



## **Consultation Document on Listing Eligibility and Conservation Actions**

### ***Antechinus argentus* (silver-headed antechinus)**

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

- 1) the eligibility of *Antechinus argentus* (silver-headed antechinus) 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 and Energy.

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 and Energy  
PO Box 787  
Canberra ACT 2601

**Responses are required to be submitted by 28 July 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 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.

# *Antechinus argentus*

silver-headed antechinus

## **Taxonomy**

Conventionally accepted as *Antechinus argentus* (Baker, Mutton & Hines 2013).

## **Species/Sub-species Information**

### **Description**

The silver-headed antechinus is a small carnivorous marsupial. The species has a small head, large ears and narrow snout. The head, neck and shoulders are silver-grey, merging gradually through olive-buff to deep olive-buff on the flanks, rump and upper surface of the tail base. The belly is green-yellow-buff, buff to olive-buff. The species has pale, slightly broken eye rings and pale silver feet. The tail is bicoloured, darker on top and lighter underneath, with both sides getting darker towards the tip (Baker et al. 2013). Females have a pouch with eight nipples (Mason et al. 2016). The species is sexually dimorphic for size, with males up to three times heavier than females (Mason et al. 2016). Males weigh 40-46 g, while females weigh 20-23 g (E Mason, pers. comm. 2017, unpublished data).

### **Distribution**

The silver-headed antechinus is known from two isolated subpopulations located in central-eastern Queensland - the plateau at the eastern escarpment of Kroombit Tops National Park, located 70 km south-west of Gladstone; and Blackdown Tableland National Park, located 220 km west of Gladstone (Mason et al. 2016). Within Kroombit Tops National Park, the species has been recorded from two sites, the 'northern' site and the southern 'Lookout' site, which are 5.5 km apart (Baker et al. 2013). The species has been recorded at one site in Blackdown Tableland National Park (E Mason, pers. comm. 2017, unpublished data). Due to historic isolation of each subpopulation, the species has become genetically divergent between the Kroombit Tops National Park and Blackdown Tableland National Park sites (A Baker, pers. comm. 2017).

### **Relevant Biology/Ecology**

At Kroombit Tops National Park, the silver-headed antechinus occurs on an undulating sandstone plateau bounded on the eastern side by an escarpment with cliffs, at an elevation of 850-900 m asl (Baker et al. 2013; Mason et al. 2016). The habitat of both recorded sites are floristically and structurally similar, being *Eucalyptus montivaga* (blackbutt) with subdominant *Corymbia trachyphloia* (brown bloodwood) shrubby tall open-forest. The shrub layer and ground cover of both sites varies in height, cover and species (Baker et al. 2013). However, sclerophyllous shrubs and *Xanthorrhoea* (grass trees) are more prevalent at the southern 'Lookout' site, with grasses and ferns more prevalent at the northern site (Mason et al. 2016). At Blackdown Tableland National Park, the silver-headed antechinus occurs in similar wet, altitudinal open forest habitat (A Baker, pers. comm. 2017).

There is limited information on the ecology of the species due to the limited number of individuals that have been captured (Baker et al. 2013). However, the biology of the silver-headed antechinus and its life-history characteristics are considered to fit the norm of the genus (Mason et al. 2016).

At Kroombit Tops National Park, the mating season for the species occurs over a 1-3 week period between mid to late-June and early-July (Mason et al. 2016). Coinciding with the mating season, the species undergoes a synchronised annual male die-off, characteristic of *Antechinus* (Mason et al. 2016; Baker et al. 2013). A 30 day gestation period has been inferred for the species (Baker et al. 2013), with females giving birth to eight young in late-July to early August (Mason et al. 2016). Young attach to the nipples and are carried in the pouch of the female (Baker et al. 2013). Juveniles disperse at 3-4 months of age and become 'adult' at seven months old (Baker et al. 2013).

The species is insectivorous. Based on analysis of faecal pellets, the species predominantly preys on beetles and cockroaches, but also consumes other insects including ants, crickets, grasshoppers, butterflies and spiders (Mason et al. 2015).

Males live for a maximum of 11.5 months (Mason et al. 2015), while the maximum longevity of females is two years (A Baker, pers. comm. 2017).

## Threats

There have been no formal analysis of the threatening processes that are impacting the species. However, the silver-headed antechinus is likely to be highly habitat specific and particularly sensitive to disturbance (Mason et al. 2016). Increased frequency and intensity of fire events is suspected to threaten the abundance of silver-headed antechinus. Several other threatening processes are considered to potentially impact the species, including habitat disturbance by feral herbivores, predation by introduced predators, and habitat modification by invasive flora (Baker et al. 2013; Mason et al. 2016). Increased frequency of fire weather days resulting from climate change is also considered to pose a potential threat to the silver-headed antechinus.

Table 1 – Threats impacting the silver-headed antechinus in approximate order of severity of risk, based on available evidence.

Threat factor	Threat type and status	Evidence base
Fire		
Increased frequency and intensity of fire events	suspected current	<p>Studies of other <i>Antechinus</i> species show that abundance is positively affected by complex vegetation structure and high litter cover (i.e. <i>A. flavipes</i>). Studies also show that abundance is negatively affected by fire in both the short- and long-term (i.e. <i>A. minimus</i>) (Mason et al. 2016; Kelly &amp; Bennett 2008; Wilson et al. 2001).</p> <p>An increase in the frequency and intensity of wildfires or planned burns in silver-headed antechinus habitat is likely to threaten the species through the removal of large woody debris and vegetation cover, which are frequently used by the species for refuge and foraging (Baker et al. 2013; A Baker, pers. comm. 2017).</p> <p>Wildfires in October 2013 at Kroombit Tops National Park burnt the entire northern site and half the southern 'Lookout' site. Trapping studies in 2014 resulted in uneven capture rates between the sites with three captures (three individuals) at the northern site and 67 captures (16 individuals) at the southern 'Lookout' site. It is considered that the few captures at the northern site may be a result of a severe reduction in habitat complexity caused by the 2013 fire (Mason et al. 2016). The removal of vegetation cover by fire is also likely to facilitate predation on small mammals by introduced species, particularly cats (Leahy et al. 2016; McGregor et al. 2014).</p>
Climate Change		
Altitudinal shift from rising temperatures and decreasing rainfall	suspected current	<p>Across the distribution of the species, temperatures are predicted to increase and rainfall is predicted to decrease in response to global warming (Baker et al. 2013). Declines in the distribution of the silver-headed antechinus is suspected to be a result of the species withdrawing from lower altitude habitat to match the upward altitudinal shift of suitable habitat (A Baker, pers. comm. 2017).</p>

Increased frequency of fire weather days	potential future	With climate change there is likely to be an increase in the frequency of very high and extreme fire weather days. Increased frequency and intensity of wildfires is likely to be detrimental to the silver-headed antechinus (Baker et al. 2013).
Invasive species		
Predation by cats ( <i>Felis catus</i> ) and foxes ( <i>Vulpes vulpes</i> )	suspected current	Cats and foxes are known to occur at Kroombit Tops National Park (DEHP 2017a). Cats are also present at Blackdown Tableland National Park (DEHP 2017b). Cats and foxes pose a threat as they are likely to prey upon silver-headed antechinus (Mason et al. 2016; A Baker, pers. comm. 2017). However, the threat of predation by cats and foxes on the silver-headed antechinus has not been demonstrated.
Predation by dogs ( <i>Canis familiaris</i> )	potential	Dogs are present in Kroombit Tops National Park (DEHP 2017a) and Blackdown Tableland National Park (DEHP 2017b). Dogs pose a potential threat as they may prey upon silver-headed antechinus (Mason et al. 2016). However, the threat of dogs on the silver-headed antechinus has not been demonstrated.
Habitat disturbance and competition by pigs ( <i>Sus scrofa</i> )	potential	Feral pigs are present in Kroombit Tops National Park (DEHP 2017a) and Blackdown Tableland National Park (DNPRSR 2013). The grazing habits of pigs pose a potential threat to the silver-headed antechinus through disturbance and removal of ground cover and woody debris, which are used by the species for foraging and denning. Pigs are also likely to prey upon invertebrates which poses a potential level of competition between pigs and the silver-headed antechinus (Baker et al. 2013). However, the threat of pigs on the silver-headed antechinus has not been demonstrated.
Habitat disturbance by feral cattle ( <i>Bos taurus</i> ) and horses ( <i>Equus caballus</i> )	potential	Feral cattle and horses are known to occur at Kroombit Tops National Park (DEHP 2017a). Feral cattle are also known to occur at Blackdown Tableland National Park (DEHP 2017b). Cattle and horses pose a potential threat to the silver-headed antechinus through the disturbance of ground cover and woody debris, which are used by the species for foraging and denning (Baker et al. 2013). However, the threat of cattle and horses on the silver-headed antechinus has not been demonstrated.
Habitat modification by lantana ( <i>Lantana camera</i> )	potential	Lantana is a thicket forming shrub and is a Weed of National Significance. It is increasing in prevalence in Kroombit Tops National Park (Baker et al. 2013) and occurs in Blackdown Tableland National Park (DNPRSR 2013). Lantana poses a threat to the silver-headed antechinus through the potential to alter habitat structure, invertebrate populations and fire regimes (Baker et al. 2013).

**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.		(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

*based on any of the followin*

**Evidence:**

The species was described in 2013 from captures at Kroombit Tops National Park (Baker et al. 2013), and in 2015 the species was discovered at Blackdown Tableland National Park (Mason et al. 2016). A decline in the species abundance has been observed at Kroombit Tops National Park (A Baker, pers. comm. 2017). However, given the species' recent discovery, there is currently no estimate of population size reduction for the species.

The data presented above appear to be insufficient 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.

<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)	<b>&lt; 100 km<sup>2</sup></b>	<b>&lt; 5,000 km<sup>2</sup></b>	<b>&lt; 20,000 km<sup>2</sup></b>
B2. Area of occupancy (AOO)	<b>&lt; 10 km<sup>2</sup></b>	<b>&lt; 500 km<sup>2</sup></b>	<b>&lt; 2,000 km<sup>2</sup></b>
AND at least 2 of the following 3 conditions indicating distribution is precarious for survival:			
(a) Severely fragmented OR Number of locations	<b>= 1</b>	<b>≤ 5</b>	<b>≤ 10</b>
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

**Evidence:**

The extent of occurrence (EOO) is estimated at 1008 km<sup>2</sup>, and the area of occupancy (AOO) is estimated at 12 km<sup>2</sup>. These figures are based on the mapping of point records from 1997 to 2017, obtained from state and Commonwealth agencies, museums and non-government agencies. 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 (DoEE 2017).

The silver-headed antechinus occurs in two isolated locations, making its geographic distribution restricted. The population appears to be in decline based on an observed altitudinal contraction in its distribution and low trapping records following fire events (A Baker, pers. comm. 2017). The silver-headed antechinus population is considered to undergo fluctuations in the number of mature individuals as a result of the species' annual male die-off during the mating season (Mason et al. 2016). However, the species is not considered to undergo extreme fluctuations as the population is unlikely to experience a tenfold increase or decrease.

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.

<b>Criterion 3. Population size and decline</b>			
	<b>Critically Endangered Very low</b>	<b>Endangered Low</b>	<b>Vulnerable Limited</b>
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)	<b>Very high rate 25% in 3 years or 1 generation (whichever is longer)</b>	<b>High rate 20% in 5 years or 2 generation (whichever is longer)</b>	<b>Substantial rate 10% in 10 years or 3 generations (whichever is longer)</b>
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 species is likely to be low in abundance. The number of mature individuals following annual male die off is estimated to be very low (less than 250) based on the low number of recent capture records across the species distribution (A Baker, pers. comm. 2017).

The population appears to be in decline based on an observed altitudinal contraction in its distribution and low trapping records following fire events (A Baker, pers. comm. 2017). The species is occurs in two subpopulations, with less than 250 mature individuals in each subpopulation.

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:**

The species is likely to be low in abundance. The number of mature individuals following annual male die off is estimated to be very low (less than 250) based on the low number of recent capture records across the species distribution (A Baker, pers. comm. 2017).

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

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

**Evidence:**

Population viability analysis has not been undertaken for the species. 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**

- Ensure there is no decrease in population size or area of occupancy for the silver-headed antechinus.

**Conservation and Management Priorities**

Breeding, propagation and other ex situ recovery action

- Develop a plan for establishing and resourcing a captive breeding program to maintain an insurance population in the event of a decline or extinction in the wild.



## Fire

- Fires must be managed to ensure that prevailing fire regimes do not disrupt the life cycle of the silver-headed antechinus; that they support rather than degrade the habitat necessary to the species; that they do not promote invasion of exotic flora species; and that they do not increase impacts of predation and feral herbivores.
- Implement a fire management strategy of infrequent, patchy, low-medium intensity fire to sufficiently to retain hollow logs and large woody debris on the ground.
- Ensure that a high proportion of the habitat is maintained with a post-fire age sufficient to provide adequate cover for the silver-headed antechinus.
- Fire management authorities and land management agencies should use suitable maps and install field markers to avoid damage to the silver-headed antechinus and its habitat.

## Invasive species

- Undertake control programs to eradicate cats, foxes, pigs, cattle and horses from silver-headed antechinus habitat to reduce the impact of predation and habitat disturbance on the species. Ensure immediate and ongoing post-fire predator control within the habitat when fires do occur.
- Undertake weed control for lantana at infested sites, occupied or potentially occupied by the species, using appropriate methods.

## Stakeholder Engagement

- Liaise with organisations which are undertaking research for silver-headed antechinus, to ensure up-to-date population information informs the implementation of conservation actions.
- Liaise with applicable Queensland Government agencies to ensure appropriate management activities/programs are undertaken in Kroombit Tops National Park and Blackdown Tableland National Park to manage threats to silver-headed antechinus.

## Survey and Monitoring priorities

- Regularly monitor known subpopulations to more precisely assess population size, distribution and population trends.
- Monitor the response of subpopulations to fire events, using appropriate measures (e.g. occupancy, population abundance, individual mortality, ranging behaviour, breeding success) to improve understanding of the silver-headed antechinus' response to fire.
- Undertake surveys in suitable habitat to locate any additional occurrences of the species.
- Monitor the progress of conservation actions, including the effectiveness of management actions, and adapt them if necessary.

## Information and Research priorities

- Investigate trapping methods and species specific lures to improve capture rates of silver-headed antechinus during surveys and monitoring.
- Continue to investigate the use of specially trained detection dogs to improve species detectability during surveys and monitoring.
- Investigate options for linking and enhancing current silver-headed antechinus subpopulations, and options for establishing additional subpopulations.
- Continue to investigate the ecological requirements of silver-headed antechinus to improve understanding about the species' susceptibility to threatening processes, including climate change.

## **Collective list of questions – your views**

1. Is the information used to assess the nationally threatened status of the species robust? Have all the underlying assumptions been made explicit?
2. Can you provide additional data or information relevant to this assessment?
3. Can you provide any additional or alternative references, information or estimates on longevity, average life span and generation length?
4. Do you have any additional information in the ecology or biology of the species not in the current advice?
5. Has the survey effort for this species been adequate to determine its national adult population size? If not, please provide justification for your response.
6. Do you consider the way the population size has been derived to be appropriate? Are there any assumptions and unquantified biases in the estimates? Did the estimates measure relative or absolute abundance? Do you accept the estimate of the total population size of the species? If not, please provide justification for your response.
7. Are you able to comment on the extent of decline in the species/subspecies' total population size over the last 10 years? Please provide justification for your response.
8. Please provide (if known) any additional evidence which shows the population is stable, increasing or declining.
9. Does the assessment consider the entire geographic extent and national extent of the species? If not, please provide justification for your response.
10. Has the survey effort for this species been adequate to determine its national distribution? If not, please provide justification for your response.
11. Is the distribution described in the assessment accurate? If not, please provide justification for your response and provide alternate information.
12. 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.
13. Can you provide estimates (or if you disagree with the estimates provided, alternative estimates) of the extent of occurrence and/or area of occupancy.
14. Do you consider that the way the historic distribution has been estimated is appropriate? Please provide justification for your response.
15. Can you provide estimates (or if you disagree with the estimates provided, alternative estimates) of the former extent of occurrence and/or area of occupancy.
16. Do you consider that all major threats have been identified and described adequately?
17. To what degree are the identified threats likely to impact on the species in the future?
18. Are the threats impacting on different populations equally, or do the threats vary across different populations?
19. Can you provide additional or alternative information on past, current or potential threats that may adversely affect the species at any stage of its life cycle?

20. What planning, management and recovery actions are currently in place supporting protection and recovery of the species? To what extent have they been effective?
21. Can you recommend any additional or alternative specific threat abatement or conservation actions that would aid the protection and recovery of the species?
22. Would you recommend translocation (outside of the species' historic range) as a viable option as a conservation actions for this species?
23. What individuals or organisations are currently, or potentially could be, involved in management and recovery of the species?

### **References cited in the advice**

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