Australian Government
Department of the Environment

Consultation Document on Listing Eligibility and Conservation Actions

Litoria nannotis (waterfall frog)

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

1) the eligibility of *Litoria nannotis* (waterfall frog) for inclusion on the EPBC Act threatened species list; 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 2 March 2018.

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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.

Privacy notice

The Department will collect, use, store and disclose the personal information you provide in a manner consistent with the Department's obligations under the Privacy Act 1988 (Cth) and the Department's Privacy Policy.

Any personal information that you provide within, or in addition to, your comments in the threatened species assessment process may be used by the Department for the purposes of its functions relating to threatened species assessments, including contacting you if we have any questions about your comments in the future.

Further, the Commonwealth, State and Territory governments have agreed to share threatened species assessment documentation (including comments) to ensure that all States and Territories have access to the same documentation when making a decision on the status of a potentially threatened species. This is also known as the 'common assessment method'. As a result, any personal information that you have provided in connection with your comments may be shared between Commonwealth, State or Territory government entities to assist with their assessment processes.

The Department's Privacy Policy contains details about how respondents may access and make corrections to personal information that the Department holds about the respondent, how respondents may make a complaint about a breach of an Australian Privacy Principle, and how the Department will deal with that complaint. A copy of the Department's Privacy Policy is available at: http://environment.gov.au/privacy-policy

Litoria nannotis

(waterfall frog)

Taxonomy

Conventionally accepted as *Litoria nannotis* (Andersson, 1916)

Species Information

Description

The waterfall frog is larger than the other torrent treefrogs (*Litoria lorica* (armoured mistfrog)*, L. rheocola* (common mistfrog) and *L. nyakalensis* (mountain mistfrog)). The waterfall frog is slate, olive or dull brown on the back, and white or cream on the belly. There are often brown areas on the throat, and the armpits and groin area are flesh-coloured. There is extensive, irregular dark mottling all over the body. The skin is finely granular with occasional small, scattered warts. The species has large fingers with basal webbing and large toe discs that are nearly fully webbed. There is no vocal sac. The snout is bluntly rounded, and the tympanum (ear disc) is indistinct (Liem 1974; Anstis 2013). The male mating call has been described as a repeated "crawk crawk crawk" or a gentle, popping, slow growl-like sound that is difficult to hear above the sound of flowing water (McDonald 1992; Richards 1993). Body size varies geographically, with individuals from the Carbine Tablelands being larger than other specimens. Body size varies from 40−53 mm snout-to-vent (SVL) length in most populations to 54−60 mm SVL in the Carbine Tableland population (Cunningham 2002).

Unpigmented eggs (136−216 eggs per clutch; 1.98−3.4 mm diameter) are laid in gelatinous egg masses under rocks in water (Liem 1974; Hero & Fickling 1996). The tadpoles are adapted for fast flowing stream conditions, having a suctorial mouth, muscular tail, narrow tail fins and ventro-lateral spiracle (external respiratory opening)(Liem 1974).

Distribution

The waterfall frog has three deeply divergent (genetically distinct) lineages, distributed from Paluma to the Tully River, the Tully River to Lamb Range, and Mount Lewis to Big Tableland (Schneider et al. 1998). Its extent of occurrence has been estimated at approximately 9000 km².

Historically the waterfall frog occurred throughout the Wet Tropics Biogeographical Region between Paluma and Mungumby Creek in north-east Queensland, at altitudes of 80−1300 m (McDonald 1992). Since 1990, population declines have been recorded at most upland sites; a survey during the summer of 1991−1992 between Townsville and Cooktown found that it was present at only one of 21 previously occupied upland sites south of the Daintree River (Richards et al. 1993). This range contraction continued, affecting upland rainforest sites between the Daintree and Bloomfield Rivers in 1993 (Ingram & McDonald 1993; Trenerry et al. 1994), and sites north of the Bloomfield River in 1994 (McDonald & Alford 1999). Following the major declines, the waterfall frog had disappeared from most upland sites above 400 m where it was previously recorded, with stable populations only occurring at lowland sites (180−400 m) (Richards et al. 1993; Laurance et al. 1996; McDonald & Alford 1999).

In 2011−2014, surveys of several frog species in the Wet Tropics recorded the waterfall frog at two upland rainforest sites on the Carbine Tableland that it had previously disappeared from, suggesting that the species may be recovering in some localized areas. Additionally, the surveys found that the waterfall frog persisted at many sites in the rainforest−dry forest ecotones on the western periphery of the Wet Tropics; the species was recorded at nearly all dry forest sites surveyed, with the sites located up to 20 km from rainforest at altitudes of 400−1000m (Hoskin & Puschendorf 2014). The chytrid fungus was present on more than 50 percent of all

the frogs swabbed (over 400 waterfall frogs over 18 sites), but there were only clinical signs of chytrid disease (i.e. sick and dying frogs) at one dry forest site (Hoskin & Puschendorf 2014). Puschendorf et al. (2011) hypothesised that the hotter environmental (rock surface) temperatures of dry forest sites compared to rainforest sites inhibits the chytrid fungus proliferating on the frogs' skin. Recent work by McKnight et al. based on surveys during 2015-2017 found that the waterfall frogs have made a strong recovery in the upland sites and were found to be present in many of the upland streams from which they had previously disappeared. Their work presents several possible hypotheses to explain this recovery.

Relevant Biology/Ecology

The waterfall frog is a stream dwelling species that is endemic to the Wet Tropics Bioregion (Williams & Hero 1998; Williams & Hero 2001; Hodgkinson & Hero 2003). It is restricted to rocky stream habitats in rainforest or wet sclerophyll forest where there is fast flowing water, waterfalls and cascades (Liem 1974; McDonald 1992). Unlike most stream-breeding frog species that live in the adjacent forest and use the stream habitat for breeding, both males and females use the stream as primary habitat throughout the year (Hodgkinson & Hero 2001; Hodgkinson & Hero 2003). Adults are generally found on boulders beside or behind waterfalls, but may be perched on trees or litter beside streams (Liem 1974). Adults and juveniles sometimes form small aggregations (4−6 individuals) amongst large boulders behind waterfalls (Liem 1974).

Tadpoles are predominantly found in fast flowing sections of streams, in riffles or torrents, adhering to rocks (Richards 1992). The waterfall frog is one of the few Australian species where the tadpoles exhibit adaptations to torrent environments, such as a streamlined body shape, large suctorial mouthparts and a muscular tail (Liem 1974; Richards 1992; Anstis 2013).

Gravid females, and males with nuptial pads, are encountered all year round (McDonald & Martin unpubl. data, cited in NQTFRT 2001) indicating that breeding can occur at any time of year. Breeding occurs in streams (Hodgkinson & Hero 2001). Unpigmented eggs (136−216 eggs per clutch; 1.98−3.4 mm diameter) are laid in gelatinous egg masses under rocks in water (Liem 1974; Hero & Fickling 1996).

The waterfall frog displays distinctly different nocturnal and diurnal behaviour. During the day nearly all frogs are restricted to the stream environment where they shelter in small refuges behind waterfalls or wedged between rocks in the stream. Waterfall frogs occasionally bask in splash zones beside waterfalls (Hodgkinson & Hero 2001). At night, the species is much more active; individuals can be found in exposed positions within the stream, and some venture away from the water to forage in streamside vegetation. Waterfall frogs do not move further than 15 m from the stream, and always return before dawn (Hodgkinson & Hero 2001).

Threats

The waterfall frog is one of seven species of frogs occurring in upland rainforest streams in north-eastern Queensland that experienced substantial range contractions and population declines between 1988 and late 1994 (Ingram & McDonald 1993; Richards et al. 1993). These species share the common characteristics of having a low fecundity, a high degree of habitat specialisation and reproduction in fast flowing streams (Williams & Hero 1998). The declines are believed to be due to the chytrid fungus.

The table below lists the threats impacting the species in approximate order of severity of risk, based on available evidence.

Threat factor	Consequence rating	Extent over which threat may operate	Evidence base
Disease - Chytrid fungus	Severe	Whole of range	Chytridiomycosis is an infectious disease caused by the

			amphibian chytrid fungus (*Batrachochytrium dendrobatidis*) that affects amphibians worldwide, causing mass die-offs and some species extinctions (Department of the Environment and Energy 2016). Chytridiomycosis has become endemic in the Wet Tropics of Queensland, with infection prevalence higher during winter and at higher elevations (600−800 m) (Woodhams & Alford 2005). There is considerable circumstantial evidence to support the hypothesis that chytridiomycosis, caused by the chytrid fungus or a viral infection, has contributed to the decline of upland stream-dwelling frog species (Laurance et al. 1996; Berger et al. 1998). Declines have been rapid, occurring over 2−3 month periods (McDonald & Alford 1999), and there is little evidence that environmental changes such as adverse weather, habitat destruction or pollution were responsible. However, there is now evidence that waterfall frog populations persist in warmer and drier sites on the periphery of their former range despite high prevalence of chytrid infection (Hoskin & Puschendorf 2014).
Invasive species	Severe	Most of range	Yellow crazy ants spray formic acid to subdue prey, which causes burns and irritates the skin and eyes of animals. They can have severe impacts on a range of ecological processes and lead to significant loss of biodiversity. Yellow crazy ants were detected within the World Heritage Area and Little Mulgrave National Park in 2012 and now cover up to 61 ha (WTMA 2016) within these protected areas. In December 2013 yellow crazy ants were also detected in the Kuranda area (WTMA 2016).
Climate change (temperature	Moderate	Whole of range	Climate change is predicted to result in increased rainfall across

increase, extreme weather events e.g. cyclones, droughts)			northern Australia (Haylock & Nicholls 2000). This may alter the hydrology and breeding frequency of stream-dwelling frogs, and make them vulnerable to being dislodged in high flows. Changes in hydrology and other effects of climate change (e.g. reduction in food supply) may also alter the susceptibility of frogs to the chytrid fungus, but these impacts are likely to be variable among species and sites (DoEE 2016).
Habitat loss and degradation (e.g. clearing, trampling, fragmentation, altered hydrology, salinity)	Moderate	Part of range	Feral pigs are responsible for riparian habitat damage and potentially cause adult frog mortality. However there is very little research into their impacts on native frog populations (Richards et al. 1993).

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%**

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.

based on any of the followin

(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

Evidence:

While there was a substantial decline in both abundance and extent of occurrence of this species, it occurred in the early 1990s, over 15 years ago. While there is no estimate of generation length for this species, it is may be similar to two similar-sized *Litoria* species found in similar habitats (Red-eyed Tree Frog (*L. chloris*), Lesueur's Tree Frog (*L. lesueuri*))(Morrison

et al. 2004) and thus less than approximately four years. The initial decline in abundance of this species is thus outside of the timespan stipulated for this criterion.

Since the 1990s decline the population has stabilised and it remains abundant at lowland sites and recent surveys show that it is present in many of the upland streams from which they had previously disappeared (McKnight et al. 2017). Additionally, the species has persisted under these conditions despite the presence of chytrid fungus and thus further decline cannot be inferred or projected.

The data presented above appear to be demonstrate that the **species is ineligible 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 km²**	**< 5,000 km²**	**< 20,000 km²**
B2. Area of occupancy (AOO)	**< 10 km²**	**< 500 km²**	**< 2,000 km²**
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 calculated extent of occurrence is 19 500 km^2, and the area of occupancy is 224 km^2 (DoEE 2017). These figures are based on the mapping of point records from post-1997 observations (20 year timeframe), compiled from state and Commonwealth agencies along with museums, herbaria, research institutions and non-government organisations. The EOO was calculated using a minimum convex hull, and the AOO calculated using a 2x2 km grid cell method, based on the IUCN Red List Guidelines 2014.

The species is widespread over a large area of the Wet Tropics, there are more than 10 populations and it is not severely fragmented. Given the stability in population sizes despite the long term exposure to chytrid fungus no continuing decline is anticipated. The species does not show extreme fluctuations.

The data presented above appear to demonstrate that the species is **species is ineligible 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 3. Population size and decline			
	Critically Endangered	**Endangered Low**	**Vulnerable Limited**

		Very low		
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:

The waterfall frog is abundant at lowland sites (e.g. Phillott et al. 2010) covering an extensive area and thus population is likely to exceed 10 000 individuals.

The data presented above appear to demonstrate that the species is **ineligible 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:

The waterfall frog is abundant at lowland sites covering an extensive area and thus population is likely to exceed 10 000 individuals

The data presented above appear to demonstrate that the species is **ineligible 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 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,**	**≥ 20% in 20 years or 5 generations,**	**≥ 10% in 100 years**

	whichever is longer (100 years max.)	**whichever is longer (100 years max.)**	

Evidence:

Population viability analysis has not been undertaken. Therefore, 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.

Consideration for delisting

The waterfall frog was listed as Endangered under the EPBC Act at the commencement of the Act in 2000. There was a dramatic range contraction with an observed reduction in population size in the late 1980s and early 1990's due to the spread of the chytrid fungus. However, the waterfall frog population appears now to have remained relatively stable at low altitude sites (< 400 m asl)(e.g. McDonald & Alford 1999; Northern Queensland Threatened Frogs Recovery Team 2001; Hodgkinson & Hero 2003; Phillott & Young 2009; Phillott et al. 2010; Hoskin & Puschendorf 2014).

The waterfall frog has extensive occupied habitat located within protected areas in Queensland (Wet Tropics World Heritage Area). Delisting the species is not expected to result in the loss of any recovery actions that could result in it becoming eligible for re-listing in the future.

Note: if the species is found to be ineligible for listing as a threatened species under the EPBC Act, the following section of this consultation document will not be relevant

Conservation Actions

Recovery Plan

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.

Conservation and Management priorities

Disease

- Minimise the spread of the chytrid fungus by implementing suitable hygiene protocols to protect priority populations, as described in the Threat abatement plan for infection of amphibians with chytrid fungus resulting in chytridiomycosis (DotEE 2016).
- Provide disease identification and prevention protocols (methods of handling, diagnostic keys, etc) to researchers and land managers for use in the field.

Invasive species (including threats from grazing, trampling, predation)

- Reduce the impacts of habitat destruction by feral pigs on existing populations by using fencing (where feasible) and reducing pig numbers.
- Control yellow crazy ants by baiting at critical stages of the ants' life cycle.

Stakeholder Engagement

- Collaborate with land managers bordering (outside of) the Wet Tropics World Heritage Area to protect and manage dry forest areas where the species occurs, or which contain potential habitat for the species, from threats due to disease and invasive species.

- Interested nature conservation, land management and land holder groups could be engaged in conservation management activities, such as survey and monitoring, but should be made aware of the need to follow correct field practices and hygiene protocols to mitigate the risks of trampling and disease transmission. If necessary, use workshops to aid stakeholders in developing the skills and knowledge required to manage threats to this species while undertaking these activities.
- Inform the public about the status and recovery efforts for the species, e.g. by providing information to visitors to the Wet Tropics World Heritage Area and publicising the species through the media.

Survey and Monitoring priorities

- Monitor the abundance at selected monitoring sites over time, to more precisely assess population size, and to ensure that population densities are self-sustaining and remain at or increase above current levels.
- Monitor the health of the existing population(s) to ensure that diseases or other factors are not threatening the species, and to improve understanding of how the species can survive through disease outbreaks.
- Undertake targeted surveys in suitable habitat and potential habitat to locate any additional populations.

Information and research priorities

- Investigate the ecological requirements (e.g. habitat use, diet, movement patterns) and life history characteristics of the species relevant to its persistence.
- Improve understanding of the impact of infection by chytrid fungus on the waterfall frog to better inform existing or new conservation actions. This includes knowledge on:
    - the different strains of the fungus;
    - levels of virulence;
    - mechanisms for resistance to the disease;
    - treatment options; and
    - the potential of other species (e.g. freshwater crayfish) to act as reservoirs or vectors for transmission of the fungus (DotEE 2016).
- Improve understanding of how climate change will likely impact the waterfall frog due to altered temperatures, rainfall, environmental stressors and diseases.
- Improve understanding of the impacts of feral pigs and yellow crazy ants on the waterfall frog.
- Improve understanding of husbandry methods for the species.
- Improve understanding of the impacts of environmental toxins.

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Wet Tropics Management Authority (WTMA) (2016). Stamp Out Yellow Crazy Ants. Viewed 2 December 2016. Available on the internet at: http://www.wettropics.gov.au/stamp-out-yellow-crazy-ants.html.

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^2) 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?
    - Would the development and implementation of a translocation strategy be of benefit?
    - 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?