

NSW SCIENTIFIC COMMITTEE

Preliminary Determination

The Scientific Committee, established by the *Threatened Species Conservation Act 1995* (the Act), has made a Preliminary Determination to support a proposal to list a population of the Long-nosed Potoroo (northern subspecies) *Potorous tridactylus tridactylus* (Kerr, 1792) in the Wardell area as an ENDANGERED POPULATION in Part 2 of Schedule 1 of the Act. Listing of Endangered populations is provided for by Part 2 of the Act.

The Scientific Committee has found that:

1. The Long-nosed Potoroo *Potorous tridactylus* (Kerr, 1792) (family Potoroidae) is listed as Vulnerable in New South Wales (NSW) and *Potorous tridactylus tridactylus* is listed as Vulnerable under the federal *Environment Protection and Biodiversity Conservation Act 1999*. The Long-nosed Potoroo comprises three genetically distinct subspecies (Frankham *et al.* 2012a). On mainland southeastern Australia, the northern subspecies *Potorous tridactylus tridactylus*, is separated from the southern subspecies *P. tridactylus trisulcatus* by the Sydney Basin. A third subspecies, *Potorous tridactylus apicalis*, occurs in Tasmania and the Bass Strait islands (Frankham *et al.* 2012a, 2016). The population that is the subject of this determination is part of the northern sub-species *P. t. tridactylus*.
2. The Long-nosed Potoroo is a medium sized potoroid marsupial with brown-grey fur, a rufous tinge on the flanks and pale grey underparts (Menkhorst and Knight 2001). It has a long and tapering nose with a bare patch of skin extending onto the snout (Johnston 2008). Ears are short and rounded and dark grey on the outer surface. The tail is tapered with sparse fur and blackish in colour (Menkhorst and Knight 2001). Individuals range in size with a head and body length of 259–378 mm (females) and 287–410 mm (males), a tail length of 198–254 mm (females) and 204–262 mm (males) and weigh between 660–1350 g (females) and 740–1640 g (males) (Claridge *et al.* 2007; Johnston 2008).
3. The Long-nosed Potoroo is distributed along the east coast and Great Dividing Range of Australia from southeastern Queensland through NSW and Victoria, just extending into southeastern South Australia, some Bass Strait islands and to northern and eastern Tasmania (Menkhorst and Knight 2001; Claridge *et al.* 2007; Johnston 2008). It inhabits a variety of vegetation types including coastal heathland, coastal woodland, wet and dry sclerophyll forests and rainforest (Claridge *et al.* 2007; Johnston 2008; Menkhorst and Knight 2001; Frankham *et al.* 2012b; Woinarski *et al.* 2014). A dense understorey (Claridge *et al.* 2007) is used for sheltering while adjacent open areas are used for foraging (Menkhorst and Knight 2001).
4. The Long-nosed Potoroo reaches sexual maturity at about 12 months of age and can live up to seven years in the wild and more than 12 years in captivity (Johnston 2008). Reproduction takes place throughout the year (Menkhorst and Knight 2001; Woinarski *et al.* 2014) although more frequently in late winter/early spring and again in late summer (Johnston 2008). Only a single young is produced at a time (Johnston 2008; Woinarski *et al.* 2014) and two to three young per year (Woinarski *et al.* 2014). Young stay in the pouch for about four months (Johnston 2008). Generation length is three to four years (Woinarski *et al.* 2014). Although the number of births is relatively high, juvenile mortality is also thought to be high (Frankham *et al.* 2011). The Long-nosed Potoroo shows high female philopatry, but dispersal in both sexes is limited and is significantly impacted by habitat fragmentation (Frankham *et al.* 2012b, 2014, 2016).
5. The Long-nosed Potoroo is mostly nocturnal (Claridge *et al.* 2007; Menkhorst and Knight 2001) and mostly solitary (Menkhorst and Knight 2001; Woinarski *et al.* 2014) although it has been known to live in small groups (Johnston 2008). It digs small holes in the ground while foraging for food (Johnston

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2008) and mostly consumes hypogeal fungi, which can account for up to 80% of its diet (Claridge *et al.* 2007), along with tubers, invertebrates, seeds, fleshy fruits and vascular plants (Claridge *et al.* 2007; Johnston 2008; Menkhorst and Knight 2001; Woinarski *et al.* 2014). Hypogeal fungi are thought to be more prevalent in poorer soils and therefore soil fertility may influence the distribution of this species (Claridge *et al.* 2007). In turn, this species has an important role to play in ecosystem functioning, being significant dispersers of the fungi on which they feed (Andren *et al.* 2013). Home range size varies from 1 to 19 ha depending on habitat quality with male home ranges being larger than those of females (Woinarski *et al.* 2014).

6. A population of Long-nosed Potoroo (northern subspecies) occurs in a fragment of native vegetation near Wardell, in the Richmond River Valley on the far north coast of NSW (Andren *et al.* 2013). The population occupies the Ngunya Jargoon Indigenous Protected Area (IPA) and contiguous areas of native vegetation bordered by the Richmond River to the south and east, Coolgardie to the north and the Blackwall Range to the west. The population is surrounded by cleared agricultural land (D. Arnold *in litt.* 2016; A. Claridge *in litt.* 2016) which is likely to prevent the dispersal of Long-nosed Potoroo (northern subspecies) into and out of this population (Frankham *et al.* 2014, 2016). The population is therefore considered to be disjunct. Records of Long-nosed Potoroo at Wardell show a concentration of animals in the western and southern parts of the site indicating there may be a preference for habitat within the central area which comprises low dense heathland (R. Goldingay *in litt.* 2016).
7. The Wardell population of Long-nosed Potoroo (northern subspecies) occupies an area of 2,050 ha of heathland and woodland with a heath understorey, about half of which occurs within the Ngunya Jargoon IPA. The extent of occurrence of the population is estimated to be 7.5 km² based on a minimum convex polygon enclosing all mapped occurrences of the species, the method of assessment recommended by IUCN (2016). The area of occupancy (AOO) is estimated to be 24 km² based on 2 x 2 km grid cells, the scale recommended for assessing AOO by IUCN (2016). The geographic distribution of the population is therefore considered to be highly restricted.
8. The population is estimated to contain fewer than 250 individuals inferred from a density of 0.23 – 0.26 individuals per ha and the amount of suitable habitat (Mason 1997). The number of individuals is estimated to be low.
9. Throughout its range the Long-nosed Potoroo is threatened by habitat loss from agriculture, urban expansion, inappropriate fire regimes and predation by introduced Red Foxes (*Vulpes vulpes*) and feral cats (*Felis catus*) (Woinarski *et al.* 2014). The extinction of some northern populations has been attributed to these factors (A. Claridge *in litt.* 2016). This species may also be adversely affected by habitat degradation through livestock grazing, weed infestation and too-frequent fires resulting in the reduced availability of food resources, particularly hypogeal fungi which form a large part of the diet (Woinarski *et al.* 2014). The proposed realignment of the Pacific Highway to the western boundary of the area (NSWRMS 2016) encompassing the Wardell population will reduce the extent of suitable habitat and further impede movement to nearby vegetated areas. A road corridor could also lead to an increase in the incidence of fire (Milledge 2016), road mortality (depending on the effectiveness of fauna connectivity measures which are detailed in NSWRMS 2016), weed invasion (Hill *et al.* 2005) and potentially exacerbate impacts from introduced predators such as foxes and cats (May and Norton 1996; Meek and Saunders 2000; Harris *et al.* 2010; Hradsky *et al.* 2017). ‘Clearing of Native vegetation’, ‘High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition’, ‘Predation by the European Red Fox *Vulpes vulpes* (Linnaeus, 1758)’ and ‘Predation by the Feral Cat *Felis catus* (Linnaeus, 1758)’ are listed as Key Threatening Processes under the Act.

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10. In northern NSW the habitat of the Long-nosed Potoroo on the coastal plain from the Richmond Valley northwards has become highly fragmented due to the clearing of native vegetation. Of the 87,265 ha of suitable habitat originally occurring in this area, only 23,992 ha remains, a reduction of 72.5% (Andren *et al.* 2013). As a consequence, Long-nosed Potoroo populations in this area have been in steady decline for decades (Andren *et al.* 2013). Surveys carried out between 1985 and 2005 recorded this species at Cudgen Lake, Brunswick Heads, Tyagarah Nature Reserve, Wardell and Cobaki Lakes. However, extensive surveys carried out in these areas between 2006 and 2012 failed to detect any Long-nosed Potoroos except at Wardell (Andren *et al.* 2013) and Cobaki Lakes. However the Cobaki Lakes population has been further threatened by recent substantial clearing of suitable habitat (Andren *et al.* 2013).
11. The population of the Long-nosed Potoroo at Cobaki Lakes and Tweed Heads West is listed as an Endangered population under the Act (NSW Scientific Committee 2011).
12. The population of the Long-nosed Potoroo (northern subspecies) *Potorous tridactylus tridactylus* (Kerr, 1792) in the Wardell area is eligible to be listed as an Endangered population as, in the opinion of the Scientific Committee, it is facing a very high risk of extinction in New South Wales in the near future as determined in accordance with the following criteria as prescribed by the *Threatened Species Conservation Regulation 2010*:

Clause 11 Criteria for listing determinations by Scientific Committee

The population is facing a very high risk of extinction in New South Wales in the near future as, in the opinion of the Scientific Committee, it satisfies any one or more of the following paragraphs and also meets the criteria specified in one or more of the following clauses:

- (a) it is disjunct or near the limit of its geographic range.

Clause 13 Highly restricted geographic distribution of population and other conditions

The geographic distribution of the population is estimated or inferred to be highly restricted and:

- (a) a projected or continuing decline is observed, estimated or inferred in either of the key indicators:
 - (a) an index of abundance appropriate to the taxon, or
 - (b) the geographic distribution, habitat quality or diversity, or genetic diversity.

Clause 14 Low numbers of mature individual in population and other conditions

The estimated total number of mature individuals in the population is low and:

- (a) a projected or continuing decline is observed, estimated or inferred in either of the key indicators:
 - (a) an index of abundance appropriate to the taxon, or
 - (b) the geographic distribution, habitat quality or diversity, or genetic diversity.

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NSW Scientific Committee

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