

# Nature Conservation (New Holland Mouse) Conservation Advice 2019

Notifiable instrument NI2019–317

made under the

Nature Conservation Act 2014, s 90C (Conservation Advice)

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## 1 Name of instrument

This instrument is the *Nature Conservation (New Holland Mouse) Conservation Advice 2019*.

## 2 Commencement

This instrument commences on the day after its notification day.

## 3 Conservation advice for the New Holland Mouse

Schedule 1 sets out the conservation advice for the New Holland Mouse (*Pseudomys novaehollandiae*).

Arthur Georges  
Chair, Scientific Committee  
17 May 2019

# Schedule 1

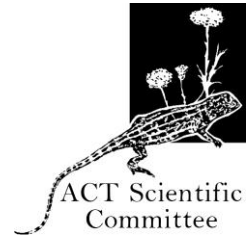
(see s 3)

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**ACT**  
Government

Environment, Planning and  
Sustainable Development



# CONSERVATION ADVICE

## NEW HOLLAND MOUSE

### *Pseudomys novaehollandiae*

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#### CONSERVATION STATUS

The New Holland Mouse *Pseudomys novaehollandiae* (Waterhouse, 1843) is recognised as threatened in the following jurisdictions:

International	<b>Vulnerable</b> , International Union for Conservation of Nature (IUCN) Red List
National	<b>Vulnerable</b> , <i>Environment Protection and Biodiversity Conservation Act 1999</i> <b>Vulnerable</b> , <i>The Action Plan for Australian Mammals 2012</i>
ACT	<b>Vulnerable</b> , <i>Nature Conservation Act 2014</i>
NSW	<b>Secure</b> , <i>Biodiversity Conservation Act 2016</i>
VIC	<b>Threatened</b> , <i>Flora and Fauna Guarantee Act 1988</i> <b>Endangered</b> , <i>Advisory List of Threatened Vertebrate Fauna 2013</i>
QLD	<b>Vulnerable</b> , <i>Nature Conservation Act 1992</i>
TAS	<b>Endangered</b> , <i>Threatened Species Protection Act 1995</i>

#### CRITERIA

The New Holland Mouse is listed as Vulnerable in the ACT Threatened Native Species List under IUCN Criterion B — B2ab(ii,iii,iv,v) (Woinarski et al. 2014 and 2016). The factors that make it eligible include *limited* numbers and geographic distribution, which is precarious for the survival of the species resulting in further likely declines in numbers due to habitat loss and predation by introduced predators (Threatened Species Scientific Committee (TSSC) 2010)<sup>1</sup>.

#### DESCRIPTION AND ECOLOGY

The New Holland Mouse is a small, burrowing native rodent, similar in size and appearance to the introduced house mouse (*Mus musculus*). However, it can be distinguished by its slightly larger ears and eyes, the absence of a notch on the upper incisors and the absence of a distinctive 'mousy' odour (TSSC 2010).



New Holland Mouse at Mulligans Flat (EPSDD)

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<sup>1</sup> The Commonwealth Conservation Advice (TSSC 2015) has formed the basis of this advice. The species has been listed as part of a process to align ACT threatened species listings with those of the Commonwealth.

The species is grey-brown in colour and its dusky-brown tail is darker on the dorsal side. The species has a head-body length of approximately 65–90 mm, a tail length of approximately 80–105 mm and a hind foot length of approximately 20–22 mm (Menkhorst and Knight 2001).

While specimens of the New Holland Mouse from Tasmania are larger in weight than specimens from the mainland, head–body length and skull measurements are similar (Hocking 1980; Lazenby 1999). It is a social animal, living predominantly in burrows shared with other individuals (Kemper 1980; Lazenby et al. 2008). Litter size ranges from 1–6 young, with first-year females producing one litter per season and second-year females producing three or four (Seebeck et al. 1996). The generation length is less than two years with females reaching sexual maturity at 13 weeks of age and living up to two years (Kemper 1990; Seebeck et al. 1996).

## DISTRIBUTION AND HABITAT

The New Holland Mouse was once distributed from southern Queensland through to western Victoria and in northern Tasmania. It is now largely restricted to the coast of central and northern NSW, with one inland occurrence near Parkes in central-west NSW (EPSDD 2013).

The species is common in collections of historically-aged bones in caves in the Canberra region, and was probably a common component of local forest, woodland and heath communities. The species has probably not occurred for 130 years in pastoral landscapes like Mulligans Flat that were cleared and developed earlier in settlement and subject to major degradation by rabbits from the 1880s onwards (EPSDD 2013). The New Holland Mouse was reintroduced into Mulligans Flat Woodland Sanctuary (MFWS) in 2013 (see Conservation Issues section below).

Abicair et al. (in review) identified the habitat associations of the New Holland Mouse within an historic environment, as well as trends in stage-specific loss of genetic diversity throughout the reintroduction process. The reintroduced population favoured structurally open native tussock grassland dominated by *Rytidosperma pilosum* (Abicair et al. in review). The dense clay-based substrate at preferred Mulligans Flat Woodland Sanctuary (MFWS) habitat was different to those documented at coastal locations, and lacked soft deep topsoil, sandy substrate and leaf litter suggesting that substrate type may not be a critical habitat component of the species or the species may be capable of burrowing and nesting in more diverse substrate types (Abicair et al. in review).

## THREATS

Threats to the New Holland Mouse in Australia are detailed in the Mammal Action Plan and the Commonwealth Conservation Advice (Woinarski et al. 2014; TSSC 2010) and include:

- inappropriate fire regimes
- predation by feral cat and red foxes
- habitat loss; fragmentation; and degradation
- lower rainfall and more frequent droughts related to climate change.

## MAJOR CONSERVATION OBJECTIVES

The priority management objectives for the New Holland Mouse in the ACT relate to the three areas of conservation action, namely the: (1) establishment of a captive colony at Tidbinbilla Nature Reserve and evaluation of the contribution of the captive colony at the Australian National University in serving as a long-term insurance colony; (2) establishment of a fenced population at Mulligans Flat/Goorooyarroo and possibly elsewhere in the ACT; and (3) re-establishment of populations of the New Holland Mouse in the wild in the ACT where it is now locally extinct.

As such, the objectives for management are to:

- enable the ACT to contribute effectively to the national objective of re-establishing viable, wild populations of the New Holland Mouse (DoE 2010) in areas where it has previously occurred but now locally extinct
- establish and maintain one or more fenced areas within the ACT (e.g. MFWS) to protect and restore habitat of the New Holland Mouse and other species through intensive management of habitat (including rabbit damage) and introduced predators and other pest species
- support the establishment and maintenance of captive breeding colonies of the New Holland Mouse in the ACT
- undertake research of immediate relevance to achieving the above objectives, in an adaptive management context
- provide opportunity for strategic research into the biology of the New Holland Mouse that may be relevant to management in captivity or in the wild, or subsequently become relevant as circumstances change and
- provide opportunity to build constituency and community awareness of conservation and opportunity for the community to become directly involved in conservation action.

## CONSERVATION ISSUES

### Captive Colony

The only captive population in Australia is held as a breeding colony of ca150 individuals at the Australian National University and a second colony is planned at Tidbinbilla Nature Reserve (NR) (pers. comm. A Manning 2019).

The Tidbinbilla NR population will be managed as a captive breeding 'insurance' population and to provide opportunity for research into animal husbandry, reproductive biology of the species. As an insurance colony, it is important to assess and maintain the genetic diversity of the captives. Maintaining genetic diversity is important for the fenced population to be augmented or re-established should it decline or fail; or should stocks be needed for conservation efforts elsewhere. Genetic diversity needs to be assessed in the context of genetic diversity of wild populations elsewhere in Australia.

### Mulligans Flat-Goorooyarroo

In 2010, 25 individuals collected from the NSW central coast, under NSW licences. These bred in captivity and in autumn 2013, 24 mice were released into MFWS to test the ability of the captive-born mice to adapt to natural wild foods and nesting material with the majority prospering (EPSDD 2013). By October 2013, a further 55 of the captive-bred mice had been released into the sanctuary using soft release methods, and surveys in 2016 indicated the reintroduced population had persisted for three years confirming that breeding at MFWS had occurred (Abicair et al. in review). A follow-up presence/absence survey will be undertaken and another release is planned for later in 2019 (pers. comm. A Manning 2019) to introduce additional founders to the reintroduced population to increase population size and ensure gene flow (Abicair et al. in review).

The population at the MFWS, to be expanded to include Goorooyarroo NR, is considered a contained population, protected from exotic predators, but open to the semi-natural variations of population density.

Specific management issues to be considered for the Mulligans Flat/Goorooyarroo reserve populations are:

- (a) whether the reserve is a stepping stone to support ultimate releases and establishment of the New Holland Mouse in the wild, or whether it is to also be considered an end in itself, that is, the first of what may be several 'mainland islands' (sensu Saunders and Norton 2001, see also Legge et al. 2018) established as a sustainable, long-term solution to the historical loss of iconic native species from the ACT and
- (b) potentially conflicting needs of other threatened or endangered species within the reserve as manipulation of habitat to meet the needs of one species can alter habitat suitability for another.

A monitoring program should be undertaken to assess the effect of habitat manipulation and New Holland Mouse release on other threatened species, with potential trigger points/remedial action.

### Reintroduction to the Wild

The Scientific Committee does not currently support releases of the New Holland Mouse to the wild, as it considers:

- (a) control of predator numbers to be impractical at the levels necessary for the successful translocation and establishment of the mouse in the wild and
- (b) even were such predator control possible, the mouse has residual wild populations elsewhere in Australia, reducing the need for its re-establishment in the ACT.

In any case, there should be assessment by relevant independent experts of the release proposal/translocation plan and its feasibility before any release.

## OTHER RELEVANT ADVICE, PLANS OR PRESCRIPTIONS

- Commonwealth Listing Advice — New Holland Mouse (TSSC 2010)
- Commonwealth Conservation Advice — New Holland Mouse (DoE 2010)
- The Action Plan for Australian Mammals 2012 (Woinarski et al. 2014)
- Guidelines for Reintroductions and Other Conservation Translocations (IUCN/SSC 2013)
- Translocation for Conservation (Australasian Wildlife Management Society 2013)
- Conservator Guidelines for the Translocation of Native Flora and Fauna in the ACT (ACT Government 2018).

## LISTING BACKGROUND

The New Holland Mouse was listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 11 August 2010. In 2019, under the *Nature Conservation Act 2014*, the ACT Scientific Committee recommended the New Holland Mouse be listed in the Vulnerable category in the ACT Threatened Native Species List to align with the EPBC Act listing. The New Holland Mouse has not been previously listed as threatened in the ACT as it was presumed to be locally extinct (since the 1880s), until reintroductions to the Mulligans Flat Sanctuary in 2013.

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## FURTHER INFORMATION

Further information on this species or other threatened species and ecological communities can be obtained from Environment, Planning and Sustainable Development Directorate (EPSDD).

Phone: (02) 132281, EPSDD Website: <http://www.environment.act.gov.au/cpr>