



Consultation Document on Listing Eligibility and Conservation Actions

Stagonopleura guttata (Diamond Firetail)

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

- 1) the eligibility of *Stagonopleura guttata* (Diamond Firetail) for inclusion on the EPBC Act threatened species list in the Vulnerable category; and
- 2) the necessary conservation actions for the above species.

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

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

Responses are to be provided in writing either by email to:

species.consultation@environment.gov.au

or by mail to:

The Director
Migratory Species Section
Biodiversity Conservation Division
Department of Agriculture, Water and the Environment
PO Box 858
Canberra ACT 2601

Responses are required to be submitted by 18 March 2022.

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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/system/files/pages/d72dfd1a-f0d8-4699-8d43-5d95bbb02428/files/tssc-guidelines-assessing-species-2018.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>.

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* (Cwth) 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> .

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.



Consultation Document for *Stagonopleura guttata* (Diamond Firetail)



Diamond Firetail (*Stagonopleura guttata*) © Copyright, Dennis Jacobsen (from Shutterstock)

Conservation status

Stagonopleura guttata (Diamond Firetail) is being assessed by the Threatened Species Scientific Committee to be eligible for listing under the EPBC Act. The Committee's preliminary assessment is at Attachment A. The Committee's preliminary assessment of the species' eligibility against each of the listing criteria is:

- Criterion 1: A2bce+3ce+4bce: Vulnerable
- Criterion 2: Not eligible
- Criterion 3: Not eligible
- Criterion 4: Not eligible
- Criterion 5: Insufficient data

The main factor that appears to make the species eligible for listing in the Vulnerable category is that the population has declined by an estimated 30–50% over the last ten years (one generation 2.2 years), with a high probability of declines continuing (Hodder et al. 2021). There are currently estimated to be 136,000 (range 68,000–272,000) mature individuals in the wild,

however the reliability of this estimate is low (Hodder et al. 2021; S Garnett pers. comms. 9 Nov 2021). The extent of occurrence (EOO) is estimated at 1,500,000 km² (range 1,400,000–1,600,000 km²), and the area of occupancy (AOO) is estimated at 25,000 km² (range 12,500–50,000 km²). Both the EOO and AOO have contracting trends (high reliability) (Hodder et al. 2021).

Local declines, particularly in the south and east of the species' range (Map 1), are now evident based on reporting rate trends (Hodder et al. 2021). The underlying reason for the decline of the species is the ongoing clearance of native vegetation for large scale agriculture which has reduced the size and quality of important nesting and breeding habitats (Hodder et al. 2021). Widespread habitat degradation caused by overgrazing has also negatively impacted the species by causing the replacement of native perennial grasses with exotic annual grasses. This has resulted in the starvation of Diamond Firetails during periods when exotic annual grass seed germinates in autumn and winter (if no alternative seed sources exist) (Higgins et al. 2007; Hodder 2019). Habitat patches are also degraded by grazing stock and invasive species such as rabbits (*Oryctolagus cuniculus*) that remove the shrub layer (Barrett et al. 2002).

Species can also be listed as threatened under state and territory legislation. For information on the current listing status of this species under relevant state or territory legislation, see the [Species Profile and Threat Database](#).

Species information

Taxonomy

Conventionally accepted as *Stagonopleura guttata* (Shaw 1796).

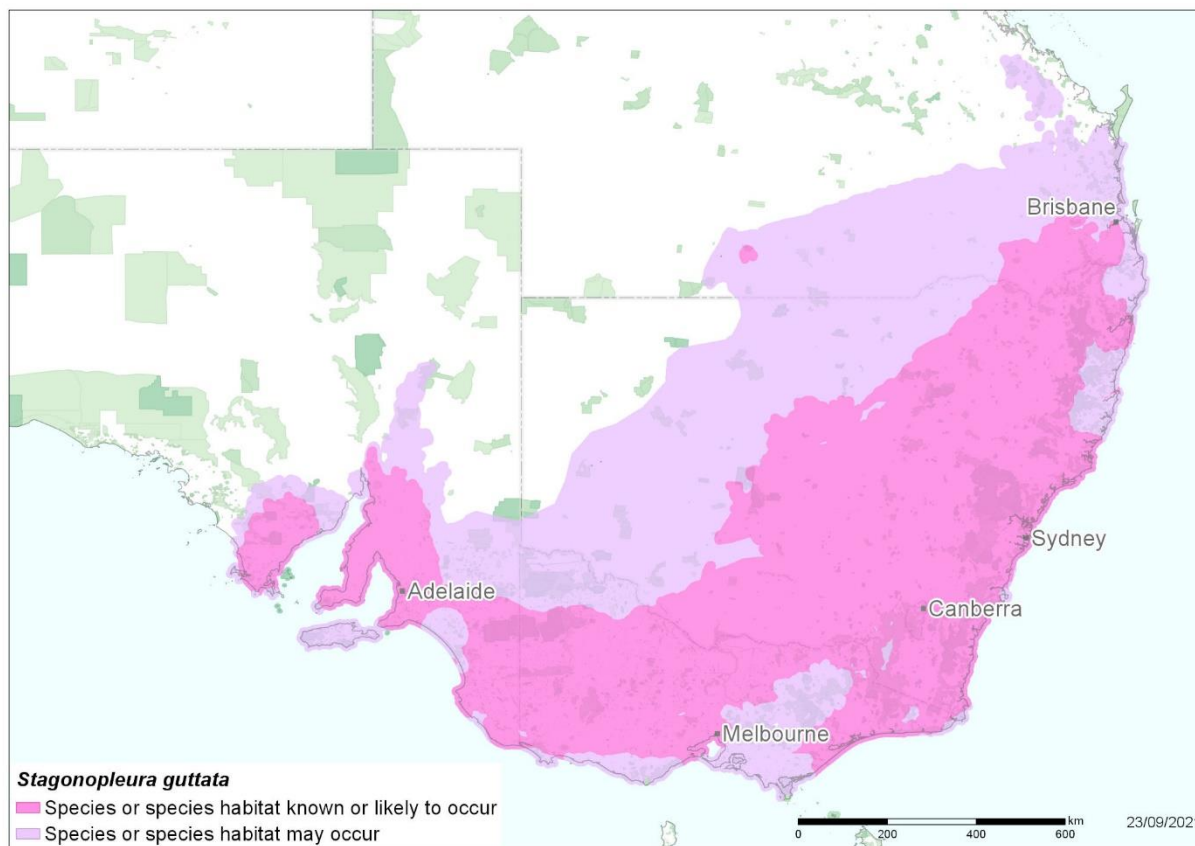
Description

The Diamond Firetail is a large (length 10 to 12 cm, weight 17 grams), striking finch with a bright red bill, and red eyes and rump. The white throat and lower breast are separated by a broad black breast-band that extends into the strongly white-spotted, black flanks. It has a grey back and head, and ashy-brown wings. The female is similar to the male although sometimes smaller. The juvenile Diamond Firetail has a black bill and is duller in colour.

Distribution

Diamond Firetails occur on the south-east mainland of Australia from south-east Queensland to Eyre Peninsula, South Australia, and about 300 km inland from the sea (Higgins et al. 2007). Their range once extended to north Queensland inland from Cardwell, but they now occur only in the very south of the state (Hodder et al. 2021). They have disappeared from many of the more settled parts of New South Wales, ACT and Victoria, and birds in South Australia appear to have been separated into three isolated subpopulations (Eyre Peninsula, Mt Lofty to Southern Flinders Ranges, and the south-east) (Higgins et al. 2007), with few records from a fourth (Yorke Peninsula) in the last decade (Hodder et al. 2021).

Map 1 Modelled distribution of Diamond Firetail



Source: Base map Geoscience Australia; species distribution data [Species of National Environmental Significance](#) database.

Cultural and community significance

Diamond Firetails are known to occur on the lands of at least the following Indigenous Peoples: Adnyamathanha, Anaiwan, Barap Barap, Barkindji, Barngarla, Bigambul, Birpai, Bundjalung, Darkinjung, Dharug, Dhudhuroa, Dja Dja Wurrung, Dunghutti, Eastern Maar, Euahlayi, Gamilaraay, Githabul, Gumbaynggirr, Gunaikurnai, Gunditjimara, Gundungurra, Jaadwa, Jadawadjali, Jaithmathang, Jarowair, Jupagulk, Kamilaroi, Kurna, Kooma, Mandandangi, Mulwaree, Nari Nari, Narungga, Nauo, Ngadjuri, Ngambri, Ngarrindjeri, Ngunnawal, Perrepa Perrepa, Taungurun, Wadawurrung, Wadi Wadi, Waka Waka, Wamba Wamba, Warrabinga, Waveroo, Wemba Wemba, Wergaia, Wilyakali, Wiradjuri, Wongaibon, Wonnarua, Worimi, Wotjobaluk, Wurundjeri, Yorta Yorta and Yuwaalaraay (Hodder et al. 2021). The cultural and community significance of the species is not known. Further research into the subject area may benefit the conservation of the subspecies by providing insights about traditional land management.

Relevant biology and ecology

Diamond Firetails occur in eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats, including farmland and grassland with scattered trees (Higgins et al. 2007). They prefer areas with relatively low tree density, few large logs, and little litter cover but high grass cover (Antos et al. 2008). Diamond Firetails usually occur in flocks of between 5 to 40, and occasionally more. The species appears to be sedentary, though some populations move locally. Their flight is described as low and direct in long lines with slight undulations. Birds roost in dense shrubs or in smaller nests built especially for roosting.

Diamond Firetails feed exclusively at ground level, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially during the breeding season) (Blakers et al. 1984; Read 1994). As such, birds are often observed hopping around on the ground (Higgins et al. 2007). In the Mt Lofty Ranges, birds also rely on seeds of Drooping She-oak *Allocasuarina verticillata* in winter in areas where perennial grasses have been replaced by exotic annuals (Hodder 2019).

Between August and January, groups separate into small colonies to breed. Nests are bottle-shaped and are made of green grass blades and stems lined with fine grasses and feathers. To safeguard their eggs and nestlings, Diamond Firetails often build their nests into the base of the large stick-nest of a bird of prey such as a Whistling Kite (*Haliastur sphenurus*), White-bellied Sea-Eagle (*Haliaeetus leucogaster*), Wedge-tailed Eagle (*Aquila audax*), Brown Falcon (*Falco berigora*), Nankeen Kestrel (*Falco cenchroides*) or a Square-tailed Kite (*Lophoictinia isura*). Others choose to build their nests among the prickly foliage of shrubs such as hakeas, rose bushes, boxthorn and the Sea Urchin Hakea (*Hakea petiolaris*). Both partners build the nest, however, only the female does the weaving. Both partners incubate the eggs and care for the young. Usually only one clutch is laid per season. A clutch size of 4–5 eggs is normal (Higgins et al. 2007).

Habitat critical to the survival

Habitat critical to the survival or important habitats of a species or ecological community refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal;
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);
- to maintain genetic diversity and long-term evolutionary development; or
- for the reintroduction of populations or recovery of the species or ecological community.

Habitat critical to the survival of the Diamond Firetail includes areas of:

- Eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats;
- low tree density, few large logs, and little litter cover but high grass cover for foraging, roosting and breeding;
- Drooping She-oak (*Allocasuarina verticillata*) within the Mt Lofty Ranges.

Any known or likely habitat (Map 1) should be considered as habitat critical to the survival of the species. Additionally, areas that are not currently occupied by the species due to recent disturbance (e.g. fire, grazing or human activity), but should become suitable again in the future, should also be considered habitat critical to the survival of the species.

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat.

Diamond Firetail habitat also occurs in a wide range of land tenures and ownership arrangements, including on private land, travelling stock routes and reserves, state forests and

state reserves, and National Parks. It is essential that the highest level of protection is provided to these areas and that enhancement and protection measures target these productive sites.

Habitat critical to the survival should not be cleared, fragmented or degraded. If removal of habitat critical to the survival cannot be avoided or mitigated, then an offset should be provided. Actions identified in this document may form suitable offsets.

Threats

Ongoing clearing of native vegetation is the underlying reason for the decline of the species. There is also widespread degradation of habitat that remains (Ford 2011) which has led to the replacement of native perennial grasses with exotic annual grasses. This has resulted in the starvation of firetails during periods when exotic annual grass seed germinates in autumn and winter (if no alternative seed sources exist) (Higgins et al. 2007; Hodder 2019). Habitat patches are also degraded by grazing stock, rabbits (*Oryctolagus cuniculus*), and overabundant kangaroos (*Macropus* spp.) that remove the shrub layer (Barrett et al. 2002). The agricultural matrix matters too as; firetails are more likely to persist in a matrix of sheep grazing - a land-use that has been declining (ABARES 2020) - than in matrixes where surrounding areas are grazed by cattle or sown to grain crops (Barrett et al. 2002).

Table 1 Threats impacting Diamond Firetail

Threat	Status and severity ^a	Evidence
Habitat loss, degradation and fragmentation		
Habitat loss caused by clearing for large scale agriculture	<ul style="list-style-type: none"> • Status: historical, current & future • Confidence: known • Consequence: severe • Trend: increasing • Extent: across part of its range 	<p>The main threats to bird survival in agricultural areas is habitat loss caused by over-clearing of native vegetation and subsequent degradation of remnant habitat patches (Stevens 2001). Since European settlement, over 80% of woodlands in south-east Australia have been cleared (Bradshaw 2012). Remaining remnants are generally isolated and small, and often below the critical size needed to sustain healthy populations of many bird species (Olsen et al. 2005). Populations appear unable to persist in areas which lack remnants of native vegetation larger than 200 hectares (N. Schrader, pers. comm. cited in NSW Scientific Committee 2000).</p> <p>Additionally, as habitats become increasingly fragmented due to clearing, native birds become more vulnerable to the other threats such as predation by feral species and destructive fires. The species may also lose the ability to recolonise previously suitable habitat (Olsen et al. 2005).</p>
Weeds, particularly exotic annual grasses, altering habitat	<ul style="list-style-type: none"> • Status: historical, current & future • Confidence: known • Consequence: severe 	<p>Invasive weeds have the ability to change the floristic and structural characteristics of habitat, thereby changing resource availability for native birds (French & Zubovic</p>

Threat	Status and severity ^a	Evidence
	<ul style="list-style-type: none"> • Trend: increasing • Extent: across the entire range 	<p>1997). The replacement of native perennial grasses with exotic annual grasses (e.g. African lovegrass <i>Eragrostis curvula</i>) has resulted in the starvation of Diamond Firetails during periods when exotic annual grass seed germinates (during autumn and winter) if there are no alternative seed sources (Higgins et al. 2007; Hodder 2019). Some weeds may also increase the flammability of habitat, amplifying bushfire risk (Salvo Aires 2014).</p>
<p>Habitat degradation caused by domestic livestock grazing</p>	<ul style="list-style-type: none"> • Status: historical, current & future • Confidence: known • Consequence: severe • Trend: increasing • Extent: across part of its range 	<p>Native tree and shrub seedlings and grassy woodland groundcover species are highly susceptible to domestic livestock grazing (Barrett et al. 2002). Unlike native herbivores, most domestic stock are hard-hoofed and cause significantly more damage to soil structure from compaction, and damage to native plants by trampling (Barrett et al. 2002). The reduction or removal of understorey habitat (e.g., native shrubs, herbs and grasses) can reduce foraging and nesting site availability, reduce shelter, and subsequently increase the risk of predation (Olsen et al. 2005).</p> <p>The other major influence of livestock grazing is its interaction with weed invasion (Martine & Alan 2005). Livestock grazing can exacerbate weed spread through seed dispersal, soil and vegetation disturbance, and nutrient enrichment (Martine & Alan 2005).</p>
<p>Habitat degradation caused by rabbit and overabundant kangaroo grazing</p>	<ul style="list-style-type: none"> • Status: current & future • Confidence: low • Consequence: moderate • Trend: static • Extent: unknown 	<p>Reduction of seed in heavily grazed grasslands likely reduce food availability for Diamond Firetail.</p> <p>There is evidence that feral rabbits (<i>Oryctolagus cuniculus</i>) negatively impact native species via competition for resources, alteration of the structure and composition of vegetation, and land degradation (Barrett et al. 2002; Commonwealth of Australia 2016a, 2016b). Grazing pressure by rabbits has reduced the capacity of woodlands to regenerate, consequently reducing Diamond Firetail nesting, feeding and foraging habitat quality.</p> <p>Overabundant kangaroos <i>Macropus</i> spp. grazing pressure can also negatively affect the subspecies by preventing regeneration (Willson & Bignall 2009).</p>
<p>Fire</p>		

Threat	Status and severity ^a	Evidence
Increase in frequency, scale, or intensity of fire	<ul style="list-style-type: none"> • Status: current & future • Confidence: known • Consequence: unknown • Trend: increasing • Extent: across the entire range 	<p>Too frequent fire may contribute to Diamond Firetail decline through: changes in composition and/or structure of vegetation; increased weed invasion following fire; loss of woody debris; and decline in invertebrate abundance (Spencer & Baxter 2006). Several fires in close succession can also prevent plants and animals from returning to an area (particularly in fragmented landscapes) and prevent soil seed set (Wilson & Bignall 2009).</p> <p>Since little is known about the appropriate fire regime for the species, particularly in fragmented landscapes, the potential for negative outcomes from management actions is high. A greater level of understanding is required to achieve effective management.</p>
Climate change		
Increased likelihood of extreme events (i.e., wildfire, heatwave, and drought)	<ul style="list-style-type: none"> • Status: current & future • Confidence: known • Consequence: unknown • Trend: increasing • Extent: across the entire range 	<p>Since 1950, the number of record hot days (above 35°C) across Australia has more than doubled and the mean temperature has increased by about 1.4°C Celsius since 1910 (BOM & CSIRO 2020; IPCC 2021). Heatwaves are also lasting longer, reaching more extreme maximum temperatures, and occurring more frequently over many regions of Australia, including south-eastern Australia (Perkins-Kirkpatrick et al. 2016; Evans et al. 2017; Herold et al. 2018; BOM & CSIRO 2020). Heatwaves exacerbate drought, which in turn can increase bushfire risk (Climate Council 2014) and adversely impact resource availability. (BOM & CSIRO 2020) Birds are vulnerable to extreme heatwaves that overwhelm their physiological limits (McKechnie et al 2012).</p> <p>It is not fully known how these weather events, or the cumulative effect of these weather events, affect Diamond Firetail survival and reproduction and its habitat. The precautionary principle should be applied to ensure suitable quality and quantity of habitat needed by the species is conserved across its known and suspected range.</p>
Competition		
Noisy Miner territorial competition	<ul style="list-style-type: none"> • Status: current & future • Confidence: known • Consequence: unknown 	<p>The Noisy Miner <i>Manorina melanocephala</i> is a native species that often aggressively excludes other small woodland birds from</p>

Threat	Status and severity ^a	Evidence
	<ul style="list-style-type: none"> • Trend: static • Extent: across part of its range 	remnants they occupy (Willson & Bignall 2009). Unfortunately, Noisy Miners have benefited from landscape-scale clearing and fragmentation. They typically dominate open Eucalypt woodland remnants on farms, in tree corridors and clumps of paddock trees, especially those lacking a shrubby understorey (Crates et al. 2018). Local scale control programs at critical breeding sites may benefit the species where Noisy Miners are identified a threat.
Predation		
Predation by Pied Currawongs	<ul style="list-style-type: none"> • Status: current & future • Confidence: known • Consequence: unknown • Trend: static • Extent: across part of its range 	With increased fragmentation of habitat there has been an increase in edge effects which includes the increase of edge-specialists. The Department of Environment and Climate Change NSW (2005) found that nest predation of Diamond Firetails by Pied Currawongs (<i>Strepera graculina</i>) increased with the degradation of fragmented remnants. Weeds species with berries, such as Hawthorn and Cotoneaster, can invade remnants which has assisted an increase in the population of Pied Currawongs.

Status—identify the temporal nature of the threat;

Confidence—identify the extent to which we have confidence about the impact of the threat on the species;

Consequence—identify the severity of the threat;

Trend—identify the extent to which it will continue to operate on the species;

Extent—identify its spatial content in terms of the range of the species.

Table 3 Diamond Firetail risk matrix

Likelihood	Consequences				
	Not significant	Minor	Moderate	Major	Catastrophic
Almost certain				<ul style="list-style-type: none"> Habitat loss caused by clearing for large scale agriculture 	
Likely		<ul style="list-style-type: none"> Habitat degradation caused by rabbit and overabundant kangaroo grazing 	<ul style="list-style-type: none"> Noisy Miner territorial competition 	<ul style="list-style-type: none"> Habitat degradation caused by domestic livestock grazing Invasive weeds, particularly exotic annual grasses, altering habitat 	
Possible		<ul style="list-style-type: none"> Predation by Pied Currawongs 			
Unlikely					
Unknown			<ul style="list-style-type: none"> Increased likelihood of extreme events (i.e., wildfire, heatwave, and drought) Increase in frequency, scale, or intensity of fire 		

Priority actions have then been developed to manage the threat particularly where the risk was deemed to be 'very high' or 'high'. For those threats with an unknown or low risk outcome it may be more appropriate to identify further research or maintain a watching brief.

Conservation and recovery actions

Primary conservation outcome

- Maintain or increase current abundance and distribution.

Conservation and management priorities

Habitat loss caused by clearing for large scale agriculture

- Retain and protect woodland, open forest, grassland and mallee habitat from clearing, fragmentation and disturbance (areas of 200 ha or greater within woody vegetation are particularly significant).

- Protect and maintain areas of high quality habitat, which includes open forest, woodland, mallee and grasslands with a diverse ground layer dominated by a mixture of grass species which seed at different times of year (providing a year round food supply) and provides scattered shrubs for shelter. Areas with access to water, especially riparian areas, are especially important.
- Undertake revegetation using a diverse mix of locally appropriate native species, which will produce high quality habitat. Revegetation should focus on:
 - expanding areas of existing habitat,
 - connecting isolated habitat patches (either through corridor or stepping stone plantings), and/or establishing additional habitat patches in landscapes with already existing, although insufficient, patches of suitable habitat.
 - Areas with access to water, especially riparian areas, are especially important. Care should be taken to ensure that riparian revegetation programs are sufficiently wide (minimum 50 m wide), and that the composition of the ground and understorey is managed.
- Restore native perennial grasses and casuarinas to habitat fragments.
- Retain mistletoe and scattered patches of dense shrubs for nesting habitat, particularly in areas close to water.
- Expand and reconnect smaller fragments of habitat by fencing and encouraging natural regeneration or applying revegetation techniques where regeneration fails.

Habitat degradation caused by domestic livestock grazing

- Reduce grazing intensity and regularity so that a diverse grass sward and scattered shrub layer is maintained, and seeding grasses and forbs that the species requires are present throughout the year.
- Actively manage pest and pastoral grazing in occupied patches, including control of overabundant herbivores.
- Exclude domestic stock grazing from high value habitats.
- Modify grazing management practices that will maintain or improve habitat values and still allow some grazing to occur at strategic times of the year.

Invasive weeds, particularly exotic annual grasses, altering habitat

- Undertake control of invasive exotic plant species that compete with native grasses, so as to increase the prevalence and diversity of food plants, in suitable habitat (e.g., exotic, winter-fruiting shrubs such as cotoneasters, hawthorns, firethorns and privets).
- Targeted removal of weeds significantly compromising habitat values (e.g., invasive perennial grasses) and restore native vegetation.

Stakeholder engagement/community engagement

- Target in-perpetuity covenants or stewardship agreements to landholders with high quality remnant woodland habitat.
- Support community education programs to achieve regional conservation outcomes.

- Engage landholders to adopt appropriate grazing regimes.

Survey and monitoring priorities

- Monitor long term trends and status of the species.
- Determine population densities and trends in a representative area across the range.
- Monitor the effectiveness of management actions and trends in local populations regularly. Any site-based management will be adapted, added or removed over time in response to monitoring results.

Information and research priorities

- Establish criteria for sites where management investment to secure Diamond Firetail populations is warranted, including identifying high value habitats (e.g., within domestic stock grazing areas).
- Determine whether Diamond Firetails require an active captive breeding and reintroduction program into restored landscapes.
- Develop techniques for restoring native perennial grasslands.
- Undertake experimental reintroductions within closely managed environments, including the provision of seed.
- Use modelling techniques to investigate the potential impact of climate change on the species and their habitat critical for survival.
- Measure the abundance and impact of Noisy Miners on the species' populations and habitat, and determine appropriate management actions with demonstrated effectiveness to reduce the impacts of Noisy Miners if/where required.

Recovery plan decision

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.

Links to relevant implementation documents

- [Threat abatement plan for competition and land degradation by rabbits](#) (Commonwealth of Australia 2016b).
- [Listing assessment for aggressive exclusion of birds from potential woodland and forest habitat by over-abundant noisy miners \(*Manorina melanocephala*\)](#) (Commonwealth of Australia 2014)

Conservation Advice and Listing Assessment references

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THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

The Threatened Species Scientific Committee draft listing assessment

Attachment A: Listing Assessment for *Stagonopleura guttata*

Reason for assessment

Prioritisation of a nomination from the TSSC.

Assessment of eligibility for listing

This assessment uses the criteria set out in the [EPBC Regulations](#). The thresholds used correspond with those in the [IUCN Red List criteria](#) except where noted in criterion 4, sub-criterion D2. The IUCN criteria are used by Australian jurisdictions to achieve consistent listing assessments through the Common Assessment Method (CAM).

Key assessment parameters

Table 4 includes the key assessment parameters used in the assessment of eligibility for listing against the criteria.

Table 4 Key assessment parameters

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Number of mature individuals	136,000	68,000	272,000	<p>The population estimate of Diamond Firetail is the product of the three measures of AOO and the density recorded in 2 ha 20 min surveys ($2.72 \pm SD 2.99$; BirdLife Australia 2020 cited in Hodder et al. 2021). Each 2x2 km square contributing to the AOO is assumed to indicate 16 ha of suitable habitat (S Garnett pers. comm. 9 Nov 2021).</p> <p>The following assumptions were made in the estimates of the population size:</p> <ul style="list-style-type: none"> • The AOO, which attributes 2x2 km of habitat to any point at which the species is recorded, is based only on sightings of birds that have been entered into the BirdLife Australia database (S Garnett pers. comm. 9 Nov 2021). Many areas occupied by the species are likely to be unrecorded. From some, however, the birds may have disappeared since the record was made. For this reason, the AOO has wide error margins (S Garnett pers. comm. 9 Nov 2021). • The area surveyed within any part of the AOO is likely to be small relative to the total 2x2 km assumed to be occupied (S Garnett pers. comm. 9 Nov 2021). In some 2x2 km AOO squares, the entire area will be suitable habitat and occupied. In others, only a fragment of occupied habitat may remain. For there to be a

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
				<p>record at all must mean there is 2 ha of habitat in which the species was present in at least part at the time of the survey (S Garnett pers. comm. 9 Nov 2021). The population estimates assume that double that area is available within every 2x2 km, which is deliberately highly conservative (S Garnett pers. comm. 9 Nov 2021).</p> <ul style="list-style-type: none"> The density of 1.36 birds/ha (2.72 in each 2 ha plot surveyed) is based on surveys in which observers have noted the number of individuals they have seen during a survey. The number of individuals recorded during surveys is highly variable (\pmSD 2.99) (S Garnett pers. comm. 9 Nov 2021). <p>The reliability of this population estimate is very low (S Garnett pers. comm. 9 Nov 2021).</p>
Trend	Declining			<p>Local experience of declines, particularly in the south and east and now evident in reporting rate trends (Hodder et al. 2021).</p> <p>The reliability of this estimate is high as there is a high probability of declines continuing (Hodder et al. 2021).</p>
Generation time (years)	2.2	1.7	2.8	Bird et al. (2020). The reliability of this estimate is low.
Extent of occurrence	1,500,000 km ²	1,400,000 km ²	1,600,000 km ²	Hodder et al. (2021). The reliability of this estimate is high.
Trend	Contracting			Hodder et al. (2021). The reliability of this estimate is high.
Area of Occupancy	25,000 km ²	12,500 km ²	50,000 km ²	The minimum AOO is the number of 2x2 km squares within they have been recorded since 1990, although they may have been extirpated from some areas (Hodder et al. 2021). The reliability of this estimate is low (Hodder et al. 2021).
Trend	Contracting			Hodder et al. (2021). The reliability of this estimate is high.
Number of subpopulations	3	2	100	The species appears to have been separated into three isolated subpopulations (Eyre Peninsula, Mt Lofty to Southern Flinders Ranges, and the south-east) (Higgins et al. 2007) with few records from a fourth (Yorke Peninsula) in the last decade (Hodder et al. 2021). The reliability of this estimate is low.
Trend	Declining			Hodder et al. (2021). The reliability of this estimate is high.

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Basis of assessment of subpopulation number	At least two isolated subpopulations in South Australia, however due to the fragmentation of woodland habitat and low dispersal distances there are there may be many other subpopulations of Diamond Firetail (Hodder et al. 2021).			
No. locations	>10			Hodder et al. (2021)
Trend	Not calculated			Hodder et al. (2021)
Basis of assessment of location number	Not calculated: the spatial nature of the threats, even though stochastic in space and time, is such that there are >10 geographically or ecologically distinct areas were a single threatening event could affect all individuals of the taxon present within a period of three years (Hodder et al. 2021).			
Fragmentation	Not severely fragmented (Hodder et al. 2021).			
Fluctuations	Not subject to extreme fluctuations in EOO, AOO, number of subpopulations, locations or mature individuals (Hodder et al. 2021).			

Criterion 1 Population size reduction

Reduction in total numbers (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%
<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.</p> <p>A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3]</p> <p>A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.</p>	Based on any of the following		<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>

Criterion 1 evidence

Eligible under Criterion 1 A2bce+3ce+4bce for listing as Vulnerable

Diamond Firetails occur on the south-east mainland of Australia from south-east Queensland to Eyre Peninsula, South Australia and about 300 km inland from the sea (Higgins et al. 2007). Reporting rate data can be used to determine bird species abundance. Data used in trend analyses are limited to standardised bird surveys drawn from discrete (spatially separated) sites which have multiple repeat observations over time. Although reporting rates were stable

between BirdLife Australia Atlases (Barrett et al. 2002), Diamond Firetails are one of a suite of taxa considered to be declining in south-eastern Australia (Hodder et al. 2021). Local experience of declines, particularly in the south and east, are especially evident (Hodder et al. 2021). Recent trends in reporting rates across the range of the species are consistent with this: from 2000–2019, reporting rates from 2 ha 20 min counts and 500 m area searches declined by 58% and 46%, respectively (2000–2009: 40% and 41%; 2010–2019: 35% and 7%) (Hodder et al. 2021).

However, not all regional results are consistent. In the Mt Lofty Ranges, abundance in 151 2 ha plots monitored annually between 2001 and 2016 declined by about 2% p.a. (TAA Prowse, PJ O'Connor, SJ Collard, KJ Peters, HP Possingham unpublished cited in Hodder et al. 2021). Furthermore, in north-east New South Wales reporting rates at 41 sites declined from 18% in 1977–1980 to 12% in 2004–2006 (Gosper & Gosper 2016) and zero in 2020 (DG Gosper, CR Gosper pers. comm. cited in Hodder et al. 2021). However, there was no significant change in reporting rates from 2 ha 20 min surveys for 1999–2013 for the Brigalow Belt or South-east Mainland regions (BirdLife Australia 2015); there was a strongly significant increase of 10% p.a. in surveys during 2000–2015 at over 165 sites in southern New South Wales (Lindenmayer et al. 2018); and drought had no impact on reporting rates in central New South Wales (Ellis & Taylor 2014). Reporting rates in the Australian Capital Territory show a six-fold fluctuation, with peaks in 1987–1996 and 2006–2011 and a trough in 2000–2006 and a steady decline from 2011–2017 (Canberra Ornithologists Group 2020).

Though regional trend data report a variety of estimates, reporting rate trends across the species' range indicate a continuing rapid decline in the population size of 30–50% over the last ten years (one generation 2.2 years) with high probability of declines continuing (Hodder et al. 2021). While there is no dedicated range-wide monitoring, the species is still sufficiently common that reporting rate trends are likely to reflect changes in abundance (Hodder et al. 2021).

The continued clearance of native vegetation (EES 2019) is the underlying reason for the decline of the species (Hodder et al. 2021). There is also widespread degradation of remaining habitat (Ford 2011), which has led to the replacement of native perennial grasses with exotic annual grasses. This often results in the starvation of firetails during periods when exotic annual grass seed germinates in autumn and winter if there are no alternative seed sources (Higgins et al. 2007; Hodder 2019). Habitat patches are also degraded by grazing stock, rabbits (*Oryctolagus cuniculus*), and kangaroos (*Macropus* spp.) that remove the shrub layer (Barrett et al. 2002).

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

Criterion 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:			
(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			

Criterion 2 evidence

Not eligible

Diamond Firetail EOO and AOO are estimated to be 1,500,000 km² (range 1,400,000–1,600,000 km²) and 25,000 km² (range 12,500–50,000 km²), respectively (Hodder et al. 2021). The species is not considered to be severely fragmented. The number of locations has not been calculated, though the spatial nature of the threats, even though stochastic in space and time, is such that there are >10 geographically or ecologically distinct areas where a single threatening event could affect all individuals of the taxon present within a period of three years (Hodder et al. 2021). An ongoing population decline is projected due to decreases in quantity and quality of habitat. Diamond Firetails are not subject to extreme fluctuations in EOO, AOO, number of subpopulations, locations or mature individuals (Hodder et al. 2021).

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 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:			
(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			

Criterion 3 evidence

Not eligible

The total number of mature individuals is estimated to be 136,000 (range 68,000–272,000; low reliability) with a declining trend (Hodder et al. 2021). There are estimated to be three subpopulations with a declining trend. The number of mature individuals in the largest subpopulation is estimated to be 125,000 (range 60,000–260,000) (Hodder et al. 2021). The species is not subject to extreme fluctuations in EOO, AOO, number of subpopulations, locations or mature individuals (Hodder et al. 2021).

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

Criterion 4 Number of mature individuals

	Critically Endangered Extremely low	Endangered Very Low	Vulnerable Low
D. Number of mature individuals	< 50	< 250	< 1,000
D2. ¹ Only applies to the Vulnerable category Restricted area of occupancy or number of locations with a plausible future threat that could drive the species to critically endangered or Extinct in a very short time			D2. Typically: area of occupancy < 20 km ² or number of locations ≤ 5

¹ The IUCN Red List Criterion D allows for species to be listed as Vulnerable under Criterion D2. The corresponding Criterion 4 in the EPBC Regulations does not currently include the provision for listing a species under D2. As such, a species cannot currently be listed under the EPBC Act under Criterion D2 only. However, assessments may include information relevant to D2. This information will not be considered by the Committee in making its recommendation of the species' eligibility for listing under the EPBC Act, but may assist other jurisdictions to adopt the assessment outcome under the [common assessment method](#).

Criterion 4 evidence

Not eligible

The total number of mature individuals is 136,000 (range 68,000–272,000; low reliability) (Hodder et al. 2021).

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

Criterion 5 evidence

Insufficient data to determine eligibility

Population viability analysis appears not to have been undertaken, and therefore there is 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.

Adequacy of survey

The survey effort has been considered adequate and there is sufficient scientific evidence to support the assessment.

CONSULTATION QUESTIONS FOR *Stagonopleura guttata* (Diamond Firetail)

SECTION A - GENERAL

1. Is the information used to assess the nationally threatened status of the species/subspecies robust? Have all the underlying assumptions been made explicit? Please provide justification for your response.
2. Can you provide additional data or information relevant to this assessment?
3. Have you been involved in previous state, territory or national assessments of this species/subspecies? If so, in what capacity?

PART 1 – INFORMATION TO ASSIST LISTING ASSESSMENT

SECTION B DO YOU HAVE ADDITIONAL INFORMATION ON THE ECOLOGY OR BIOLOGY OF THE SPECIES/SUBSPECIES? (If no, skip to section C)

Biological information

4. Can you provide any additional or alternative references, information or estimates on longevity, average life span and generation length?
5. Do you have any additional information on the ecology or biology of the species/subspecies not in the current advice?

SECTION C ARE YOU AWARE OF THE STATUS OF THE TOTAL NATIONAL POPULATION OF THE SPECIES/SUBSPECIES? (If no, skip to section D)

Population size

6. Has the survey effort for this taxon been adequate to determine its national adult population size? If not, please provide justification for your response.
7. 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/subspecies? If not, please provide justification for your response.
8. If not, can you provide a further estimate of the current population size of mature adults of the species/subspecies (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/subspecies 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:

<50,000 50,001–100,000 100,001–150,000 150,000 – 200,000

- 200,001 – 250,000 250,001 – 300,000 >300,001

Level of your confidence in this estimate:

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

SECTION D ARE YOU AWARE OF TRENDS IN THE OVERALL POPULATION OF THE SPECIES/SUBSPECIES? (If no, skip to section E)

9. Does the current and predicted rate of decline used in the assessment seem reasonable? Do you consider that the way this estimate has been derived is appropriate? If not, please provide justification of your response.

Evidence of total population size change

10. Are you able to provide an estimate of the total population size during the late 2000s (*at or soon after the start of the most recent three generation period*)? 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/subspecies 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:

- <50,000 50,001–100,000 100,001–150,000 150,000 – 200,000
- 200,001 – 250,000 250,001 – 300,000 >300,001

Level of your confidence in this estimate:

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

11. Are you able to comment on the extent of decline in the species/subspecies' total population size over the last approximately 13 years (i.e., three generations)? 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.

Decline estimated to be in the range of:

1–30% 31–50% 51–80% 81–100% 90–100%

Level of your confidence in this estimated decline:

0–30% - low level of certainty/ a bit of a guess/ not much information to go on

31–50% - more than a guess, some level of supporting evidence

51–95% - reasonably certain, suggests this range of decline

95–100% - high level of certainty, information indicates a decline within this range

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

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

SECTION E ARE YOU AWARE OF INFORMATION ON THE TOTAL RANGE OF THE SPECIES/SUBSPECIES? (If no, skip to section F)

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

13. Does the assessment consider the entire geographic extent and national extent of the species/subspecies? If not, please provide justification for your response.

14. Has the survey effort for this species/subspecies been adequate to determine its national distribution? If not, please provide justification for your response.

15. Is the distribution described in the assessment accurate? If not, please provide justification for your response and provide alternate information.

16. 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.

17. 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.

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

<500,000 km² 500,001 – 1,000,000 km² 1,000,001 – 1,500,000 km²

1,500,001 – 2,000,000 km² >2,000,001 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 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.

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

- <10,000 km² 10,001 – 20,000 km² 20,001 – 30,000 km²
- 30,001 – 40,000 km² 40,001 – 50,000 km² > 50,000 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

SECTION F ARE YOU AWARE OF TRENDS IN THE TOTAL RANGE OF THE SPECIES/SUBSPECIES? (If no, skip to section G)

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

18. Do you consider that the way the historic distribution has been estimated is appropriate? Please provide justification for your response.
19. 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.

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:

- <500,000 km² 500,001 – 1,000,000 km² 1,000,001 – 1,500,000 km²

1,500,001 – 2,000,000 km² >2,000,001 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:

<10,000 km² 10,001 – 20,000 km² 20,001 – 30,000 km²

30,001 – 40,000 km² 40,001 – 50,000 km² > 50,000 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

PART 2 – INFORMATION FOR CONSERVATION ADVICE ON THREATS AND CONSERVATION ACTIONS

SECTION G DO YOU HAVE INFORMATION ON THREATS TO THE SURVIVAL OF THE SPECIES/SUBSPECIES? (If no, skip to section H)

20. Do you consider that all major threats have been identified and described adequately?
21. To what degree are the identified threats likely to impact on the species/subspecies in the future?
22. Are the threats impacting on different populations equally, or do the threats vary across different populations?

23. Can you provide additional or alternative information on past, current or potential threats that may adversely affect the species/subspecies 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?

SECTION H DO YOU HAVE INFORMATION ON CURRENT OR FUTURE MANAGEMENT FOR THE RECOVERY OF THE SPECIES/SUBSPECIES? (If no, skip to section I)

25. What planning, management and recovery actions are currently in place supporting protection and recovery of the species/subspecies? 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/subspecies?
27. Would you recommend translocation (outside of the species' historic range) as a viable option as a conservation actions for this species/subspecies?

SECTION I DO YOU HAVE INFORMATION ON STAKEHOLDERS IN THE RECOVERY OF THE SPECIES/SUBSPECIES?

28. Are you aware of other knowledge (e.g., traditional ecological knowledge) or individuals/groups with knowledge that may help better understand population trends/fluctuations, or critical areas of habitat?
29. Are you aware of any cultural or social importance or use that the species/subspecies has?
30. What individuals or organisations are currently, or potentially could be, involved in management and recovery of the species/subspecies?
31. How aware of this species/subspecies are land managers where the species/subspecies is found?
32. What level of awareness is there with individuals or organisations around the issues affecting the species/subspecies?
 - a. Where there is awareness, what are these interests of these individuals/organisations?
 - b. Are there populations or areas of habitat that are particularly important to the community?

PART 3 – ANY OTHER INFORMATION

33. Do you have comments on any other matters relevant to the assessment of this species/subspecies?