

Consultation Document on Listing Eligibility and Conservation Actions

Neophema chrysostoma (Blue-winged Parrot)

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

- 1) the eligibility of *Neophema chrysostoma* (Blue-winged Parrot) 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: <u>species.consultation@environment.gov.au</u>

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.

Contents of this information package	Page
General background information about listing threatened species	2
Information about this consultation process	3
Draft information about the Blue-winged Parrot and its eligibility for listing	4
Conservation actions for the species	10
References cited	12
Collective list of questions – your views	24

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 <u>'common</u> <u>assessment method'</u>. 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: <u>http://environment.gov.au/privacy-policy</u>.

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 *Neophema chrysostoma* (Blue-winged Parrot)



Blue-winged parrot © Copyright, Wright Out There (from Shutterstock)

Conservation status

Neophema chrysostoma 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: A2bc: Vulnerable
- Criterion 2: Not eligible
- Criterion 3: Not eligible
- Criterion 4: Not eligible
- Criterion 5: Insufficient data

The main factors that appear to make the species eligible for listing in the Vulnerable category are that the population appears to have declined by 30–50% in three generations (11 years) (Holdsworth et al. 2021). There are currently an estimated 10,000 (range 7,500–15,000) mature Blue-winged Parrots in the wild with a declining trend (Holdsworth et al. 2021). The extent of occurrence (EOO) for the species is estimated to be 170,000 km² (range 155,000–190,000 km², stable trend), however the area of occupancy (AOO) is contracting and is estimated to be 11,000 km² (range 9,000–19,000 km²) (Holdsworth et al. 2021). Significant declines in reporting rates

in the core range in Tasmania and Victoria are considered indicative of a population wide decline. This is likely due to changes in habitat quality (Holdsworth et al. 2021).

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 <u>Species Profile and Threat Database</u>.

Species information

Taxonomy

Conventionally accepted as Neophema chrysostoma (Kuhl 1820).

Description

Up to 24 cm in length with a weight of less than 50 g, the Blue-winged Parrot is a slender parrot with an olive-green head and upper body, grading to light green on the fore-neck (Higgins 1999). The upper tail is green-blue, with yellow sides. The underparts are yellow, and there may be orange in the centre of the belly. A yellow facial patch extends back to the eye (Higgins 1999). A narrow, dark blue band runs from eye to eye across the forehead. The Blue-winged Parrot gets its name from the large, dark blue patch on the wings. The female is similar to the male, but with slightly duller colours (Higgins 1999).

Distribution

Blue-winged Parrots breed on mainland Australia south of the Great Dividing Range in southern Victoria from Port Albert in Gippsland west to Nelson, and sometimes in the far south-east of South Australia, and the north-western, central and eastern parts of Tasmania (Map 1; Emison et al. 1987; Higgins 1999).

A partial migrant, variable numbers of birds migrate across Bass Strait in winter, apparently making the flight non-stop based on the scarcity of records from the Bass Strait islands. During the non-breeding period, from autumn to early spring, birds are recorded from northern Victoria, eastern South Australia, south-western Queensland and western New South Wales, with some birds reaching south-eastern New South Wales and eastern Victoria, particularly on the southern migration (Higgins 1999).



Map 1 Modelled distribution of Blue-winged Parrot

Source: Base map Geoscience Australia; species distribution data Species of National Environmental Significance database.

Cultural and community significance

Blue-winged Parrots are known to occur on the lands of the following Indigenous Peoples: Adnyamathanha, Barapa Barap, Barkindji, Barngarla, Bidawal, Boandik, Boon Wurrung, Budjiti, Bunurong, Dieri, Dja Dja Wurrung, Eastern Maar, First People of River Murray & Mallee, Gunaikurnai, Gunditjimara, Jaadwa, Jadawadjali, Jupagulk, Kaurna, Kokatha, Kullilli, Kunja, Latji Latji, Malyangapa, Murrawarri, Nari Nari, Narungga, Ngadjuri, Ngarrindjeri, Ngemba, Ngintait, Nindi-Ngudjam Ngarigu Monero, Nukunu, Nyeri Nyeri, Palawa, Perrepa Perrepa, Ualarai, Wadawurrung, Wadi Wadi, Wadigali, Wamba Wamba, Wangaaypuwan,

Wangkangurru/Yarluyandi, Wayilwan, Wemba Wamba, Wergaia, Wilyakali, Wiradjuri, Wongaibon, Wongkumara, Wotjobaluk, Wurundjeri, Yandruwandha/Yawarrawarrka and Yorta Yorta (Holdsworth 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 species by providing insights about traditional culture and land management.

Relevant biology and ecology

Blue-winged Parrots inhabit a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. They tend to favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones (Higgins 1999; Holdsworth et al. 2021). The species can also be seen in altered environments such as airfields, golf-courses and paddocks. Pairs or small parties of Blue-winged Parrots forage mainly near or on the ground for seeds of a wide range of native and introduced grasses, herbs and shrubs (Higgins 1999).

Blue-winged Parrots breed in Tasmania, coastal south-eastern South Australia and southern Victoria. During the breeding season (spring and summer), birds occupy eucalypt forests and woodlands (Higgins 1999). Blue-winged Parrots form monogamous pairs. Nests are made in hollows, preferably with a vertical opening, in live or dead trees or stumps. Usually 4–6 eggs are laid on a bed of decaying wood (Higgins 1999). The female alone incubates the eggs, leaving the nest at intervals to be fed by the male. Both parents feed the nestlings. In Victoria, birds are known to breed mainly in heathy forests and woodlands and in wetter forests soon after fire or logging (Emison et al. 1987).

Before migrating from Tasmania in autumn, many birds congregate on saltmarshes and agricultural land before departing north (Higgin 1999). While on the mainland, mobile flocks feed in saltmarsh and rough pasture in coastal Victoria. Birds are known to move more than 100 km inland during winter to feed in semi-arid chenopod shrubland and sparse grassland (Holdsworth et al. 2021). Many aspects of the movements of the Blue-winged Parrot are poorly understood. Researchers know that most Blue-winged Parrots that breed in Tasmania migrate to the mainland, leaving a handful behind. However, detailed information about their wintering migration routes is lacking.

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 Blue-winged Parrot include areas that include:

- Foraging and staging habitats found from coastal, sub-coastal and inland areas, right through to semi-arid zones including: grasslands, grassy woodlands and semi-arid chenopod shrubland with native and introduced grasses, herbs and shrubs.
- Wetlands both near the coast and in semi-arid zones used for foraging and staging.
- Eucalypt forests and woodlands within the breeding range in Tasmania, coastal southeastern South Australia and southern Victoria.
- Live and dead trees and stumps with suitable hollows within the breeding range.

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 became 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.

Blue-winged Parrot habitat occurs across a wide range of land tenues and ownership arrangements, including on private land, travelling stock routes and reserves, state forests and state reserves, and National Parks (including the Tasmanian Wilderness World Heritage Area). 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

Though there is no clear explanation for the population decline of Blue-winged Parrots, declines have likely been caused by habitat loss and deterioration in habitat quality (Holdsworth et al. 2021). For example, in Tasmania land clearing for agriculture continues to remove Blue-winged Parrot habitat (FDA 2020); while livestock grazing throughout the species' range likely degrades grassland habitat and reduces seed availability (Seddon et al. 2003).

Other threats that may impact the species include: droughts which reduce the productivity of coastal saltmarsh and other habitats used in the non-breeding season (Boon et al. 2011, 2012); and fires (Evans et al. 2017; Di Virgilio et al. 2019; Dowdy et al. 2019). Cats (*Felis catus*) and, on the mainland, foxes (*Vulpes vulpes*), may take some birds given they feed on the ground (DELWP 2016; Woinarski et al. 2017). Nesting birds may also be subject to excessive predation by introduced sugar gliders (*Petaurus breviceps*) (Stojanovic et al. 2014), though this remains unproven and Blue-winged Parrots nest in the presence of Sugar Gliders in Victoria. Psittacine Beak and Feather Disease (PBFD) may also have reduced survival and reproductive success of the species (Raidal & Peters 2018).

Threat	Status and severity a	Evidence			
Habitat loss, degradation and fragmentation					
Habitat loss caused by clearing for agriculture	 Status: current & future Confidence: inferred Consequence: moderate Trend: static Extent: across part of its range 	The main threat to bird survival in agricultural areas is habitat loss caused by over-clearing of native vegetation, and subsequent degradation of the remnants of vegetation (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). 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, and lose the ability to recolonise once suitable habitat recovers (Olsen et al. 2005). The ongoing fragmentation and			

Table 1 Threats impacting Blue-winged Parrot

Threat	Status and severity a	Evidence
		degradation of remnant vegetation can also disrupt essential ecosystem processes such as pollination, seed dispersal and regeneration (Jackson et al. 2016). Land clearing for agriculture continues to remove habitat particularly in Tasmania, given that up to 40 ha can now be cleared witheware neuroit (EDA 2020). These
		activities may negatively impact Blue-winged Parrots. Retention and replanting of native vegetation in agricultural areas are needed, as is the cessation of land clearing.
Habitat degradation caused by domestic livestock grazing	 Status: historical, current & future Confidence: inferred Consequence: moderate Trend: increasing Extent: across part of its range 	Native grassy woodland groundcover species are highly susceptible to domestic livestock grazing (Seddon et al. 2003). 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 (Willson & Bignall 2009). A reduction or removal of understorey habitat (e.g., native herbs and grasses) can reduce foraging sites, reduce shelter, and consequently increase the risk of predation (Olsen et al. 2005). 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).
Invasive weeds	 Status: current Confidence: inferred Consequence: moderate Trend: static Extent: across part of its range 	Invasive weeds have the ability to change the floristic and structural characteristics of habitat, thereby changing resource availability (French & Zubovic 1997). Furthermore, some weeds may increase the flammability of the habitat, amplifying bushfire risks (Salvo Aires 2014). More research is required to assess the specific species which may impact Blue- winged Parrot feeding and breeding habitats, and the extent of this threat.
Climate change	Ι	Ι
Increased likelihood of extreme events (i.e., wildfire, heatwave and drought)	 Status: current & future Confidence: inferred Consequence: moderate Trend: increasing Extent: across the entire range 	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 since 1910 (BOM & CSIRO 2020; IPCC 2021). Heatwayes are also lasting longer.

Threat	Status and severity a	Evidence
		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 also exacerbate drought, which in turn can also increase bushfire risk (Climate Council 2014) and adversely impact resource availability (BOM & CSIRO 2020). Birds are also vulnerable to extreme heatwaves that overwhelm their physiological limits (McKechnie et al. 2012).
		Droughts may have reduced productivity of coastal saltmarsh and other habitats used in the non- breeding season (Holdsworth et al. 2021).
		The cumulative effect of the climate anomalies has led to and will continue to increase the likelihood of extreme events such as wildfire, drought and heatwave (Di Virgilio et al. 2019; BOM & CSIRO 2020) which may have detrimental impacts on Blue-winged Parrots and their habitats.
Fire		
Inappropriate fire regimes	 Status: current/future Confidence: inferred Consequence: moderate Trend: increasing Extent: across the entire range 	Inappropriate fire regimes are the greatest threat to Australia's birds after direct human destruction and alteration of habitats (Kearney et al. 2020). Frequent fires can deplete the soil seed bank, and reduce soil seed viability (Wilson & Bignall 2009). For example, grass seeds on or very close to the soil surface are vulnerable to being destroyed or sterilised as fire passes (DPIRD 2021). This may contribute to Blue- winged Parrot decline through reduced seed availability leading to food shortages. Long-term, the composition and/or structure of vegetation may change so that it is no longer suitable (Spencer & Baxter 2006).
		Fire suppression can be as detrimental as too frequent fires (Wilson & Bignall 2009). Fire plays an important role in environmental ecology, and is needed to trigger natural processes, such as stimulating seed germination (Olsen et al. 2005). Infrequent fire results in wood thickening and loss of grassy woodlands, granivorous

Threat	Status and severity a	Evidence	
		species and general biodiversity (Olsen et al. 2005). 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.	
Predation			
Predation by introduced Sugar Gliders in Tasmania	 Status: current & future Confidence: suspected Consequence: unknown Trend: static Extent: across part of its range 	While considered a species native to the Australian mainland, Sugar Gliders are thought to be introduced to mainland Tasmania (Gunn 1851; Rounsevell et al. 1991; Lindenmayer 2002; Hui 2006). Nest predation by Sugar Gliders may pose a threat to Blue-winged Parrots breeding in Tasmania as inferred by research on Swift Parrots (Stojanovic et al. 2014; Heinsohn et al. 2015). Sugar Gliders not only prey on nesting young and eggs of Swift Parrots, but also often kill the sitting female (Stojanovic et al. 2014; Heinsohn et al. 2015).	
Predation by cats and foxes	 Status: current & future Confidence: known Consequence: low Trend: static Extent: across part of its range 	Predation by feral cats (Commonwealth of Australia 2015a, 2015b) is a threat to Blue-winged Parrots, as documented by Woinarski et al. (2017). The threat of cats may be amplified by bushfires as they take advantage of recently burnt areas (McGregor et al. 2016), as they prefer to hunt in open habitats (McGregor et al. 2015). Foxes may kill some birds on the mainland, given the species forages on the ground (Commonwealth of Australia 2008a, 2008b; Holdsworth et al. 2021).	
Competition			
Competition for tree hollows	 Status: current/future Confidence: inferred Consequence: low Trend: unknown Extent: across the entire range 	A large proportion of Australian bird species use tree hollows as nesting sites (Newton 1994), and almost all arboreal marsupials use tree hollows (e.g., breeding site or shelter; Lindenmayer et al. 1991). As a result, inter-specific competition may be a common occurrence, especially where the abundance of hollows has declined. It is absolutely crucial to implement actions to prevent the further loss of hollow-bearing trees in order to minimise the long-term risk of extinction of hollow-dependent species (Manning et al. 2013: Le	

Threat	Status and severity a	Evidence
		Roux et al. 2014), including Blue- winged Parrots.
Disease		
Psittacine Beak and Feather Disease (PBFD)	 Status: current/future Confidence: suspected Consequence: low Trend: unknown Extent: across the entire range 	Psittacine Beak and Feather Disease (PBFD) is a widespread, lethal parrot disease, typically transferring between adults, nestlings and contaminated nest hollows (DEE 2016). Although Blue- winged Parrots are susceptible to PBFD, the threat level is relatively low. However, with decreasing nesting hollows and intensified competition, it is possible that the likelihood of disease transmission could be greater in the future.

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.

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	Moderate risk 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			

Table 2 Risk prioritisation

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

Likelihood	Consequences						
	Not significant	Minor	Moderate	Major	Catastrophic		
Almost certain							
Likely		 Predation by introduced Sugar Gliders Predation by cats and foxes Competition for tree hollows 	Inappropriate fire regimes	 Habitat loss caused by clearing for agriculture Habitat degradation caused by domestic livestock grazing 			
Possible		 Invasive weeds Psittacine Beak and Feather Disease (PBFD) 		 Increased likelihood of extreme events (i.e., wildfire, heatwave and drought) 			
Unlikely							
Unknown							

Table 3 Common Blue-winged Parrot matrix

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

- Establish causes of recent declines.
- Stable or increasing abundance across the distribution .

Conservation and management priorities

Habitat loss caused by clearing for large scale agriculture

- Cease all land clearing of habitat critical for the survival of Blue-winged Parrot.
- Establish new habitat patches in areas where native vegetation cover is lacking.
- Promote ecological management of woodland remnants on private and public land.
- Protect and enhance feeding and breeding habitat, including preparation of management plans for key habitat across the winter range.

Habitat degradation caused by domestic livestock grazing

• Restore degraded grasslands and grassy woodlands habitat to support the recovery of Bluewinged Parrot. For example:

- Undertake revegetation, using a diverse mix of locally appropriate native species, focussing on expanding and connecting areas of existing habitat or widening wildlife corridors wherever possible.
- Prevent intensive grazing in high value grasslands and grassy woodland 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.

Increased likelihood of extreme events (i.e., wildfire, heatwave and drought)

• Actively manage the landscape to minimise the risk of very large wildfires, particularly of very large high intensity wildfires.

Inappropriate fire regimes

- Develop a site-based fire management strategies with local authorities which considers the ecological needs of the species.
- Use climate modelling techniques to investigate the potential impact of climate change on the species and their habitat critical for survival.

Stakeholder engagement/community engagement

- Coordinate recovery efforts among different jurisdictions and interested stakeholders.
- Target in-perpetuity covenants or stewardship agreements to landholders with high quality remnant habitat.
- Raise awareness among landholders in a local area known to have important habitat for the species, to engage them in proactive management and monitoring of the species' population on their land.
- Support community education programs to achieve regional conservation outcomes.
- Raise public awareness of the importance of large old trees (particularly isolated paddock trees and hollow-bearing trees, live and dead) and undertaking restoration and revegetation to replace cohorts of trees where they have been removed from the landscape, particularly in areas adjacent to and connecting woodland remnants.
- Encourage responsible pet ownership, e.g., keeping cats indoors.
- Consult with local authorities to determine the appropriate methods and the effectiveness of weed control and implement recommendations.

Survey and monitoring priorities

- Determine population trends across its range.
- Monitor for cases of Psittacine Beak and Feather Disease (PBFD). If active, work with local authorities and develop site-based management strategies.

Information and research priorities

- Understand localised and range-wide causes of mortality, decline and threats including:
 - Sugar Glider nest predation impacts on the mainland.
- Clarify migration movements and pathways.

- Determine if the Tasmanian breeding population is genetically separate from that on the mainland.
- Determine breeding extent in Tasmanian forestry areas and implement adequate forestry management prescriptions to prevent logging of hollow bearing trees critical for breeding success.
- Determine breeding success and factors that affect it.
- Understand foraging ecology, specifically the species' ability to survive in altered landscapes (e.g., where native grasses have been replaced with introduced species), and changes to ground layer dynamics.
- Identify sites where hollows are limiting and develop and implement strategies to increase hollow availability. Actions include:
 - Development of a nest box program tailored to the species' needs,
 - nest box installation,
 - the humane control of introduced species, and
 - identification and the protection of trees having the potential to develop hollows.

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

- <u>Threat abatement plan for predation by European red fox</u> (Commonwealth of Australia 2008b).
- <u>Threat abatement plan for predation by feral cats</u> (Commonwealth of Australia 2015b).

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 Neophema

chrysostoma

Reason for assessment

Prioritisation of a nomination from the TSSC.

Assessment of eligibility for listing

This assessment uses the criteria set out in the <u>EPBC Regulations</u>. The thresholds used correspond with those in the <u>IUCN Red List criteria</u> except where noted in criterion 4, subcriterion 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.

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification	
Number of mature individuals	10,000	7,500 15,000		While there are no quantitative data available on the Blue-winged Parrot population size, experts estimated there are about 10,000 mature individuals (Holdsworth et al. 2021). This reliability of this estimate is low (Holdsworth et al. 2021).	
Trend	Declining			There is broad agreement the population is declining based on reporting rates in the core range in Tasmania and Victoria (M Holdsworth, B Green, P Menkhorst, J Starks unpublished cited in Holdsworth et al. 2021). The reliability of this estimate is medium.	
Generation time (years)	3.8	3.4	4.2	Bird et al. (2020). The reliability of this estimate is medium.	
Extent of occurrence	170,000 km ²	155,000 km²	190,000 km ²	The minimum is the number of 2x2 km squares that includes all records since 1990 (Holdsworth et al. 2021). The reliability of this estimate is high	
Trend	Stable			Holdsworth et al. (2021). The reliability of this estimate is high.	
Area of Occupancy	11,000 km ²	9,000 km ²	19,000 km ²	The minimum AOO is the number of 2x2 km squares that includes all records (Holdsworth et al. (2021). The reliability of this estimate is low.	
Trend	Contracting			Holdsworth et al. (2021). The reliability of this estimate is medium.	

Table 4 Key assessment parameters

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Number of subpopulations	2	1	2	Holdsworth et al. (2021). The reliability of this estimate is medium.
Trend	Stable Holdsworth et reliability of th		Holdsworth et al. (2021). The reliability of this estimate is high.	
Basis of assessment of subpopulation number	Victorian and Tasmanian breeding subpopulations are assumed to be separate but may min The Tasmanian subpopulation is thought to be the largest (Holdsworth et al. 2021).			e assumed to be separate but may mix. gest (Holdsworth et al. 2021).
No. locations	>10	Holdsworth et al. (2021)		Holdsworth et al. (2021)
Trend	Not calculated			Holdsworth et al. (2021)
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 (Holdsworth et al. 2021).			
Fragmentation	Not severely fragmented (Holdsworth et al. 2021).			
Fluctuations	Not subject to extreme fluctuations in EOO, AOO, number of subpopulations, locations or mature individuals (Holdsworth 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	Enda Seve	ngered re reduction		Vulnerable Substantial reduction
A1		≥ 90%	≥ 70%	6		≥ 50%
A2 , <i>A</i>	A3, A4	≥ 80%	≥ 50%	6		≥ 30%
A1 A2 A3 A4	Population reduction observed, estimat past and the causes of the reduction are understood AND ceased. Population reduction observed, estimat past where the causes of the reduction be understood OR may not be reversibl Population reduction, projected or susp to a maximum of 100 years) [(<i>a</i>) cannot An observed, estimated, inferred, projec reduction where the time period must if future (up to a max. of 100 years in futur reduction may not have ceased OR may ha mumarible.	red, inferred or suspected in e clearly reversible AND red, inferred or suspected in may not have ceased OR ma e. pected to be met in the futur t be used for A3] cted or suspected populatio nclude both the past and th ure), and where the causes or not be understood OR may	the the y not e (up n e f not	Based on any of the following	(a) (b) (c) (d) (e)	direct observation [except A3] an index of abundance appropriate to the taxon a decline in area of occupancy, extent of occurrence and/or quality of habitat actual or potential levels of exploitation the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Criterion 1 evidence

Eligible under Criterion 1 A2bc for listing as Vulnerable

Blue-winged Parrots breed on mainland Australia south of the Great Dividing Range in southern Victoria from Port Albert in Gippsland west to Nelson, and sometimes in the far south-east of

South Australia, and the north-western, central and eastern parts of Tasmania (Emison et al. 1987; Higgins 1999). A partial migrant, variable numbers of birds migrate across Bass Strait in winter. During the non-breeding period, from autumn to early spring, birds are recorded from northern Victoria, eastern South Australia, south-western Queensland and western New South Wales with some birds reaching south-eastern New South Wales and eastern Victoria, particularly on the southern migration (Higgins 1999).

Sixty years ago, Blue-winged Parrots were widespread, and the commonest parrot in Tasmania (McColl 1957), but the species has greatly declined over the last at least two decades. In Tasmania, reporting rates from regular 5 km area searches across the north declined by 77% from 2008–2018, and by 75% across the state from 2001–2005 to 2013–2017. At two long-term monitoring sites near Wynyard in north-western Tasmania, reporting rates from 5 km area searches declined by >75% from 1999–2016 (Newman & Ashby 2018) and 64% from 2010–2020 (M Newman unpublished cited in Holdsworth et al. 2021). There have been too few 2 ha 20 min surveys and 500 m area searches in Tasmania to analyse for this species (Holdsworth et al. 2021).

On the mainland, annual reporting rates from the breeding range in southern Victoria during the breeding season (September–January) declined by 59% and 26% for 2 ha 20 min surveys and 500 m area searches, respectively, from 2009–2019 (BirdLife Australia 2020; Cornell Lab 2020) but reporting rates in the non-breeding range of inland New South Wales, South Australia and Queensland are too low for analysis (Holdsworth et al. 2021). Two local analyses show no trend: in the Midlands, Tasmania, Blue-winged Parrots were more abundant on 72 surveyed sites in 2016, a wet year, than when previously surveyed in 1996–1998 (Bain et al. 2020), but there was no monitoring in the intervening period. In the Greater Geelong and Surf Coast region, Victoria, annual reporting rates of breeding and non-breeding between 2009 and 2020 show no clear trend (BirdLife Australia 2020; Cornell Lab 2020; C Morley unpublished cited in Holdsworth et al. 2021).

There are estimated to be 10,000 mature individuals in the wild, and there is broad agreement the population is declining (M Holdsworth, B Green, P Menkhorst, J Starks unpublished cited in Holdsworth et al. 2021). However, given the large EOO and AOO of the species, and lack of data from most of the species distribution, further surveys would assist to better understand whether these declines are occurring at the species level, or only in some local areas that have perhaps become unsuitable causing shifts within the distribution (e.g. from northern Tasmania to the Tasmanian midlands). Nevertheless, surveys in northern Tasmania and within the breeding range surveys in southern Victoria do demonstrate a substantial population reduction (Holdsworth et al. 2021). Holdsworth et al. (2021) estimate that the population has declined by 30–50% in three generations (11 years). This decline is likely due to changes in habitat quality (Holdsworth et al. 2021). The EOO for the species is estimated to be 170,000 km² (range 155,000–190,000 km², high reliability), and AOO estimated to be 11,000 km² (range 9,000–19,000 km², medium reliability) (Holdsworth et al. 2021). The EOO for the species is stable, however the AOO for the species is contracting (Holdsworth et al. 2021).

This assessment appears 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	AND at least 2 of the following 3 conditions:						
(a)	a) Severely fragmented OR Number ≤ 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						

Criterion 2 evidence Not eligible

subpopulations; (iv) number of mature individuals

Blue-winged Parrot's EOO is estimated to be 170,000 km² (range 155,000–190,000 km², high reliability), and AOO estimated to be 11,000 km² (range 9,000–19,000 km², medium reliability) (Holdsworth et al. 2021). The EOO for the species is stable, however the AOO for the species is contracting (Holdsworth et al. 2021). Victorian and Tasmanian breeding subpopulations are assumed to be separate but may mix. The species is estimated to occur at more than 10 locations and is not severely fragmented. The species is not subject to extreme fluctuations in EOO, AOO, number of subpopulations, locations or mature individuals (Holdsworth 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
(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

While there are no quantitative data available on the Blue-winged Parrot population size, experts estimated there are about 10,000 (range 7,500–15,000, low reliability) mature individuals, and there is broad agreement the population is declining (M Holdsworth, B Green, P Menkhorst, J Starks unpublished cited in Holdsworth et al. 2021). Holdsworth et al. (2021) estimate that the population has declined by 30–50% in the last three generations (11 years). However, the species' geographic distribution does not appear to be precarious for its survival and it is not subject to extreme fluctuations in the number of mature individuals (Holdsworth 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 km² 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 <u>common</u> <u>assessment method</u>.

Criterion 4 evidence Not eligible

There is limited quantitative data available on the Blue-winged Parrot population size, however experts estimated there are about 10,000 (range 7,500–15,000, low reliability) mature individuals in the wild (M Holdsworth, B Green, P Menkhorst, J Starks unpublished cited in Holdsworth et al. 2021).

The data presented above appear to demonstrate that 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.

<u>CONSULTATION QUESTIONS FOR Neophema chrysostoma (Blue-winged</u> <u>Parrot)</u>

SECTION A - GENERAL

- 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

<u>SECTION B</u> 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?

<u>SECTION C</u> 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:

□<5,000 □5,001−10,000 □10,001−15,000 □15,000-20,000 □>20,000

Level of your confidence in this estimate:

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

□<5,000 □5,001−10,000 □10,001−15,000 □15,000-20,000 □>20,000

Level of your confidence in this estimate:

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

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

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

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

- □ 51–95% reasonably certain, suggests this range of decline
- \Box 95–100% high level of certainty, information indicates a decline within this range
- \Box 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.

<u>SECTION E</u> 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:

□<100,000 km² □100,001−150,000 km² □150,001−200,000 km²

 \Box 200,001–250,000 km² \Box 250,001–300,000 km² \Box >300,000 km²

Level of your confidence in this estimated extent of occurrence

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

 \Box 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:

 \Box <5,000 km² \Box 5,001-10,000 km² \Box 10,001-15,000 km² \Box 10,001-15,000 km² \Box >20,000 km²

Level of your confidence in this estimated extent of occurrence:

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

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

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

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

 \Box 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:

□<100,000 km² □100,001−150,000 km² □150,001−200,000 km²

200,001–250,000 km² 250,001–300,000 km² >300,000 km²

Level of your confidence in this estimated extent of occurrence

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

 \Box 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:

 \Box <5,000 km² \Box 5,001-10,000 km² \Box 10,001-15,000 km² \Box 10,001-15,000 km²

□ >20,000 km²

Level of your confidence in this estimated extent of occurrence:

- \Box 0–30% low level of certainty/ a bit of a guess/ not much data to go on
- \Box 31–50% more than a guess, some level of supporting evidence
- □ 51–95% reasonably certain, data suggests this range of decline
- \Box 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

<u>SECTION G</u> 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?

<u>SECTION I</u> 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?