



## Consultation Document on Listing Eligibility and Conservation Actions

### *Myrmecobius fasciatus* (numbat)

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

- 1) the eligibility of *Myrmecobius fasciatus* (numbat) for inclusion on the EPBC Act threatened species list in the 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](mailto: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.

# *Myrmecobius fasciatus*

numbat

*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 will be 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.*

## **Taxonomy**

Conventionally accepted as *Myrmecobius fasciatus* (Waterhouse, 1836). No subspecies are recognised.

## **Species/Subspecies Information**

### **Description**

Numbats are small marsupials, with a head and body length of 200–250 mm and a tail length of 150–180 mm. Males attain slightly higher body weights than females (maximum 700 g and 550 g respectively) (DPaW 2015a).

Its fur is reddish-brown on the head and upper back, with a distinct horizontal black stripe through the eye and partway down the back. There are faint white bands across the body, which become stronger towards the rump where they are accentuated by the progressively darker and eventually jet-black bands between the white bands. The number of white bands varies between four and eleven. The bands are often broken with the two halves offset along the midline. The pattern formed by these bands is unique to the particular animal, and may be used to identify individuals. The hair on the underside of the body is off-white. The tail is covered with long brown hairs, many of which are tipped with white. The underside of the tail, near the body, is brick-red (DPaW 2015a).

The numbat has a pointed nose and elongated jaw which houses 50–52 teeth, the largest number recorded in any Australian terrestrial mammal. The teeth are poorly developed and many do not protrude beyond the gums. The tongue is exceptionally long and can be extended at least 5 cm beyond the tip of the nose (about the length of the head) (DPaW 2015a).

### **Distribution**

The numbat once occurred over much of southern semi-arid and arid Australia, from the west coast of south-western Australia eastwards through the western deserts (Calaby 1960; Finlayson 1961; Burbidge & Fuller 1979; Friend et al., 1982; Burbidge et al., 1988; Peacock 2006) into southern Northern Territory (Woinarski et al., 2007), much of South Australia, western New South Wales and north-western Victoria (Friend 2008). It was apparently absent from the Karri *Eucalyptus diversicolor* forest of south-western Australia and from the Nullarbor Plain, although there is a late Pleistocene fossil record from Madura Cave (Lundelius & Turnbull 1978, cited in Friend 1989). Burbidge et al. (2009), using modern, historical and subfossil data, found that Numbats occurred in 11 of Australia's 85 bioregions and that they became extinct in all but one.

By the 1970s, numbats had disappeared from most of their range, surviving only in small areas of south-west Western Australia (in the northern jarrah forest, Swan coastal plain, Dryandra near Narrogin, Boyagin near Brookton, Tutanning near Pingelly, bushland south of Hyden, and Perup, east of Manjimup). By the 1980s, many subpopulations were lost (Friend 2010), leaving only two: the Dryandra and Perup subpopulations.

In the mid-1980s, experimental fox control at Dryandra demonstrated that the near removal of foxes resulted in a rapid increase in numbat numbers (Friend 1990). Subsequent captive breeding resulted in re-introductions to several sites in south-western Australia, but only some of these were successful. Numbats have been successfully translocated to two fenced areas in eastern Australia from which foxes (*Vulpes vulpes*) and feral cats (*Felis catus*) have been removed: Yookamurra Sanctuary (South Australia, 1994) and Scotia Sanctuary (New South Wales, 1999) (Viera et al., 2007). The numbat populations in these eastern sanctuaries are considered to be self-sustaining.

### Relevant Biology/Ecology

The numbat's original habitat ranged from *Acacia aneura* (mulga) woodland and sand plain and sand dune areas dominated by *Triodia* spp. (spinifex) hummock grassland in the arid zone (Friend et al., 1982; Burbidge et al., 1988) to eucalypt woodlands and forests in south-west Western Australia (Friend 1989). Unusually for an Australian marsupial, it is diurnal and this exposes it to predation by raptors such as *Aquila audax* (wedge-tailed eagles), *Falco berigora* (brown falcons), *Hieraaetus morphnoides* (little eagles) and *Accipiter fasciatus* (brown goshawks), as well as reptiles such as *Varanus gouldii* (Gould's monitor) and *Morelia spilota* (carpet python) (Calaby 1960; Friend 1986). Introduced predators, such as the fox and feral cat, coupled with widespread land clearing in southern parts of its range, are the major causes of its decline. Numbats seek overnight refuge in hollow logs, tree hollows and burrows, which provide protection from predators.

The numbat's diet primarily consists of termites, with some ants apparently ingested accidentally (Friend 1989). Subsurface termite galleries are located by smell and dug out with both front feet. Observations on a captive specimen by Fleay (1942) indicate that 15 000 to 20 000 termites are required by an adult animal each day.

Breeding in the numbat is highly seasonal. Mating occurs in January and the gestation period is 14 days (Friend & Whitford 1986, 1993; Friend 2008). Most young are born in summer (Calaby 1960; Friend & Burrows 1983), although it is possible that some are born as late as April. The usual litter size is four. There is no pouch, and the young are held to the female by their oral attachment to the nipples and the active entwinement of their forelimbs in the crimped hair of the mammary area. Development of the young while attached is particularly slow. The period of attachment is up to six months (Calaby 1960) after which time the young are placed, in July, in a burrow or occasionally a hollow log (Christensen 1975; Friend & Burrows 1983). The female continues to suckle the young in the burrow at night. Juveniles start to emerge from the burrow in September, and are foraging independently by October. By mid-December they have dispersed with dispersal movements of up to 15 km having been observed. Females breed in their first year but males are not sexually mature until their second year (Friend 2008). Longevity does not exceed five years (Friend 2008). Generation length is assumed to be two years (Woinarski et al., 2014).

### Threats

Table 1 – Threats to the numbat in approximate order of severity of risk, based on available evidence

Threat factor	Consequence rating	Extent over which threat may operate	Evidence base
Predation by foxes	Severe to catastrophic	Entire	Foxes have been implicated in the decline of numbats from most of their range (Kinnear et al., 2002; Friend 2008). Numbat numbers increased after fox control (Friend 1990).
Predation by feral	Severe	Entire	Cats predate on numbats;

cats			impact at a population level is likely to be significant.
Predation by raptors	Moderate to severe	Entire	Raptors are natural predators, but raptor numbers are often elevated in remnant vegetation where they can feed on adjacent agricultural lands.
Habitat loss and fragmentation	Severe in past, now minor-moderate	Large	Many vegetation remnants are too small to maintain viable subpopulations.
Inappropriate fire regimes	Minor	Entire	Numbats die in fires and predation rates increase following fires. Frequent hot fires can lead to fewer hollow logs and lower food availability.

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

<b>Criterion 1. Population size reduction (reduction in total numbers)</b>			
Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	<b>Critically Endangered Very severe reduction</b>	<b>Endangered Severe reduction</b>	<b>Vulnerable Substantial reduction</b>
<b>A1</b>	<b>≥ 90%</b>	<b>≥ 70%</b>	<b>≥ 50%</b>
<b>A2, A3, A4</b>	<b>≥ 80%</b>	<b>≥ 50%</b>	<b>≥ 30%</b>
A1	Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.		
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.		
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]		
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.		
	(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		
	<i>based on any of the following</i>		

#### **Evidence:**

Numbers of numbats were very low by the late 1970s, with probably around 300 individuals in total (Friend 2010). Since then the population has increased, with the population size in 2015 estimated to be 600–1000 mature individuals (DPaW 2015b; Table 2). However, a continual decline has been observed in three of the eight self-sustaining populations within the last five years (Table 2).

In Dryandra, after foxes were controlled numbers increased to an estimated 600 in 1992, but declined to around 50 in 2007 (Friend & Burbidge 2008) and then increased to around 80 in 2015 (Friend pers. comm., cited in DPaW 2015b). Research carried out in 2011–12 showed that feral cats have become the main predator of numbats in Dryandra (Friend pers. comm., cited in Woinarski et al., 2014), and the population is declining (Table 2).

At Perup, numbats also declined in the 1970s (Christensen et al., 1984; Friend 1990), but following fox control the population recovered and the distribution expanded (Friend, pers. comm., cited in Woinarski et al., 2014). The population in the Upper Warren, which includes Perup, is now stable or increasing (Table 2).

Translocations/re-introductions have met with varying success, with some failing (e.g. Karroun Hill Nature Reserve, Dale Conservation Park, Karakamia Sanctuary) and others resulting in self-sustaining populations (Boyagin, Batalling, Yookamurra, Scotia). In 2005 half of the reintroduced sites/populations had declined, and there was a lack of success in establishing further populations outside of fenced areas during the early 2000s (T. Friend pers.comm., cited in DPaW 2015b).

Numbats naturally occur at low densities. They do not enter traps and can only be monitored by sighting surveys from vehicles along transects or, in suitable soil types, by track counts (Connell & Friend 1985). Numbats are monitored annually at Dryandra and Boyagin (Western Australia), Scotia (New South Wales) and Yookamurra (South Australia), and less frequently at other sites in Western Australia.

Table 2 – Subpopulation information for the numbat (DPaW 2015).

Location	Survey date	No. Mature individuals	Land tenure	Threats
Dryandra woodland (declining)	2014 (targeted survey)	Estimated maximum 80 adults (T. Friend, pers. comm.) Declining trend over the last 10 years (T. Friend, pers. comm.)	State forest (SF)	Predation, inappropriate fire regimes, genetic viability
Boyagin NR (sustaining)	2014 (targeted survey)	Estimated 50-70 adults (T. Friend, pers. comm.) Stable over the last 10 years (T. Friend, pers. comm.)	Nature reserve (NR)	As above
Batalling SF (sustaining)		Estimated 50-100 adults (Friend, pers.comm.) Declining trend over the last 10 years (Friend, pers.comm.)	SF	As above
Tutanning NR (declining)		Estimated ~20 adults (T. Friend, pers. comm.) Declining trend over the last 10 years (T. Friend, pers. comm.)	NR	As above
Dragon Rocks NR (declining)		Estimated maximum of 30 adults (T. Friend, pers.comm.) Declining trend over the last 10 years (T. Friend, pers. comm.)	NR	As above
Stirling Range NP (status unknown)		There has been no recent confirmation, and no estimates. Declining trend over the last 10 years (T. Friend, pers. comm.)	National Park (NP)	
Cocanarup (status unknown)		Estimated maximum 20 adults however, there has been no recent confirmation but based on the small area of habitat within this	Timber Reserve	

		reserve, few sightings and post translocation declines. Declining trend over the last 10years (T. Friend, pers. comm.)		
Upper Warren (includes Perup)		Population estimate at probably 200-500 (T. Friend, pers. comm.) Stable or increasing trend over the last 10 years (T. Friend, pers. comm.)	SF, NR, NP	
Yookamurra Sanctuary (SA) (sustaining)	2014 (targeted survey)	Estimated population ~110 (2013) (23 recorded in 2014)	Private property – Australian Wildlife Conservancy (AWC)	Fire, native predators
Scotia Sanctuary (NSW) (sustaining)	2013 (targeted survey)	Estimated population ~100 (2013)	Private property – AWC	Fire, native predators

In summary, the overall population is estimated to be declining, but the rate of decline is unlikely to approach 30 percent in a 10 year period (Woinarski et al., 2014). Substantial population size reductions mostly occurred more than 10 years ago (DPaW 2015).

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.

<b>Criterion 2. Geographic distribution as indicators for either extent of occurrence AND/OR area of occupancy</b>			
	<b>Critically Endangered Very restricted</b>	<b>Endangered Restricted</b>	<b>Vulnerable Limited</b>
B1. Extent of occurrence (EOO)	< 100 km <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
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:

Woinarski et al. (2014) estimated the extent of occurrence, including translocations, to be 177 300 km<sup>2</sup>. DPaW (2015b) estimated the EOO to be 62 000 km<sup>2</sup> using a minimum convex polygon around post-2004 database records in Western Australia, plus the area of Yookamurra and Scotia Sanctuaries.

Woinarski et al. (2014) calculated the area of occupancy to be 525 km<sup>2</sup>; however, due to a lack of recent point data they considered this to be a significant underestimate and the AOO is likely

to be around 1200 km<sup>2</sup> (Friend, pers comm., cited in Woinarski et al., 2014). DPaW (2015b) calculated the AOO to be 1650–1658 km<sup>2</sup>, using 2x2 km grids over around post-2004 database records in Western Australia plus the area of Stirling Range NP and Dragon Rocks NR. Both AOO estimates meet the threshold for listing as Vulnerable under Criterion 2 B2.

The species occurs at eight self-sustaining locations/subpopulations (two extant subpopulations and six translocated populations) and has a severely fragmented distribution, which meets condition (a). There is a continuing decline in the number of mature individuals (Woinarski et al., 2014) which meets condition (b)(v).

The data presented above appear to demonstrate that the species is **eligible for listing as Vulnerable** 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
(a) (ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%
(b) Extreme fluctuations in the number of mature individuals			

#### Evidence:

In 2015, the estimated number of mature individuals in Western Australia was 400–800, with the total population estimated to have 600–1000 mature individuals (DPaW 2015b). This meets the threshold for Endangered under this criterion.

The largest population, the Upper Warren, is estimated to have 200–500 individuals (Table 2) and there is an estimated and projected continuing decline in the number of mature individuals (Woinarski et al., 2014; DPaW 2015b). Considering the uncertainty in the data and applying the precautionary approach, the species may be considered to have fewer than 250 mature individuals in each subpopulation, which satisfies Criterion C2(a)(i).

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

**Evidence:**

There is estimated to be fewer than 1000 mature numbats in the wild (see Criteria 1 and 3).

The data presented above appear to demonstrate that the species is **eligible for listing as Vulnerable** 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:**

Population viability analysis appears not to have been undertaken, there are insufficient data to demonstrate if the species is 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 numbat is in place in the State of Western Australia (DPaW 2015a), and a national recovery plan is being prepared for adoption under the EPBC Act.

**Primary Conservation Actions**

1. Control the numbers of foxes and feral cats in areas occupied by numbats
2. Manage and monitor the status of wild and re-introduced populations
3. Continue to undertake captive breeding and targeted translocation programs.

**Conservation and Management Priorities**

Theme	Specific actions	Priority
Active mitigation of threats	Maintain a high degree of control of foxes.	High
	Control feral cats as technology becomes available.	High
	Minimise predation by raptors in vegetation remnants.	High

	Where possible and effective, enhance habitat extent and connectivity.	Low
Captive breeding	Maintain captive colonies as insurance against extinction in the wild and as a source of animals for translocations.	High
Quarantining isolated populations	N/a	
Translocation	Continue to translocate to sites where threatening processes are ameliorated.	High
Monitoring	Maintain monitoring of all subpopulations.	High
Community engagement	Maintain community involvement and education.	Medium

### Survey and Monitoring priorities

Theme	Specific actions	Priority
Survey to better define distribution	N/a	
Establish or enhance monitoring program	Develop better ways of estimating the size of numbat subpopulations	High

### Information and Research priorities

Theme	Specific actions	Priority
Assess impacts of threats on species	N/a	
Assess effectiveness of threat mitigation options	Continue to assess the effectiveness of fox and feral cat control	High
Assess habitat requirements	N/a	
Assess diet, life history	N/a	
Undertake research to develop new or enhance existing management mechanisms	Develop broad-scale, targeted feral cat eradication technology	High

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Available on the internet at: [www.iucnredlist.org](http://www.iucnredlist.org)

## **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 km<sup>2</sup>) 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?