

A CASE OF BITTEN BETTONGS

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ABSTRACT

Australia has a unique collection of native fauna, which is often threatened by physical harm or the destruction of its habitat and conservation of endangered species is a primary concern. Investigation of the recent deaths of Bettongs in Lincoln National Park, South Australia was undertaken by the Forensic Odontology Unit, Adelaide University to determine the likely perpetrator. Feral domestic cats were deemed to be responsible, as indicated by bitemarks on the radiotransmitter collars. (*J Forensic Odontostomatol* 2002;20;10-2)

Key Words: Bettong, Bitemarks, Forensic Odontology, South Australia

INTRODUCTION

The Bush-tailed Bettong (*Bettongia penicillata*) is a small, fur-covered Australian marsupial belonging to the Family Potoroide¹ (Fig. 1). It is bipedal and omnivorous and its habitat is located across southern and western Australia, where dense ground vegetation required for protection and food can be found. Due to shrinking habitat and increasing prevalence of predators these Bettongs are now considered an endangered species.^{1,2}

In the past decade vigorous breeding programs have been established by both the South Australian and Western Australian government departments and by private conservationists, and stable populations of Bettongs now exist in a number of conservation parks. In September 1999 Bettongs were re-introduced into a large area of natural bushland in Lincoln National Park (Fig.2) after previously being



Fig.1: Brush-tailed Bettong (Bettongia penicillata)

classified as extinct from the area.² The large area and unusual shape of the park meant that, unlike releases in other areas of the state, a predator fence was not utilized.

The first Bettongs to be released were all fitted with radio collars so that their location could be tracked by radio telemetry. Initial success allowed other Bettongs to be translocated to the area but by March 2001 it was obvious that a significant level of predation was occurring (Fig. 3).²

MATERIALS

In April 2001, the Forensic Odontology Unit received five radio-transmitter collars retrieved from Bettongs killed in Lincoln National Park from a representative of the South Australian Department for Environment and Heritage. Eight additional collars from the same area were received in May 2001.

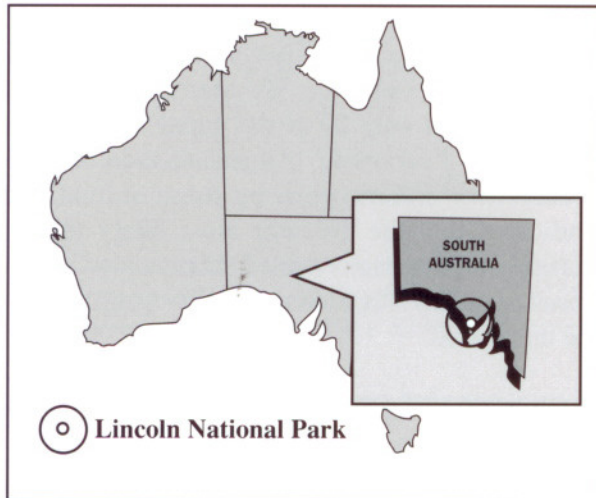


Fig.2: Location of Lincoln National Park

Examination of the collars revealed evidence of marks consistent with tooth morphology (Fig. 4) and the bitemarks on all the collars were similar in appearance, pointing to the possibility of one species of predator being responsible.

A comparison of these marks was made with various species thought to be the most likely predators of the region and which wildlife rangers considered would be either feral cats or foxes. Feral dogs and dingoes are also found in the area, along with several birds of prey. Skulls of each species were obtained from the South Australian Museum.

The cat family has a dentition that is specialized for grasping and killing prey by slicing the flesh. They display a short muzzle, with the incisor teeth making

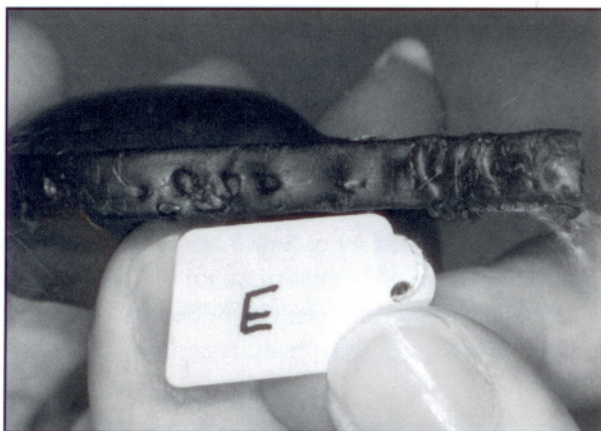


Fig.4: Radio transmitter collar

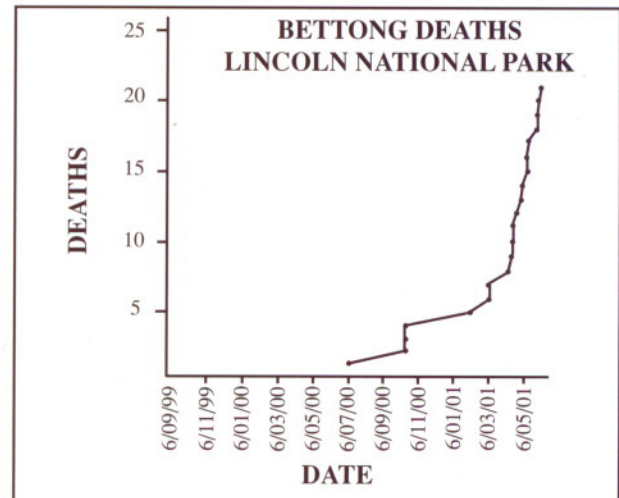


Fig.3: Bettong mortalities in Lincoln National Park from release date in September 1999 to May 2001. Each point represents one death starting from 6/7/2000

an approximately straight line across the front of the mouth and large canines at the corners.³ Carnassial teeth (P^4 and M_1) form sharp cutting blades (Fig. 5) while dogs and foxes have larger jaws, with teeth designed for tearing and crushing.

RESULTS

The arch shape, inter-arch distance, and tooth shape were consistent with the species *Felis catus* (Fig. 6). *Vulpes vulpes* (fox) and *Canis familiaris* (dog/dingo) were excluded primarily on tooth size and arch width.

DISCUSSION

Studies in comparative anatomy of various species have shown that mammals are characterized by a

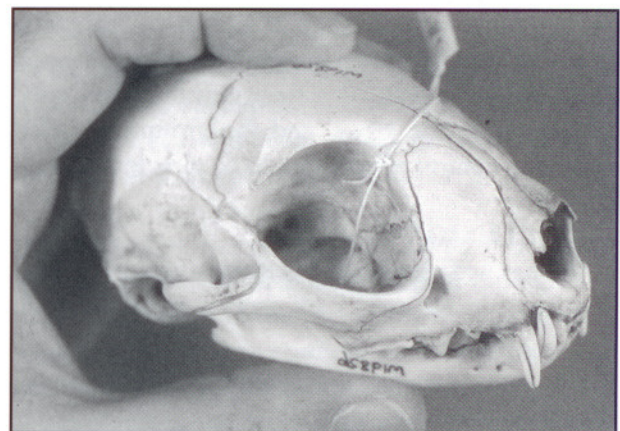


Fig.5: Skull of domestic cat (*Felis catus*)



Fig.6: Match of tooth shape and inter-arch distance between bitemark on collar and *Felis catus*

heterodont dentition, with teeth varying in form in different locations within the mouth.⁴ The typical mammalian dentition is generally considered to have the formula $I^3C^1P^4M^4$ and it is recognized that certain individual or groups of teeth are adapted to meet the requirements of specialized function, including mastication, fighting, defence, manipulation and holding of young.⁴

Introduced species from five mammalian groups, including carnivores such as dog, cat and fox live in a feral state in Australia¹ and were not introduced accidentally but were brought in as pets or to be hunted for sport. Neglect has allowed them to breed and have a huge impact on the local fauna and environment, in some circumstances rendering native fauna extinct in certain regions.

Reintroduction projects, coupled with targeted local predator control measures, are aimed at restoration of the population balance in favour of indigenous animals. Identification of specific species responsible for the death of native animals assists in determining the areas, and the groups, to which predator control efforts should be directed.

CONCLUSION

Bettongs had previously been classified as extinct in the Lincoln National Park area of South Australia.

A reintroduction program, commenced in late 1999, was proving successful but predation rates were found to be extensive. By March 2002, it was estimated that only 20 of the initial 113 Bettongs released had survived.⁵ An examination of radio-transmitter collars worn by these animals has indicated that the predator most likely to have inflicted the bitemarks was a feral cat and as a direct result of this investigation a control program will now be introduced.

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