carrying capacity of the habitat, and this happens in both disturbed and undisturbed habitats. (Depuch Island is relatively pristine and free of mainland disturbances) When populations exist under such circumstances (i.e., in a 'predator pit'), extinctions can eventually occur due to chance alone. Whatever the cause(s), the message is clear; if fauna that is now extinct or rare on the mainland is to persist on island refugia, the fox must be excluded.

Acknowledgements

We gratefully acknowledge the information provided by Dr. W.D.L. Ride and for his comments on a draft of this manuscript. The logistical support provided by P. Pennings and K. Morris was much appreciated. Helicopter time was generously supplied by Hamersley Iron Pty.

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