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| EN **Endangered** | Tasmania: TSP Act 1995<br>Victoria: *FFG Act 1988* |
| VU **Vulnerable** | Federal: *EPBC Act 1999*<br>NSW: *BC Act 2016*<br>Queensland: *NC Act 1992* |

# Pookila (*Pseudomys novaehollandiae*) Fire Fact Sheet

## National Pookila Recovery Team

v1.0 February 2026

### Purpose

This document aims to provide land managers and fire-response teams with background knowledge on the Pookila (New Holland Mouse; *Pseudomys novaehollandiae*) to aid in planning and responding to fire in occupied Pookila habitat. It does not provide prescriptions for burning and should not be used as a stand-alone guide for burn planning. All wildlife monitoring and planned burning activities must be conducted with appropriate approvals and permitting for your state and land tenure.

### The Pookila

The Pookila is a small (12-28 g) Australian mouse species known from disjunct populations from Tasmania and Flinders Island, through Victoria and NSW into south east Queensland[1]. Two Evolutionarily Significant Units (ESUs) are recognised and managed separately for the species – the Southern ESU (Victoria and likely Tas), and the Northern ESU (NSW and Queensland)[2,3]. Although still appropriately classified as the same species, these ESUs are genetically and morphologically distinct, with animals in the Southern ESU significantly larger than those in the Northern ESU (18-28 g vs 12-20 g)[1,2].

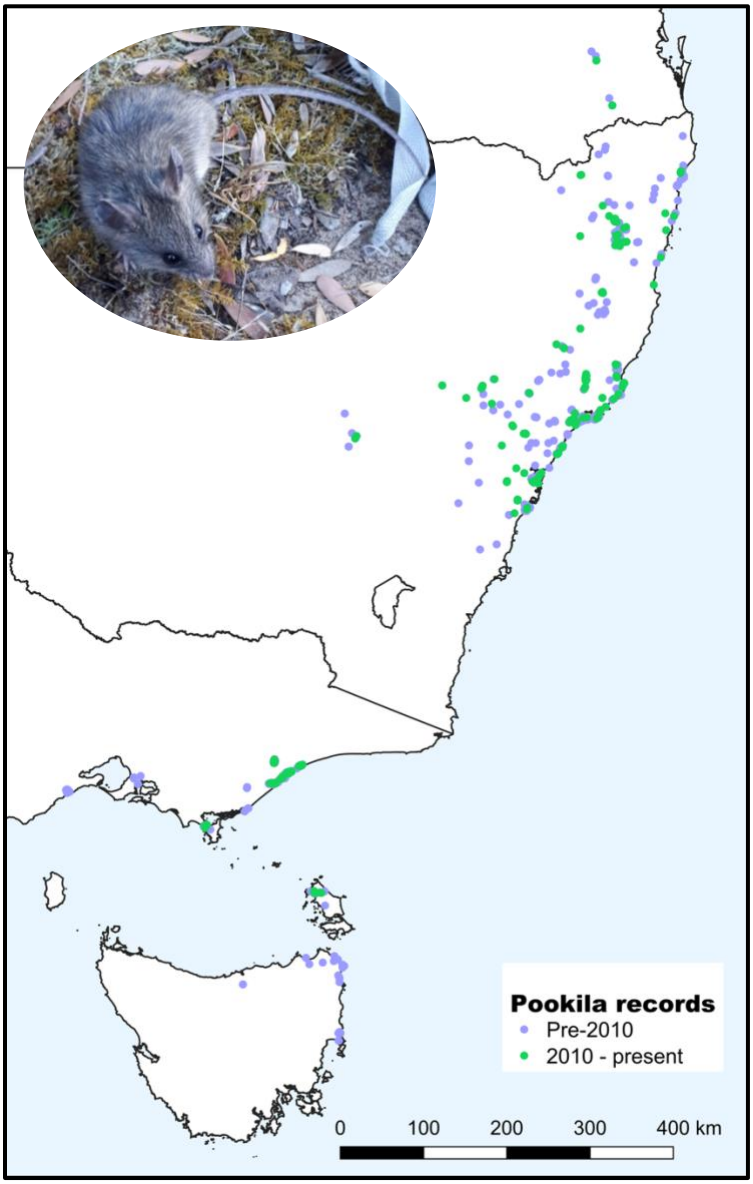


**Figure 1.** Pookila records across the species' national distribution. Up-to-date detailed maps of specific areas are available on request.

Pookila home range size varies with habitat quality and resource availability but is roughly around 0.5 – 2 ha[4]. Pookila are nocturnal and dig complex underground burrow systems in which they nest during the day[5]. They are omnivorous, feeding on seeds, flowers, fruits, fungi and invertebrates. The species is highly vulnerable to changes in long-term rainfall patterns – population numbers fall dramatically in response to drought and take several years to recover[6], with the Millenium Drought implicated in the species' extirpation from Anglesea[7]. Conversely, population numbers can increase in response to increases in rainfall[8], however, these modest increases fall short of what would be considered a 'boom' for a rodent species. This may be reversed in the north of the species range where above-average rainfall may have negative impacts on the species.

### What is Pookila habitat?

Habitat for Pookila varies across the species' range, but the species is most commonly associated with sandy soils and floristically diverse heathlands, heathy or grassy woodlands, vegetated sand dunes and grassy forests[4,9–16]. Many key habitat species for the Pookila are highly susceptible to *Phytophthora cinnamomi* dieback and control of the pathogen's spread is critical to protecting remnant habitat[17,18].


Contact: Dr Phoebe Burns, Chair, pburns@zoo.org.au

## Fire response

The response of Pookila to fire events is highly context specific[19]. Fire can be an important tool for regenerating heathland species in Pookila habitat and maintaining suitable habitat structure and composition. Higher population numbers have been observed in early successional stages[8,20,21], however, large-scale high severity wildfire and planned burns have also extirpated populations at a local level[13,19]. Current best-practice fire management for Pookila requires consideration of several factors outlined below, and appropriate fire regimes are highly location-specific.

## Recommendations for delivering a Pookila-friendly burn

- **Patchy burns** – retaining patches of unburnt ground cover within the fire area is likely to provide refuge from predators and improve food availability (flowers, fruits, seeds, leaf matter, fungi and invertebrates). Consider patchiness within a home range (e.g. 200 m x 200 m) rather than the burn unit scale. Burn objectives within areas known to be occupied by the species should be modified to aim for a maximum of approximately 40-50% coverage. Partnership with local First Nations communities to adopt cultural burning practices for the site may also support this.
- **High fuel moistures** – choosing to burn when fuel moistures are higher than local burn prescriptions can also help promote a suitably patchy burn. This may also be achieved by burning in the evening as relative humidity is increasing, under increasing cloud, or burning shortly after a rain event should conditions allow. For example, in coastal heath and heathy woodland in Victoria, 15-20% fuel moisture is now considered ideal, with rain in the fortnight prior to the burn.
- **Avoid burning during spring and summer (breeding season)** – fire during the breeding season while females are pregnant or have young in the nest may increase the risk of litter loss through stress and food shortages. The species is more reliant on vegetative food sources (flowers, fruits and seeds) during this period, amplifying the impacts of loss of mature vegetation through fire.
- **Minimise burning in drought years** – aside from increasing the risk of the fire severity being higher than intended, burning during drought means that the mice are likely already experiencing food stress. Vegetation will recover more slowly during drought, further reducing food availability and shelter. Consider excluding known occupied habitat from burning in drought years.
- **Exceptions for areas of tea tree encroachment** – Coast Tea Tree encroachment is a key threat to Pookila habitat and has contributed to the loss of Pookila in formerly occupied areas (e.g. parts of Yanakie Isthmus). Where tea tree has been identified locally as an ecological issue requiring intervention, control efforts may require burning with the intent of high coverage and intensity during drier periods and lower fuel moistures, often in spring and potentially paired with mulching. Pookila are rarely still present in habitat once it reaches this stage and risks to Pookila from targeted burning of tea tree are low unless fire extends into current occupied suitable habitat.

## Preparing for a planned burn or responding to wildfire

- ***Phytophthora cinnamomi* (PC) hygiene** – ensure staff are briefed on the risks of spreading PC and are provided with Phytoclean or methylated spirits to clean boots, equipment, vehicles and machinery. Many of the Pookila's preferred habitat and forage species are highly susceptible to PC, with the risk of spreading PC increased as a result of planned burn and bushfire operations.
- **Soil disturbance** – Avoid creation of new mineral earth breaks, using natural features (drainage lines, water bodies, and damper vegetation) or existing track and trail networks as burn control lines where feasible. Creation of new breaks may damage Pookila burrows and increase access for cats and foxes along these new pathways.
- **Predator control** – Pre- and post-fire cat and fox control is recommended where cover may be reduced in and around burnt areas, increasing the likely impacts of predation on a local population. In general, this is considered the highest priority management action for Pookila following bushfire.
- **Fire retardant use** – Contact the Recovery Team to discuss fire retardant use in areas occupied by Pookila.
- **Monitoring** – Consider doing pre- and post-burn camera monitoring work to help continue to improve our understanding of Pookila fire responses. Please contact the Recovery Team for assistance designing a monitoring program.
- **Rabbit control** – Avoid use of poisoned oat and carrot baits (1080, Pindone) in areas occupied by Pookila, including along tracks. Pookila are likely to ingest and succumb to the baits.

## Critical populations

While all remaining Pookila populations are important, there are several that are at particularly high risk due to their fire history, small size and isolation, and require additional focus in fire planning. Please reach out to the Recovery Team to discuss works in these areas. These populations include:

- Victoria: Royal Botanic Gardens Cranbourne, Dutson Downs, Gippsland Lakes Coastal Park, The Lakes National Park, Providence Ponds Flora and Fauna Reserve, Yiruk Wamoon - Wilsons Promontory National Park
- Tasmania: Flinders Island; all locations with historical or recent records
- NSW: Goobang National Park; Broadwater National Park
- Queensland: all locations with historical or recent records

## A Case Study – Progress Road Burn, Loch Sport 2022

The 2022 Progress Rd fuel reduction burn west of Loch Sport was a 60 ha burn with the primary objective of reducing risk to life and property. The burn also happened to be in a patch of extremely high quality, occupied Pookila habitat, introducing a secondary aim of conserving the mouse in situ. While threatened species are considered in all planned burning in Victoria, this was the first burn where Pookila were considered in every stage of burn planning and delivery with a targeted monitoring program to guide planning and assess the species' response to fuel management.

### Fauna monitoring

Pre-fire camera surveys for the Pookila were conducted at ten sites a month prior to the burn, with live trapping at four sites conducted the week of the burn. Pookila were detected at nine camera sites and all four live-trapping sites. Post-fire camera surveys were conducted 6 weeks and 12, 24 and 36 months post-burn, and live trapping has been conducted each Autumn. The pre-burn survey data informed the planning of the operation.

### Fuel and habitat monitoring

Fuel moisture data was collected once or twice a week in the month leading up to the burn. This allowed burn planners to understand how the fuel was responding to rainfall events and predict a suitable burn window. The standard prescriptions at the time were 12-15% fuel moisture content, however, we were recording fuel moistures from 15-20% and up to 25% in some sections prior to ignition. This included a range of different fuel types from coastal heath (lower fuel moisture, more critical habitat) to denser Coast Tea Tree stands (higher fuel moisture, unsuitable habitat). Prior to the burn we conducted habitat structure and floristic composition surveys across two sites within the burn area and terrestrial laser scanner surveys at all ten sites. Post-fire we conducted terrestrial laser scanner surveys at burnt sites (seven).

### Burn strategy

The intent was to use higher fuel moistures to reduce burn coverage and severity. The burn was delivered in late April with benign weather conditions and low wind. The burn was broken into multiple blocks and ignited over multiple days, to improve control of fire behaviour and enable us to progress in a considered manner, and hold fire as required. The pre-burn briefing covered the importance of the area as habitat for the Pookila and the need to deliver a patchy burn to maintain refugia. A species expert was present on site to answer questions and provide additional context to ground crews.

### Outcomes

Both burn objectives were met – risk to life and property was demonstrably reduced and Pookila persisted in situ at all detection sites. The burn was completed at 40% coverage, with varied fire severity throughout the burn. Some patches remained unburned, whether due to wetter fuels or discontinuous fuels, however, this was considered an acceptable outcome in the context of ensuring a patchy burn and maintenance of refugia. Post-fire camera monitoring indicated Pookila persistence at all nine detection sites immediately post-fire and in the following Autumn. Live trapping data indicate Pookila numbers have remained comparable within the burn area and nearby unburnt habitat.

## We're here to help – and we would love your help!

The National Pookila Recovery Team includes members from land management agencies in all Pookila-occupied states. If you have any questions, please reach out to us. We can provide advice on how to approach a planned burn in an occupied area, whether an area is currently occupied, or how to support the species after wildfire.

And we would love your help too – if you're planning a burn in Pookila country, please let us know! We are always keen to conduct pre- and post-burn surveys to continue learning how Pookila respond to different sorts of fire. We

are also always eager to get out as quickly as possible after bushfires to assess impacts on the species; where appropriate, please consider allowing our experts to access the fire ground as soon as possible.

Email Dr Phoebe Burns (Chair, National Pookila Recovery Team; pburns@zoo.org.au) or Luke Smith (Chair, Pookila Habitat and Fire Management Subgroup; luke.smith@deeca.vic.gov.au) for further info or find out who the mouse people are in your region.

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