Antechinus vandycki

Tasman Peninsula dusky antechinus

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Image © Queensland Museum, Gary Cranitch

Scientific name: ***Antechinus vandycki*** Baker, Mutton, Mason and Gray, 2015

Common name: Tasman Peninsula dusky antechinus

Group: Vertebrate, Mammalia, Dasyuromorphia, family **Dasyuridae**

Status: *Threatened Species Protection Act 1995*: **vulnerable**

Environment Protection and Biodiversity Conservation Act 1999: **Not listed**

Distribution: Endemic status: **Endemic to Tasmania**

Tasmanian NRM Regions: **South**

Tasmanian IBRA Bioregions (V6): **South East**

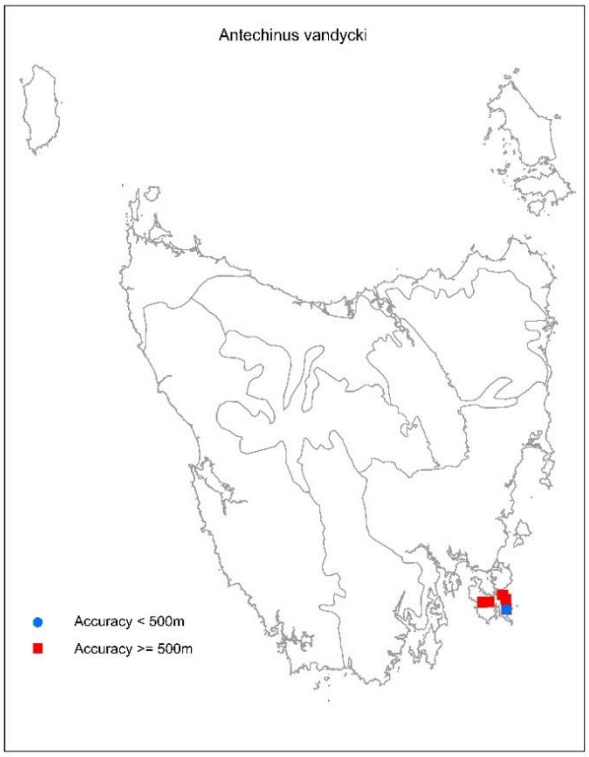

Figure 1. The distribution of Tasman Peninsula dusky antechinus observations (as at Oct 2021), showing IBRA regions.

Plate 1. The Tasman Peninsula dusky antechinus (Image © Queensland Museum, Gary Cranitch).

SUMMARY: The Tasman Peninsula dusky antechinus (*Antechinus vandycki*) is a small, terrestrial species of carnivorous marsupial with a combined tail and body length of around 230 mm. It was identified as a separate species from the Tasmanian dusky antechinus (*Antechinus swainsonii*) in 2015. It is difficult to distinguish between the two species in the field. The Tasman Peninsula dusky antechinus has only been recorded from wet forest and scrub on the Tasman Peninsula in southeast Tasmania, and it is suspected to be geographically isolated from *A. swainsonii* populations (i.e. allopatric species).

Knowledge of the distribution, habitat requirements and ecology of the Tasman Peninsula dusky antechinus is extremely limited and further research is required. Habitat requirements and ecology are likely to be similar to both the mainland dusky antechinus (*Antechinus mimetes*) and Tasmanian dusky antechinus (*A. swainsonii*).

Threats to the Tasman Peninsula dusky antechinus are likely to include: predation by cats; habitat loss, fragmentation and modification; competition with introduced rodents; and inappropriate fire management. Given its limited known distribution and likely small population size, this species is at risk from catastrophic events such as disease and high intensity bushfire.

IDENTIFICATION AND ECOLOGY

The Tasman Peninsula dusky antechinus (*Antechinus vandycki*) is a small, terrestrial species of carnivorous marsupial of the dasyurid family that includes quolls and Tasmanian devils. Adult males have a recorded combined head and body length between 100 and 140 mm, tail length of 90 to 120 mm (combined head to tail length 195 to 255 mm), and weights between 45 g and 95 g; like their closest relative the Tasmanian dusky antechinus (*A. swainsonii)*, adult females are likely to be around 10% smaller (Baker et al. 2015). Given the limited number of individuals with recorded measurements, greater variation than above should be expected.

The Tasman Peninsula dusky antechinus is greyish-brown in appearance, moderate-dark grey on the back, pale grey on the sides, and light grey-white on the underside, with brownish highlights on the body that are more notable on the flanks and towards the rump. The ears are relatively small. The tail tapers gradually toward the tip, is shorter than the head-body length, and is bicoloured (Plate 1).

The eight individuals identified as Tasman Peninsula dusky antechinus by Baker et al. (2015) and Mutton (2017) were captured in wet eucalypt forest and sclerophyll rainforest. Limited knowledge of Tasman Peninsula dusky antechinus restricts definitive conclusions regarding its habitat use, requirements, life history and ecology. However, Tasman Peninsula dusky antechinus and the Tasmanian dusky antechinus are the most closely related species (genetically and morphologically) in the dusky antechinus complex (Baker et al. 2015, Mutton 2017), and therefore are likely to share similar ecological traits.

The Tasman Peninsula dusky antechinus likely has a synchronised, annual reproductive strategy driven by peak food availability (mainly invertebrates) during and after the weaning of young (McAllan 2003). Synchronised annual breeding likely occurs in winter between May and October, may vary altitudinally, and is followed by male die-off within a few weeks (Baker et al. 2015, Hocking 1975, McAllan 2003). Lifespan in the wild is likely to be up to 12 months for males, and two years for females (McAllan 2003).

Survey techniques

To date Tasman Peninsula dusky antechinus have been surveyed using small box "Elliott" traps baited with oats, peanut butter, peanut oil and bacon but trapping rates are reported to be very low (Baker et al. 2015). Hair tubes/tunnels may provide an alternative, more efficient method for detecting the presence of *Antechinus* spp. but discrimination between different species by hair is unreliable (Lobert et al. 2001, Paull et al. 2012).

DNA analysis of ear tissue or hair samples collected using the above techniques is likely required to confirm identification until further research reveals alternatives. Environmental-DNA sampling and analysis of soil and/or water bodies may prove a useful means of determining presence/absence (Leempoel et al. 2020). Scent detecting dogs, trained on *A. swainsonii* carcasses and/or scats could prove a useful survey technique. Camera traps could also be used to detect the presence of dusky antechinus, although are unlikely to permit species discrimination.

Confusing species

Dusky antechinuses in Tasmania (*A. vandycki* and *A. swainsonii*) can be distinguished from the swamp antechinus (*Antechinus minimus*) by the following: 1) Dusky antechinuses have darker, softer, less grizzled upper fur, with no yellow-rufous wash on the rump and flanks; 2) Dusky antechinuses have pale grey underparts vs. pale yellow-grey to buff for *A. minimus*; 3) Dusky antechinuses exhibit greater contrast between their upper and lower fur; 4) Dusky antechinuses lack the distinct, pale eye-ring of *A. minimus* (Menkhorst and Knight 2001, Dickman 2008).

The Tasman Peninsula dusky antechinus is reported to have lighter, overall fur colouration than the Tasmanian dusky antechinus (Baker et al. 2015). However, the subtlety of this difference, and the limited numbers of males (seven) and absence of females from this assessment render it unreliable for field identification until more specimens can be examined. Species identification requires confirmation by genetic analysis, or cranio-facial skeletal measurements taken from carcasses.

DISTRIBUTION AND HABITAT

The Tasman Peninsula dusky antechinus, as at October 2021, was known from only eight specimens from the Taranna forests and Fortescue Bay on the eastern Tasman Peninsula in southeast Tasmania, and one specimen (in the British Museum) collected from "Tasman's Peninsula".

A further three dusky antechinus observations from central and eastern Tasman Peninsula, originally identified as Tasmanian dusky antechinus, are presumed to be Tasman Peninsula dusky antechinus following the taxonomic revision by Baker et al. (2015).

Distribution of Tasman Peninsula dusky antechinus is likely to include suitable habitat across the Tasman Peninsula, and possibly the adjacent Forestier Peninsula. It is feasible, but unlikely, that its range may extend north of Dunalley into the Wielangta. Limited evidence (~25 specimens) suggests that the Tasmanian dusky antechinus is present elsewhere in Tasmania, and that the two species are allopatric (geographically separated) (Baker et al. 2015).

The eight specimens with confirmed identifications and accurate locations were found in or within 500 m of: wet eucalypt forest, rainforest, broadleaf scrub, eucalypt plantation, patches of leptospermum forest, dry eucalypt forest and coastal scrub. Additional communities found within 500 m of two unverified records are: non-eucalypt forest and woodland, leptospermum with rainforest scrub, and small patches of cleared and modified land.

Other dusky antechinus species typically inhabit shrubland, woodland, open forest and/or closed forest communities with complex ground cover i.e. litter and woody debris (Dickman 1991, Lunney et al. 1987, Newsome et al. 1975, Wilson et al. 2003).

Habitat use is likely to be similar to the Tasmanian dusky antechinus, including using logs, tree hollows and leaf litter for nests, shelters and burrows; and leaf litter, logs, loose bark and tree surfaces for foraging (Dickman 1991). Tasman Peninsula dusky antechinus females may burrow or use nest tunnels in creek banks during winter as per Tasmanian dusky antechinus (Dickman 2008).

Table 1. Population summary for the Tasman Peninsula dusky antechinus

	Location	Tenure	NRM region*	1:25 000 mapsheet	Years last (first) recorded	Extent of subpopulation (ha)	Abundance
1	Taranna and Fortescue Forests	Crown land (forestry), Tasman National Park.	South	Taranna, Hippolyte	2014 (1963)	Unknown	Unknown. 8 individual records.
2	Koonya Forest and Nubeena	Private Land, Crown land (forestry).	South	Port Arthur	2014 (2011)	Unknown	Unknown. 3 individual records

*NRM region = Natural Resource Management region

POPULATION PARAMETERS

Low capture rates (Baker et al. 2015) for the few studies conducted, and a poorly understood distribution, mean that population and/or density estimates are unavailable. Population size is likely to increase following weaning of young sometime from late winter to early summer, gradually decrease through autumn, then rapidly decline following post-breeding male die-off in winter (McAllan 2003).

RESERVATION STATUS

Known locations are within Tasman National Park (4 locations), Future Potential Production Forest (1) and private land (2). The species is also likely to occur within Permanent Timber Production Zone Land. Given the poorly understood distribution and population structure of the species it is not possible to reliably assess reservation status of the species.

CONSERVATION STATUS

The Tasman Peninsula dusky antechinus was listed as vulnerable under the Tasmanian *Threatened Species Protection Act 1995* in 2020 under criteria B1 and B2(c): extent of occurrence less than 20,000 km^2, area of occupancy less than 2,000 km^2; and known to exist at no more than ten locations; and continuing decline (inferred, observed or projected) in area, extent and/or quality of habitat.

The Tasman Peninsula dusky antechinus has not been nominated for assessment against the criteria for listing under the *Environment Protection and Biodiversity Conservation Act 1999*, or the IUCN Red List.

THREATS, LIMITING FACTORS & MANAGEMENT ISSUES

Habitat modification, fragmentation and loss: The Tasman Peninsula dusky antechinus occurs within or close to Permanent Timber Production Forest, Future Potential Production Forest and private land, which are all at potential risk of habitat modification.

Habitat modification resulting in loss of ground cover (e.g. clear-felling, some plantation management practices, roads, agricultural conversion, burning and bushfire) may lead to increased predation, decreased dispersal and population fragmentation, leading to isolated, small, unviable populations.

However, higher densities of the mainland dusky antechinus have been reported in regenerating logged forest containing the ground cover habitat preferred by the species (Lunney et al. 1987).

This suggests a complex relationship with forestry, driven by factors affecting habitat and local availability of invertebrate food resources. This observation is consistent with confirmed Tasman Peninsula dusky antechinus observations in areas of regrowth forest with a history of fire and harvesting (Neyland 2015).

Small population(s): Stochastic events, low genetic diversity and inbreeding depression are risk factors for small populations of Tasman Peninsula dusky antechinus.

Inappropriate fire management and bushfires: Studies of other dusky antechinus species demonstrate a negative relationship with recently burnt habitat following fire, attributed to the loss of ground cover, leaf litter, other invertebrate habitat and invertebrates, and increased feral cat predation (Newsome et al. 1975, Lunney et al. 1987).

Local bushfires could significantly reduce core populations both directly and through habitat loss/modification, particularly loss of groundcover and litter. Widespread, intense bushfire on the Tasman Peninsula could severely impact the known populations.

Feral and domestic cat predation: Feral cats are present within the known distribution of the Tasman Peninsula dusky antechinus and pose a predation risk to the species.

Direct and secondary poisoning: Consumption of poison baits may occur both directly, and indirectly through consumption of invertebrates that have consumed poison baits or poisoned animal carcasses. This is primarily of concern near residential areas and farming operations.

Disease: Small populations are prone to stochastic loss though disease outbreaks. Toxoplasmosis infection has been reported in antechinus species, but little is known about the resulting degree of morbidity and mortality (Wildlife Health Australia 2019).

Limiting factors: A limiting factor is the absence of adequate information for the species on distribution, habitat use and requirements, ecology, population size, population structure, population trends, genetic diversity and threats.

Low trapping rates indicate that resource intensive methods are likely required to collect additional information, or new approaches to data collection need to be developed.

MANAGEMENT STRATEGY

Preliminary land management advice: Seek advice from the Threatened Species and Private Land Conservation Section, NRE Tas.

Management objectives:

The main objective for the management of the Tasman Peninsula dusky antechinus is to decrease the risk of extinction by maintaining the integrity of habitat at known sites through appropriate land management, and improve understanding of the ecology, population dynamics and threatening processes impacting the species.

What has been done?

Surveys: Targeted surveys to date have been limited to the Taranna and Fortescue forests, Tasman Peninsula, as reported in the taxonomic revision (Baker et al 2015, Mutton 2017).

Forest Management: Core and potential range boundaries and key habitats have been identified and incorporated into the Natural Values Atlas and the Forest Practices Authority's "Threatened Species Advisor" planning tool.

What is needed?

Agencies, groups or individuals may assist with some or all of the following recovery actions. Coordinated efforts may achieve the best and most efficient results.

- Improve public awareness of the species by distributing the listing statement to key landholders, land managers and regulators;
- Establish the full extent of the species distribution by developing more efficient detection and monitoring methods for the species;
- Increase understanding of the species' distribution and overlap with the Tasmanian dusky antechinus;
- Increase understanding of the population structure, size, density, dynamics and trends, and the factors influencing them;

- Increase understanding of the basic ecology of the species including diet, habitat use, habitat requirements, home ranges, dispersal, reproduction, species interactions;
- Confirm, identify and increase understanding of threats, and their relative importance in conservation management;
- Improve protection of the species by reassessing the conservation status of the species when new knowledge comes to light;
- Improve protection and management of key habitats and populations through land reservation, by developing and providing land management advice, and engagement with regulators, landholders and land managers;
- Increase public awareness of the Tasman Peninsula dusky antechinus within the local community, throughout Tasmania and beyond;
- Improve protection of the species by developing and implementing a cat management plan for the Tasman and Forestier Peninsulas;
- Ensure relevant landowners, land managers and regulators are aware of the listing status, distribution and likely habitat requirements of Tasman Peninsula dusky antechinus, so that impacts can be considered in land management and planning processes;
- Increase understanding of key threats that contribute to species risk and to reduce these risks once identified.

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Permit: A permit is required under the Tasmanian *Threatened Species Protection Act 1995* to knowingly "take" (which includes kill, injure, catch, damage, destroy and collect), keep, trade in or process any specimen of a listed species.