

# THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

---

The Minister's delegate approved this conservation advice on 01/04/2016.

## Conservation Advice

### *Potorous gilbertii*

Gilbert's potoroo

*Note: The information contained in this conservation advice was primarily sourced from 'The Action Plan for Australian Mammals 2012' (Woinarski et al., 2014). Any substantive additions obtained during the consultation on the draft are cited within the advice. Readers may note that conservation advices resulting from the Action Plan for Australian Mammals show minor differences in formatting relative to other conservation advices. These reflect the desire to efficiently prepare a large number of advices by adopting the presentation approach of the Action Plan for Australian Mammals, and do not reflect any difference in the evidence used to develop the recommendation.*

In November 2015 a bushfire burnt through the Mt Gardner headland of Two Peoples Bay Nature Reserve, near Albany, Western Australia and severely impacted the habitat of the original wild population of Gilbert's potoroo. In January 2016 this species was identified as one of the 20 mammals within the Australian Government's Threatened Species Strategy for priority conservation. This conservation advice has been updated in consultation with the Western Australia government to reflect the current status of this species and any proposed changes to conservation actions.

#### **Conservation Status**

*Potorous gilbertii* (Gilbert's potoroo) is listed as Critically Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). The species is eligible for listing as prior to the commencement of the EPBC Act, it was listed as Critically Endangered under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth).

The main factors that are the cause of the species being eligible for listing in the Critically Endangered category are its small population size and its precarious geographic distribution.

#### **Description**

Gilbert's potoroo, is a small nocturnal marsupial, with a densely furred body, which lives in small groups or colonies. Adults range from 700 g to 1200 g and there is little sexual dimorphism (Courtenay and Friend 2004). This species is the only existing species of *Potorous* in Western Australia, where it is endemic. It has long hind feet and long, curved claws on its front feet that it uses to dig for food. The species is brown to grey above and paler below, it has a slender and slightly downwards curved snout and dense fur on the sides of its face (Friend 2008).

#### **Distribution**

Early reports of Gilbert's potoroo state the species was locally abundant in the vicinity of King George Sound in the 19<sup>th</sup> century (Gould 1863). Specimens were collected east of Albany between King George Sound and Pallinup River from 1866 to 1869 with the last official record of the species collected in the 1870s (Courtenay and Friend 2004). Since then this species was thought to be extinct until it was rediscovered in 1994 at the Mt Gardner headland of Two Peoples Bay Nature Reserve, near Albany (Sinclair, Danks & Wayne 1996). In November 2015 wildfire caused the near loss of this population. There is also an assisted colonisation population in the Bald Island Nature Reserve (8 km<sup>2</sup>), about 50 km east of Albany (Schoch 2007; Woinarski et al., 2014) which was established in 2005. It has also been reintroduced to a mainland

introduced predator-free enclosure (3.8 km<sup>2</sup>) in Waychinicup National Park in 2010 (Woinarski et al., 2014).

In 2012 there was estimated to be 100 individuals (Woinarski et al., 2014) but this had declined to an estimate of 60 in 2015. It has been estimated that Mount Gardener had the capacity to support 30-40 individuals (Friend, 2008c, 2009), but this capacity has been reduced significantly due to fires in November 2015. Post-fire surveys confirmed the presence of at least five adults and the significant loss of habitat. This triggered a salvage program which is being implemented to ensure the maintenance of these animals while habitat recovers.

Twelve Gilbert's potoroos were released onto Bald Island Nature Reserve between 2005–2007 (Friend 2009; Finlayson *et al.*, 2010). This population was estimated to exceed 65 individuals in 2012 but is currently estimated to be around 40 individuals (DPaW pers comm. 2016). Since 2009, Bald Island and Mount Gardener animals have been used to establish a new wild population in a 380 ha introduced predator-free fenced area in Waychinicup National Park. Despite regular supplements from Bald Island, this population has failed to thrive, and now comprises less than 20 individuals.

A captive colony was maintained for 15 years but captive breeding was not successful with no offspring provided for translocations and all remaining captive animals were released into the Waychinicup fenced enclosure in 2010 (Woinarski et al., 2014).

### Relevant Biology/Ecology

A small area within Two Peoples Bay Nature Reserve (1000 ha) is considered Gilbert's potoroo habitat and in 2012 the species occurred in at least four separate patches of long-unburnt, dense shrubland on the valley slopes. A network of tunnels through this heathland enables the potoroos to move around quickly under cover. The floristic and structural composition of these core habitat patches is largely uniform and can be described as follows: *Melaleuca striata* (a shrub) and *M. uncinata* (broom honey-myrtle) shrubland between 1.5–2 m tall with 70–100 percent canopy cover, with a dense understorey of sedges including *Lepidosperma* sp. and *Anarthria scabra* (a herb) (WA DEC 2009b). Gilbert's potoroo uses *Gastrolobium* spp. thickets and sometimes shelters under deep accumulations of 'needles' in *Allocasuarina fraseriana* (Western Sheoak) clumps. Vegetation that forms potoroo habitat at Two Peoples Bay had not been burnt for at least fifty years until 2015 and it is likely that long-unburnt areas are necessary to support the species, at least in the presence of introduced predators.

Trapping and radio-tracking has shown that Gilbert's potoroos live in small groups unevenly dispersed across their habitat. These colonies are isolated from each other but dispersing sub-adult animals and some older males move between them. Amongst resident animals there is little overlap in home range between animals of the same sex, but there is strong overlap between males and females. Gilbert's potoroo males have home ranges of 15–25 ha (measured over two weeks in summer), whereas females, juveniles and sub-adult animals of both sexes move within only 3–6 ha (Friend 2000).

Wild Gilbert's potoroos breed throughout the year. One joey is produced at a time and females can give birth every four months. Young females become sexually mature at about one year of age and males a little later. Potoroos can live for up to ten years, but longevity in the wild would usually be less. Juveniles remain in the mother's home range well after weaning, leaving at between seven and 18 months of age (Courtenay & Friend, 2004). Between 60–80 percent of pouch young do not attain maturity (Friend 2008c). Generation length is estimated to be 3–4 years.

It is the only potoroid in the high rainfall area of far south Western Australia. It digs for fruiting bodies of hypogeal, mycorrhizal fungi, which are essential symbionts of many vascular plants, and disperses the spores. Like the *Potorous longipes* (long-footed potoroo), the diet of Gilbert's potoroo consists almost entirely of fungi. A study of dietary composition (Nguyen 2000) found that

fungal material made up more than 90 percent of the diet, as well as invertebrates and occasionally seeds from fleshy fruits.

## Threats

Table 1- Threats

Threat factor	Threat type and status	Evidence base
Fire		
Fire regimes	Known Current	The last wild population of Gilbert's potoroo occurred in dense, long unburnt vegetation that was highly vulnerable to wildfire. A major fire burnt through this area in November 2015 severely impacting habitat and the wild population.
Lowered genetic variability	Potential Future	With already low numbers of individuals the impact of the 2015 fire may result in a greater loss of genetic diversity.
Invasive species		
Predation by Foxes and Feral Cats	Known Current	Gilbert's potoroo is within the critical weight range (35 g–5 kg) of mammals thought to be most susceptible to fox ( <i>Vulpes vulpes</i> ) and feral cat ( <i>Felis catus</i> ) predation (Burbidge & McKenzie, 1989). Both of these predators are known to occur in the Two Peoples Bay area, though fox baiting has occurred in the area since 1988. These predators are absent on Bald Island and within the enclosure at Waychinicup National Park; however, if foxes or feral cats invaded Bald Island or the Waychinicup enclosure and were not immediately detected and eradicated, they could cause a major reduction in the population size (Short et al., 2002).

## Conservation Actions

### Conservation and Management priorities

#### Fire

- Develop and implement fire management strategies for all subpopulations that minimise the impact of fire on Gilbert's potoroo and their habitat, without increasing the risks of large, higher intensity fires.
- Monitor the recovery of the Mount Gardener site to determine when habitat is suitable to re-establish this population.

#### Invasive species

- Maintain fox and feral cat baiting programs on Mount Gardner, Two Peoples Bay Nature Reserve, and continue to ensure the predators absence on Bald Island and within the enclosure in Waychinicup National Park.

#### Establishing new populations

- Develop a translocation plan for Gilbert's potoroo including:
  - identification and selection of at least two new release sites,
  - protocols for monitoring source/translocated subpopulations,
  - strategies to maintain or improve genetic diversity in all subpopulations.

- Carry out reintroduction or introduction of Gilbert's potoroo to at least two sites.

#### Stakeholder Engagement

- Continued support and involvement of 'Gilbert's Potoroo Action Group' in the conserving the species.
- Formulate and implement an education strategy to increase public awareness of the Gilbert's potoroo'.

#### Survey and Monitoring priorities

- Continue to monitor all populations to determine trends, population size, and the health of individuals within populations.
- Assess the success of translocation of Gilbert's potoroos to the fenced enclosure in the Waychinicup National Park.

#### Information and research priorities

- Monitor the effectiveness of fox and feral cat control programs in reducing activity and/or abundance of these predators in areas with suitable habitat for Gilbert's potoroo.
- Develop consistent and reliable protocols for monitoring and managing the impact of native predators.
- Determine the genetic characteristics of the Gilbert's potoroo populations to sufficiently inform appropriate management within and between populations. Investigate the limitations to population growth on Bald Island and in the Waychinicup enclosure.
- Develop molecular tools to understand dietary complexity in Gilbert's potoroo.
- Undertake research into the natural dietary requirements of Gilbert's potoroo that include production of fungal fruiting bodies or other food supplements to provide trophic resources that support survival and reproductive capacity.

#### References cited in the advice

- Burbidge, A.A. & McKenzie N.L. (1989). Patterns in the modern decline of Western Australia's vertebrate fauna: causes and conservation implications. *Biological Conservation*. 50:143-198
- Courtenay, J. & Friend T. (2004). *Gilbert's Potoroo (Potorous gilbertii) Recovery Plan July 2003-June 2008*. [Online]. Wanneroo, Western Australia: Threatened Species Unit, Department of Conservation and Land Management.
- Finlayson GR, Finlayson ST, Dickman CR (2010) Returning the rat-kangaroos: translocation attempts in the family Potoridae (superfamily Macropodoidea) and recommendations for conservation. In 'Macropods: The biology of kangaroos, wallabies and rat-kangaroos.' (Eds G. Coulson and M. D. B. Eldridge.) pp. 245-262. (CSIRO Publishing: Collingwood).
- Frankham GJ, Handasyde KA, Eldridge MDB (2012) Novel insights into the phylogenetic relationships of the endangered marsupial genus *Potorous*. *Molecular Phylogenetics and Evolution* 64, 592-602.
- Friend, J. A. (2000). *Radio-tracking of Gilbert's Potoroo*. Unpublished report to Bankwest Landscape Conservation Visacard. Department of Conservation and Land Management, Perth.
- Friend, J.A. (2008). Gilbert's Potoroo. In: Van Dyck S., & Strahan R., eds. *The Mammals of Australia*. 3rd ed. Page(s) 297-298. Sydney, NSW: Reed New Holland.

- Friend, T. (2008c) Cross-fostering Gilbert's potoroo. *Landscape*. 23,6-8.
- Friend, T. (2009) Endangered! Gilbert's potoroo. *Landscape*. 29(4),45.
- Gould, J. (1841). Monograph of the Macropodidae or family of Kangaroos. Part 1. J. Gould, London.
- Gould, J. (1863). *The Mammals of Australia*. J. Gould, London.
- Green, K., Mitchell, A. T. & Tennant, P. (1998). Home range and microhabitat use by the long-footed potoroo, *Potorous longipes*. *Wildlife Research* 25, 357-372.
- Long, K. I. (2001). Spatio-temporal interactions among male and female Long-nosed Potoroos, *Potorous tridactylus* (Marsupialia: Macropodoidea): mating system implications. *Australian Journal of Zoology* 49, 17-26.
- Nguyen, V. (2000). A diet study of Australia's most critically endangered mammal Gilbert's Potoroo, *Potorous gilbertii* (Marsupialia: Potoroidae). Edith Cowan University, unpublished Honours Thesis.
- Schoch, K. (2007). Saving our species, saving our state. *Landscape*. 22 (4):10-16
- Short J, Kinnear JE, Robley A (2002) Surplus killing by introduced predators in Australia – evidence for ineffective anti-predator adaptations in native prey species? *Biological Conservation* 103, 283 – 301.
- Sinclair, E. A., Danks, A. & Wayne, A F. (1996). Rediscovery of Gilbert's potoroo, *Potorous tridactylus*, in Western Australia. *Australian Mammalogy* 19(1), 69-72.
- Sinclair EA, Westerman M (1997) Phylogenetic relationships within the genus *Potorous* (Marsupialia: Potoroidae) based on allozyme electrophoresis and sequence analysis of the cytochrome-b gene. *Journal of Mammalian Evolution* 4, 147-161.
- Western Australia Department of Environment and Conservation (WA DEC) (2009b). *Gilbert's Potoroo Information Sheet*. [Online]. Albany, Western Australia: Department of Environment and Conservation.
- Woinarski, J., Burbidge, A. and Harrison, P. (2014). *The Action Plan for Australian Mammals 2012*. CSIRO Publishing.