



Consultation Document on Listing Eligibility and Conservation Actions

Lasiorhinus krefftii (northern hairy-nosed wombat)

You are invited to provide your views and supporting reasons related to:

- 1) the eligibility of *Lasiorhinus krefftii* (northern hairy-nosed wombat) for inclusion on the EPBC Act threatened species list in the Critically Endangered category; and
- 2) the necessary conservation actions for the above species.

Evidence provided by experts, stakeholders and the general public are welcome. Responses can be provided by any interested person.

Anyone may nominate a native species, ecological community or threatening process for listing under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or for a transfer of an item already on the list to a new listing category. The Threatened Species Scientific Committee (the Committee) undertakes the assessment of species to determine eligibility for inclusion in the list of threatened species and provides its recommendation to the Australian Government Minister for the Environment.

Responses are to be provided in writing either by email to:
species.consultation@environment.gov.au

or by mail to:

The Director
Marine and Freshwater Species Conservation Section
Wildlife, Heritage and Marine Division
Department of the Environment
PO Box 787
Canberra ACT 2601

Responses are required to be submitted by 15 March 2017.

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General background information about listing threatened species

The Australian Government helps protect species at risk of extinction by listing them as threatened under Part 13 of the EPBC Act. Once listed under the EPBC Act, the species becomes a Matter of National Environmental Significance (MNES) and must be protected from significant impacts through the assessment and approval provisions of the EPBC Act. More information about threatened species is available on the department's website at:

<http://www.environment.gov.au/biodiversity/threatened/index.html>.

Public nominations to list threatened species under the EPBC Act are received annually by the department. In order to determine if a species is eligible for listing as threatened under the EPBC Act, the Threatened Species Scientific Committee (the Committee) undertakes a rigorous scientific assessment of its status to determine if the species is eligible for listing against a set of criteria. These criteria are available on the Department's website at:

<http://www.environment.gov.au/biodiversity/threatened/pubs/guidelines-species.pdf>.

As part of the assessment process, the Committee consults with the public and stakeholders to obtain specific details about the species, as well as advice on what conservation actions might be appropriate. Information provided through the consultation process is considered by the Committee in its assessment. The Committee provides its advice on the assessment (together with comments received) to the Minister regarding the eligibility of the species for listing under a particular category and what conservation actions might be appropriate. The Minister decides to add, or not to add, the species to the list of threatened species under the EPBC Act. More detailed information about the listing process is at:

<http://www.environment.gov.au/biodiversity/threatened/nominations.html>.

To promote the recovery of listed threatened species and ecological communities, conservation advices and where required, recovery plans are made or adopted in accordance with Part 13 of the EPBC Act. Conservation advices provide guidance at the time of listing on known threats and priority recovery actions that can be undertaken at a local and regional level. Recovery plans describe key threats and identify specific recovery actions that can be undertaken to enable recovery activities to occur within a planned and logical national framework. Information about recovery plans is available on the department's website at:

<http://www.environment.gov.au/biodiversity/threatened/recovery.html>.

Information about this consultation process

Responses to this consultation can be provided electronically or in hard copy to the contact addresses provided on Page 1. All responses received will be provided in full to the Committee and then to the Australian Government Minister for the Environment.

In providing comments, please provide references to published data where possible. Should the Committee use the information you provide in formulating its advice, the information will be attributed to you and referenced as a 'personal communication' unless you provide references or otherwise attribute this information (please specify if your organisation requires that this information is attributed to your organisation instead of yourself). The final advice by the Committee will be published on the department's website following the listing decision by the Minister.

Information provided through consultation may be subject to freedom of information legislation and court processes. It is also important to note that under the EPBC Act, the deliberations and recommendations of the Committee are confidential until the Minister has made a final decision on the nomination, unless otherwise determined by the Minister.

Lasiorhinus krefftii

northern hairy-nosed wombat

Taxonomy

Conventionally accepted as *Lasiorhinus krefftii* (Owen 1872).

The taxonomic classification is not fully resolved (Jackson & Groves 2015). *Lasiorhinus krefftii* was originally described in 1872 as a fossil from deposits at Wellington Caves (as *Phascolomys krefftii*). A skin from Moonie Rover, south-eastern Queensland was described by De Vis as *P. gillespiei* in 1900, and the Epping Forest population was described as *L. latifrons barnardi* by Longman in 1939. Some subsequent treatments have treated *barnardi* and *gillespiei* as synonyms of *krefftii*; however Groves (2005) considered that they should be treated as subspecies or distinct species.

Taylor et al. (1994) compared the genetic composition of samples from *L. krefftii* from Epping Forest, to museum specimens from Deniliquin, and to southern hairy-nosed wombats *L. latifrons*, and confirmed that the extinct Deniliquin population was closest genetically to that from Epping Forest.

Woinarski et al. (2014) recognises the relatively conservative option of treating *barnardi* and *gillespiei* as subspecies of *krefftii*, and considers *L. k. gillespiei* to be Extinct and *L. k. barnardi* to be Critically Endangered.

Species/Subspecies Information

Description

The northern hairy-nosed wombat is a ground-dwelling herbivorous marsupial. It has a broad nose, pointy ears and greyish fur. It is heavily built with a broad head, short legs, and strong claws for digging (DEHP 2016). It is the largest of the three extant wombat species, including *Vombatus ursinus* (the common, or bare-nosed wombat) and *Lasiorhinus latifrons* (the southern hairy-nosed wombat). The average adult weight is 32 kg, with adult females slightly heavier than males (Horsup 2004), and can grow to more than one metre in length (DEHP 2016).

Compared with the common wombat, the northern hairy-nosed wombat has softer fur, longer and more pointed ears, and a broader muzzle fringed with fine whiskers. The southern hairy-nosed wombat is similar in appearance to the northern species, but often has a white patch on the nose and chest (DEHP 2016).

Distribution

Fossil records show that the northern hairy-nosed wombat was once widespread across Victoria, New South Wales (NSW) and Queensland (Qld). However, at the time of European settlement it was not common and had a fragmented distribution restricted to three locations: south-central NSW (Deniliquin), south-eastern Qld (St George to Moonie River) and central Qld. By 1908 the species was only found in the Epping Forest area of central Qld, where it is restricted to a 600 hectare area (Johnson 1991; Woinarski et al., 2014). The Epping Forest area was settled in 1860, and high numbers of cattle (*Bos taurus*) were recorded during the early 1900s (Horsup 2004).

At the time of writing this Conservation Advice, the northern hairy-nosed wombat occurs at only two locations: Epping Forest National Park (EFNP) in central Qld; and a translocation-reintroduction site, the Richard Underwood Nature Refuge (RUNR), at Yarran Downs near St George in south-eastern Qld. This reintroduction site is within the species' historic range.

The EFNP comprises approximately 32 km² of *Acacia harpophylla* (brigalow) and *Acacia cambagei* (gidgee) scrubs on heavy non-cracking clay soils. A gully runs north-south through the

EFNP on deep alluvial sands that support trees (*Lysiphyllum hookeri* (bauhinia), *Corymbia clarksoniana* (long-fruited bloodwood) and *Corymbia tessellaris* (Moreton Bay ash)) (Horsup, 2004). The species' estimated range within the EFNP is 3–6 km² (Johnson 1991; A. Horsup pers. comm., cited in Woinarski et al., 2014). Estimates of the number of individuals at the EFNP indicate that there has been an increase from 35 individuals in the 1980s, to 60 individuals in the period 1985–1993 (Horsup 2004), to 200 individuals in 2012 (A. Horsup pers. comm., cited in Woinarski et al., 2014).

The RUNR colony was established in 2009, with 15 northern hairy-nosed wombats translocated from the EFNP between 2009 and 2013. The RUNR comprises about 1.3 km² of eucalypt woodland on old river levees, and the northern hairy-nosed wombat habitat is enclosed by a predator-proof fence (DEHP 2016). At the time of writing this Conservation Advice published information about the size of the species' range within the 1.3 km² RUNR was not available.

Relevant Biology/Ecology

The northern hairy-nosed wombat shelters during the day in burrows within extensive warren systems, and forages at night (DEHP 2016). At the EFNP, they inhabit open eucalypt woodland and dig burrows in deep, sandy soils on levee banks deposited by a creek that no longer flows through the area. They will forage in areas of heavy clay soils adjacent to the sandy soils, but do not dig burrows in these areas, which become water-logged in the wet seasons (DEHP 2016).

The wombat burrows are often located close to *Lysiphyllum hookeri* (native bauhinia), the roots of which probably provides stability for the extensive burrows. The burrows have several entrances and may be used by more than one individual (probably female-female and not female-male associations), but 70 percent of the time are used by a solitary individual (Horsup 2004). The burrows provide effective shelter from the hot and cold temperatures experienced in central Queensland, and probably assist the northern hairy-nosed wombat to minimise water loss during hot and dry environmental conditions (Horsup 2004).

The diet of northern hairy-nosed wombats mostly comprises native grasses (e.g. *Aristida* spp. (three-awned grasses) and *Enneapogon* spp. (bottle-washer grasses)). However, dietary studies indicate that individuals are increasingly consuming the introduced buffel grass (*Cenchrus ciliaris*), which has increased in abundance from two to 27 percent between 1982–83 and 1993–96 (Horsup 2004). The heavy clay soils support the year-round supply of grass that the northern hairy-nosed wombat requires. The estimated size of the area that adult northern hairy-nosed wombats graze, and the number of hours at night that they are active, differs between seasons: six hectares grazed over six hours in winter (dry season), compared to three hectares grazed over two hours in summer (wet season) (Johnson 1991, cited in Horsup 2004).

Breeding is closely linked to summer rainfall and the increased availability of grass at that time. Females give birth to a single young, and capture data indicate that most young are born between November and April. The young leave the pouch after eight to nine months, and are weaned the following summer when they are around 12 months old. Before weaning, the young remain inside the burrows while their mothers forage at night (Horsup 2004).

The proportion of females breeding in the population has been correlated to summer rainfall. In periods of good rainfall, females can breed once every two years; single young are born during spring-summer and spend 9–10 months in the pouch (Woinarski et al., 2014). Reproductive output is considerably reduced in drought years: only 20 percent of the females in the population were recorded as breeding during a drought in 1996–97, compared to 50–75 percent during 1985–93 (Crossman et al., 1994, cited in Horsup 2004). Similarly, the proportion of independent young (weighing less than 22 kg) in the population declined from 71 percent in 1985–87 to 27 percent during the 1996–1997 drought (Horsup 2004).

The species is relatively long-lived, with records of captive and tagged wild individuals living up to 25–30 years (Horsup 2004; DEHP 2016). Females are estimated to reach sexual maturity at two and a half years and males at three years (DEHP 2016). Generation length is estimated at 14 years (Woinarski et al., 2014).

A low adult mortality rate has been recorded for the species, even during drought conditions (Horsup 2004; DEHP 2016). Burrows, and the stable environment that they provide, have been attributed as assisting individuals to conserve energy and minimise water loss (DEHP 2016). Supplementary food and water is provided at EFNP and RUNR; however, while some individuals use these resources, particularly in winter and during dry conditions, not all northern hairy-nosed wombats will use them.

Threats

The species' historic decline is mainly attributed to the impacts of pastoralism, exacerbated during periods of drought (Dinwoodie 2012). Other factors that have contributed to population declines include predation by dingoes and wild dogs, and habitat degradation associated with the spread of the prolific buffel grass (Horsup 2004; Dinwoodie 2012).

Table 1 – Threats impacting the northern hairy-nosed wombat in approximate order of severity of risk, based on available evidence

Threat factor	Threat type	Threat status	Evidence base
Invasive species and competition from native species (including threats from grazing and predation)			
Predation by dingoes and wild dogs	known	past	<p>Episodes of predation by <i>Canis dingo</i> (dingo) and wild dog (<i>Canis lupus familiaris</i>) have been a major cause of mortality for the managed population (Banks et al., 2003b; Horsup 2004). A 20 km long predator-proof fence was constructed to enclose northern hairy-nosed wombat habitat at EPNP in 2002, following episodes of dingo and wild dog predation during 2000–01 that killed 10 northern hairy-nosed wombats (Horsup 2004).</p> <p>The predator-proof fence at EFNP also excludes foxes (<i>Vulpes vulpes</i>), but not cats (<i>Felis catus</i>). Horsup (2004) notes that while foxes and cats are not known to prey on the northern hairy-nosed wombat, they may pose a potential threat to juveniles and they carry diseases that affect the other species of wombats (e.g. toxoplasmosis and sarcoptic mange). The predator-proof fence at RUNR excludes all predators, including cats.</p>
Weeds – habitat degradation and fire	potential	current	<p>Buffel grass (<i>Cenchrus ciliaris</i>) outcompetes native grasses and probably leads to a reduction in the diversity of preferred grasses for feeding (Horsup 2004); it also leads to a change in the fire frequency by providing fuel continuity. This grass is increasing in abundance in northern hairy-nosed wombat habitat, and is increasingly being used as a food source. A decrease in the quality of food may potentially affect the health of the species (Horsup 2004).</p>
Competition for food from native and introduced herbivores	potential	current	<p>Given the fenced nature of the existing colonies and the lack of suitable and connected habitat beyond, the current populations of northern hairy-nosed wombats rely upon a supplemented diet. <i>Macropus giganteus</i> (eastern grey kangaroos) and <i>Wallabia bicolor</i> (swamp wallabies) compete with wombats for access to supplementary water provided at water stations. Eastern grey kangaroos compete with wombats for grass, especially during extended dry periods. Swamp</p>

			<p>wallabies usually consume all the supplementary feed at feed stations before wombats can access it (Horsup 2013).</p> <p>Wombats also compete for resources with rabbits (<i>Oryctolagus cuniculus</i>) which occur within the fence-enclosed sites at EFNP and RUNR (Horsup 2004). The potential for competition may increase during drought (Dinwoodie 2012).</p>
Habitat modification and disturbance (including from fire)			
Habitat loss and fragmentation	known	past and current	Habitat at the two known localities is not under threat of being cleared or grazed by livestock. However, ongoing loss of habitat through tree clearing and habitat alteration across the species' former range reduces the quality and quantity of potential sites, and limits the number of places, at which to establish new populations of northern hairy-nosed wombats in the future (Horsup 2004; DEHP 2016).
Competition for food with domestic stock	known	past	<p>The decline in the species' distribution and abundance has been attributed to the effects of grazing by domestic livestock, particularly cattle. The threat of competition with domestic livestock is now controlled at the two known localities, with fencing erected to preclude cattle from the EFNP site in 1981 and the RUNR site in 2009 (Horsup 2004).</p> <p>However, the presence of introduced grazing animals across the species' former range threatens potential wombat habitat, and future reintroduction sites will need to be destocked if livestock are present.</p>
Limited availability of food within a restricted distribution	known	current	<p>The species' range is small (AOO is less than 10 km²) and restricted to two fence-enclosed locations (EFNP and RUNR), meaning individuals cannot emigrate to find new resources or refuges. As such, the species' resilience is reduced against factors that may deleteriously impact the health of individuals, including environmental conditions that reduce the availability of food for prolonged periods (e.g. fire, floods, drought or climate change). Drought slows reproductive output, and reduces body condition and survival rates of the species (DEHP 2016). During floods in 2008, burrows were not inundated at EFNP, but the area was surrounded by flood water (DEHP 2016).</p> <p>Climate change is likely to reduce grasslands available for foraging, and increase the frequency of severe drought and floods. The species' small range and population size means that even a small number of individual deaths may significantly impact the species.</p>
Wildfire	potential	potential	Wombats are well protected from fire in their burrows, but fire threatens their food supply (DEHP 2016).
Disease			
Disease within a restricted	potential	potential	No life-threatening diseases have been detected in the northern hairy-nosed wombat (Horsup 2004). Diseases,

distribution			such as toxoplasmosis (<i>Toxoplasma gondii</i>) (found in cat faeces) and sarcoptic mange (<i>Sarcoptes scabiei</i>), may pose a potential threat, but at the time this Conservation Advice was written they were not known to affect the northern hairy-nosed wombat. However, the species' small range and population size, along with its lowered genetic variability, means that its resilience against disease is low and any impacts from disease may be significant.
Lack of genetic viability			
Lowered genetic variability	known	current	In the 1980s, the total population had declined to an estimated 35 individuals, creating a genetic bottleneck. Genetic analysis has confirmed that the species has less genetic variability than the closely related southern hairy-nosed wombat (Taylor et al., 1994). The species is therefore susceptible to genetic threats such as further loss of genetic variation, inbreeding and reduced resilience to disease.

Assessment of available information in relation to the EPBC Act Criteria and Regulations

Criterion 1. Population size reduction (reduction in total numbers)			
Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	Critically Endangered Very severe reduction	Endangered Severe reduction	Vulnerable Substantial reduction
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3, A4	≥ 80%	≥ 50%	≥ 30%
<div style="display: flex; align-items: flex-start;"> <div style="flex: 1;"> <p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.</p> <p>A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3]</p> <p>A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.</p> </div> <div style="flex: 1; padding-left: 20px;"> <p style="text-align: center;"><i>based on any of the following</i></p> <ul style="list-style-type: none"> (a) direct observation [except A3] (b) an index of abundance appropriate to the taxon (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat (d) actual or potential levels of exploitation (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites </div> </div>			

Evidence:

The population size and sex ratio of the northern hairy-nosed wombat has been monitored since the mid-1980s (e.g. Hoyle et al., 1995), and recently using genetic analysis of hair samples (Banks et al., 2003a). Results from those counts have been consistently corroborated with monitoring data related to burrow activity (A. Horsup pers. comm., cited in Woinarski et al., 2014). The monitoring data indicate a marked increase in population size subsequent to the 1980s (Fig. 1).

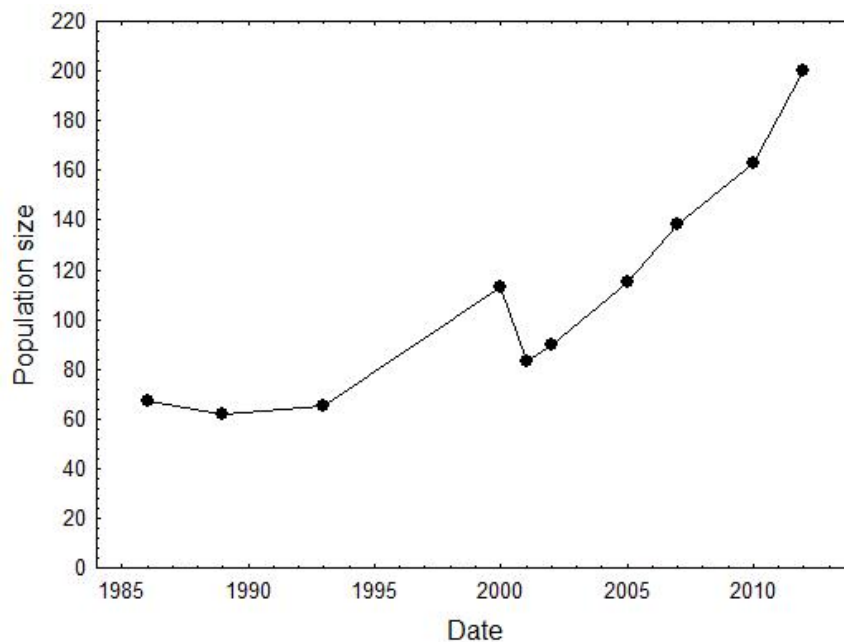


Fig. 1. Changes in population size of Northern Hairy-nosed Wombat, Epping Forest

In the 1980s, the total population was estimated to be about 35 individuals, a considerable decline from that known for the area over preceding decades (Horsup 2004). However, with intensive management (initially including removal of cattle: Gordon et al., 1985; Taggart et al., 2008), this increased to about 113 individuals in 2000, to 138 in 2007 (Dinwoodie 2012), to 163 in 2010 (A. Taylor pers. comm., cited in Woinarski, 2014) and to about 200 in 2012 (A. Horsup pers. comm., cited in Woinarski, 2014). Of these, about two-thirds of the population are considered to be mature adults (A. Horsup pers. comm., cited in Woinarski, 2014).

In 2000–2001, predation by dingoes caused about 15–20 deaths, but that problem has been resolved through establishment of a 20 km dingo-proof fence (Horsup 2004). Breeding females formerly comprised a minority of the population, with their number estimated at 25 in 2000 (Banks et al., 2003a). However, the proportion has increased to close to parity, with a more recent estimate of 87 breeding females (A. Taylor pers. comm., cited in Woinarski, 2014).

The data presented above appear to demonstrate the species is not eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 2. Geographic distribution as indicators for either extent of occurrence AND/OR area of occupancy			
	Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited
B1. Extent of occurrence (EOO)	< 100 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
AND at least 2 of the following 3 conditions indicating distribution is precarious for survival:			
(a) Severely fragmented OR Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			

- (c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals

Evidence:

The extent of occurrence and area of occupancy of the northern hairy-nosed wombat are both estimated to be 6 km² (Woinarski et al., 2014), and meet the thresholds for listing as Critically Endangered.

The translocated population at RUNR is considered to be part of the same subpopulation and location as the persistent population at EFNP, as its viability in the short- to medium-term may depend upon an ongoing exchange of individuals with the source population (Woinarski et al., 2014). Therefore, the species occurs at a single location and the threshold for listing as Critically Endangered under condition (a) is met. Habitat quality is inferred to be decreasing due to the spread of non-native grasses (Woinarski et al., 2014), which satisfies condition (b)(iii).

The data presented above appear to demonstrate that the species is **eligible for listing as Critically Endangered** under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 3. Population size and decline				
		Critically Endangered Very low	Endangered Low	Vulnerable Limited
Estimated number of mature individuals		< 250	< 2,500	< 10,000
AND either (C1) or (C2) is true				
C1	An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future)	Very high rate 25% in 3 years or 1 generation (whichever is longer)	High rate 20% in 5 years or 2 generation (whichever is longer)	Substantial rate 10% in 10 years or 3 generations (whichever is longer)
C2	An observed, estimated, projected or inferred continuing decline AND its geographic distribution is precarious for its survival based on at least 1 of the following 3 conditions:			
(a)	(i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
	(ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%
(b)	Extreme fluctuations in the number of mature individuals			

Evidence:

In 2012 the population size was estimated at about 200, with two-thirds considered to consist of mature individuals (Horsup pers. comm., cited in Woinarski et al., 2014). At the 2013 census there was an estimated population of 196 wombats at EFNP and 9 wombats at RUNR (DEHP 2016). With an expected increase since 2013, it is estimated that there are approximately 230 northern hairy-nosed wombats in the total population in 2016 (DEHP 2016).

Although the population size is very low, numbers have increased over the past three generation period (42 years). Refer also to Criterion 1.

The data presented above appear to demonstrate the species is not eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 4. Number of mature individuals			
	Critically Endangered Extremely low	Endangered Very Low	Vulnerable Low
Number of mature individuals	< 50	< 250	< 1,000

Evidence:

In 2012 the population size was estimated at about 200, with two-thirds considered to consist of mature individuals (Horsup pers. comm., cited in Woinarski et al., 2014). At the 2013 census there was an estimated population of 196 wombats at EFNP and 9 wombats at RUNR (DEHP 2016). With an expected increase since 2013, it is estimated that there are approximately 230 northern hairy-nosed wombats in the total population in 2016 (DEHP 2016).

The data presented above appear to demonstrate that the species is **eligible for listing as Endangered** under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 5. Quantitative Analysis			
	Critically Endangered Immediate future	Endangered Near future	Vulnerable Medium-term future
Indicating the probability of extinction in the wild to be:	≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)	≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)	≥ 10% in 100 years

Evidence:

A population viability analysis has not been undertaken.

The data presented above appear to demonstrate the species is not eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Conservation Actions

Recovery Plan

A recovery plan for the northern hairy-nosed wombat was developed by the State of Queensland (Horsup 2004) and adopted as a national recovery plan under the EPBC Act in 2005. A review of the plan in 2013 concluded that most of the actions have been implemented. The plan expired in 2016.

A decision about whether there should be a recovery plan for this species has not yet been determined. The purpose of this consultation document is to elicit additional information to help inform this decision.

Primary Conservation Actions

1. Continue to construct and maintain enclosure fencing around existing populations
2. Ensure sufficient food resources by managing competition from other herbivores, invasive weeds, and providing supplementary food and water where required
3. Secure suitable habitat and establish additional populations through reintroductions.

Conservation and Management priorities

Invasive species and competition from native species (including threats from grazing and predation)

- Continue to construct and maintain enclosure fencing around existing wombat populations to exclude domestic stock, dingoes, wild dogs, foxes and cats; remove any of these animals found in the enclosures.
- Regularly inspect fencing, particularly after fires, floods or storm events, and repair immediately where required.
- Monitor the numbers of kangaroos and rabbits and the potential for competition with the northern hairy-nosed wombat, and manage to reduce the numbers of kangaroos and rabbits if required. Provide supplementary food and water where necessary.
- Provide supplementary feeding, if necessary, during periods of low rainfall.
- Control the spread of buffel grass and other invasive weed species.
- Implement weed hygiene practices to prevent the introduction and spread of weeds.

Habitat loss disturbance and modifications (including from fire)

- Re-establish native grasses in areas with existing populations.
- Ensure adjacent land managers are aware of the species' occurrence and implement protection measures against key and potential threats.
- Manage the risk of fire by maintaining a fire break system, and burn periodically to create a mosaic of burned and unburned areas (as per DEHP 2016).

Disease

- Monitor the presence of pathogens and manage any potential outbreaks of disease including, but not limited to, toxoplasmosis and sarcoptic mange.
- Develop and implement a disease incursion protocol to prevent the introduction of disease from other animals and people (such as researchers) entering wombat sites.

Stakeholder engagement

- Continue to foster community and volunteer involvement that provide financial and material contribution, and intellectual benefits to the species' conservation.
- To identify, and potentially protect, further northern hairy-nosed wombat habitat within its former distribution for the purposes of establishing new reintroduction sites, identify the relevant stakeholders and develop appropriate engagement strategies.

Population planning

- Identify suitable habitat sites for potential reintroductions.
- Develop and implement a reintroduction strategy, including how to acquire and manage reintroduction sites.
- Undertake reintroductions to establish additional populations, and manage and monitor the populations to ensure long-term viability.

Survey and Monitoring priorities

- Monitor population numbers and trends, sex ratios, health and reproductive status of the species.
- Support and enhance existing monitoring programs, including maintaining volunteer caretaker programs at all sites for survey and monitoring.
- More precisely assess the species' ecological requirements and the relative impacts of threatening processes, by designing and implementing a monitoring program to obtain and clarify baseline data.
- Monitor (and, if necessary, manipulate) genetic diversity at EFNP and reintroduction site(s).
- Monitor changes in available foraging resources for the species over time.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.

Information and research priorities

- Assess the species' ecological requirements for maintaining self-sustaining populations, including the relationship between population size and the area of fenced enclosures.
- Assess the extent to which food availability may limit population size or reproductive success.
- Investigate the impacts of buffel grass on the health and condition of the species arising from its use as a fodder source.
- Assess the efficacy and impacts of management options for reducing the spread of buffel grass.
- Continue to investigate the requirements for successful reintroduction programs (e.g. number of individuals for each translocation, adverse impacts on the source population at EFNP, conditions to protect the health and welfare of translocated individuals, viability of source and translocated populations).
- Assess options and techniques for, and likely success of, artificial insemination.
- Investigate the feasibility of establishing a captive population.
- Continue to investigate and improve population monitoring techniques.

References cited in the advice

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Consultation questions

1. Do you agree with the current taxonomic position of the Australian Faunal Directory for this taxon (as identified in the draft conservation advice)?
2. Can you provide any additional references, information or estimates on longevity, age of maturity, average life span and generation length?
3. Has the survey effort for this taxon been adequate to determine its national distribution and adult population size?
4. Do you accept the estimate provided in the nomination for the current population size of the taxon?
5. For any population with which you are familiar, do you agree with the population estimate provided? If not, are you able to provide a plausible estimate based on your own knowledge? If so, please provide in the form:
 - Lower bound (estimated minimum):
 - Upper bound (estimated maximum):
 - Best Estimate:
 - Estimated level of Confidence: %
6. Can you provide any additional data, not contained in the current nomination, on declines in population numbers over the past or next 10 years or 3 generations, whichever is the longer?
7. Is the distribution as described in the nomination valid? Can you provide an estimate of the current geographic distribution (extent of occurrence or area of occupancy in km²) of this taxon?
8. Has this geographic distribution declined and if so by how much and over what period of time?
9. Do you agree that the taxon is eligible for inclusion on the threatened species list, in the category listed in the nomination?
10. Do you agree that the threats listed are correct and that their effects on the taxon are significant?
11. To what degree are the identified threats likely to impact on the taxon in the future?
12. Can you provide additional or alternative information on threats, past, current or potential that may adversely affect this taxon at any stage of its life cycle?
13. In seeking to facilitate the recovery of this taxon, can you provide management advice for the following:
 - What individuals or organisations are currently, or need to be, involved in planning to abate threats and any other relevant planning issues?
 - What threats are impacting on different populations, how variable are the threats and what is the relative importance of the different populations?
 - What recovery actions are currently in place, and can you suggest other actions that would help recover the taxon? Please provide evidence and background information.
14. Can you provide additional data or information relevant to this assessment?
15. Can you advise as to whether this species is of cultural significance to Indigenous Australians?