

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 the Long-footed Potoroo *Potorous longipes* Seebeck and Johnston, 1980 as a CRITICALLY ENDANGERED SPECIES in Part 1 of Schedule 1A of the Act, and as a consequence, to omit reference to the Long-footed Potoroo *Potorous longipes* Seebeck and Johnston, 1980 from Part 1 of Schedule 1 (Endangered species) of the Act. Listing of Critically Endangered species is provided for by Part 2 of the Act.

The Scientific Committee has found that:

1. The Long-footed Potoroo *Potorous longipes* Seebeck and Johnston, 1980 is a large rat-kangaroo (Potoroidae), grey-brown above, grey below, males weigh up to 2.3 kg and females up to 1.7 kg (NPWS 2002; Menkorst and Seebeck 2013). It is distinguished from its closest relative the Long-nosed Potoroo (*Potorous tridactylus*) by its larger size and longer hind-foot in relation to head length, the presence of a small raised pad (posthallucal) on the sole of the foot between the heel and the base of the joined second and third toes and possession of 24 chromosomes (in *P. tridactylus* there are 12 chromosomes in females, 13 in males) (Seebeck and Johnston 1980; NPWS 2002; Menkorst and Seebeck 2013).
2. The Long-footed Potoroo is restricted to three small disjunct populations within mainland southern-eastern Australia (Woinarski *et al.* 2014). Only one of the known populations occurs in NSW, the remaining two are within Victoria (Nunan *et al.* 2000). Nunan *et al.* (2000) state that “A fourth sub-population may exist near Mount Drummer, east of Cann River, where part of a skull was discovered in a predator scat in 1990. A fossil skull has been found at Yarrangobilly Caves, south-west of Canberra (Seebeck 1992a), and a museum specimen collected last century has its location as ‘near Rosedale’, which is in central Gippsland (Seebeck and Johnston 1980)”. The NSW population is located in South East Forest National Park and possibly adjacent areas of private land or lands managed by the Forestry Corporation of NSW (Yambulla and Bondi State Forests) (NPWS 2002). Two records from predator scats from Yambulla State Forest indicate that this species potentially is found in Yambulla State Forest (Broome *et al.* 1997), however this is not definitive as canids have large home ranges and it is possible that wild dogs and foxes forage within South East Forest National Park and later defecate in the adjacent areas (Lunney *et al.* 1990). A 2003 record from Coopracambra National Park in far eastern Victoria, adjacent to the NSW border is reported in DOE (2014a). This record was identified with 95% certainty from hair samples from a trapped animal that escaped before it could be identified (Robley and Wright 2004).
3. Long-footed Potoroos have never been directly observed nor trapped in NSW despite intensive survey for this species within areas predicted by a habitat model based on climate and vegetation (Broome *et al.* 1997; Claridge 2002; NPWS 2002). In NSW intensive survey for this species in the period 1988-1996 yielded only 17 definite records, comprised of 6 predator scat records and 11 hair-tube detections (Broome *et al.* 1997). In contrast in Victoria the Long-footed Potoroo has been routinely trapped and in some Victorian locations it occurs in high densities (NPWS 2002; Claridge 2002; DSE 2009).

NSW SCIENTIFIC COMMITTEE

4. The habitat of Long-footed Potoroo is described in detail in the NSW Recovery Plan (NPWS 2002), largely based on studies of this species from Victoria. The Long-footed Potoroo has been found in a range of vegetation types, although proximity to wetter forest types and the availability of dense ground cover for shelter appears to be an important habitat requirement (NPWS 2002). The species has been recorded at sites as low as near sea-level to around 1370 m in elevation a.s.l (NPWS 2002; DSE 2009). In mainland southeast Australia wet forest types are generally widespread (Robinson 1991 cited in NPWS 2002), however, in south-eastern NSW these forest types tend to be restricted to riparian areas (Saxon and Claridge 1995). Radio-tracking and trapping studies from Victoria have demonstrated that this species is active in a range of topographic positions from creeks to ridge tops (Hill and Triggs 1985; Scotts and Seebeck 1989; Green *et al.* 1998). The Long-footed Potoroo is considered to be a dietary specialist, dependent on the fruiting bodies of underground or truffle-like fungi (Claridge and May 1994; Green *et al.* 1999; NPWS 2002). Green *et al.* (1999) found that truffle-like fungi made up an average of 91% of the diet, with plant material and insects the remainder. Claridge and May (1994) suggested that the Long-footed Potoroo may be the most fungi dependant or mycophagist animal in Australia, and it likely requires an abundance of this food source year-round in suitable habitat (NPWS 2002). Areas with a regular high abundance of truffle-like fungi are thought to be rare and patchy, both in the present day and in recent geological history (NPWS 2002), which may explain the current patchy distribution of the Long-footed Potoroo. The processes driving fungal availability are not well understood, particularly in relation to disturbance history (NPWS 2002). Available evidence suggests that habitat in NSW is probably marginal (Claridge 2002).
5. Data from Victoria suggest that reproductive timing varies among sites and can be either aseasonal (Green and Mitchell 1997) or peak in July-September (NPWS 2002). Pouch life is 140-150 days and young leave the pouch at about 113 days and become independent at about 20 weeks of age (Seebeck 1992b; NPWS 2002). After about a year, animals disperse from their natal territories (Green and Mitchell 1997) and become sexually mature at about two years old (Seebeck 1992b). Life span in the wild is unknown, however captive animals have lived more than 14 years (NPWS 2002). In the field life expectancy is presumably less. The Long-footed Potoroo is less fecund than the Long-nosed Potoroo (*Potorous tridactylus*) (Seebeck 1992a) or bandicoots (Scott *et al.* 1999). Rapid population increases, as have been documented with bandicoots in areas with sustained fox control (Dexter *et al.* 2011), are therefore unlikely to occur.
6. Home ranges vary among sites (22 to 60 ha, 14 to 23 ha) and males have larger home ranges than females (Green *et al.* 1998; Scotts and Seebeck 1989; Seebeck *et al.* 1989). Long-footed Potoroos are thought to be monogamous and territorial, breeding pairs maintain exclusive home ranges, although the home range of juveniles is typically within the parental home range (NPWS 2002). It is thought that in NSW home ranges may be larger than in Victoria, due to lower resource availability in NSW compared with Victorian sites, although this has not been quantified (NPWS 2002). Although the dispersal ability of the Long-footed Potoroo is poorly understood (DSE 2009), there is no evidence that sufficient habitat linkages exist between the known NSW population and the next nearest known populations in Victoria (NPWS 2002). Frankham *et al.* (2014) found restricted male biased dispersal in the closely related Long-nosed Potoroo, along with high levels of female philopatry and limited gene flow between populations separated by 6-8 km of apparently suitable habitat. It is not clear if these findings from the Long-nosed

NSW SCIENTIFIC COMMITTEE

Potoroo are applicable to the Long-footed Potoroo, since the former species is smaller in size and has a much smaller home range (around 1.4 ha for females and 2.0 ha in males; Bennett 1987), compared with Long-footed Potoroo (14 – 60 ha; Scotts and Seebeck 1989; Seebeck *et al.* 1989; Green *et al.* 1998).

7. The Long-footed Potoroo has proven difficult to detect within NSW (see Broome *et al.* 1997; NPWS 2002) making quantification of population size uncertain. Given that this species likely occurs in marginal habitat in NSW compared with Victoria (Claridge 2002; NPWS 2002) and only a single likely low-density population is known from the State, it can be inferred that the NSW population is a small proportion of the total population of this species. It is likely the total population of this species in NSW is very low. The NSW population was stated to be “probably numbering less than a few hundred individuals (Saxon and Claridge 1995).” in the NSW Recovery Plan (NPWS 2002).
8. The geographic distribution of the Long-footed Potoroo is considered to be highly restricted. The area of occupancy (AOO) is estimated to be approximately 60 to 72 km² based on 15-18 2x2 km grid cells, the scale recommended for assessing area of occupancy by IUCN (2014). The lower bound was calculated using the 17 verified records from Broome *et al.* (1997). The upper bound includes all records contained in the NSW OEH Atlas of Wildlife (accessed August 2014) although, as some of these records are likely to be erroneous, the upper bound is likely to over-estimate AOO. The extent of occurrence (EOO) in NSW is estimated to be between 122 km² and 915 km². The lower bound is based on a minimum convex polygon enclosing all reliable mapped occurrences of the species, the method of assessment recommended by IUCN (2014). The upper bound was estimated by encompassing all areas of potential habitat (see Claridge 2002) contiguous with plausible but unverified records from the OEH Wildlife Atlas (accessed March 2014). The upper bound is likely to overestimate the EOO as available evidence suggests the majority of predicted habitat is not occupied by this species.
9. The Long-footed Potoroo in NSW faces a range of threats including: predation by foxes and dogs and perhaps cats; disturbance to habitat resulting in loss of ground cover or diminished food resources; competition for food resources with the feral pig (*Sus scrofa*); extinction of smaller colonies through lack of breeding opportunity or success; disease (e.g. Cryptococcosis, Balanoposthitis, Bairnsdale Ulcer) and browsing, grazing and trampling by feral deer (various species) may alter the composition and structure of habitat (NPWS 2002; Vaughan *et al.* 2007; DSE 2009; Vaughan-Higgins *et al.* 2011). Climate change may change the availability (both quantity and seasonality) of the fungal food source for this species (DSE 2009; Kauserud *et al.* 2010; Bateman *et al.* 2012a and b) although this remains unstudied in the habitats used by this species and the potential impacts are unknown. The NSW population is at the eastern extreme of the known range of this species and the habitat is likely to be marginal (Claridge 2002), increasing vulnerability to climate change impacts. ‘Anthropogenic climate change’, ‘Herbivory and environmental degradation caused by feral deer’, ‘Predation by the European red fox (*Vulpes vulpes*)’, ‘Predation by the feral cat (*Felis catus*)’ and ‘Predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)’ are listed as Key Threatening Processes under the NSW *Threatened Species Conservation Act 1995*.
10. Long-footed Potoroo *Potorous longipes* is listed as an Endangered species under the *Environment Protection and Biodiversity Conservation Act 1999*.

ESTABLISHED UNDER THE THREATENED SPECIES CONSERVATION ACT 1995

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NSW SCIENTIFIC COMMITTEE

11. Long-footed Potoroo *Potorous longipes* Seebeck and Johnston, 1980 is eligible to be listed as a Critically Endangered species as, in the opinion of the Scientific Committee, it is facing an extremely high risk of extinction in New South Wales in the immediate future as determined in accordance with the following criteria as prescribed by the *Threatened Species Conservation Regulation* 2010:

Clause 8 Low numbers of mature individuals of species and other conditions

The estimated total number of mature individuals of the species is:

(a) very low,

and either:

(d) a projected or continuing decline is observed, estimated or inferred in either of the key indicators:

Professor Michelle Leishman
Chairperson
NSW Scientific Committee

Exhibition period: 17/10/14 – 12/12/14

Proposed Gazettal date: 17/10/14

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NSW SCIENTIFIC COMMITTEE

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NSW SCIENTIFIC COMMITTEE

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