



Consultation Document on Listing Eligibility and Conservation Actions

Stagonopleura bella samueli (Western Beautiful Firetail)

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

- 1) the eligibility of *Stagonopleura bella samueli* (Western Beautiful Firetail) for inclusion on the EPBC Act; 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 2 July 2021.

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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 bella samueli* (Western Beautiful Firetail)

Conservation status

Stagonopleura bella samueli 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 subspecies' eligibility against each of the listing criteria is:

- Criterion 1: Insufficient data
- Criterion 2: Not eligible
- Criterion 3: Insufficient data
- Criterion 4: Insufficient data
- Criterion 5: Insufficient data

Based on a preliminary assessment of available data, the subspecies appears to be ineligible to be listed under the EPBC Act. Despite the subspecies extremely restricted extent of occurrence (EOO) (72 km²) and area of occupancy (AOO) (36 km²), the subspecies is ineligible for listing due to the spatial nature of the threats. There are >10 geographically or ecologically distinct areas where a single threatening event could affect all individuals of the subspecies present. The subspecies is also not subject to extreme fluctuation of (i) EOO; (ii) AOO; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals. The subspecies is also not considered to be severely fragmented. No information is available on current population size or population trends of the subspecies.

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

Species information

Taxonomy

Western Beautiful Firetail are conventionally accepted as *Stagonopleura bella samueli* (Mathews 1912).

The subspecies is endemic to the Mount Lofty Ranges, Fleurieu Peninsula, and Kangaroo Island. Two other subspecies are currently recognised. The nominate subspecies *bella* occurs in NSW, eastern Victoria (as far west as Melbourne), and in Tasmania; including Flinders Island. The subspecies *interposita* occurs in far south-west Victoria and south-east South Australia. Blakers et al. (1984) identified a gap in the distribution of this species which isolates the Mount Lofty Ranges, Fleurieu Peninsula, and Kangaroo Island populations. No breeding records exist for the

area of this reputed gap, supporting the notion of an isolated subspecies (Department of Environment and Heritage 2008).

Description

Western Beautiful Firetails are approximately 11 cm in length, have a wingspan of 14 cm, and weigh around 14 g. They are a small but plump finch, with short wings. Western Beautiful Firetail are very similar in appearance to the nominate subspecies.

Adults are finely barred black throughout the entire body. Their upperparts are largely grey-brown. A black mask is present across the lores of the bird, contrasting with a blueish orbital ring, giving a “masked” appearance. The bill of Western Beautiful Firetail is bright red. It is slightly shorter and narrower than that of the nominate. The underparts of the subspecies are largely white, but maintain a distinctive black barring. A black patch is present on the underbody. This is typically larger on male individuals, and less prominent on females. The uppertail coverts and base of the tail are a prominent bright red colour. They have a small, square-tipped tail. The legs and feet are pinkish-brown. The tarsus of female Western Beautiful Firetail is shorter than those of the nominate.

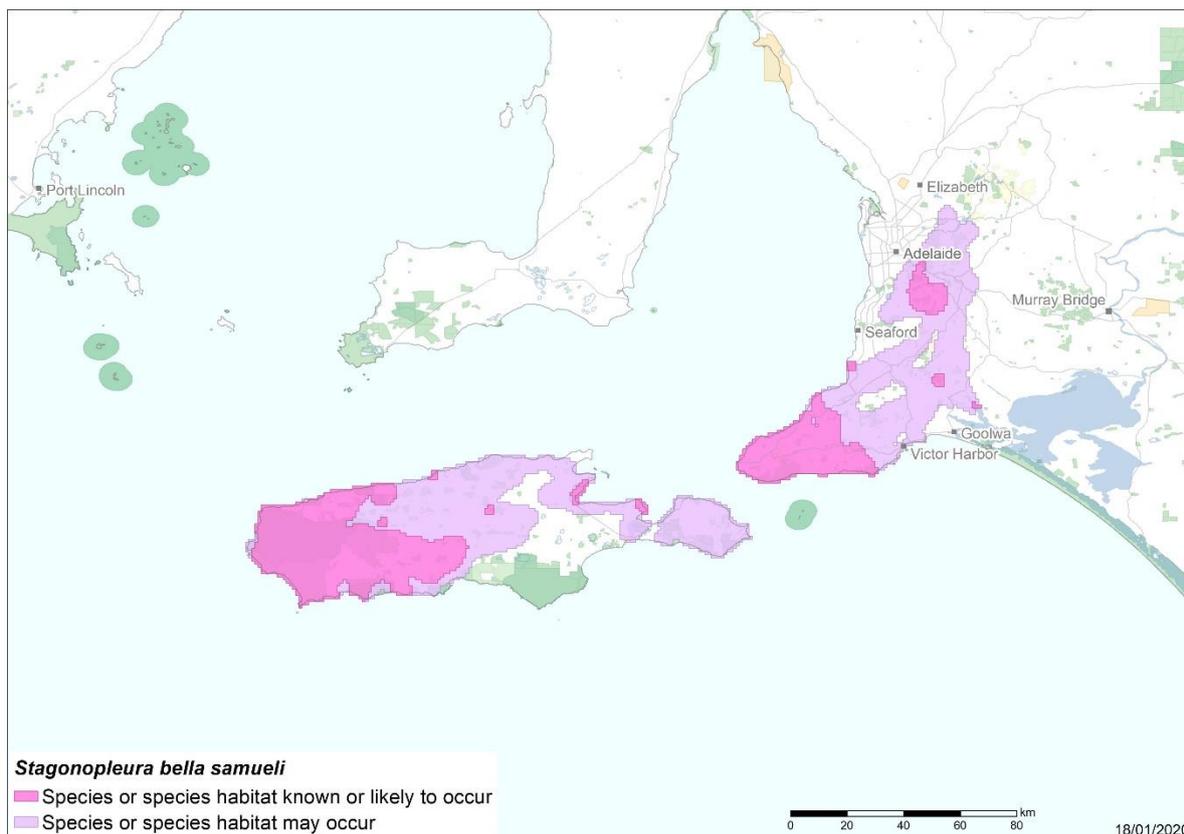
Juveniles are similar in appearance to adults, but generally are duller and browner throughout.

Distribution

The Western Beautiful Firetail is widespread on Kangaroo Island, which supports the highest density of the subspecies (Robinson & Kemper N.D.) (Figure 1). The subspecies has also been identified on the Fleurieu Peninsula, and within the southern Mount Lofty Ranges. Within these areas, most records come from three locations: The Deep Creek Conservation Park, Newland Head Conservation Park, and Cox Scrub Conservation Park (Department of Environment and Heritage 2008).

There is insufficient information available to describe the distribution in more detail. Further surveys and monitoring programs are required to assess the area of occupancy, population size and trend of the subspecies post 2019/2020 bushfires.

Map 1 Modelled distribution of Western Beautiful Firetail



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

Cultural and community significance

There is no known cultural or community significance of the Western Beautiful Firetail. However, much of Kangaroo Island, the Mount Lofty Ranges, and Eyre Peninsula occurs in the region of the following Traditional Owner groups: Ramindjeri, Ngarrindjeri, Kurna, Narangga and Peramangk. Further research into the subject area may benefit the conservation of the subspecies by providing insights about traditional culture and land management.

Relevant biology and ecology

The Western Beautiful Firetail presumably possesses a similar biology and ecology to the nominate subspecies. It is suspected that the Western Beautiful Firetail is mainly granivorous, eating the seeds of grasses and other plants. Food plants include both native and introduced species (Department of Environment and Heritage 2008). Other vegetable matter likely forms a small part of the subspecies' diet, as do insects. Foraging activities usually take place amongst ground vegetation, or within low vegetation. Foraging occurs in small flocks of 3–12 birds, or in pairs during the breeding season.

Outside of the breeding season, Western Beautiful Firetail build roost-nests which are used during periods of inclement weather. These are unlined nests which have a small entrance-tunnel. Roost nests are occupied for approximately two months before being abandoned. New roost nests are then built nearby.

The breeding habits of the Beautiful Firetail are not well studied. The breeding and egg-laying periods for the subspecies cannot be accurately stated. A suspected breeding season likely

occurs between September and January (Department of Environment and Heritage 2008). Nests are typically built in the fork of dense foliage or shrubs; often in tea-tree, *Acacia*, *Hakea*, or *Bursaria*. Occasionally nests are built in taller trees such as eucalypts.

The nest of the Beautiful Firetail is shaped like a bottle on its side, with a long tunnel leading to a round egg-chamber. Nests are typically made of long grass stems, vines, twigs, and leaves. The inside of nests are lined with feathers, fur, plant down, and sometimes fine grass or wool. Clutches of three to eight eggs are typical. Sometimes two broods may be reared in succession (Department of Environment and Heritage 2008). Incubation duties are performed by both adults, with changeovers occurring every 90–120 minutes. In captivity, the incubation period lasts for 13–15 days. The fledging period lasts for approximately 23 days.

Western Beautiful Firetails are presumed to be sedentary, or resident, only undertaking some local movements. The subspecies has a large home range, up to several square kilometres. It is presumed to use specific parts of this large home range for a few days, before moving to a different area, and thereby covering the whole home range over a period of time (Department of Environment and Heritage 2008).

Habitat critical to survival

The Western Beautiful Firetail occurs throughout Kangaroo Island, and within the southern Mount Lofty Ranges and Fleurieu Peninsula. The subspecies likely inhabits shrubland and woodland, especially those containing casuarinas, paperbarks, and tea-trees. The subspecies is also likely to inhabit eucalypt woodlands and forests with a shrubby/heathy understory. Areas near watercourses, swamps, and marshes tend to support the highest density of individuals. Low shrubby habitats such as grasslands, heathlands and sedgeland also provide possible habitat for the subspecies. Any known or likely habitat should be considered as habitat critical to the survival of the subspecies. Additionally, areas that are not currently occupied by the subspecies because they have been burnt (either during the 2019/20, or in future fires), but should become suitable again in the future, should also be considered habitat critical to survival.

Additionally, the whole of Kangaroo Island has been identified as a Key Biodiversity Area (KBA) (BirdLife International 2020), guided by the KBA Standard (IUCN 2016). Although this subspecies has not been identified as a KBA trigger species, conservation actions implemented would likely benefit other already threatened species (e.g., Glossy Black-cockatoo (Kangaroo Island) *Calyptorhynchus lathami halmaturinus*) and other species with similar ecological needs (e.g., Kangaroo Island White-eared Honeyeater *Nesoptilotis leucotis thomasi*) which were also affected by the 2019/2020 bushfires.

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

Threats

The threats affecting Western Beautiful Firetail likely resemble those affecting other threatened bird species of Kangaroo Island, the Mount Lofty Ranges, and the Fleurieu Peninsula. The primary threat to Western Beautiful Firetail is the loss of suitable habitat by processes such as wildfires, and habitat clearance for urban expansion and agriculture. Large swathes of native vegetation in South Australia have been removed during the expansion of agricultural systems. These activities severely fragmented areas of native vegetation. Recent wildfire events have

further exacerbated this habitat fragmentation. Following the 2019/20 bushfires, burnt area on Kangaroo Island covered 210,606 hectares, affecting almost half of the island (Boulton et al. 2020; Government of South Australia 2020). Throughout the whole of South Australia, some 278,838 hectares of land burnt. The extent to which this affected Western Beautiful Firetail is currently unknown. It is suspected that large portions of the subspecies' habitat critical for survival was either completely burnt, or severely degraded. The subspecies is now at a greater risk of being negatively affected by intensified edge effects; increases in habitat degradation by pest animals, and invasive weeds.

Predicted changes to the climate of Kangaroo Island, the Mount Lofty Ranges, and the Fleurieu Peninsula are likely to considerably exacerbate the future risk of extreme weather events. Wildfires and droughts are predicted to become increasingly common and more severe. The Western Beautiful Firetails' resilience to these changes is unknown; however, it is likely that these changes will significantly impact the size and health of remaining populations.

Table 1 Threats impacting Western Beautiful Firetail

Threat	Status and severity	Evidence
Fire		
Increase in frequency and/or intensity of wildfires	<ul style="list-style-type: none"> • Status: current, future • Confidence: known • Consequence: severe • Trend: increasing • Extent: across the entire range 	<p>The 2019/20 bushfires on Kangaroo Island burnt 210,606 hectares, affecting almost half of the island (Boulton et al. 2020; Government of South Australia 2020). In total, the burnt area in South Australia covered 278,838 hectares (Keelty et al. 2020), also affecting the Mount Lofty Ranges and Fleurieu Peninsula populations of Western Beautiful Firetail.</p> <p>Initial fire mapping has indicated that many bird species have lost major proportions of their habitat in these fire-affected areas (Boulton et al. 2020).</p> <p>The cumulative effects of climate change have increased and will continue to increase the likelihood of intense bushfires in South Australia (BOM 2010, 2018; Government of South Australia 2015, 2020). Wildfire events and inappropriate fire regimes are likely to be a major future threat to subpopulations of Western Beautiful Firetail.</p>
Climate change		
Increased likelihood of extreme events (i.e., wildfire, heatwave, and drought)	<ul style="list-style-type: none"> • Status: current/future • Confidence: inferred • Consequence: severe • Trend: increasing • Extent: across the entire range 	<p>In the Kangaroo Island NRM region average temperatures are projected to increase by 1.6–3.5 degrees Celsius by 2070. Annual rainfall in South Australia is projected to decline by 7.5 to 8.9 percent by 2050, and 7.9 to 12.5 percent by 2070 (Resilient Hills and Coasts 2016). Within the Kangaroo Island region, rainfall is projected to decrease by up to 30 percent by 2070 (Government of South Australia 2015).</p>

Threat	Status and severity	Evidence
		<p>The cumulative effects of climate change are contributing to a continued increase the likelihood of extreme events such as heatwaves, droughts, and more intense bushfires (BOM 2010, 2018; Government of South Australia 2015, 2020). These could contribute to increased heat-related illness and mortality rates within Western Beautiful Firetail populations. Increasing temperatures and decreasing rainfall are also likely to degrade the habitats of native plants and animals and improve conditions for some pest animals and weeds. These climate anomalies may have detrimental impacts to Western Beautiful Firetail and their habitats.</p>
Habitat loss, degradation and modifications		
<p>Habitat degradation by pest animals (i.e., pigs and peacocks)</p>	<ul style="list-style-type: none"> • Status: current • Confidence: known • Consequence: moderate • Trend: static • Extent: across the entire range 	<p>Pest animals pose a considerable threat to the subspecies as they cause widespread habitat degradation and increase competition for resources. In 2007 approximately 80 percent of agricultural businesses within the Kangaroo Island NRM region reported pest animal problems and resultantly implemented pest animal control activities (Government of South Australia 2015).</p> <p>The major pests currently on Kangaroo Island are feral pig (<i>Sus scrofa</i>) and the peafowl (<i>Pavo cristatus</i>). Feral pigs cause habitat degradation through grazing, trampling, and digging. They may also spread the plant pathogen <i>Phytophthora cinnamomi</i>, which can cause severe diebacks of native vegetation (Commonwealth of Australia 2017a).</p> <p>The impacts of peafowl are not well studied. Their pest status primarily originates from the species' tendency to feed on agricultural crops and pasture, impacting livestock. They are also susceptible to diseases and parasites, which could spread to native species (Latham 2011). Cunningham et al. (2016) modelled peafowl population sizes on Kangaroo Island and indicated that unmanaged peafowl populations on the island could exceed 2,000 individuals after 10 years. Therefore, it is important for management actions to be in place.</p>

Threat	Status and severity	Evidence
<i>Phytophthora cinnamomi</i> induced diebacks	<ul style="list-style-type: none"> • Status: current & future • Confidence: suspected • Consequence: moderate • Trend: unknown • Extent: across part of its range 	<p>Due to having ideal climatic conditions (i.e., warm and wet winters, and dry summers), Kangaroo Island is particularly vulnerable to <i>P. cinnamomi</i> (Burgess et al. 2016). <i>P. cinnamomi</i> affects a wide range of native plants, altering their structural and floristic characteristics (Commonwealth of Australia 2018a; Hardham & Blackman 2018). This is potentially threatening because of its capacity to cause widespread dieback and consequently reduce habitat suitability for Western Beautiful Firetail.</p>
Invasive weeds	<ul style="list-style-type: none"> • Status: current • Confidence: known • Consequence: low • Trend: increasing • Extent: across the entire range 	<p>Invasive weeds are a potential minor threat as they can change the availability of resources, reducing the quality of habitat (French & Zubovic 1997). Additionally, due to the flammable nature of some weeds (e.g., gorse <i>Ulex europaeus</i>), the risk and severity of wildfire is also increased (Invasive Plants and Animals Committee 2016).</p>
Habitat fragmentation	<ul style="list-style-type: none"> • Status: historical, current • Confidence: known • Consequence: minor • Trend: increasing • Extent: across the entire range 	<p>Much of the Western Beautiful Firetail's habitat has been cleared. The remaining habitat is highly fragmented and degraded due to increased edge effects, grazing by domestic stock and rabbits (<i>Oryctolagus cuniculus</i>) (mainland only), and the removal of firewood. Whilst the habitat types used by Western Beautiful Firetail are naturally patchy, they now are reduced in both size and quality. The remaining populations of Western Beautiful Firetail are likely small and isolated, with reduced inter-population dispersal capabilities. This may have already resulted in the local extinction of some populations. However, further research is required to fully understand the consequences of this population isolation.</p>
Predation		
Predation by cats and foxes	<ul style="list-style-type: none"> • Status: current • Confidence: inferred • Consequence: moderate • Trend: static • Extent: across the entire range 	<p>Predation by cats (<i>Felis catus</i>) may be a threat to the Western Beautiful Firetail, because it forages on or near the ground (Woinarski et al. 2017). Kangaroo Island has a higher average density of feral cats than similar environments on the mainland, with a total of around 1,600 individuals on the island (Taggart et al. 2019; Hohnen et al. 2020). A large proportion of these feral cats are thought to have perished during the</p>

Threat	Status and severity	Evidence
		<p>2019/20 wildfire event. However, predation impacts on surviving wildlife could still be higher post-fire, and cat populations are likely to recovery over time.</p> <p>Management actions to control feral cats are in place. Current goals aim to eradicate feral cats from Kangaroo Island by 2030 (Kangaroo Island Landscape Board 2015).</p> <p>European red fox (<i>Vulpes vulpes</i>) are pests elsewhere in South Australia and may affect the Mount Lofty Ranges and Fleurieu Peninsula populations of Western Beautiful Firetail. It is a key priority to prevent these invasive predators from becoming established on Kangaroo Island (Government of South Australia 2015).</p>

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.

Each threat has been described in Table 1 in terms of the extent that it is operating on the species. The risk matrix (Table 3) provides a visual depiction of the level of risk being imposed by a threat and supports the prioritisation of subsequent management and conservation actions. In preparing a risk matrix, several factors have been taken into consideration, they are: the life stage they affect; the duration of the impact; and the efficacy of current management regimes, assuming that management will continue to be applied appropriately (Table 2). The risk matrix (Table 3) and ranking of threats has been developed in consultation with experts, community consultation and by using available literature.

Table 2 Risk prioritisation

Likelihood	Consequences				
	Not significant	Minor	Moderate	Major	Catastrophic
Almost certain	Low risk	Moderate risk	Very high risk	Very high risk	Very high risk
Likely	Low risk	Moderate risk	High risk	Very high risk	Very high risk
Possible	Low risk	Moderate risk	High risk	Very high risk	Very high risk
Unlikely	Low risk	Low risk	Moderate risk	High risk	Very high risk
Unknown	Low risk	Low risk	Moderate risk	High risk	Very high risk

Categories for likelihood are defined as follows:

Almost certain – expected to occur every year

Likely – expected to occur at least once every five years

Possible – might occur at some time

Unlikely – such events are known to have occurred on a worldwide basis but only a few times

Rare or Unknown – may occur only in exceptional circumstances; OR it is currently unknown how often the incident will occur

Categories for consequences are defined as follows:

Not significant – no long-term effect on individuals or populations

Minor – individuals are adversely affected but no effect at population level

Moderate – population recovery stalls or reduces

Major – population decreases

Catastrophic – population extinction

Table 3 Western Beautiful Firetail risk matrix

Likelihood	Consequences				
	Not significant	Minor	Moderate	Major	Catastrophic
Almost certain			Habitat fragmentation	Climate change	Wildfire
Likely		Invasive weeds	Predation by cats and foxes	Pest animals	
Possible			<i>P. cinnamomi</i> induced diebacks		
Unlikely					
Unknown					

Priority actions have been developed to manage the threat particularly where the risk was deemed to be ‘very high’ (red cells) or ‘high’ (yellow cells). 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

- Stable population of Western Beautiful Firetail on Kangaroo Island.

Conservation and management priorities

Wildfire

- Fire management protocols in place to prevent fires affecting more than 25 percent of the population per decade.
- Actively manage the landscape to minimise the risk of very large fires, particularly of very large high intensity fires.
- Develop approaches to stop fire on hot, windy days.
- Develop a site-based fire management strategy with local authorities which considers the ecological needs of the subspecies.
- Monitor bushfire-affected areas to assess the impact of wildfire on the subspecies and their habitats, and the capacity of the subspecies to recover from such events.
- Minimise or avoid burning unburnt areas within or adjacent to recently burnt ground that may provide refuge, until the burnt areas have recovered sufficiently to support the subspecies once again.

Climate change

- Use climate modelling techniques to investigate the potential impact of climate change on the subspecies and their habitat critical for survival.

Habitat degradation by pest animals (i.e., pigs and peafowl)

- Assess the impact of pest animals on the subspecies and its habitats, and the effectiveness of current control programs and incorporate new knowledge into management interventions.
- Continue to implement a management plan for the control or eradication of feral/pest species throughout Kangaroo Island, the Mount Lofty Ranges, and the Fleurieu Peninsula.
- Manage or improve existing breeding, non-breeding, and foraging habitat.

Habitat fragmentation

- Undertake native vegetation restoration activities in degraded areas previously known to support Western Beautiful Firetail.

Predation by cats and foxes

- Continue to implement Kangaroo Island Feral Cat Eradication Program with the aim of eradicating feral cats on the island by 2030.
- Continue to implement Feral Cat Threat Abatement Plan (Commonwealth of Australia 2015b).

***P. cinnamomi* and invasive weeds**

- Continue to raise public awareness on the impact of *P. cinnamomi* on native vegetation and ecosystems (e.g., promote the Bushwalking Guidelines to prevent *P. cinnamomi* (Natural Resources Kangaroo Island 2017)).
- Review the risk of *P. cinnamomi* and regularly monitor for sites of infection.
- Undertake surveys to assess the effectiveness of the control program for *P. cinnamomi* and incorporate new knowledge into management preventions.
- Consult with local authorities to determine the appropriate methods and the effectiveness of weed control and implement recommendations.

Stakeholder engagement/community engagement

- Develop and implement a broad strategy to raise awareness and educate the public about Western Beautiful Firebird conservation.
- Develop and implement a targeted strategy to promote the use of citizen science in relation to Western Beautiful Firebird conservation.
- Support and train volunteers to monitor Western Beautiful Firetail colonies.
- Continue to raise public awareness of the impact of *P. cinnamomi* on native vegetation and ecosystems, including promoting the Weed Control App produced by Biosecurity SA, and the Bushwalking guidelines developed to prevent the spread of *Phytophthora cinnamomi*.

Survey and monitoring priorities

- Conduct surveys around the island to determine the distribution and abundance of the subspecies, with a particular focus on the fire affected areas, and the rate of recovery of both habitat and birds within these areas.
- Identify and map available habitat and assess habitat health.
- Monitor the frequency of predation by native species.
- Undertake surveys of the effectiveness of the control program for *P. cinnamomi* and incorporate new knowledge into management interventions.

Information and research priorities

- Investigate and develop an approach for the creation of new breeding sites.
- Undertake further research/surveys to expand on current evidence of the subspecies' ability to re-colonise fire affected areas.
- Undertake research on breeding success, survival and causes of mortality.
- Use climate modelling techniques to investigate potential influence of climate change on breeding and foraging habitats.
- Use climate modelling to assess the risk of extreme weather events throughout known areas of Western Beautiful Firetail habitat.
- Determine Western Beautiful Firetail's sensitivity / resilience to climate change and disturbance by extreme climate events.

Recovery plan decision

A decision about whether there should be a recovery plan for this subspecies 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 Plans:

- [Threat abatement plan for predation by feral cats](#) (Commonwealth of Australia 2015b).
- [Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs \(*Sus scrofa*\)](#) (Commonwealth of Australia 2017b).
- [Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomi*](#) (Commonwealth of Australia 2018b).

Other relevant implementation documents:

- [Australian Weeds Strategy 2017-2027](#) (Invasive Plants and Animals Committee 2016).
- [Bushfire recovery where it matters most: Impacts and actions in Key Biodiversity Areas affected by the 2019/20 Bushfire Crisis](#) (BirdLife Australia 2020)
- [Feral cat eradication on Kangaroo Island 2015-2030 PROSPECTUS](#) (Kangaroo Island Landscape Board 2015).

- [Kangaroo Island Biosecurity Strategy 2017-2027](#) (Triggs 2017).
- [Kangaroo Island Feral Cat Eradication Program](#) (Kangaroo Island Landscape Board 2020).
- [Kangaroo Island: Fire extent map and Regional Bushfire Recovery Workshop Report](#) (Department of Agriculture, Environment and Water 2020).
- [Kangaroo Island Wildlife and Habitat Recovery Planning Workshop Summary Report DRAFT](#) (National Environmental Science Program 2020)

Conservation Advice and Listing Assessment references

Adelaide Hills Council (2020) *Loss of Habitat*. [Online] Viewed 13 January 2021. Available at: <https://www.ahc.sa.gov.au/ahc-resident/Pages/Loss-of-habitat.aspx>

Bird JP, Martin R, Akçakaya HR, Gilroy J, Burfield IJ, Garnett ST, Symes A, Taylor J, Şekercioğlu ÇH and Butchart SHM (2020) Generation lengths of the world's birds and their implications for extinction risk. *Conservation Biology* 34, 1252-1261.

Blakers M, Davies SJJF, Reilly PN (1984) *The Atlas of Australian Birds*. Melbourne University Press, Melbourne.

Boles WE (1988) Comments on the Subspecies of Australian Native and Introduced Finches. *Emu* 88, 1, 20-24.

BOM (Bureau of Meteorology) & CSIRO (2010) *State of the Climate 2010*. CSIRO, Acton.

BOM (Bureau of Meteorology) & CSIRO (2018) *State of the Climate 2018*. CSIRO, Acton.

Boulton R, Hunt T, Ireland L, Thomas J (2020) *Kangaroo Island Rapid Bird Assessments, February 2020*. BirdLife Australia, Carlton, Victoria.

Burgess TI, Scott JK, McDougall KL, Stukely MJC, Crane C, Dustan WA, Brigg F, Andjic V, White D, Rudman T, Arentz F, Ota N, Hardy G (2016) Current and projected global distribution of *Phytophthora cinnamomi*, one of the world's worst plant pathogens. *Global Change Biology* 23, 4, 1661-1674.

Commonwealth of Australia (2017a) *Background Document - Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (Sus scrofa)*. Department of the Environment and Energy, Canberra.

Commonwealth of Australia (2018a) *Background document: Threat abatement plan for disease in natural ecosystems caused by Phytophthora cinnamomi*. Department of the Environment and Energy, Canberra.

Cunningham CX, Prowse TAA, Masters P, Cassey P (2016) Home range, habitat suitability and population modelling of feral Indian peafowl (*Pavo cristatus*) on Kangaroo Island, South Australia. *Australian Journal of Zoology* 64, 2, 107-116.

DAWE (Department of Agriculture, Water and the Environment) (2021) *Stagonopleura bella samueli*. Unpublished data.

Department of Environment and Heritage (2008) *Adelaide and Mount Lofty Ranges South Australia. Threatened Species Profile. Stagonopleura bella. Beautiful Firetail*. Government of South Australia, Adelaide.

Ford H, Barrett G, Saunders D, Recher H (2001) Why have birds in the woodlands of Southern Australia declined? *Biological Conservation* 97, 1, 71-88.

French K & Zubovic A (1997) Effect of the Weed *Chrysanthemoides monilifera* (Bitou Bush) on Bird Communities. *Wildlife Research* 24, 6, 727-735.

Government of South Australia (2015) *Natural Resource Management. Kangaroo Island State and Condition Reporting. South Australia 2014*. Department of Environment, Water and Natural Resources, Adelaide.

Government of South Australia (2020) *Wildlife recovery on Kangaroo Island Update*. [Online] Viewed 9 November 2020. Available at: <https://www.environment.sa.gov.au/news-hub/news/articles/2020/03/ki-wildlife-recovery-update>

Hardham AR, Blackman LM (2018) *Phytophthora cinnamomi*. *Molecular Plant Pathology* 19, 2, 260-285.

Hohnen T, Berris K, Hodgens P, Mulvaney J, Florence B, Murphy BP, Legge SM, Dickman CR, Woinarski JCZ (2020) Pre-eradication assessment of feral cat density and population size across Kangaroo Island, South Australia. *Wildlife Research* 47, 8, 669-676.

Invasive Plants and Animals Committee (2016) *Australian Weeds Strategy 2017-2027*. Department of Agriculture and Water Resources, Canberra.

Kangaroo Island Landscape Board (2015) *Feral cat eradication on Kangaroo Island 2015-2030 PROSPECTUS*. Kangaroo Island Landscape Board & Kangaroo Island Council, South Australia.

Keast A (1958) Intraspecific variation in the Australian finches. *Emu* 58, 3, 219-246.

eelty M., Dilag L., Loughlin B., Howard A., Daid S., Gardner L., Boddington D. (2020) Independent Review into South Australia's 2019-20 Bushfire Season. Government of South Australia, Adelaide.

Latham A.D.M. (2011). *Options for controlling peafowl (Pavo cristatus) in New Zealand*. Landcare Research, report prepared for Horizons Regional Council, Palmerston North, New Zealand.

McGregor HW, Legge S, Jones ME & Johnson CN (2015) Feral Cats Are Better Killers in Open Habitats, Revealed by Animal-Borne Video. *PLoS ONE* 10, 8. doi:10.1371/journal.pone.0133915.

McGregor HW, Legge S, Jones ME & Johnson CN (2016) Extraterritorial hunting expeditions to intense fire scars by feral cats. *Scientific Reports* 6. <https://doi.org/10.1038/srep22559>

Resilient Hills and Coasts (2016). *Resilient Hills and Coasts: Climate Change Adaptation Plan for the Adelaide Hills, Fleurieu Peninsula and Kangaroo island Region*. Report prepared for Alexandrina Council on behalf of Resilient Hills and Coasts project partners by Seed Consulting Services & URPS, South Australia.

Robinson A.C., Kemper C.M. (N.D.) *Kangaroo Island Biological Survey*. [Online] Accessed 9 November 2020. Available at:

<https://www.environment.sa.gov.au/files/sharedassets/public/science/ki-biological-survey-mammals-birds-reptiles-gen.pdf>

Taggart PL, Fancourt BA, Bengsen AJ, Peacock DE, Hodgens P, Read JL, McAllister MM & Caraguel CGB (2019) Evidence of significantly higher island feral cat abundance compared with the adjacent mainland. *Wildlife Research* 46, 5, 378-385.

Woinarski JCZ, Woolley LA, Garnett ST, Legge SM, Murphy BP, Lawes MJ, Comer S, Dickman CR, Doherty TS, Edwards G, Nankivill A, Palmer R, Paton D (2017) Compilation and traits of Australian bird species killed by cats. *Biological Conservation*, 216, 1-9.

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Attachment A: Listing Assessment for *Stagonopleura bella samueli*

Reason for assessment

This assessment follows prioritisation of a nomination from the public/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	Not calculated			
Trend	Contracting			It is presumed that following the 2019/20 bushfires on Kangaroo Island, the population of Western Beautiful Firetail considerably decreased. Further population declines are expected to have occurred in recent years due to continued habitat degradation throughout the subspecies' range. Currently there is no evidence for the extent of decline.
Generation time (years)	2.2 years	1.7 years	2.8 years	Estimated generation length is derived from values listed by Bird et al (2020).
Extent of occurrence	72 km ²			(DAWE 2021)
Trend	Contracting			Continual declines in the Extent of Occurrence have been observed since 1990 (DAWE, 2021). Declines are suspected to continue due to land clearance, degradation and wildfire events.
Area of Occupancy	36 km ²			(DAWE 2021)

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Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Trend	Contracting			Continual declines in Area of Occupancy have been observed since 1990 (DAWE 2021). Declines are suspected to continue due to land clearance, degradation and wildfire events.
Number of subpopulations	Not calculated			
Trend	Not calculated			
Basis of assessment of subpopulation number	Not applicable			
No. locations	>10			The spatial nature of the threats is such that there are >10 geographically or ecologically distinct areas where a single threatening event could affect all individuals of the species present within a period of one generation. The 2019/2020 fire demonstrated that Kangaroo Island's topography and stochastic variation in fire spread leaves numerous unburnt habitat fragments. A similar situation is true for the Mount Lofty Ranges and Fleurieu Peninsula.
Trend	Stable			
Basis of assessment of location number	The spatial nature of the threats is such that there are >10 geographically or ecologically distinct areas where a single threatening event could affect all individuals of the species present within a period of one generation. The 2019/2020 fire demonstrated that Kangaroo Island's topography and stochastic variation in fire spread leaves numerous unburnt habitat fragments. A similar situation is true for the Mount Lofty Ranges and Fleurieu Peninsula.			
Fragmentation	Not severely fragmented- no parameter was changed by an order of magnitude by the 2019/20 fire.			
Fluctuations	Not subject to extreme fluctuations in EOO, AOO, number of subpopulations, locations or mature individuals - no parameter was changed by an order of magnitude by the 2019/20 fire.			

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

Criterion 1 evidence

Insufficient data to determine eligibility

The Western Beautiful Firetail subspecies is endemic to Kangaroo Island, Fleurieu Peninsula, and the southern Mount Lofty Ranges. They occur most widely across Kangaroo Island (Baxter 2015). Kangaroo Island was heavily impacted during the 2019/2020 bushfires, where around half of the island was burnt (DEW 2020; Todd & Maurer 2020). The extent of overlap between the fire and the subspecies' distribution has not been determined. A reduction in total numbers cannot be demonstrated. No studies have determined past or present population size or trends for the Western Beautiful Firetail.

There is insufficient data to determine the subspecies eligibility for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the subspecies' 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.

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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

Western Beautiful Firetail occur on Kangaroo Island, the Fleurieu Peninsula and Mount Lofty Ranges. In 1990 the Western Beautiful Firetail had an estimated EOO of 9,638 km² and an AOO of 288 km². By 2000 the EOO had declined to 8,520 km² and the AOO had declined to 180 km². In 2012, the EOO was estimated to be 5,900 km² and the AOO as 112 km². Currently, Western Beautiful Firetail have an estimated EOO of 72 km² and area of occupancy (AOO) of 36 km² (Department of Agriculture, Water and the Environment 2021).

Estimates in 2020 show further declines in EOO and AOO for the subspecies (DAWE 2021). These declines are largely due to the 2019/20 bushfire event on Kangaroo Island which burnt and estimated 210,606 hectares, affecting almost half of the island (Boulton et al. 2020; Government of South Australia 2020). In total, the burnt area in South Australia covered 278,838 hectares (Keelty et al. 2020), also affecting the parts of the Mount Lofty Ranges and Fleurieu Peninsula. Following this event, only 13 percent of the original native vegetation in the Mount Lofty Ranges remains (Adelaide Hills Council 2020). Continued future declines have been projected based on evidence of land clearance and degradation, and frequent wildfire events; however, the spatial nature of the threats is such that there are >10 geographically or ecologically distinct areas where a single threatening event could affect all individuals of the species present within a period of one generation. The subspecies is not subject to extreme fluctuations in EOO, AOO, number of subpopulations, locations, or mature individuals.

The data presented above appear to demonstrate the subspecies is not eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional

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information to better understand the subspecies' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 3 Population size and decline

	Critically Endangered Very low	Endangered Low	Vulnerable Limited
Estimated number of mature individuals	< 250	< 2,500	< 10,000
AND either (C1) or (C2) is true			
C1. An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future)	Very high rate 25% in 3 years or 1 generation (whichever is longer)	High rate 20% in 5 years or 2 generation (whichever is longer)	Substantial rate 10% in 10 years or 3 generations (whichever is longer)
C2. An observed, estimated, projected or inferred continuing decline AND its geographic distribution is precarious for its survival based on at least 1 of the following 3 conditions:			
(a) (i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
(a) (ii) % of mature individuals in one subpopulation =	90 - 100%	95 - 100%	100%
(b) Extreme fluctuations in the number of mature individuals			

Criterion 3 evidence

Insufficient data to determine eligibility

No population estimates are available for the Western Beautiful Firetail.

The data presented above appear to demonstrate the subspecies is not eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the subspecies' 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.

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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

Insufficient data to determine eligibility

No population estimates are available for the Western Beautiful Firetail.

The data presented above appear to demonstrate the subspecies is not eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the subspecies' 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

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Population viability analysis appears not to have been undertaken, and therefore there is insufficient data to demonstrate if the subspecies is eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the subspecies' 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.

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CONSULTATION QUESTIONS FOR *Stagonopleura bella samueli* (Western Beautiful 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:

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Number of mature individuals is estimated to be in the range of:

- 1–50 51–250 251–1000 >1000 >10 000

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 1990s (*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:

- 1–50 51–250 251–1000 >1000 >10 000

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

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11. Are you able to comment on the extent of decline in the species/subspecies' total population size over the last approximately 24 years (i.e., three generations/10 year period)? 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.

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

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

Level of your confidence in this estimated extent of occurrence

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

If, because of uncertainty, you are unable to provide an estimate of 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 km² 11 – 500 km² 501 – 2000 km² >2000 km²

Level of your confidence in this estimated extent of occurrence:

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

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

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ranges suggested in the table below of ranges of past extent of occurrence, and also choose the level of confidence you have in this estimated range.

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

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

Level of your confidence in this estimated extent of occurrence

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

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

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

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

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

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

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

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

Level of your confidence in this estimated extent of occurrence:

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

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

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

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

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

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?

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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

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