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# ZOOTAXA

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## **Taxonomic revision of *Phascogale tapoatafa* (Meyer, 1793) (Dasyuridae; Marsupialia), including descriptions of two new subspecies and confirmation of *P. pirata* Thomas, 1904 as a ‘Top End’ endemic**

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## Abstract

The Australian Brush-tailed Phascogale (*Phascogale tapoatafa sensu lato*) has a broad but highly fragmented distribution around the periphery of the Australian continent and all populations are under significant ongoing threat to survival. A new appraisal of morphological and molecular diversity within the group reveals that the population in the ‘Top End’ of the Northern Territory is specifically distinct from all others, including those in the Kimberley region of Western Australia to the west and on Cape York of Queensland to the east. The name *P. pirata* Thomas, 1904 is available for the ‘Top End’ taxon. Three geographically disjunct populations are distinguished at subspecies level within *P. tapoatafa* on a suite of external and cranio-dental features; these are found in southeast Australia from South Australia to mid-coastal Queensland (nominotypical *tapoatafa*), southwest Western Australia (*wambenger* subsp. nov.), and the Kimberley region of Western Australia (*kimberleyensis* subsp. nov.). A potential fourth subspecies occurs on Cape York but remains too poorly represented in collections for adequate characterization. Molecular divergence estimates based on partial sequences of the mitochondrial *cytochrome b* gene indicate that the range disjunction across southern Australia probably dates from the Late Pliocene, with the multiple disjunctions across northern Australia being more recent though almost certainly exceeding 400,000 years. An argument is made for the continued use of the subspecies rank in Australian mammalogy, despite a general lack of consistency in its current application.

**Key words:** Marsupial, taxonomy, Australia, biogeography, subspecies

## Introduction

At the time of European settlement of Australia, Brush-tailed Phascogales [*Phascogale tapoatafa* (Meyer, 1793); Fig. 1] were among the most widely distributed of all dasyurid marsupials (Fig. 2). In eastern Australia, they ranged more or less continuously in mesic habitats from the Lofty Range of South Australia at least to mid-coastal Queensland. Across northern Australia, populations occurred in three areas—on Cape York Peninsula in Queensland, across the ‘Top End’ of the Northern Territory, and in the Kimberley region of Western Australia. An isolated population in the forested southwest corner of Western Australia completed their range. The Northern Territory population was described as subspecies *P. t. pirata* Thomas, 1904, and this name was subsequently applied to some or all of the northern Australian populations (e.g. Tate 1947; Troughton 1967; Cuttle 1983; Soderquist 1995b).

The contemporary distribution of Brush-tailed Phascogales is greatly reduced and there are growing concerns over the conservation status of all populations (Soderquist 1995b; Rhind 2004). For this reason, there is a pressing need to understand the degree of historical continuity between the various populations and to ascertain their taxonomic status. Spencer *et al.* (2001) examined genetic variation in the mitochondrial *cytochrome b* (*cyt b*) gene, with a particular interest in the status of the southwestern population of *P. tapoatafa*. They found a surprisingly high level of divergence between the southwestern and southeastern populations, and also between each of these and samples from the Northern Territory. Rhind *et al.* (2001) demonstrated morphometric differences between populations. Both studies emphasised the need for a full taxonomic revision of the group.