



Consultation Document on Listing Eligibility and Conservation Actions

***Trisyntopa scatophaga* (antbed parrot moth)**

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

- 1) the eligibility of *Trisyntopa scatophaga* (antbed parrot moth) 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 is 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
Terrestrial Species Conservation Section
Wildlife, Heritage and Marine Division
Department of the Environment
PO Box 787
Canberra ACT 2601

Responses must be submitted by Monday 1 August 2016.

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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.

Trisyntopa scatophaga

antbed parrot moth

Taxonomy

Conventionally accepted as *Trisyntopa scatophaga* (White).

Species/Sub-species Information

Description

The antbed parrot moth (family Oecophoridae), is small and grey. The wingspan of males is approximately 30-35 mm, females approximately 40 mm (Turner 1923). Much of the body is dark in colour, although the hindwings are paler, and slightly broader, than the forewings. The only distinctive colouration on the wings is a dark spot near the centre. The wing margins bear numerous hairs. The adult mouthparts, especially the proboscis, are greatly reduced (Turner 1923).

Larvae are creamy-white, approximately 3 cm long prior to pupation. They bear numerous dark spots with fine hairs (Turner 1923). One pupa has been recorded: 14 mm long, with two, 1 mm long, finger-like projections on the ventral surface near the head. The cocoon into which the larva retreats after feeding is a soft, oval, silken tube, approximately 25 mm long, and open at one end (Turner 1923).

Distribution

The antbed parrot moth has been collected from only one location: approximately 15 km north of Coen and 4 km east of Mt Croll, in the Kulla-McIlwraith Range National Park, in far north Queensland (Atlas of Living Australia 2016). The moth occurs exclusively in association with *Psephotus chrysopterygius* (golden-shouldered parrot), whereby the nestlings' excreta is eaten by larvae of the moth within the bird's nest (Turner 1923; Higgins 1999). This parrot is endemic to southern and central Cape York Peninsula, where it creates nests excavated in termite mounds in grassy areas within tea-tree (*Melaleuca* spp.) or *Eucalyptus chlorophylla* (shiny-leafed box) savannas (Garnett et al., 2011). The golden-shouldered parrot also occurs in parts of Alwal and Staaten River National Parks, and in several cattle stations (Garnett et al., 2011) on Indigenous land.

Although the antbed parrot moth has been collected from only one locality, it is certainly much more widespread, as indicated by the following accounts: 'larvae..[have been found] in every nest examined, with one exception...' (Turner 1923, p. 170), 'nests [are] usually colonised by..[the].. moth' (Higgins 1999, p. 454), and 'most nests are occupied by moth larvae' (Zborowski & Edwards 2007, p. 72). During surveys at Artemis Station, in south-central Cape York Peninsula, larvae were found in 97.4% of nest cavities (S. Shephard pers. comm., cited in Cooney et al., 2009a). The extent of occurrence (EOO) of the golden-shouldered parrot has been estimated to be approximately 3000 km² and stable, and the area of occupancy (AOO) has been estimated to be 1800km² and declining (Garnett et al., 2011). Therefore, the EOO and AOO of the antbed parrot moth may be similar to those of the golden-shouldered parrot, although this needs to be confirmed by systematic surveys.

Nests are excavated by the golden-shouldered parrot almost exclusively in the conical mounds of *Amitermes scopulus*, but nests are also known from the magnetic mounds of *A. laurensis*, and the turret-shaped mounds of *Nasutitermes triodiae* (spinifex termite) (Higgins 1999). *Amitermes scopulus* is endemic to central and northern Cape York Peninsula; *A. laurensis* occurs in the tropics of northern Queensland and the Northern Territory, and *N. triodiae* occurs across the northern half of Australia (Watson & Abbey 1993).

The antbed parrot moth is wholly dependent on the golden-shouldered parrot. The moth has not been found in the nests of other birds in the same area, nor to live independently of birds on another food source. The moth has not been found at lights or anywhere else but in nests of the golden-shouldered parrot (Zborowski & Edwards 2007).

The abundance of the antbed parrot moth is unknown, although nests typically harbour a large number of larvae. In 1922, four adults were observed at one nest in which larvae were apparently absent, and additional adults were reared from cocoons removed from this nest (Turner 1923).

The number of mature individuals of the golden-shouldered parrot has been estimated at approximately 2500 but decreasing (Garnett et al., 2011). As most bird nests are apparently occupied by the moth, and multiple adult moths emerge from each nest, the total abundance of the antbed parrot moth is likely to be several thousand, although declining.

Relevant Biology/Ecology

The genus *Trisyntopa* consists of three species of moths, each of which lives in the nests of different species of parrots (Cooney et al., 2009a).

In 1922, nests of golden-shouldered parrots were observed infested with antbed parrot moth larvae (Turner 1923, Zborowski & Edwards 2007). Larvae live in a mass of silken tunnels on the floor of the nest, and consume the nestlings' excreta as they are produced (Zborowski & Edwards 2007). When fully grown, larvae form a cluster of cocoons placed horizontally at the thinnest part of the nest wall, so that they extend through the wall from the interior of the nest to the exterior of the mound. This allows the moths to escape even if the termites close the nest entrance after the birds have left (Zborowski & Edwards 2007). The life history of the moth is synchronised with that of its host: early notes on the behaviour of the moth and bird suggested that the appearance of the larvae coincides with the hatching of the parrot eggs (Turner 1923), and when the parrot chicks fledge, larvae move to the walls of the nest cavity to pupate, emerging to repeat the process during the next parrot breeding season (Cooney et al., 2009b).

The adult moths do not feed, and have only limited dispersal ability. After emerging, adults of the closely related moth species *T. neossophila* (which is associated with the hooded parrot, *Psephotus dissimilis*) leave the termite mound and seek a current season's hooded parrot nest in which to lay eggs (Cooney et al., 2009b). The generation length of the antbed parrot moth is unknown, but likely to be approximately 11-12 months, like that of *T. neossophila* (Cooney et al., 2009b).

The antbed parrot moth apparently contributes significantly to the hygiene of the nest; however, as far as is known, the moth is not likely to be necessary for the survival of the bird (Garnett, pers. comm., cited in Zborowski & Edwards 2007), as golden-shouldered parrot nestlings have been reared successfully from moth-less nests (Zborowski & Edwards 2007).

The parrot's choice of mound in which to excavate the nest is thought to be related to the activity cycle of the termites (ST Garnett and GM Crowley, pers. comm., cited in Higgins 1999). Termites are known to attack golden-shouldered parrot nestlings (Higgins 1999); however, it is unknown whether the termites cause mortality of the antbed parrot moth. The golden-shouldered parrot does not appear to harm any stage of the antbed parrot moth (Turner 1923).

Threats

Based on current knowledge, the most critical threat to this species is any decline of the golden-shouldered parrot (Cooney et al., 2009b). Therefore, the key threats to the moth tend to act indirectly, via their impacts on the golden-shouldered parrot.

Table 1 – Threats impacting the golden-shouldered parrot (and, therefore, the antbed parrot moth) in approximate order of severity of risk, based on available evidence

Threat factor	Threat type	Threat status	Evidence base
Impacts of domestic species			
Grazing by cattle (<i>Bos indicus</i>) causing a change in habitat	known	current	Cattle graze on grasses that provide seeds during the wet season for the golden-shouldered parrot, thus reducing seed availability (Crowley & Garnett 2001). A secondary effect of grazing has been the development of a coarser mosaic of burning histories, which is thought to decrease the chances of dispersing parrots finding suitable foraging habitat in the wet season (Garnett and Crowley 1999). Appropriate fires are required to keep the grasslands open and promote wet season food availability (DEHP 2016).
Invasive species			
Disturbance to nest sites by feral pigs (<i>Sus scrofa</i>) and cattle	known	current	Monitoring suggests that termite mounds large enough for the parrots are being lost faster than they are being replaced, largely from damage by feral pigs and cattle (Garnett et al., 2011).
Fire			
Changes in fire regimes	suspected	current	The contraction in range of the golden-shouldered parrot is also linked to a change in fire regime. The avoidance of intentionally hot burns in areas under pastoral management (Crowley & Garnett 2000; Crowley et al., 2009) and lower fuel loads as a result of cattle grazing (Garnett et al., 2011), are together resulting in the invasion of grassland by woodland (Crowley et al., 2009), notably <i>Melaleuca viridiflora</i> (broad-leaved ti-tree). This woodland thickening appears to have increased the vulnerability of birds to predation during the wet season and while nesting.

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.	<i>based on any of the followin</i>	(a)	direct observation [except A3]
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.		(b)	an index of abundance appropriate to the taxon
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]		(c)	a decline in area of occupancy, extent of occurrence and/or quality of habitat
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.		(d)	actual or potential levels of exploitation
			(e)	the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Evidence:

The generation length of the antbed parrot moth is unknown, but likely to be approximately 11-12 months (Cooney et al., 2009b). For this criterion, decline is assessed over the longer of ten years or three generations. As three generations are approximately three years, decline is assessed over ten years for this assessment.

Whether there has been any population decline in the antbed parrot moth is unknown. Although decline in the golden-shouldered parrot has occurred over the last several decades, past, current or future declines in population size of the golden-shouldered parrot are unlikely to exceed 30 percent in any three-generation period (approximately 12 years) (Garnett et al., 2011). This estimate can also be applied to the total population of the antbed parrot moth.

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 antbed parrot moth is certainly much more widespread than the single known locality, with many accounts of the species (e.g. Turner 1923; Higgins 1999; Zborowski & Edwards 2007) referring to its presence in almost all parrot nests examined during limited surveys. The EOO of the golden-shouldered parrot was estimated to be approximately 3000 km² and stable, and the

AOO was estimated to be 1800 km² and declining (Garnett et al., 2011). At this stage, the EOO and AOO of the antbed parrot moth are assumed to be similar to the golden-shouldered parrot. The golden-shouldered parrot occurs at five locations in Cape York (Garnett et al., 2011), and the antbed parrot moth likely occurs at the same five locations; however, this needs to be confirmed by systematic surveys across the range of the parrot.

Decline in habitat quality for the golden-shouldered parrot is continuing across many areas of Cape York Peninsula. Changes in fire regime associated with grazing have led to native grassland being invaded by ti-trees, leading to a decline in nest density in parts of the parrot's range. Nests are also damaged by grazing cattle and feral pigs. There is no evidence that the antbed parrot moth undergoes extreme natural fluctuation in population size.

In summary, the EOO of the golden-shouldered parrot (and therefore the moth) is <5000 km², with a fragmented distribution at likely five localities, and likely continuing decline in area, extent, and quality of habitat due to the effects of ongoing threats.

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 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:

The number of mature individuals of the antbed parrot moth is unknown; however, in 1922 one nest was observed to harbour a 'large number' of larvae. Four adults were observed at another nest in which larvae were apparently absent, and additional adults were reared from cocoons removed from this nest (Turner 1923). During surveys in the Northern Territory in 2006-07 for the closely related moth *Trisyntopa neossophila*, a mean of 53 larvae (range 25-72) and 2.3 adults (range 1-4) occupied each of 16 nests of *Psephotus dissimilis* (hooded parrot) (Cooney et al, 2009a). Based on these, albeit limited, data it is likely that only a few adult moths are present in any nest at any one time, although the cumulative number of adult moths from each nest may increase over time.

The golden-shouldered parrot usually breeds in pairs (Higgins 1999); therefore, approximately 1250 nests would be required for 2500 adult birds, assuming a 1:1 ratio of males to females. If an average of 2.3 adult moths are present in each nest, the total number of mature individuals of the antbed parrot moth could be approximately 2500-3000. Cooney et al. (2009b) estimated the total number of adult antbed parrot moths to be 2300, based on the hooded parrot/*T. neossophila* data.

Although decline is occurring in the golden-shouldered parrot (and therefore the moth), it has not been quantified (Garnett et al., 2011). There are two subpopulations of the golden-shouldered parrot: a northern one estimated to comprise 1500 mature individuals (at 2009), and a southern subpopulation comprising an estimated 1000 mature individuals (Garnett et al., 2011). Both subpopulations of the parrot are each greater than 1000 mature individuals, and each subpopulation comprises 60 percent and 40 per cent of the total population size.

The data presented above appear to demonstrate the species is not eligible for listing under this criterion, because the required thresholds are not met. 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 total number of mature individuals of the antbed parrot moth has been estimated at 2300 (Cooney et al., 2009b), and between 2500 and 3000 (see previous criterion). Both these estimates are greater than 1000.

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 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, and 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 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. Protect and enhance all habitat where the golden-shouldered parrot occurs.
2. Conduct systematic surveys for the antbed parrot moth to better define its distribution and abundance.

Conservation and Management Priorities

Note: based on current knowledge, the most critical threat to the antbed parrot moth is any decline of the golden-shouldered parrot, and so the following conservation management priorities are designed to maintain persistence of the parrot, on which the moth depends.

Impacts of domestic species

- Ensure land managers are aware of the species' occurrence and manage grazing by cattle to ensure that there is sufficient food available for the golden-shouldered parrot during the wet season.
- Protect termite mounds from damage and destruction by cattle (and feral pigs) throughout the range of the golden-shouldered parrot.

Fire

- Manage fire to maintain open grassy habitat in key nesting areas (current and potential), including with the reinstatement of carefully planned storm burns in the late dry/early dry season.
- Manage fire to produce a fine-scale mix of vegetation of differing ages, including some relatively long-unburnt vegetation.

Invasive species

- Manage sites to identify, control and reduce the spread of invasive species, particularly feral pigs. Manage grazing, trampling and rooting around termite mounds at important sites through exclusion fencing or other barriers. Where possible, control feral pigs using other appropriate methods (DEH 2005). Continue feral animal control programme in Alwal National park, and all other national parks where the golden-shouldered parrot occurs.
- Identify and control any weeds that could threaten the antbed parrot moth using appropriate methods, such as the careful use of herbicides or digging and removal. Ensure that any mechanical disturbance and overspray associated with chemical control are minimised, and do not impact the wet season food sources (perennial grasses) of the golden-shouldered parrot.

Stakeholder Engagement

- Engage with existing recovery teams, state government departments and non-government organisations to raise awareness of the relationship between the antbed parrot moth and the golden-shouldered parrot, and the importance of coordinated management of threats to the golden-shouldered parrot and antbed parrot moth.

- Integrate any survey and monitoring activities for the golden-shouldered parrot with those for the antbed parrot moth.
- Land managers (Queensland Department of National Parks, Sport and Racing; managers of Indigenous land) should be given information about managing fire and cattle for the benefit of the threatened species.
- Determine objectives for any public engagement to improve management on Indigenous and Parks land to ensure recent scientific knowledge is incorporated into public land management.

Survey and Monitoring priorities

- Conduct targeted, systematic surveys for the antbed parrot moth throughout the range of the golden-shouldered parrot to better define the moth's distribution and abundance. Confirm whether the moth distribution covers the extent of distribution of the golden-shouldered parrot.
- Establish and maintain a monitoring programme for the antbed parrot moth based on these data to:
 - determine trends in population size and distribution, mortality and timing of life history stages;
 - determine threats and their impacts on this species; and
 - 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 ecological requirements of the antbed parrot moth relevant to the persistence of the species. Further clarify the relationship between the moth, its parrot and termite host. Determine the relationship between nest (termite mound) distribution and survival of the antbed parrot moth.
- Determine whether the antbed parrot moth lives in the nests of other bird species occurring in the same area and habitat, e.g. red-backed kingfisher (*Todiramphus pyrrhopygia*).

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Available on the Internet at: https://www.ehp.qld.gov.au/wildlife/threatened-species/endangered/endangered-animals/goldenshouldered_parrot.html
- IUCN (International Union for Conservation of Nature) (2014). Guidelines for using the IUCN Red List categories and Criteria, version 11. Available on the Internet at:
<http://www.iucnredlist.org/documents/RedListGuidelines.pdf>

Collective list of questions – your views

*(Note: for the purpose of this assessment, generation length for *Trisyntopa scatophaga* has been estimated at one year. The listing guidelines for criterion 1 consider decline over a period of three generation lengths or 10 years, whichever is longer. As three generations are equal to approximately three years, decline is considered over a ten-year period.*

Biological information

1. Can you provide any additional or alternative references, or other additional information on the biology and/or ecology of this species?
2. Do you know if the antbed parrot moth lives in the nests of bird species *other than* the golden-shouldered parrot (e.g. red-backed kingfisher)? If so, in which area(s)?
3. Can you provide any additional information on the relationship between the moth and its bird and termite hosts? Do you believe the moth is wholly dependent on both taxa?
4. Can you provide any information regarding the level and general requirements for recruitment?

Population size

5. Can you provide an estimate of the current population size of mature adults of this species (national extent)? Please provide supporting justification or other information.

If, because of uncertainty, you are unable to provide a single number, you may wish to provide an estimated range. If so, please choose one of the ranges suggested in the table below of possible species numbers, and also choose the level of confidence you have in this estimate:

Number of mature individuals is estimated to be in the range of: <input type="checkbox"/> 1–50 <input type="checkbox"/> 51–250 <input type="checkbox"/> 251–1000 <input type="checkbox"/> >1000 <input type="checkbox"/> >10 000
Level of your confidence in this estimate: <input type="checkbox"/> 0–30% - low level of certainty/ a bit of a guess/ not much information to go on <input type="checkbox"/> 31–50% - more than a guess, some level of supporting evidence <input type="checkbox"/> 51–95% - reasonably certain, information suggests this range <input type="checkbox"/> 95–100% -high level of certainty, information indicates quantity within this range <input type="checkbox"/> 99–100% - very high level of certainty, data are accurate within this range

Evidence of total population size change

6. Are you able to provide an estimate of the total population size during the mid 2000s? Please provide justification for your response.

If, because of uncertainty, you are unable to provide a single number, you may wish to provide an estimated range. If so, please choose one of the ranges suggested in the table below of possible species numbers, and also choose the level of confidence you have in this estimate.

Number of mature individuals is estimated to be in the range of:
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<input type="checkbox"/> 1–50 <input type="checkbox"/> 51–250 <input type="checkbox"/> 251–1000 <input type="checkbox"/> >1000 <input type="checkbox"/> >10 000
<p>Level of your confidence in this estimate:</p> <input type="checkbox"/> 0–30% - low level of certainty/ a bit of a guess/ not much information to go on <input type="checkbox"/> 31–50% - more than a guess, some level of supporting evidence <input type="checkbox"/> 51–95% - reasonably certain, information suggests this range <input type="checkbox"/> 95–100% -high level of certainty, information indicates quantity within this range <input type="checkbox"/> 99–100% - very high level of certainty, data are accurate within this range

7. Are you able to comment on the extent of decline in the species' total population size over the last approximately 10 years? Please provide justification for your response.

If, because of uncertainty, you are unable to provide an estimate of decline, you may wish to provide an estimated range. If so, please choose one of the ranges suggested in the table below of ranges of decline, and also choose the level of confidence you have in this estimated range.

<p>Decline estimated to be in the range of:</p> <input type="checkbox"/> 1–30% <input type="checkbox"/> 31–50% <input type="checkbox"/> 51–80% <input type="checkbox"/> 81–100% <input type="checkbox"/> 90–100%
<p>Level of your confidence in this estimated decline:</p> <input type="checkbox"/> 0–30% - low level of certainty/ a bit of a guess/ not much information to go on <input type="checkbox"/> 31–50% - more than a guess, some level of supporting evidence <input type="checkbox"/> 51–95% - reasonably certain, suggests this range of decline <input type="checkbox"/> 95–100% -high level of certainty, information indicates a decline within this range <input type="checkbox"/> 99–100% - very high level of certainty, data are accurate within this range

8. Please provide (if known) any additional evidence which shows the population is stable, increasing or declining.

Current Distribution/range/extent of occurrence, area of occupancy

9. Is the distribution as described valid? If not, please provide justification for your response and provide alternative information.
10. Do you know if the distribution of the moth covers the extent of distribution of the golden-shouldered parrot?
11. Can you provide information (such as lat/long data) for all the locations where the antbed parrot moth is known to occur?

12. Are you aware of any locations where the antbed parrot moth has been searched for unsuccessfully?
13. Do you have any information on the *current* populations? Can you provide extent of occurrence data (based on convex polygon around all current populations) and area of occupancy data (based on the sum of each 2km x 2km grid over each current record)? Can you provide a distribution map of the current populations?
14. Do you know if the antbed parrot moth occurs with the golden-shouldered parrot in the Staaten River area? Please provide justification for your response.
15. Do you agree that the way the current extent of occurrence and/or area of occupancy have been estimated is appropriate? Please provide justification for your response.

Can you provide estimates (or if you disagree with the estimates provided, alternative estimates) of the extent of occurrence and/or area of occupancy.

If, because of uncertainty, you are unable to provide an estimate of extent of occurrence, you may wish to provide an estimated range. If so, please choose one of the ranges suggested in the table below of ranges of extent of occurrence, and also choose the level of confidence you have in this estimated range.

Extent of occurrence is estimated to be in the range of: <input type="checkbox"/> <100 km ² <input type="checkbox"/> 100 – 5 000 km ² <input type="checkbox"/> 5 001 – 20 000 km ² <input type="checkbox"/> >20 000 km ²
Level of your confidence in this estimated extent of occurrence <input type="checkbox"/> 0–30% - low level of certainty/ a bit of a guess/ not much data to go on <input type="checkbox"/> 31–50% - more than a guess, some level of supporting evidence <input type="checkbox"/> 51–95% - reasonably certain, data suggests this range of decline <input type="checkbox"/> 95–100% -high level of certainty, data indicates a decline within this range <input type="checkbox"/> 99–100% - very high level of certainty, data is accurate within this range

If, because of uncertainty, you are unable to provide an estimate of area of occupancy, you may wish to provide an estimated range. If so, please choose one of the ranges suggested in the table below of ranges of area of occupancy, and also choose the level of confidence you have in this estimated range.

Area of occupancy is estimated to be in the range of: <input type="checkbox"/> <10 km ² <input type="checkbox"/> 11 – 500 km ² <input type="checkbox"/> 501 – 2000 km ² <input type="checkbox"/> >2000 km ²
Level of your confidence in this estimated extent of occurrence: <input type="checkbox"/> 0–30% - low level of certainty/ a bit of a guess/ not much data to go on <input type="checkbox"/> 31–50% - more than a guess, some level of supporting evidence <input type="checkbox"/> 51–95% - reasonably certain, data suggests this range of decline <input type="checkbox"/> 95–100% -high level of certainty, data indicates a decline within this range

- 99–100% - very high level of certainty, data is accurate within this range

Past Distribution/range/extent of occurrence, area of occupancy

16. Can you provide estimates of the former extent of occurrence and/or area of occupancy of this species? Please provide justification for your response.

If, because of uncertainty, you are unable to provide an estimate of past extent of occurrence, you may wish to provide an estimated range. If so, please choose one of the ranges suggested in the table below of ranges of past extent of occurrence, and also choose the level of confidence you have in this estimated range.

Past extent of occurrence is estimated to be in the range of:

- <100 km² 100 – 5 000 km² 5 001 – 20 000 km² >20 000 km²

Level of your confidence in this estimated extent of occurrence

- 0–30% - low level of certainty/ a bit of a guess/ not much data to go on
 31–50% - more than a guess, some level of supporting evidence
 51–95% - reasonably certain, data suggests this range of decline
 95–100% -high level of certainty, data indicates a decline within this range
 99–100% - very high level of certainty, data is accurate within this range

If, because of uncertainty, you are unable to provide an estimate of past area of occupancy, you may wish to provide an estimated range. If so, please choose one of the ranges suggested in the table below of ranges of past area of occupancy, and also choose the level of confidence you have in this estimated range:

Past area of occupancy is estimated to be in the range of:

- <10 km² 11 – 500 km² 501 – 2000 km² >2000 km²

Level of your confidence in this estimated extent of occurrence:

- 0–30% - low level of certainty/ a bit of a guess/ not much data to go on
 31–50% - more than a guess, some level of supporting evidence
 51–95% - reasonably certain, data suggests this range of decline
 95–100% -high level of certainty, data indicates a decline within this range
 99–100% - very high level of certainty, data is accurate within this range

Change in status/rate of change

17. Is the information used to identify the nationally threatened status of the species robust? Have all the underlying assumptions been made explicit? Please provide justification for your response.

General

18. Can you provide additional data or information relevant to this assessment?
19. Have you been involved in developing this nomination? If so in what capacity?

Threats

20. Do you agree that the threats listed are correct and that their effect on the species is significant?
21. To what degree are the identified threats likely to impact on the species in the future?
22. What threats are impacting on different populations, how variable are the threats and what is the relative importance of the different populations? Please provide evidence and background information.
23. Can you provide additional or alternative information on threats, past, current or potential that may adversely affect this species at any stage of its life cycle?
24. Can you provide supporting data/justification or other information for your responses to these questions about threats?

Management

25. What planning, management and recovery actions are currently in place supporting protection and recovery of the species? To what extent have they been effective?
 26. Can you recommend any additional or alternative specific threat abatement or conservation actions that would aid the protection and recovery of the species?
 27. What individuals or organisations are currently, or potentially could be, involved in management and recovery of the species?
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