Australian Capital Territory

Nature Conservation (Southern Greater Glider) Conservation Advice 2023

Notifiable instrument NI2023–226

made under the

Nature Conservation Act 2014, s 90C (Conservation advice)

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1 Name of instrument

This instrument is the *Nature Conservation (Southern Greater Glider) Conservation Advice 2023*.

2 Commencement

This instrument commences on the day after its notification day.

3 Conservation advice for Southern Greater Glider

Schedule 1 sets out the conservation advice for Southern Greater Glider (*Petauroides volans*).

4 Revocation

The *Nature Conservation (Greater Glider) Conservation Advice 2019* (NI2019-232) is revoked.

Arthur Georges
Chair, Scientific Committee
14 April 2023

Schedule 1

(see s 3)

CONSERVATION ADVICE

SOUTHERN GREATER GLIDER

Petauroides volans

CONSERVATION STATUS

The Southern Greater Glider *Petauroides volans* (Kerr, 1792) is recognised as threatened in the following jurisdictions:

National	**Endangered**, *Environment Protection and Biodiversity Conservation Act 1999*
ACT	**Endangered**, *Nature Conservation Act 2014*
NSW	**Endangered**, *Biodiversity Conservation Act 2016*
VIC	**Vulnerable**, Advisory List of Threatened Fauna in Victoria 2013
QLD	**Endangered**, *Nature Conservation Act 1992*

CRITERIA

The Southern Greater Glider (southern and central) is listed as Endangered in the ACT Threatened Native Species List under IUCN Criterion A — A2(a)(b)(c), A4(b)(c) at the national level (Attachment A). The main factors that make the species eligible for listing in the Endangered category are an overall rate of population decline exceeding 50 percent over a 21-year period (three generations), including population reduction and habitat destruction following the 2019–20 bushfires (Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2022).

Greater Glider (Pavel German - AustralianNature.com)

DESCRIPTION AND ECOLOGY

The Southern Greater Glider is an arboreal nocturnal marsupial and is the largest gliding possum in Australia, with a head-body length of 35−46 cm and a long furry tail measuring 45−60 cm. The Greater Glider has thick fur that increases its apparent size. Its fur colour is white or cream below and varies from dark grey, dusky brown to light mottled grey and cream above. It has large furry ears, a short snout and a non-prehensile tail (McKay 2008).

Females give birth to single young from March to June, sexual maturity is reached in the second year, longevity has been estimated at 15 years

(Tyndale-Biscoe and Smith 1969; McKay 2008; Harris and Maloney 2010) and generation length is likely to be 7–8 years (Burbidge and Woinarski 2016).

TAXONOMY AND SYSTEMATICS

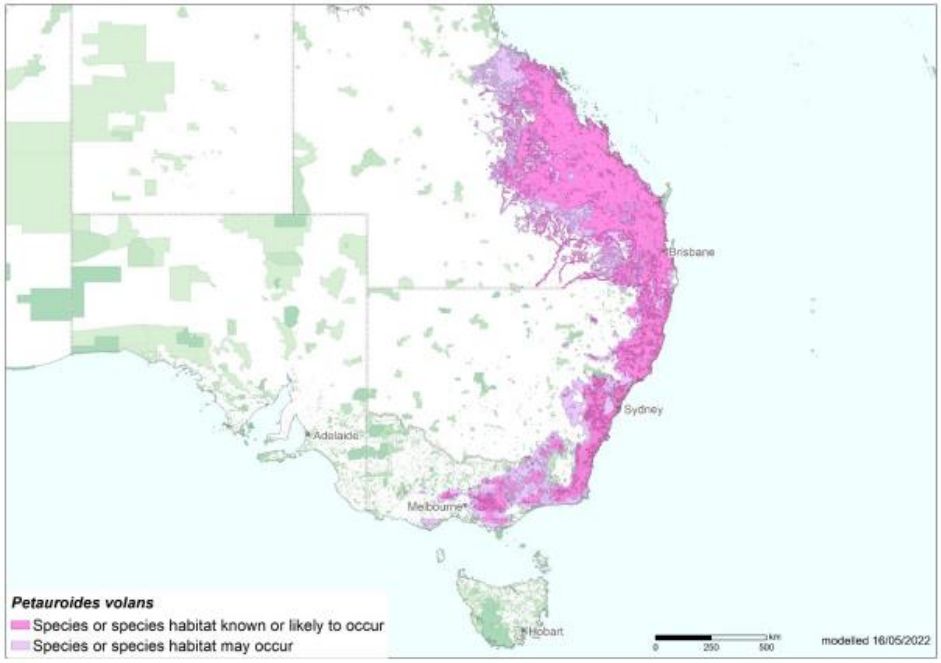
Jackson & Groves (2015) split the previously regarded single species genus into three separate species: *Petauroides minor* (northern), *P. armillatus* (central), and *P. volans* (southern) which was confirmed by genetic analysis (McGregor et al. 2020; Arbogast et al. in DCCEEW 2022). Further analysis of the southern and central taxa is required before they are formally split. The listed entity in this Conservation Advice is referred to as the Southern Greater Glider, including two lineages, with the point of contact between them in the vicinity of Coffs Harbour in NSW (KN Armstrong pers comm. in DCCEEW 2022) and the ACT population falling within the distribution of the southern lineage.

From a systematics point of view this population structure needs to be recognised by management and measures taken by relevant range jurisdictions to ensure both lineages of this species are protected.

DISTRIBUTION AND HABITAT

The Southern Greater Glider is restricted to eastern Australia, occurring from around Proserpine in central Queensland through to central Victoria (Wombat State Forest), ranging from sea level to 1200 m above sea level. The Southern Greater Glider has a high degree of site fidelity with enough den trees, occupying very small home ranges of 1–3 hectares limiting its capacity for movement and dispersal (Henry 1984; Kelh and Borsboom 1984 and Kavanagh and Whelan 2004).

Map 1 Modelled distribution of the Southern Greater Glider (southern and central lineages) (Source: DEECCW 2022)



Source: Base map Geoscience Australia; species distribution data Species of National Environmental Significance database.
Caveat: The information presented in this map has been provided by a range of groups and agencies. While every effort has been made to ensure accuracy and completeness, no guarantee is given, nor responsibility taken by the Commonwealth for errors or omissions, and the Commonwealth does not accept responsibility in respect of any information or advice given in relation to, or as a consequence of, anything containing herein.

The species prefers taller, montane, moist eucalypt forests with relatively large old trees and abundant large hollows where it shelters during the day (Woinarski et al. 2014) and favours forests with a diversity of eucalypt species, due to seasonal variation in its food-tree species (Kavanagh 1984). Ribbon-gum forest (u52) appears to be the preferred habitat in Namadgi National Park and Southern Greater Gliders were observed eating the foliage of Ribbon Gum (*Eucalyptus viminalis*) and Narrow-leaved Peppermint (*E. radiata*) during the 2019 surveys (Hawkins and Baines in prep.). Southern Greater Gliders were seldom recorded in, and were not observed feeding on, the other canopy tree species that were common along spotlighting transects (Alpine Ash (*E. delegatensis)*, Snow Gum (*E. pauciflora*), Brown Barrel (*E. fastigata*), Mountain Gum (*E. dalrympleana*) and Candlebark (*E. rubida*)), however, some of these species may provide important habitat components, particularly Mountain Gum which is a major provider of tree hollows (Hawkins and Baines in prep.).

In the Australian Capital Territory (ACT), the species has been recorded in the Namadgi National Park and Tidbinbilla Nature Reserve (Lintermans 1993). Systematic nocturnal surveys were carried out in parts of Namadgi in the 1980s, with Southern Greater Gliders recorded in several areas, including low densities along Smokers Trail (S. Davey pers. comm. in Hawkins and Baines in prep.), Warks Rd, Blundell's Creek Road and regularly recorded in spotlight counts in Tidbinbilla Nature Reserve (M. Lintermans pers. Comm.). In a post-fire fauna study undertaken by the ACT Government (Carey et al. 2003), spotlight sightings were recorded in the Warks Road and Moonlight Hollow Road area of the Lower Cotter catchment, including 13 Southern Greater Gliders in a one-kilometre section near Warks Camp.

In a follow up study of arboreal mammals in 2014 (including surveys of 10 transects covering over 140km) three Southern Greater Gliders were observed on the Camelback Fire Trail at Tidbinbilla; four on the Bendora Return and Moonlight Hollow transects (including the Warks Road area); and one on each of the Honeysuckle and Mount Franklin Road transects (Snape et al. 2015).

Long term spotlighting transects were established in 2019 for monitoring large glider populations (including Southern Greater Gliders and Yellow-bellied Gliders) in Namadgi National Park. Transect locations were stratified so that they represented different fire histories and habitats known to be suitable for large glider species. During the 2019 surveys, 20 Southern Greater Gliders were detected at five sites, all in the north of Namadgi National Park and eight were opportunistically recorded near Honeysuckle Campground (Hawkins and Baines in prep.).

The understanding of the species' distribution in the ACT remains incomplete and habitat suitability modelling is currently being undertaken to improve this understanding. The potential distribution of Southern Greater Gliders within u52 vegetation communities in relation to fire severity history and key climatic and environmental variables is being mapped for Namadgi National Park. The outcomes of this mapping will inform both future survey locations and management actions. The areas of known high density populations (northern Brindabella Range) were not affected by the 2020 Orroral fire. Conversely, most surveys within the Orroral fire footprint in the period 2004–2019 did not detect any Southern Greater Gliders. However, the fire did burn two locations (Mt Franklin Rd South, and Honeysuckle Creek) where Southern Greater Gliders were recorded in 2014. While the species has been historically detected at these latter locations, they are not considered core habitat for the species.

THREATS

Threats to the Southern Greater Glider are outlined in the Commonwealth Conservation Advice (DCCEEW 2022) and those relevant to the ACT include:

- frequent and/or intense bushfires, especially those resulting in the loss of hollow-bearing and feed trees, post-fire starvation, dehydration and predation
- inappropriate prescribed burning
- climate change reducing habitat suitability
- increases in the frequency, intensity and duration of heatwaves associated with climate change.

Cumulative effects of these are a major threat to large native hollow-bearing trees on which the species relies (TSSC 2016). Some of the main threats in the Commonwealth advice (DCCEEW 2022) including land clearing and timber harvesting might not be relevant to the ACT as the populations occur wholly within Namadgi National Park. Currently, prescribed burning in the species habitat is directed to be undertaken appropriately under ecological guidelines (ACT Government 2019) and emphasis on improving fire management in key areas that will be strongholds under climate change is essential. McLean et al. (2018) found that wildfires severely affected the density of Southern Greater Gliders and NSW NPWS (2020) found they were not likely to survive in canopies that experienced high severity fires in the 2019–2020 Currowan Fire. Similarly, Smith and Smith (2022) could not find any Southern Greater Gliders in post-fire surveys in the Greater Blue Mountains World Heritage Area where all the eucalypt foliage had been killed by fire of high to extreme severity. Southern Greater Gliders are potentially most vulnerable to canopy fire given they seek refugia in hollows and have a very restricted home range. If they can survive a fire, sourcing quality foliage soon after fire becomes a problem (NSW NPWS 2020) as the presence of suitable eucalypt trees with live foliage appears to be a critical factor in the species survival post fire (Smith and Smith 2022).

MAJOR CONSERVATION OBJECTIVE

The priority management objective should be to maintain and/or increase population size and extent, if possible, through appropriate management of Southern Greater Glider habitat and connectivity to habitat in NSW.

CONSERVATION PRIORITIES

Recommended management actions are provided in the Commonwealth Conservation Advice (DCCEEW 2022. As the most suitable habitat for this species in the ACT is in reserved areas, priorities for the conservation of the Southern Greater Glider and its habitat in the ACT should be to:

- identify and map critical habitat and populations of the Southern Greater Glider in the ACT, to inform fire management consistent with ecological guidelines (ACT Government 2019), for example, prescribed burns under high or extreme fire weather danger conditions should not be undertaken near high-density populations of this species (Mclean et al. 2018)
- collate existing observational records and undertake regular surveys of populations to monitor persistence and to identify any changes in density or distribution over time
- based on existing knowledge, identify and protect critical elements of the Southern Greater Glider habitat including feed trees and hollow-bearing trees that are important den trees (Mclean et al. 2018), especially from high to extreme severity fires

- formulate a strategy for the development of an emergency protocol for rescue/management of surviving individuals following fires impacting the canopy with high to extreme severity; such an emergency protocol needs to consider the short life span of gliders without access to foliage (ca 4 days), safe access to rescue areas post fire, and options for relocating/housing animals until foliage recovers post fire
- undertake collaborative research on the impacts of prescribed fire on patch occupancy and the abundance and size structure of critical habitat tree species, as to inform ecological guidelines for prescribed fire activities undertaken in Southern Greater Glider habitat with particular reference to habitat characteristics that provide life-saving refuges during heatwaves
- undertake collaborative research to improve understanding of drivers of distribution within Namadgi National Park so that core habitat and high priority conservation areas can be managed appropriately; this research should include studies of habitat requirements such as the relationships between population densities and types of hollow-bearing trees and mix of food-tree species that must be retained to ensure viable populations, particularly with consideration of food and resource availability after a large-scale fire, and for survival during heatwaves
- explore the implications of climate change for population persistence and distribution of this species in the ACT and accordingly plan management, identifying key areas of current and future habitat that may provide thermal refugia; modelling in support of this priority will require systematic monitoring and collection of population data, including reproduction and survival data when available, should be used to assess population viability and species distribution
- undertake collaborative research on the biological and environmental factors necessary to inform biophysical models to provide a predictive understanding of the habitats required for persistence in the face of climate change; such biophysical models require integration of data on climate and other environmental variables with measures of morphology, behaviour, physiology and life history of the species
- maintain active involvement in national research networks for sharing relevant knowledge on Southern Greater Glider ecology as to inform best practice management of the species in the ACT.

CONSERVATION ISSUES

As this species resides within protected areas in the ACT, and because of its particular vulnerability to canopy fires, the key issues of concern centre on fire and its management.

Fire Management

Fires that impact the canopy, whether by wildfire or controlled burns, should be minimized to the degree possible in areas occupied by greater gliders. Should such fires occur, then post-fire management should take into account the critical value of hollow bearing trees to this species, which may require modification of standard practices that involve the removal of such trees post fire. Animals surviving severe canopy fire that removes access to foliage are at severe risk of starvation within a few days. Greater Gliders are difficult to maintain in captivity, so rescue efforts should focus on translocation to areas adjacent to the fire affected areas where sufficient foliage persists, providing the opportunity for passive re-establishment in the fire affected areas as foliage regenerates.

Climate Change

Climate change impacts appear inevitable and will affect the likelihood of persistence, within the ACT, of many species. Most vulnerable in this regard are those species that are likely to be affected by increased severity and frequency of wildfire and those impacted by the severity and frequency of heatwaves, such as the Southern Greater Glider. In the case of heatwaves, greater gliders have a unique physiology to cope with eating toxic eucalypt leaves which leaves them vulnerable to hyperthermia at temperatures greater than 20°C. They accommodate these temperatures by drawing upon energy and water reserves to keep cool. Increased night-time temperatures (higher than 20°C), and higher mean annual temperatures (night-time and day-time temperatures) have been directly linked to greater glider decline in the south of their range (Eyre et al. 2022).

Capacity must be developed to model the impact on the Southern Greater Glider and its habitat under likely climate change scenarios if we are to anticipate and manage the impacts of climate change. This will require a combination of research and the development of in-house capacity for the collection of relevant data and its application in climate change modelling.

Ngunnawal Community Engagement

The ACT Government should facilitate the inclusion of the Ngunnawal people in the conservation of this species and its habitat as part of Ngunnawal Country, both in regard to integration of indigenous knowledge into planning and providing opportunity for members of the Ngunnawal community to engage in on ground activities. Reference to the draft Cultural Resource Management Plan (ACT Government in prep.) would be useful to inform culturally appropriate resource management including of native species that aligns with achieving conservation outcomes for the species.

OTHER RELEVANT ADVICE, PLANS OR PRESCRIPTIONS

- Commonwealth Conservation Advice — Greater Glider (southern and central) (DCCEEW 2022)
- The Action Plan for Australian Mammals 2012 (Woinarski et al. 2014)

LISTING BACKGROUND

The Greater Glider (including all *Petauroides* taxa) was listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 5 May 2016. The Greater Glider was listed as Vulnerable under the *Nature Conservation Act 2014* in the ACT Threatened Native Species List on 11 May 2019 to align with the EPBC Act listing.

The Northern Greater Glider (*Petauroides minor*) and the Southern Greater Glider (*Petauroides volans* – southern and central) were reassessed by the Commonwealth Threatened Species Scientific Committee (TSSC) after the 2019–2020 bushfires and were found eligible to be listed as Vulnerable and Endangered, respectively, under the EPBC Act on 5 July 2022. In response, the ACT Scientific Committee recommended the Southern Greater Glider be transferred to the Endangered category in the ACT Threatened Native Species List under the *Nature Conservation Act 2014* to align with the EPBC Act listing.

When the taxonomic split of the Southern Greater Glider (*Petauroides volans* (southern and central)) is formally recognised by the Australian Faunal Directory a listing reassessment of the two separate taxa may be undertaken under the EPBC Act.

ACTION PLAN DECISION

The ACT Scientific Committee does not recommend that the ACT Minister for the Environment make the decision to have an action plan for the species in the ACT under the *Nature Conservation Act 2014* at this time. The species occurs within Namadgi National Park and Tidbinbilla Nature Reserve and its habitat is protected.

The Commonwealth Minister for the Environment decided that there should be a national recovery plan for the species. This national recovery plan needs to be considered in the context of the population structure of the Southern Greater Glider, that is, in the context of the status of the distinct southern lineage (separate from the central lineage) which is represented in the ACT. The ACT Government and research agencies should maintain an active involvement with other jurisdictions in planning and implementing the national recovery plan and should develop an implementation plan if required to address elements specific to the ACT.

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FURTHER INFORMATION

Further information on this species or other threatened species and ecological communities can be obtained from Environment, Planning and Sustainable Development Directorate (EPSDD). Phone: (02) 132281, EPSDD Website: https://www.environment.act.gov.au/

ATTACHMENT A: NATIONAL LISTING ASSESSMENT (DCCEEW 2022)

THREATENED SPECIES SCIENTIFIC COMMITTEE

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

The Threatened Species Scientific Committee finalised this assessment on 9 September 2021.

Attachment A: Listing Assessment for *Petauroides volans* (greater glider (southern and central))

Reason for assessment

This assessment follows prioritisation of a nomination from the TSSC.

Assessment of eligibility for listing

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

Key assessment parameters

Table 3 includes the key assessment parameters used in the assessment of eligibility for listing against the criteria.

Table 3 Key assessment parameters

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Number of mature individuals	>100 000	100 000	Unknown	There is no robust estimate of the population size of the greater glider (southern and central). Woinarski et al. (2014) estimated over 100 000 mature individuals, and Nelson et al. (2018) estimated a subpopulation size of 69 000 in the Strathbogie ranges in Vic.
Trend	declining			Declines in occupancy of the greater glider (southern and central) have been recorded for over two decades in the Central Highlands (Lumsden et al. 2013; Lindenmayer 2020) and East Gippsland (L Bluff 2020. pers comm 15 October) regions of Vic. There have been losses of subpopulations in NSW within the Jervis Bay and Blue Mountains areas (Lindenmayer et al. 2011; Smith & Smith 2018). These declines were recorded pre-2019–20 bushfires and overall show a ≥30% decline. Post-fire surveys have indicated that in areas of high fire severity there is zero to very low occupancy (J Smith 2020. pers comm 10 December). Following the 2019–20 bushfires, an overall population decline of >20%, with local subpopulation extirpations, is estimated one year after the fires. This is expected to increase to >30% within three generations after the fires (Legge et al. 2021).

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Generation time (years)	7	6	8	The greater glider can live for 15 years (Jones et al. 2009) and reaches sexual maturity at two years of age (Tyndale-Biscoe & Smith 1969b), suggesting a generation length of six to eight years (Pacifici et al. 2013; Woinarski et al. 2014).
Extent of occurrence	752 962 km²	752 962 km²	1 066 146 km²	Woinarski et al. (2014) estimated the extent of occurrence (EOO) of the greater glider (southern and central) as 752 962 km², calculated using records from 1993 to 2012. The 1 066 146 km² figure was based on the mapping of point records from 2000 to 2020, obtained from state governments, museums and CSIRO (DAWE 2021). The EOO was calculated using a minimum convex hull, based on the IUCN Red List Guidelines 2019.
Trend	contracting			The EOO has contracted since European settlement, with loss of habitat from land clearing, fragmentation, timber harvesting, inappropriate fire regimes, and climate change. Local extinctions of subpopulations have occurred recently (Lindenmayer et al. 2018b), and the EOO is likely to continue contracting due to loss of habitat from the 2019–20 bushfires and climate change.
Area of Occupancy	15 316 km²	15 316 km²	>20 000 km²	The 15 316 km² figure is based on the mapping of point records from 2000 to 2020, obtained from state governments, museums and CSIRO (DAWE 2021). The AOO was calculated using a 2x2 km grid cell method, based on the IUCN Red List Guidelines 2019. The AOO is likely to be significantly under-estimated due to limited sampling across the species' range.
Trend	contracting			The AOO has contracted since European settlement, with loss of habitat from land clearing, fragmentation, timber harvesting, inappropriate fire regimes, and climate change. Local extinctions of subpopulations have occurred recently (Lindenmayer et al. 2018b, Smith & Smith 2020), and the AOO is likely to continue contracting due to loss of habitat from the 2019-20 bushfires and climate change.
Number of subpopulations	Unknown	Unknown	Unknown	The species has a broad distribution. The number of subpopulations is not able to be estimated due to insufficient sampling across its range.
Trend	declining			The number of greater gliders (southern and central) have been declining across its range, and together with the contracting AOO and EOO, the number of subpopulations is likely to be declining.

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Basis of assessment of subpopulation number	The greater glider (southern and central) number of subpopulations is unknown, as there is limited sampling across its broad range.			
No. locations	unknown	unknown	>10	The term 'location' defines a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon present (IUCN Standards and Petitions Committee 2019). There is no robust estimate of the number of locations. The 2019–20 bushfires burnt a large area of south-eastern Australia, overlapping c. 40% of the greater glider (southern and central) distribution. However, the fire intensity was highly spatially variable, with greater gliders (southern and central) persisting in at least some areas burnt at low or moderate intensity (J Smith 2020. pers comm 10 December; J Nelson 2021. pers comm 16 April). Impacts were also spatially variable, with some individuals persisting in areas burnt at high intensity, possibly due to the proximity of unburnt or low intensity burnt areas (Kavanagh et al. 2021). Thus, the number of locations may be significantly greater than 10.
Trend	declining			Climate change is likely to increase the extent, intensity and frequency of bushfires, and thus the number of locations is likely to decrease.
Basis of assessment of location number	Although the 2019-20 bushfires were extensive the habitat and landscape topography, along with the stochastic variation in fire spread, leaves numerous unburnt habitat fragments from which subpopulations may recover.			
Fragmentation	Not severely fragmented – less than 50% of the AOO are in habitat patches that cannot support minimum viable subpopulations.			
Fluctuations	Not subject to extreme fluctuations in EOO, AOO, number of subpopulations, locations or mature individuals.			

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.

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.

Based on any of the following

(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

Criterion 1 evidence

Eligible under Criterion 1 A2abc+4bc for listing as Endangered

The greater glider (southern and central) has a generation length of six to eight years (see Table 3). In this assessment a generation length of seven years is used, which gives a timeframe of 21 years for this criterion.

There are no robust estimates of population size or population trends of the greater glider (southern and central) across its distribution. However, declines in numbers, occupancy rates and extent of habitat have been recorded at many sites (see below). Although there are a few sites where subpopulations appear to be stable or increasing, the overall trend is one of decline.

Prior to 2019-20 bushfires

Victoria

The most comprehensive long-term monitoring program for the greater glider (southern and central) is in the *Eucalyptus regnans* (Mountain Ash) forests of the Central Highlands in Vic, where 160 permanent 1 ha sites across a 1,800 km^2 study area (in both conservation reserves and production forests, and spanning a broad range of forest ages and environmental settings) (Lindenmayer 2009) have been monitored annually since 1997. Over the period 1997–2010, the greater glider (southern and central) declined by an average of 8.8 percent per year (Lindenmayer et al. 2011) – a rate that if extrapolated over the 21-year period relevant to this assessment is 85 percent. The trend could in part be explained by lower-than-average rainfall and major bushfires, with the species not detected in any of the sites burned in 2009. However, the probability of observing the species was also significantly higher on sites located in the Yarra Ranges National Park than in forests broadly designated for pulp and timber production, and there was a significant positive relationship between the species' abundance and both the age of the forest and number of trees with hollows on a site (Lindenmayer 2009). Populations of large hollow-bearing trees in the Central Highlands are in rapid decline, with the rate of loss greatly exceeding the rate of recruitment (Lindenmayer et al. 2017a,b).

Other surveys undertaken in the Central Highlands, in both Mountain Ash and mixed species forests, indicate a significant decline in occupancy rates of the greater glider (southern and central) over the past two decades (Lindenmayer et al. 2011; Lindenmayer & Sato 2018; Lumsden et al. 2013).

In 2018, a broad-scale survey of 80 sites (500 m off-track transects) spread across central and north-eastern Vic found low numbers of greater gliders (southern and central) at the majority of sites. Despite many of the sites supporting seemingly suitable habitat, the species was detected on fewer than half (41 percent) of the transects. On average, 0.93 gliders (range 0–6) were detected per 500 m transect (DELWP unpublished data). Surveys in 2019 conducted at 63 sites within eastern Vic also found low numbers of the species, with individuals detected on only 19 percent of sites (0.21 gliders/500 m transect, range 0–2). Based on records held in the Victorian Biodiversity Atlas and anecdotally, these results suggest the species has declined across this area (DELWP 2019. pers comm 15 October).

In contrast, surveys using the same broad-scale survey methodology in the Strathbogie Ranges in north-eastern Vic found relatively high densities of gliders, with 4.92 gliders detected on average per transect (range 0–14; Nelson et al. 2018). Analyses of the survey data estimated the number of greater gliders (southern and central) within the Strathbogie Ranges to be 69 000, although with relatively broad confidence intervals (95 percent confidence interval 3000–121 000 individuals). A comparison of data from three surveys conducted in the Strathbogie Ranges in 1983 (Land Conservation Council 1984), 1997 (Downes et al. 1997) and 2017 (Nelson et al. 2018), suggests that the subpopulation in the Strathbogie Ranges has not

declined over a 34 year period to the extent that has been observed elsewhere in Vic (Nelson et al. 2018).

Major bushfires in 2003, 2006–2007 and 2009 burnt large areas of the greater glider (southern and central) range in Vic, and further fragmented its distribution as evidenced by surveys and species records (Lumsden et al. 2013; Vic SAC 2015). Following the 2009 bushfires, 79 percent of large living trees with cavities died in the Mountain Ash forests, with no recruitment of new large cavity-bearing trees by 2011 (Lindenmayer et al. 2013). The abundance of greater gliders (southern and central) declined at burned sites, as well as at unburnt sites that were surrounded by burned forest (Lindenmayer et al. 2013). Reoccupation of burnt sites in subsequent years is a slow process due to the small home ranges (1–4 ha) of the species and its limited dispersal capabilities (L Lumsden pers comm, cited in Vic SAC 2015). It also depends on there being no further significant fires in the interim (Vic SAC 2015). Since the 2009 fires, which burnt the Kinglake East Bushland Reserve and nearby areas, spotlighting records of greater gliders (southern and central) in these areas have significantly declined (C Cobern 2015. pers comm 9 November). The occupancy model in Lumsden et al. (2013) predicts that areas most likely to be occupied following the 2009 fires are now patchily distributed.

However, evidence of declines in occupancy in some unburnt sites in the same parts of Vic (Lumsden et al. 2013) suggest that factors other than fire are involved in the species' decline (Vic SAC 2015). A decline in suitable browse due to water stress is probably a contributing factor, as central Vic was significantly hotter and drier than normal during 2001–2009 (Vic SAC 2015). Occupancy modelling by Lumsden et al. (2013) and Wagner et al. (2020) shows that the degree of site occupancy is positively associated with site ruggedness, vegetation lushness and terrain wetness.

In East Gippsland, analysis of results from a survey of 107 sites, comprising 49 sites with previous records of greater gliders (southern and central) and 58 randomly stratified sites, found a decline in occupancy rates of about 50 percent compared to about 20 years ago (L Bluff 2020. pers comm 15 October). The survey was undertaken in 2015 and results were compared to the pre-logging survey period 1988-1995. Although the occupancy rate of all arboreal mammals that were detected in sufficient numbers to enable analysis had declined across the two decades, the greater glider (southern and central) had declined more than other species. The decline in the rate of detection was highest in coastal and foothill forests, while detection rates were high only in wet and damp tableland forest on the Errinundra Plateau and Coast Range.

In the Mount Alfred State Forest, roadside spotlighting on the same route over a 30-year period used to record frequent sightings (10–15 animals on each occasion), but only a single greater glider (southern and central) was sighted in the 18 months leading up to November 2015 (Gippsland Environment Group 2015 pers comm 24 November).

New South Wales and the Australian Capital Territory

At Jervis Bay in Booderee National Park, 110 permanent 1 ha sites (stratified across vegetation types and fire histories) were established in 2002. Lindenmayer et al. (2011) reported a highly significant decline of greater gliders (southern and central), from the species being present in 22 of the sites in 2002, to absence from all sites since 2007. The greater glider (southern and

central) has not been recorded in the National Park since 2006 and appears to have been extirpated from the area, for reasons unclear (Lindenmayer et al. 2018b).

At Murphy's Glen in the Blue Mountains, spotlighting undertaken between 1986 and 2014 shows that the species used to be consistently and regularly detected, but by 2010 was difficult to detect and likely no longer present (J Smith 2015. pers comm 22 November). However, spotlighting undertaken in 2015 recorded greater gliders (southern and central) on each of the three occasions (1, 2 and 5 individuals), which indicates that numbers may be recovering (J Smith 2015. pers comm 22 November). Anecdotal reports, including from local ecologists, indicated similar declines elsewhere in the lower Blue Mountains, and the NSW Bionet Atlas confirms a marked drop in records in the region (Blue Mountains National Park: 357 records 1990–2004, eight records 2004–2014. Blue Mountains LGA: 142 records 1990–2004, one record 2004–2014, five records 2018–2020 and only one record for 2020) (J Smith 2015. pers comm 22 November). The decline of the greater glider (southern and central) in the lower Blue Mountains is mostly likely due to the effects of increased temperatures as a result of climate change (Smith & Smith 2018, 2020). An autopsy undertaken in January 2020 on two individuals (which were found walking on the ground in the daytime), reported that they had both died from drought and extreme heat events (i.e. heat stress and dehydration) (P Ridgeway 2021. pers comm 6 January).

An isolated subpopulation at Royal National Park was thought to be lost due to fire and regional-scale decline in the Illawarra area. Following the 1994 bushfire, which burnt more than 90 percent of the park, the first confirmed sighting of a greater glider (southern and central) in Royal National Park was in 2012 (Andrew et al. 2014), although a number of surveys had been conducted since 1994 (Andrew 2001; Maloney 2007; Andrew et al. 2014).

Near Bombala in southern NSW, Kavanagh and Webb (1998) monitored greater gliders (southern and central) in 500 ha of wood production forest, and found that the subpopulation declined in all timber harvesting compartments and had not recovered eight years after harvesting. However, the effects of logging were compounded by the independent effects of predation by powerful owls, and the overall declines of greater glider in this study were attributed to predation (Kavanagh 1988).

About 30 years after clearing of eucalypt forests in Tumut, Lindenmayer et al. (1999) found that the occupancy rate of greater gliders (southern and central) in remnant patches was still lower (21 percent) compared to that in surrounding forest (38 percent), indicating that recolonization following clearing occurs slowly. It is unclear, following such disturbances, whether subpopulations recover to their former levels or persist at lower levels.

In the Dorrigo, Guy Fawkes and Chaelundi Plateaux of north-eastern NSW, surveys for the greater glider (southern and central) at 30 sites in wet sclerophyll forest recorded a density of 27.6 individuals per km, in unlogged forest with no fire history (McLean et al. 2018).

Queensland

In central Qld, the abundance of greater gliders (southern and central) declined by 89 percent across a series of 31 woodland sites sampled initially in 1973–76 and re-sampled in 2001–02 (Woinarski et al. 2006). The species is continuing to decline, based on anecdotal observations over a 20-year period (DEHP 2015) and evidence of a decline in large, hollow-bearing trees due to past timber harvesting activities and repeat prescribed burning (Eyre 2005; Eyre et al. 2010). There has been a decline in living hollow-bearing trees (25 percent) and stags (40 percent) over a 20-year period (1998–2018) in the St. Marys State forest area (T Eyre 2021 pers comm 11 January). Once habitat trees are lost from the system, the length of time required for the development/recruitment of replacement habitat trees appropriate for the species is largely prohibitive (Smith et al. 2015).

After the 2019-20 bushfires

The full impact of the 2019-20 bushfires on the greater glider (southern and central) has yet to be determined but the population is likely greatly reduced. The fires may have accelerated any ongoing population decline, with approximately 40 percent of the species' distribution overlapping with the fire-affected areas (Legge et al. 2021). These fires covered an unusually large area and, in many places, burnt with an unusually high intensity. Its pre-fire imperilment, together with the extent of mortality as a result of fire and the unfavourable post-fire conditions (loss of hollows, increased susceptibility to predators, and loss of food resources), as well as a reduction in future recruitment, led to the greater glider (southern and central) being identified as one of the highest priority species for urgent management intervention by the Wildlife and Threatened Species Bushfire Recovery Expert Panel (Legge et al. 2020).

It is known that the greater glider (southern and central) is highly susceptible to fire events, with population declines of 50 percent documented in some areas (McLean et al. 2018) and extirpation with slow recovery documented in others (Andrew et al. 2014). Following the 2019-20 bushfires, on-ground surveys in some areas are still to be conducted, and baseline data are missing on population size, distribution and density throughout the range of the species. The majority of records are from the eastern areas of NSW and Vic, which were extensively burnt (DPIE 2020; Parliament of Victoria 2020). Post-fire field survey data available to date are summarised in the section below.

In addition to direct observations (see below), an expert elicitation exercise has been run to estimate the likely decline in greater glider (southern and central) populations due to fires of varying intensity (Legge et al. 2021). This was then combined with a GIS analysis of overlap of the distribution of the greater glider (southern and central) with the fire footprint to provide an overall estimate of the likely population decline due to the fires. The result was an estimated loss of 24 percent of the population (range 17–31%) one year after the fires, assuming current management conditions (Legge et al. 2021). This estimate rises to 33 percent (range 18–48%) three generations after the fires.

Victoria

Surveys currently underway (April 2021) are focused predominantly on lightly burnt and unburnt habitat within the fire ground, but also some areas burnt at moderate to higher severity (DELWP 2021. pers comm 22 April). Surveys have been designed to visit pre-fire records of the greater glider (southern and central) near Swifts Creek and Bendoc in East Gippsland. Interim results for surveys along 500 m transects at 11 sites (one third of all sites planned for surveys) have detected the species at four lightly burnt sites, as well as at two sites that were burnt at higher severity; compared to pre-fire records, the numbers of individuals detected were lower and the species was not detected at five sites where they were previously recorded (J Nelson 2021. pers comm 19 April). Surveys at 30 sites in lower elevation forests in East Gippsland (from Cabbage Tree Creek to Drummer State Forest), that burnt at low severity, did not detect any individuals (DELWP 2021. pers comm 22 April).

Greening Australia recorded nest boxes being utilised by greater gliders (southern and central) post-fire in East Gippsland (D Liepa 2020. pers comm 10 September), and spotlighting surveys (500 m transects at 24 sites) recorded the species in low numbers at some sites. Individuals were detected at seven of the 18 sites where they were previously recorded, suggesting a 60 percent decline due to the fires (B Blake 2020. pers comm 25 September). A further spotlighting survey of 500 m transects undertaken in Mallacoota, Far East Gippsland, detected the species in only one of 12 transects where they were recorded previously, indicating a 90 percent decline (Burns & Atkins 2021). The one detection site had low canopy scorching.

Limited spotlighting surveys undertaken in the Tallarook Range in the Central Highlands, from October 2020 to March 2021, recorded the species within an area of less than 10 km^2 (N Stimson 2021. pers comm 24 June). This subpopulation may be geographically isolated and restricted to the central area of the Tallarook Range plateau, however further survey work is required to determine this.

New South Wales

South Coast

Spotlighting surveys at 71 sites, undertaken at Murramarang, Meroo and Conjola National Parks, and Corramy Regional Park in May and June of 2020, reported on average a 70 percent decline in the numbers of greater gliders (southern and central) detected at these sites, compared to surveys undertaken prior to the 2019-20 bushfires (NSW NPWS 2020).

Two post-fire surveys were undertaken in the southern tablelands east of Bombala, in November 2020 and April-May 2021 respectively. The sites were distributed across elevations ranging 800–1100 m a.s.l. A total of 18 spotlighting sites/transects (each 1000 m) were surveyed using similar methods to previous surveys undertaken in the area, with sites stratified according to modelled fire severity classes in 2019-20. Greater gliders (southern and central) were previously recorded at all 18 transects on almost every sampling occasion; in 2020-21 the species was still present at all sites but in greatly reduced numbers on the burnt sites. A negative relationship was found between the species' abundance and increasing fire severity in the local landscape, and the number of fires over the past 30 years was also found to be negatively associated with the species' abundance (Kavanagh et al. 2021).

Blue Mountains Region

In the Blue Mountains area, sites with greater glider data prior to the 2017-19 drought and 2019-20 fires were re-surveyed during 2020-21. The surveys involved three one-hour spotlight searches of sixteen 500m transects that previously supported the species, comprising eight burnt and eight unburnt transects. In the burnt transects, no greater gliders (southern and central) were detected at the two sites which had total canopy loss, whereas they were detected at reduced numbers at the six transects which had 44-77% canopy loss. The overall result was a 36% decline (p=0.00012) in the mean detection density for the six burnt transects between 2015-18 and 2020-21. However, in the eight unburnt transects there was also a reduction in numbers, with a decline (p=0.014) of 51% between 2015-16 and 2021-21 (P & J Smith 2021, pers comm 24 June).

It is estimated that 84% of known greater glider (southern and central) habitat in the Greater Blue Mountains World Heritage Area (GBMWHA) was burnt in the 2019-20 fires, with 50% burnt at low-moderate severity and 34% burnt at high to extreme severity (P & J Smith 2021. pers comm 24 June). This equates to an estimated overall decline of 60% in the subpopulation as a result of the drought, heatwaves and bushfires of 2019-20. This estimate is preliminary, with further surveys planned later in 2021 (P & J Smith 2021. pers comm 24 June).

Crookwell

Using the same methodology as for the Blue Mountains, P & J Smith (2021) surveyed greater gliders (southern and central) in five transects in reserves in the Bigga-Tuena area north-west of Crookwell. The transects were surveyed in both spring 2020 and autumn 2021. The area was unaffected by the 2019-20 bushfires but had experienced the severe drought and heatwaves of 2019. They found that numbers on the three transects where the species was previously recorded declined by 43% (p= 0.014) between 2017-18 and 2020-21. They also found that numbers in the five transects declined by 53% (p=0.006) between spring 2020 and autumn 2021. The reason for the latter decline is unclear. It may be the result of predation by powerful owls, which were recorded on four of the five transects, or long-term physiological impacts from the extreme conditions the gliders endured in 2019.

Far North Coast

Two post-fire surveys were undertaken between Coffs Harbour, Dorrigo, Glen Innes and Grafton, in November 2020 and April-May 2021 respectively. The sites were distributed across elevations ranging 30–1330 m a.s.l. A total of 94 spotlighting sites/transects (each 500 m) were surveyed using similar methods to previous surveys undertaken in the area, with sites stratified according to modelled fire severity classes in 2019-20. Greater gliders (southern and central) were recorded at 57 of the 75 sites where they had been recorded previously (76%), and at an additional 3 sites where they had not been recorded previously. Abundance remained similar in many areas after the 2019-20 bushfires, particularly in the higher elevation sites. There was only a slight negative relationship between the species' abundance and increasing fire severity in the local landscape. Many severely burnt areas supported relatively high populations while other similarly burnt areas did not, which may be due to patchiness in fire severity and the proximity of unburnt or low-severity burnt areas nearby. The number of fires over the past 30

years was also found to be negatively associated with the species' abundance (Kavanagh et al. 2021).

Queensland

Major bushfires in 2019-20 burnt part (approximately 10 percent) of the greater glider (southern and central) range in southern Queensland. While there has been no post-fire survey work undertaken for this species in Queensland to date, these fires would have caused direct and indirect mortalities through habitat loss and fragmentation, with a consequent decline in abundance of the species.

Overall population decline

The greater glider (including *P. minor)* was assessed in 2016, with the species found to be eligible for listing as Vulnerable against this criterion as follows (DoEE 2016a):

> 'There is little other published information on population trends over the period relevant to this assessment (around 21–24 years), and the above sites are not necessarily representative of trends across the species' range. However, they provide sufficient evidence to infer that the overall rate of population decline exceeds 30 percent over a 21–24-year (three generation) period (Woinarski et al. 2014), and indeed may far exceed 30 percent. The population of the greater glider is thought to be declining due to habitat loss, fragmentation, extensive fire and some forestry practices, and this decline is likely to be exacerbated by climate change (Kearney et al. 2010). The species is particularly susceptible to threats because of its slow life history characteristics, specialist requirements for large tree hollows (and hence mature forests), and relatively specialised dietary requirements Woinarski et al. 2014).'

Since that determination, there is no evidence that any of the major threats to this species have substantially reduced, and the effects of climate change are likely worsening (Smith & Smith 2020; Wagner et al. 2020). The effects of the 2019–20 bushfires are in addition to ongoing declines.

Overall decline can be estimated by combining the ongoing decline of 30 percent (see above) with decline due to the 2019–20 bushfires, i.e. *Past decline + Decline due to fires* Population proportion remaining after past decline*. Using decline rates of 24 percent (range 17–31%) one year after the fires and 33 percent (range 18–48%) three generations after the fires, as determined by Legge et al. (2021), gives an overall decline over the past three generations (21 years) of 47 percent (Criterion 1A2) and an overall decline over a three generation period including both the past and the future of 53 percent (Criterion 1A4). However, large-scale fire and catastrophic drought were not accounted for during projections of future declines (Legge et al. 2021). Given that Australia is predicted to continue to experience increased frequency, intensity and scale of bushfires into the future (BOM & CSIRO 2020), declines over a period including both the past and the future may be even greater.

Conclusion

Given the uncertainty in the estimates of overall decline, the Committee considers that the species has undergone a severe reduction in numbers of at least 50 percent over the past three generation period (21 years for this assessment) (Criterion 1A2), and over a three generation period that includes both the past and the future (Criterion 1A4). The reduction has not ceased and the cause has not ceased. Therefore, the species has met the relevant elements of Criterion 1 to make it eligible for listing as Endangered.

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 km²**	**< 5,000 km²**	**< 20,000 km²**
B2.	Area of occupancy (AOO)	**< 10 km²**	**< 500 km²**	**< 2,000 km²**
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

The Extent of Occurrence (EOO) for the greater glider (southern and central) is estimated at 1 066 146 km², and the Area of Occupancy (AOO) estimated at 15 316 km². These figures are based on the mapping of point records from 2000 to 2020, obtained from state governments, museums and CSIRO (DAWE 2021). The EOO was calculated using a minimum convex hull, and the AOO calculated using a 2x2 km grid cell method, based on the IUCN Red List Guidelines 2019. Woinarski et al. (2014) noted that the AOO, which they estimated to be 15 244 km², and the EOO which they estimated to be 752 962 km², are likely to be significant underestimates due to limited sampling across the occupied range of the greater glider (southern and central).

Following assessment of the data the Committee considers that the species is not eligible for listing in any category under this criterion as neither the EOO or AOO are limited.

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

Not eligible

There is no reliable estimate of population size, but available estimates suggest that the number of mature individuals is substantially greater than 10 000. Lunney et al. (2008) considered that the greater glider (both southern and northern) had a 'presumed large population' and was 'locally common'. In NSW, Kavanagh (2004) considered it 'widespread and common… particularly in north-eastern NSW'. Density estimates in Vic range from 0.6 to 2.8 individuals per hectare (Henry 1984; van der Ree et al. 2004; Nelson et al. 2018), and across its broader distribution density ranges from 0.01 to 5 individuals per hectare (Kavanagh 1984; Kehl & Borsboom 1984; Smith & Smith 2018; Vinson et al. 2020). However, it is noted that some of these estimates were made prior to recent population declines.

Woinarski et al. (2014) estimated the number of mature individuals to be greater than 100 000. Using a mark-recapture distance sampling approach during surveys of the Strathbogie Ranges in Vic in 2017, the subpopulation in this 21 200 ha area alone was estimated to have 69 000 individuals (Nelson et al. 2018). The Vic Government estimates that approximately 32 percent of the greater glider (southern and central) modelled range within the state was within the fire footprint, and 16 percent was burnt at high intensity. Thus, it is unlikely that the population of greater glider (southern and central) has been reduced to below 100 000 mature individuals.

Following assessment of the data the Committee considers that the species is not eligible for listing in any category under this criterion as the total population size is not limited.

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 *common assessment method*.

Criterion 4 evidence

Not eligible

Woinarski et al. (2014) estimate the population size to be greater than 100 000 mature individuals (see Criterion 3) and it is highly unlikely that the number of mature individuals is less than 1000. Additionally, the greater glider (southern and central) does not meet the quantitative threshold for Vulnerable under sub-criterion D2. The area of occupancy (AOO) is estimated to be 15 532 km² and the species occurs at more than five locations.

Following assessment of the data the Committee considers that the species is not eligible for listing in any category under this criterion as the number of mature individuals is not low.

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

Several local-level population viability analyses have been undertaken – e.g. for Yarra State Forest Vic (Possingham et al. 1994), Tumut NSW (Lindenmayer et al. 2001), Brisbane Qld (Taylor & Goldingay 2009) – but none for the full species (Woinarski et al. 2014).

Population viability analysis has not been undertaken. Therefore, there is insufficient information to determine the eligibility of the species for listing in any category under this criterion.

Adequacy of survey

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

Public consultation

Notice of the proposed amendment and a consultation document was made available for public comment for 36 business days between 6 May 2021 and 24 June 2021.

Listing and Recovery Plan Recommendations

The Threatened Species Scientific Committee recommends:

(i) that the list referred to in section 178 of the EPBC Act be amended by **transferring** *Petauroides volans* from the Vulnerable category to the Endangered category

(ii) that there should be a recovery plan for this species.