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THE HABITAT AND CONSERVATION STATUS OF THE TASMANIAN BETTONG

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INTRODUCTION

The Tasmanian bettong *(Bettongia gaimardi)* is one of three species of bettong found in Australia. All three species had wide distributions on the Australian mainland at the time of European settlement; all have since undergone a massive reduction in range and are now restricted to a number of remnant populations.

The Tasmanian bettong once ranged beyond Tasmania from south-eastern Queensland through New South Wales, Victoria and into south eastern South Australia, but it has not been recorded on mainland Australia for over 60 years. The cause of this dramatic reduction in range has been attributed to a combination of habitat clearance for agriculture, modification of habitat by stock, and the impact of various introduced animals such as the feral cat, the rabbit and in particular the fox.

This report summarizes a recently completed study carried out by Michael Driessen and Greg Hocking of the Tasmanian Department of Parks, Wildlife and Heritage which assessed the habitat associations, conservation status and management requirements of the Tasmanian bettong.

DISTRIBUTION AND HABITAT OF THE BETTONG

The range of the Tasmanian bettong extends throughout the drier parts of eastern and central Tasmania (see Figure 1). It occurs as far west as the Mersey River in the north, Derwent Bridge in the Central Highlands and National Park, Judbury and Geeveston in the south. Within this range, highland areas above 1,000m and the higher rainfall areas of the north east are excluded.

Throughout its range the bettong occurs in a number of different dry sclerophyll communities. In all 14 dry sclerophyll communities were identified. For convenience these can be categorised into the following broad groups:

Lowland Grassy Forests and Woodlands

Lowland Heathy Forests

Highland Grassy Forests and Woodlands

All communities were typified by an open understorey. Bettongs were largely unrecorded from sedgey and shrubby dry sclerophyll forests which typically have a dense understorey. In addition bettongs were rarely recorded from grassy *E. delegatensis* forests.

It is estimated that the total area of potential bettong habitat in Tasmania is in excess of 1,000,000 ha or approximately 15% of Tasmania. However, within this large area bettongs generally occur at low densities, something in the order of 1 bettong for every 17 hectares of habitat. Very limited areas support high bettong densities. These areas include heathy *Casuarina littoralis* forests in the north and north east of Tasmania, grassy *Eucalyptus rodwayi* woodlands in the Central highlands, and grassy *E. amygdalina* woodlands on lateritic soils in the Midlands. Bettong densities were also high where suitable habitat occurred on soils derived from the Mathinna beds and granite in the north east of the State. Suitable habitat on soils derived from Jurassic dolerite supported particlarly low densities. Grassy *E. dalrympleana* forests in the Central highlands also support particularly low densities.

IMPACT OF LAND MANAGEMENT PRACTICES

Most of the bettong range occurs on either private land or State Forest and is therefore vulnerable to various land management practices.

Clearing for pasture:

In the long term, conversion of forest to pasture represents the most serious threat to bettong conservation. The area of improved pasture has increased by approximately 35% to over 800,000 ha in the past 25 years and much of this area has been at the expense of bettong habitat.

1080 Poison:

Bettongs are highly susceptible to 1080 poison and evidence suggests that its repeated use leads to a reduction in bettong numbers particularly in small or isolated populations. The use of 1080 poison is widespread in Tasmania, and the number of poisoning operations has increased dramatically in recent years.

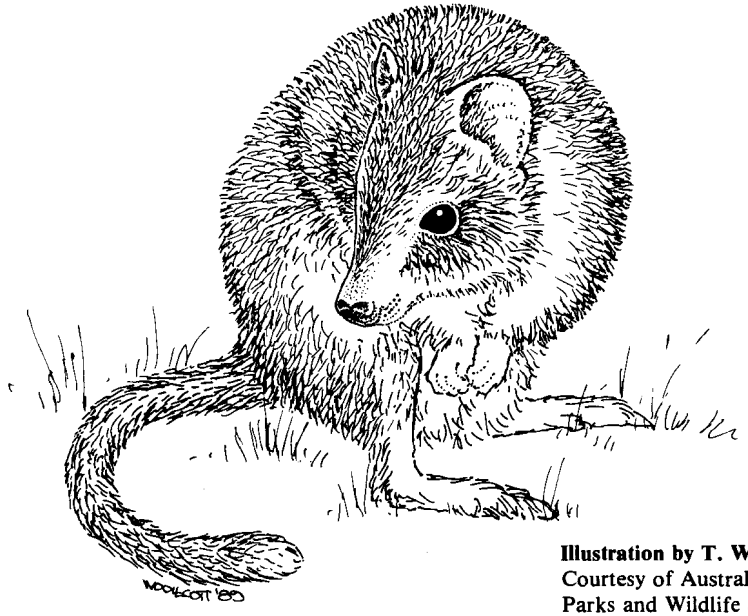


Illustration by T. Woolcott
Courtesy of Australian National Parks and Wildlife Service

Grazing:

Evidence suggests that heavy grazing is associated with a reduction in bettong densities. It is not known whether this is due to the compacting effect of stock on soil and underground fungi (upon which bettongs mainly feed) or to the use of fertilisers which increases the soil fertility and may lead to a reduction in the abundance of underground fungi and hence a reduction in bettong densities. Further investigation is warranted in this area.

Forestry Practices:

Current logging practices in general represent a minimal threat to bettong conservation. The selective removal of up to 75% of tree stems does not appear to be detrimental to bettongs provided that the essential structure of the vegetation is retained. In the long term clear felling followed by regeneration does not appear to be detrimental to bettongs provided suitable habitat is left adjacent to the cleared area. Areas supporting older regrowth forest were more suitable for bettongs than younger regrowth forest. The extent of pine and eucalypt plantations within the bettong range is relatively small although increasing steadily. Although bettongs are known to utilise eucalypt and in particular pine plantations it is not known whether they can live in plantations in the absence of any suitable native vegetation. Further investigation is required in this area.

Mining:

The extent of mining within the bettong range is very limited, however gravel quarrying represents a threat to those bettong populations on lateritic soils.

Fire:

Fire is a common occurrence within the range of the bettong and appears to play an integral part in maintaining bettong habitat to create an open understorey. Fire is also believed to promote the fruiting of mycorrhizal fungi which form the bulk of the diet of bettong.

Reservation of Habitat:

Bettong habitat is poorly reserved in Tasmania. Most reserves contain less than 400 ha of dry sclerophyll forest. Although all reserves are of some use for bettong conservation, ultimately their conservation may rely on appropriately managed reserves of larger size. It was estimated that a minimum of 3,300 ha of suitable bettong habitat is required to maintain viable populations of bettongs. Three reserves appear to meet this requirement, they are Mt William, Freycinet and Douglas Apsley National Parks. Maria Island National Park may be suitable with appropriate fire management.

Foxes:

There is a growing amount of evidence implicating the fox as one of the most, if not the most, important factor contributing to the decline and extinction of small and medium sized mammals on the Australian mainland. Whilst foxes do not occur in Tasmania, every effort must be taken to prevent the establishment of this species in the State.

CONSERVATION STATUS OF THE BETTONG

Statewide, the conservation status of the Tasmanian bettong was considered to be potentially vulnerable which means that although the species has a wide distribution and is apparently moderately abundant, it requires monitoring and protection to prevent a decline in status.

On a regional level the conservation status of the bettong in the northern Midlands is considered to be vulnerable. If current land management practices continue then the bettong is likely to become endangered in this region in the foreseeable future.

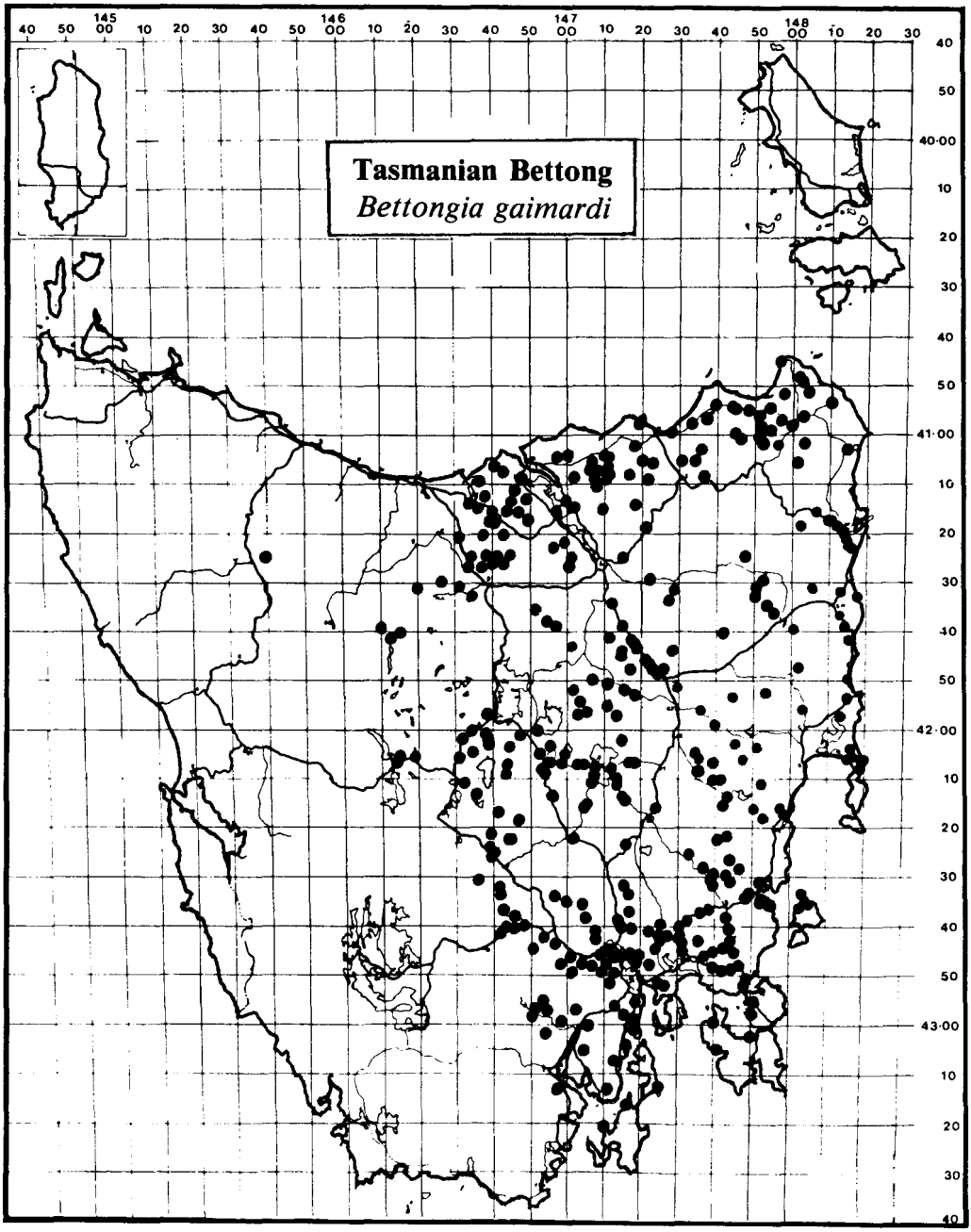


Figure 1: Distribution of bettong sites

MANAGEMENT RECOMMENDATIONS

The report makes a number of recommendations for the future management of the Tasmanian bettong. These include:

- The creation of additional reserves in areas of dry sclerophyll forest, particularly in the northern Midlands.
- Regular monitoring of bettong abundance.
- Limiting use of 1080 poison in areas containing isolated bettong populations.
- Consideration of the use of fire as a management tool to maintain bettong habitat in reserves.
- Publicity to increase the public's awareness of the bettong and its requirements.

FURTHER READING

Driessen, M.M, Hocking, G.J. & Beukers, P. (1990) Habitat, Conservation Status and Management of the Tasmanian Bettong *(Bettongia gaimardi)*. Report of the Tasmanian Department of Parks, Wildlife and Heritage.

BOOK REVIEW

Australian Cicadas

by M.S. Moulds

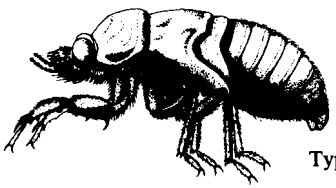
University of New South Wales Press, 217 pp. R.R.P. $39.95

Reviewed by P.B. McQuillan

Tasmanian Hairy Cicada
Tettigarcta tomentosa.

Singing cicadas are as evocative of an Australian summer as sun cream, but until now it has been difficult to find reliable information about them.

Max Moulds, our leading authority on cicadas, has finally filled that need with a handsome and comprehensive book which distils decades of endeavour. All 200-plus described species are mentioned in this book, most with detailed notes and a map on distribution, habitat, distinguishing features and where known, life-history and song.



Typical soil-dwelling cicada nymph.

The seven Tasmanian species are well covered. The low diversity of our fauna is offset by its novelty, including the elusive nocturnal hairy cicada, which is unable to sing, and three species of *Diemeniana* which are conspicuous denizens of alpine heathlands and buttongrass plains in the west and south.

Part 1 of the book is given over to 9 chapters which, among other things, cover the principles of classification and history of vernacular names, details of how cicadas produce and receive sounds, and a useful account of procedures to follow for setting up a cicada collection. A key to assist identification is not provided but the 24 colour plates are an excellent visual reference which, together with the supporting text in Part 2, guide the reader to the appropriate name for their specimen. A glossary, extensive reference list and index complete the book.

A lasting impression is that much detail on the behaviour and biology of many species remains unknown and here is a fertile field for patient endeavour. I have no hesitation in recommending this book to all naturalists.