Abridged Threatened Species Nomination Form

For nominations under the Common Assessment Method (CAM) where supporting information is available, but not in a format suitable for demonstrating compliance with the CAM, and assessment against the IUCN Red List threat status.

Cover Page *(Office use only)*

Species name (scientific and common name)**:**	***Petaurus australis* Wet Tropics subspecies** **[Yellow-bellied Glider (Wet Tropics)]**
Nomination for (addition, deletion, change)**:**	**change**
Nominated conservation category and criteria:	**Endangered B1ab(ii,iii,v)+2ab(ii,iii,v)**

Scientific committee assessment of eligibility against the criteria:		
This assessment is consistent with the standards set out in Schedule 1, item 2.7 (h) and 2.8 of the Common Assessment Method Memorandum of Understanding.		Yes ☒ No ☐
A.	Population size reduction	• **Insufficient information to assess against criteria.**
B.	Geographic range	Extent of occurrence **3,458 km^2**, area of occupancy **232 km^2, three locations and evidence of recent and continuing decline.** Endangered B1ab(ii,iii,v) +2ab(ii,iii,v)
C.	Small population size and decline	• The population is estimated to 5,500 mature individuals. • **Does not meet criterion.**
D.	Very small or restricted population	• **Meets criterion for Vulnerable under D2.**
E.	Quantitative analysis	• **Data deficient against criterion.**

Outcome*:*	
Scientific committee Meeting date:	15th November 2017
Scientific committee comments:	The species' distribution is significantly dispersed, with three patchily-distributed populations (locations) that are broken into more than a dozen subpopulations. While the overall extent of occurrence of the subspecies is thought not to have changed since European settlement, the area of occupancy has declined due to clearing and decline in habitat suitability. Certain areas with trees bearing old feeding scars no longer support Yellow-bellied Gliders, indicating local losses from suitable habitat. Approximately 80% of the tall open forest dominated by *Eucalyptus grandis* has been

	encroached upon or 'captured' by rainforest during a period from the 1940s to the early 1990s, rendering it unsuitable to the Yellow-bellied Glider. Evidence is provided via camera traps that feral cats can predate on Yellow-bellied Gliders. Species Technical Committee recommends Endangered.		
Recommendation:	Endangered 15th November 2017		
Ministerial approval:	Not approved yet	*Date of Gazettal/ Legislative effect:*	Not enacted yet.

Nomination summary *(to be completed by nominator)*

Current conservation status				
Scientific name:	***Petaurus australis* Wet Tropics subspecies**			
Common name:	Yellow-bellied Glider (Wet Tropics)			
Family name:	Petauridae	Fauna ☒	Flora ☐	
Nomination for:	Listing ☐	Change of status ☒	Delisting ☐	
1. *Is the species currently on any conservation list, either in a State or Territory, Australia or Internationally?* 2. *Is it present in an Australian jurisdiction, but not listed?*	*Provide details of the occurrence and listing status for each jurisdiction in the following table*			

Jurisdiction	**State / Territory in which the species occurs**	**Date listed or assessed (or N/A)**	**Listing category i.e. critically endangered or 'none'**	**Listing criteria i.e. B1ab(iii)+2ab(iii)**
International (IUCN Red List)		9/3/2014	Near Threatened (for the species whole distribution) No status for the Wet Tropics ESU (Evolutionarily Significant Unit)	Decreasing population
National (EPBC Act)		16/7/2000	Vulnerable	
State / Territory	1. Queensland	11/7/1996	Vulnerable	
	2.			
	3.			

Consistent with Schedule 1, item 2.7 (h) and 2.8 of the Common Assessment Method Memorandum of Understanding, it is confirmed that:	
• this assessment meets the standard of evidence required by the Common Assessment Method to document the eligibility of the species under the IUCN criteria;	Yes ☒ No ☐
Comments:	
• surveys of the species were adequate to inform the assessment;	Yes ☒ No ☐
Comments:	Although there is insufficient survey data to enable assessment against some criteria, there is considered to be adequate information to demonstrate eligibility under Criterion B
• the conclusion of the assessment remains current and that any further information that may have become available since the assessment was completed supports or is consistent with the conclusion of the assessment.	Yes ☒ No ☐
Comments:	

Nominated national conservation status: category and criteria		
Presumed extinct (EX) ☐ Critically endangered (CR) ☐ Endangered (EN) ☒ Vulnerable (VU) ☐		
None (least concern) ☐ Data Deficient ☐ Conservation Dependent ☐		
What are the IUCN Red List criteria that support the recommended conservation status category?		**Endangered B1ab(ii,iii,v)+2ab(ii,iii,v)**
Eligibility against the IUCN Red List criteria (A, B, C, D and E)		
*Provide justification for the nominated conservation status; is the species eligible or ineligible for listing against the five criteria. For **delisting**, provide details for why the species no longer meets the requirements of the current conservation status.*		
A.	Population size reduction (evidence of decline)	• No quantified decline, however observers have noted the reduction in habitat, and no recent use of some known feed trees. The area of occupancy has declined due to clearing and decline in habitat suitability. **Insufficient information to assess against criteria.**
B.	Geographic range (EOO and AOO, number of locations and evidence of decline)	• **EOO** 3,458 km^2 (using minimum convex polygon method)**; AOO** 232 km^2 (using 2 km x 2 km grid method)**.** There are three major distinct locations (Mt. Windsor Tableland, Mt. Carbine Tableland and Cardwell Range - Herberton Range) in separated patches of habitat, each of which is likely to be affected differently by key threats (including inappropriate fire regimes, and habitat loss and fragmentation through clearing). The mobility of the YBG and degree of habitat connectivity are not sufficient to allow the potential gene exchange and recolonization to occur between subpopulations, so the distribution of the subspecies is severely fragmented. The area of occupancy has declined due to ongoing clearing, and there is observed evidence of current decline in habitat suitability and in subpopulation group size (Woinarski et al. 2014). Extreme fluctuations in population size, area of occupancy, extent of occurrence and number of locations or subpopulations are not known to occur. See attached nomination form and references contained within. **Meets criterion for Endangered under B1ab(ii,iii,v)+2ab(ii,iii,v).**
C.	Small population size and decline (population size, distribution and evidence of decline)	• The population is estimated to 5,500 mature individuals. **Does not meet criterion.**
D.	Very small or restricted population (population size)	• The population is estimated to 5,500 mature individuals which is greater than the threshold for vulnerable under D1. The AOO is > 20 km^2. Number of locations is ≤ 5 and there are plausible future threats, including habitat loss and fragmentation. • **Meets criterion for Vulnerable under D2.**
E.	Quantitative analysis	• No detailed quantitative analysis of population data is available.

	(statistical probability of extinction)	**Data deficient against criterion.**

Summary of assessment information

EOO	3,458 km^2	AOO	232 km^2 (2 km x 2 km grid method).	Generation length	3-5 years

No. locations	3	Severely fragmented	Yes ☐ No ☒ Unknown ☐
No. subpopulations	12	No. mature individuals	5500

Percentage global population within Australia	100
Percentage population decline over 10 years or 3 generations	Not quantified

Threats *(detail how the species is being impacted)*

Threat *(describe the threat and how it impacts on the species. Specify if the threat is past, current or potential)*	Extent *(give details of impact on whole species or specific subpopulations)*	Impact *(what is the level of threat to the conservation of the species)*
See Attached Nomination Form		

Management and Recovery

Is there a Recovery Plan (RP) or Conservation Management Plan operational for the species?	Yes ☒ No ☐

List all relevant recovery or management plans (including draft, in-preparation, out-of-date, national and State/Territory recovery plans, recovery plans for other species or ecological communities, or other management plans that may benefit or be relevant to the nominated species).

- See Attached Nomination Form

List current management or research actions, if any, that are being undertaken that benefit the conservation of the species.

- See Attached Nomination Form

List further recommended management or research actions, if any, that would benefit the conservation of the species.

- See Attached Nomination Form

Nomination prepared by:	
Contact details:	
Date submitted:	24th September 2018
If the nomination has been refereed or reviewed by experts, please provide their names and contact details:	

Species nomination form and guidelines for adding or changing the category of a native species listing under the Queensland *Nature Conservation Act 1992* (NCA)

General notes

The purpose of this document is to nominate a species for assessment under the NCA by the Department's Species Technical Committee (STC) for its consideration and subsequent advice to the Minister.
Please use one nomination form for each species. The form may be submitted electronically, however the original, signed, hard copy must also be lodged. Lodgment instructions are provided at the end of the form. The STC will not consider nominations submitted in any other format.
Each section of the form needs to be completed with as much detail as possible, and indicate when there is no information available. Identify your references/ information sources, document reasons and supportive data. Indicate the quality of facts/information, for example was it based on research or anecdotal data; on observed data or estimated or inferred from data; or suspected to be the case. Identify confidential material and explain the sensitivity
The STC will not consider incomplete nominations or nominations with insufficient information. Your nomination will be returned to you if inadequate information is provided.
Your nomination must be supported with referenced summaries of relevant information from the scientific literature. Full bibliographic details are to be provided. The opinion of appropriate scientific experts may also be cited, provided they authorise you to do so. The names of the expert(s), their qualifications and full contact details must also be provided if they are cited.

The STC assesses nominations against the IUCN Red List Categories and Criteria (version 3.1) for the categories of extinct in the wild, endangered, vulnerable, near threatened and least concern. The IUCN updates its red list guidelines regularly and the STC uses the most recent version (version 8.0). This form will be updated in accord with revisions of IUCN criteria, if necessary. A full description of the IUCN categories and criteria can be found in: IUCN 2001. IUCN Red List Categories: Version 3.1. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK. http://www.iucnredlist.org/documents/redlist_cats_crit_en.pdf http://www.iucnredlist.org/documents/RedListGuidelines.pdf .

- Species - applies to the entity nominated under the *Nature Conservation Act*
- Population – refers to populations within a species or total population numbers for a species.

Section 1. Summary

1.1 Scientific and common name of species (or subspecies)
Yellow-bellied Glider (Wet Tropics) *Petaurus australis* (unnamed northern subspecies)
1.2 If the species is not conventionally accepted, please provide: • a taxonomic description of the species in a form suitable for publication in conventional scientific literature. State where this description has been submitted for publication; or • evidence that a scientific institution has a specimen of the species and a written statement signed by a person who is a taxonomist with relevant expertise (has worked, or is a published author, on the class of species nominated) that the species is new. Details of the qualifications and experience of the taxon expert need to be provided. For a specimen lodged at a museum or herbarium, state where the specimen is held, the collector name, collection date and collection/voucher number.
The northern subspecies is well accepted but has yet to be formally described. Preliminary genetic research supports the recognition of a separate subspecies (Cooper et al. in prep.).
1.3 If a population is being nominated, justify why the population should be considered separately from the species as a whole. This will generally require evidence why the nominated population is considered genetically distinct and/or geographically separate and/or severely threatened in comparison with all other populations of the species.
There is a 380 km disjunction between this unnamed subspecies' southern extent and the northern extent of its south-eastern subspecies *Petaurus australis australis* (Goldingay and Quin 2004). The isolated northern subspecies is recognised as being genetically distinct and was proposed as a distinct Evolutionarily Significant Unit (ESU) by Brown et al. (2006). This taxonomy was adopted by Woinarski et al. (2014) and is reflected in the EPBC Act list of threatened species. It is being nominated as a distinct subspecies, rather than a population. Additional soon-to-be published genetic analyses substantiate the separate subspecies for this ESU (Cooper et al., in prep.).
1.4 Please provide a description of the species or population that is sufficient to distinguish it from other species or populations.
The Yellow-bellied Glider has a greyish-brown body with a distinct black stripe running down its back from forehead to the base of the tail. The belly is a distinctive off-white, which may acquire a yellowish tinge in older individuals, although less so than in populations of the south-eastern subspecies. The gliding membrane has a black margin and there is a black stripe on the outer side of the hind limb to the paw. The lower limbs are black. The ears are pale in colour and bare (DERM 2011). Compared with the more widespread south-eastern Australian subspecies, the Wet Tropics subspecies is lighter in weight and darker coloured on the back. The large, pointed and bare ears feature prominently (Dennis 2012).
1.5 Current conservation status under Nature Conservation Act 1992 and the EPBC Act
Vulnerable

1.6 Proposed conservation status under the Nature Conservation Act 1992 and the EPBC Act
Endangered
1.7 IUCN Criteria under which the species is eligible for listing. The species should be judged against the criteria described in Attachment B: Categories and criteria used for assessing the status of species. The categories for extinct in the wild, endangered, vulnerable and near threatened use the most recent version of IUCN criteria.
B1ab(ii,iii,v)+2ab(ii,iii,v) (Woinarski et al. 2014)

Section 2. Species ecology/biology

2.1 Is this species conventionally accepted? If not, explain why. Is there any controversy on the taxonomy?
No. However recent unpublished research is indicating that it is a separate subspecies, and it has been recognized as ESU since 2006 (see section 1.3)
2.2 Give a brief description of the species': appearance, including size and/or weight, and sex and age variation if appropriate; social structure and dispersion (e.g. solitary/clumped/flocks)
The northern subspecies of Yellow-bellied Glider is a mid-sized gliding possum with a head and body length of 240-310 mm, and a 380-470 mm long fluffy tail. Males weigh 470-725 g and females 435-660 g. While males are heavier than females, their head and body length is only marginally longer, and females have a longer tail than males (Goldingay 2008, Dennis 2012). The two subspecies of Yellow-bellied Glider are similar in external appearance, but the isolated northern subspecies averages smaller in overall body size and has less distinctly yellow belly fur compared to *P. a. australis* (Cooper et al., in prep.). This highly vocal glider lives in family groups of one adult male, one or more females and their offspring, resulting in groups of up to six individuals (Dennis 2012). Densities of the subspecies are typically low; Goldingay and Quin (2004) reported finding 0.07 individuals/ha from a radio-tracking study.
2.3 Describe the species' habitat (e.g. aspect, topography, substrate, climate, forest type, associated species, sympatric species).
The Yellow-bellied Glider (Wet Tropics) occurs in tall wet eucalypt forest growing in a narrow strip along the western margin of the Wet Tropics rainforest, in areas above 600 m altitude. Regional ecosystems and vegetation communities associated with the species are 7.8.15ab, 7.8.16ab, 7.12.21ab, 7.12.22abde and 7.12.27b and all but one of these regional ecosystems (7.12.27) is of conservation interest (DERM 2011). These forests are typically dominated by *Eucalyptus grandis* (Flooded Gum) and *E. resinifera* (Red Mahogany), often with *Banksia integrifolia* (Coast Banksia) and *Syncarpia glomulifera* (Turpentine). This habitat is bordered by rainforest at higher altitudes and areas of higher rainfall, and by drier open forests and woodlands at lower altitudes (Woinarski et al. 2014). Sap from *E. resinifera* is a major food source, while hollow-bearing *E. grandis* are primarily used for den trees, making the species reliant on tall wet eucalypt forests (Goldingay and Quin 2004, DERM 2011). Table 1: Species of conservation interest associated with Yellow-bellied Glider (Wet Tropics) habitat.

Species	**Scientific name**	**Conservation status**	
		NCA	**EPBC**
Northern Bettong	*Bettongia tropica*	Endangered	Endangered
Magnificent Brood Frog	*Pseudophryne covacevichae*	Vulnerable	Vulnerable
A shrub	*Dodonaea uncinata*	Near Threatened	Not listed
A shrub	*Prostanthera clotteniana* (formerly *Hemigenia clotteniana*)	Endangered	Critically Endangered

2.4 What is the species' generation length? Note: Generation length is the average age of parents of the current cohort (i.e. newborn individuals in the population).
3-5 years (Woinarski et al. 2014)
2.5 Is there any other information regarding the species ecology or biology relevant to a conservation status assessment?
For the nominate subspecies, gaps in habitat of over 50 m caused by clearing can act as dispersal barriers (DERM 2011); the same is likely to apply to the northern subspecies.

Section 3. Conservation status

3.1 Describe the species' distribution in Australia and attach a map of known localities. Please include details of which Natural Resource Management and IBRA Bioregions the species occurs in.
The Yellow-bellied Glider (Wet Tropics), is restricted to a narrow and discontinuous habitat range (usually no wider than 4 km and sometimes only two trees in width) between the Yamanie Creek catchment (just north of the Herbert River Gorge, 70 km west of Cardwell) and Mt Windsor Tableland (100 km north-west of Cairns), a linear distance of about 260 km (DERM 2011). Three major locations consisting of about 12 subpopulations are identified (DERM 2011, Woinarski et al. 2014): (1) The Mt Windsor Tableland subpopulation is only known to occur around the north-western, western and south-western foothills of the Mt Windsor Tableland, over a distance of 20 km.

(2) The Mt Carbine Tableland subpopulation occurs patchily from the north branch of the Mary River (north of Mt Molloy) north to Smith Creek, a distance of 25 km. There is approximately 10 km of dry sclerophyll forest separating this subpopulation from suitable habitat on the Mt Windsor Tableland, which is thought to represent a significant barrier. Gliders in the 'Little Daintree' area (see Hedges 2006) are the subject of biennial surveys.
(3) The Cardwell Range - Herberton Range subpopulation occurs patchily from near Atherton south to the Herbert River. This subpopulation has a narrow linear distribution 120 km long, rarely wider than 2 km, and is expected to be naturally fragmented due to habitat discontinuities e.g. the Mt Baldy population at the northern end and other breaks further south. In addition, habitat clearance has increased the fragmentation of this subpopulation through the creation of two major breaks around Ravenshoe, the 'Evelyn Gap' and the 'Butchers Creek Gap'. These gaps isolate gliders in the Tumoulin area from those in the Herberton Range to the north and those in the Cardwell Range to the south of Ravenshoe.

A map of the overall distribution of the subspecies and the location of these three subpopulations is provided on the following page.

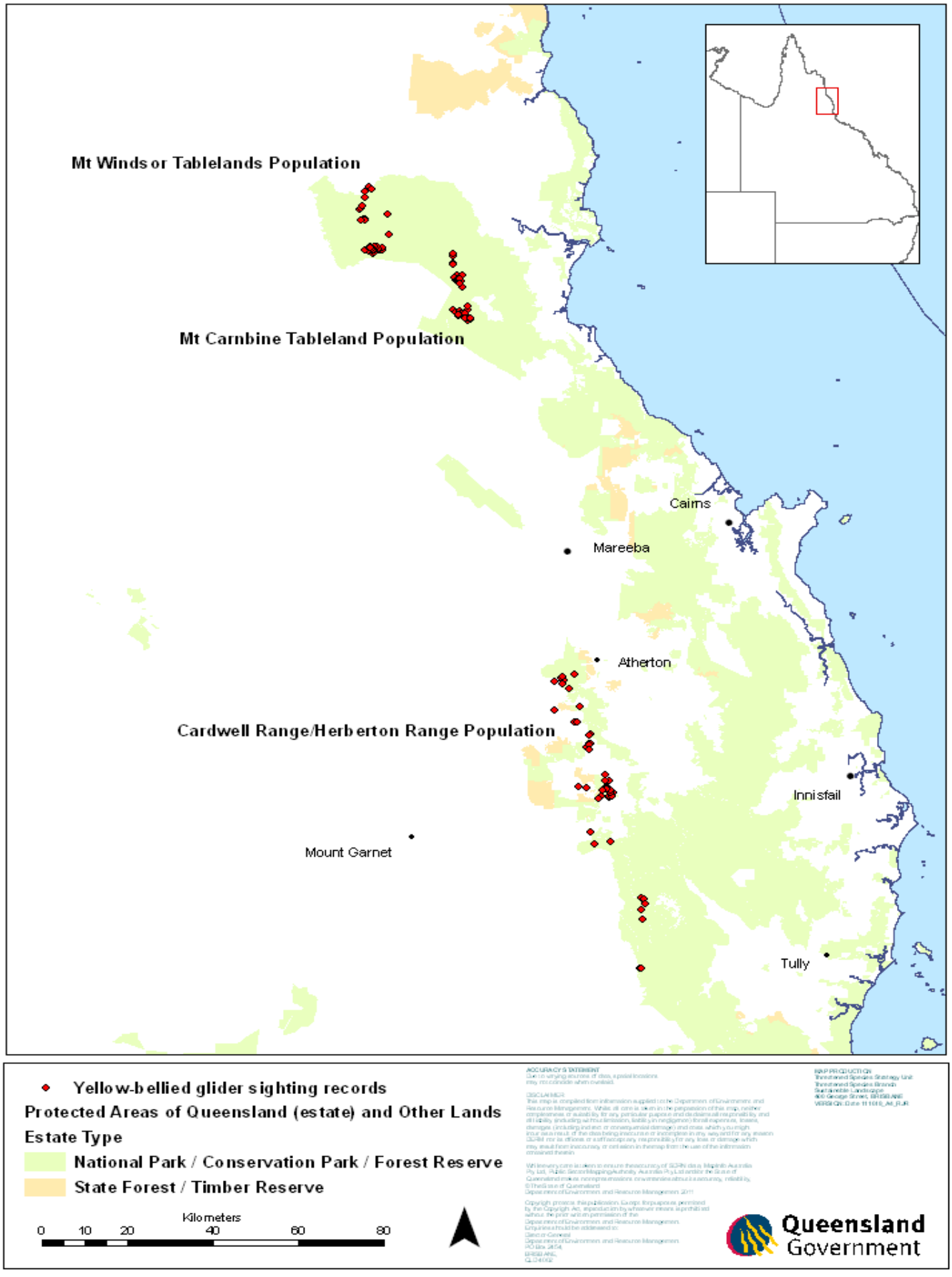
The Yellow-bellied Glider (Wet Tropics) occurs only in the Wet Tropical Rainforest IBRA Bioregion. It has been recorded from the following Natural Resource Management Areas:

- Cape York - Northern Gulf Joint Management Area
- Cape York Natural Resource Management
- Northern Gulf Resource Management Group
- Terrain Natural Resource Management

The subspecies' distribution falls entirely within the Wet Tropics of Queensland World Heritage Area.

WildNet contains records of the subspecies from the following State-protected areas:

- Baldy Mountain Forest Reserve
- Daintree National Park
- Girringun National Park
- Koombooloomba National Park
- Millstream Conservation Park
- Mount Lewis National Park
- Mount Spurgeon National Park
- Mount Windsor National Park
- Samara Nature Refuge
- Tully Falls National Park
- Tumoulin Forest Reserve
- Ravenshoe State Forest 3
- The Bluff State Forest



Source: DERM (2011)

3.2 What is the species' total extent of occurrence (in km^2) (see Attachment A)

3,458 km^2 (Atlas of Living Australia tool, Oct 2018), 2428 km^2 (Woinarski et al. 2014) 4417 km^2 (Winter 2017, revised Oct 2018)

3.3 What is the species' total area of occupancy (in km^2) (see Attachment A)

232 km^2 (Atlas of Living Australia tool, Oct 2018), 128 km^2 (Woinarski et al. 2014). 162 km^2 (Winter 2017). The figures of Winter (2017) were derived on Google Earth by delineating the actual habitat of the Yellow-bellied Glider (Wet Tropics), whereas the ALA derived figures uses the IUCN 2 km x 2 km grid calculation method.

3.4 What is the species' total population size in terms of number of mature individuals?

5500. (Winter 1997, Woinarski et al. 2014)

3.5 How many locations do you consider the species occurs in and why? Where are these located?
Note: The term 'location' defines a geographically or ecologically distinct area.

3. There are three distinct subpopulations in separated patches of habitat. These are located at Mt. Windsor Tableland, Mt. Carbine Tableland and Cardwell Range - Herberton Range, also referred to as the Greater Cardwell Range.

3.6 For flora, and where applicable, for fauna, detail the location, land tenure, survey date, estimated number of individuals and area of occupancy. This is optional for taxa nominated as near threatened or least concern. Summary distribution information such as a map and list of localities should be provided for taxa nominated as near threatened or least concern.

Location	Land tenure	Date of most recent survey	Number of individuals at location	Area of occupancy at location
Mt. Windsor Tableland	National Park	1997	350	28 km^2 in linear distance
Mt Carbine Tableland	National Park	1997	1,040	24 km^2 in fragmented linear distance
Cardwell Range – Herberton range	National Park, State Forest, Timber Reserve	1997	4,140	112 km^2 in fragmented linear distance

3.7 Is the species' distribution severely fragmented? If so, what is the cause of this fragmentation?
Note: Severely fragmented refers to the situation in which increased extinction risk to the taxon results from most individuals being found in small and relatively isolated populations (in certain circumstances this may be inferred from habitat information). These small populations may go extinct, with a reduced probability of recolonisation

The species distribution is dispersed, with three patchily-distributed populations that are broken into more than a dozen subpopulations (Dennis 2012, Winter 2017). The habitat in which the Yellow-bellied Glider (Wet Tropics) occupies is naturally somewhat fragmented, however, ongoing clearing and decline in habitat quality is further fragmenting these glider subpopulations such that the extent of gene flow between fragments is probably very low (DERM 2011, Woinarski et al. 2014).

3.8 Does the species undergo extreme natural fluctuations in population numbers, extent of occurrence or area of occupancy? To what extent and why?
Note: Extreme fluctuations can be said to occur in a number of taxa when population size or distribution area varies widely, rapidly and frequently, typically with a variation greater than one order of magnitude (i.e. a tenfold increase or decrease).

No. Significant fluctuations in population size and area of occupancy are not known to occur.

3.9 What data are there to indicate past trends in the species' population size, distribution, extent or quality of habitat? (if available, include data that indicates the percentage decline over the past 10 years or 3 generations whichever is longer)?

No published data on population trends exists.

While the overall extent of occurrence of the subspecies is thought not to have changed since European settlement (DERM 2011), the area of occupancy has declined due to clearing and decline in habitat suitability (Woinarski et al. 2014). Dennis (2012) describes how certain areas with trees bearing old feeding scars no longer support Yellow-bellied Gliders, indicating local losses from suitable habitat. Harrington et al. (2006) report that up to 80% of the tall open forest dominated by *E. grandis* has been encroached upon or 'captured' by rainforest during a period from the 1940s to the early 1990s, rendering it unsuitable to the Yellow-bellied Glider (Dennis 2012).

3.10 What data are there to indicate future changes in the species' population size, distribution, extent or quality of habitat? (if available, include data that indicates the percentage decline over 10 years or 3 generations whichever is longer (up to a maximum of 100 years in the future) where the time period is a continuous period that may include a component of the past?

No data are available, but the population size is inferred to be decreasing due mainly to decline in habitat quality and area (Woinarski et al. 2014). The general impression is that the range of the glider has contracted on the basis that old trees tapped for their sap are found well outside their current range. However, concrete evidence is sparse. The example given is the best evidence we have for 'recent' range contraction of the Tumoulin Forest glider population (Winter 2017). The general impression by those who have worked with the Yellow-bellied Glider over many years is that their group size is less now than it was in the 1980s and 1990s. The areas where this has been observed is in the

headwaters of the Daintree, the site of a biannual census, the Mt Carbine Tableland sub-population and in two areas of the Greater Cardwell Range sub-population – Gilbey Forest in the Bluff State Forest and in Tumoulin Forest Reserve. The best evidence for this is presented for the Sawmill Gully section of Tumoulin Forest. The numbers recorded have declined – range from 1-5 to 1-3 and mean from 2.75 to 1.3 (Table 1) (Winter 2017).

3.11 Has the species been reasonably well surveyed? Is the species' current known distribution and/or population size likely to be its actual distribution and/or population size?

This species has not been well-surveyed, with both DERM (2011) and Woinarski et al. (2014) identifying the need for such work. Monitoring efforts have been ongoing since the release of the Recovery Plan in 2011, but the results have not been published. A bi-annual census of a glider population in the upper reaches of the Daintree River in the Daintree National Park. It is coordinated by Queensland Parks and Wildlife Service, Mossman. The most recent survey was in July 2017. Hedges (2006) gives an account of the surveys up to 2005 and a current draft report updates the censuses. The Yellow-bellied Glider Project commenced in 2010 involves skilled volunteers in the mapping and survey of gliders and their habitat in three isolated populations at the northern end of the Greater Cardwell Range sub-population – Mt Baldy Forest Reserve, Gilbey Forest in The Bluff State Forest and Tumoulin Forest Reserve. Initially co-ordinated by Threatened Species, Environment and Heritage Protection with the help of the Tableland National Parks Volunteers now with the community group the Tree Kangaroo and Mammal Group (TKMG).

3.12 For species considered eligible for listing as extinct or extinct in the wild, please provide details of the most recent known collection, or authenticated sighting of the species in the wild and whether additional populations are likely to exist.

N/A

4. **Threats and threat abatement**

4.1 Identify past, current and future threats indicating whether they are actual or potential. For each threat describe:

a. how and where it impacts on this species
b. what its effect has been so far (indicate whether it is known or suspected; does it only affect certain populations)
c. what is its expected effect in the future (is the threat only suspected; does it only affect certain populations)

The following threat summary is derived from information in Woinarski et al (2014), together with evidence of feral cat predation (John Winter, unpublished report 2017).

Threat factor	Consequence rating	Extent over which threat may operate	Evidence base
Inappropriate fire regime	Severe	Large	Vegetation change is occurring due to reduced fire frequency and intensity (Harrington and Sanderson 1994, Winter 2004, DERM 2011, Dennis 2012); the availability of hollows and wintering trees may also be influenced by fire regimes (Winter 2004).
Habitat loss (through clearing) and fragmentation	Catastrophic	Moderate	Absent from cleared areas, and little dispersal to or from fragments, through cleared areas (DERM 2011); habitat on private land is less well protected.
Habitat change due to livestock	Moderate	Moderate	Grazing occurs in glider habitat on freehold land where the combined influence of grazing and frequent burning by grazers is to simplify the understorey and prevent regeneration of habitat components (DERM 2011).
Barbed wire fencing (entanglement)	Moderate	Moderate	Poses a threat in some areas (Dennis 2012)
Climate change	Moderate	Large (future threat)	Listed by DERM (2011) as a threat of unknown significance, although Dennis (2012) states rainforest expansion is due to long term climate trends.
Habitat change associated with wood production	Moderate	Minor	Some commercial logging still occurs in glider habitat.
Feral cat predation	Moderate	Moderate	Photographic evidence of feral cats climbing to YBG sap feeding stations (John Winter, pers comm 2017).

4.2 Where possible, provide information on threats for each occurrence/location. This is optional for taxa nominated as near threatened or least concern. Summary information should be provided for taxa nominated as near threatened or least concern.

Location	Past threats	Current threats	Future threats	Current management activities (see Q 4.5)

Herberton-Ravenshoe area	Clearing and disturbance for forestry and agriculture	N/A		Protecting and managing habitat outside the protect area estate (Action 3.1 in recovery plan, DERM 2011)
Tumoulin State Forest		Commercial logging activity	Commercial logging activity	Protecting and managing habitat outside the protect area estate (Action 3.1 in recovery plan, DERM 2011)
Mt Baldy and Herberton Range		Potential loss of individual feed and den trees from maintenance of powerlines by energy companies	Potential loss of individual feed and den trees from maintenance of powerlines by energy companies	Protecting and managing habitat outside the protect area estate (Action 3.1 in recovery plan, DERM 2011)
Mt Carbine Tableland	Entanglement in barbed wire fencing			Collation of data on barbed wire incidents, establishment of a reporting process, identification of hotspots for management, implementation of a landholder extension program (Actions 4.2-4.4 in recovery plan, DERM 2011)
All habitat locations		Feral cat predation	Feral cat predation	Protecting and managing habitat outside the protect area estate (Action 3.1 in recovery plan, DERM 2011). The only known program to control feral cats is being conducted by the Tree Kangaroo and Mammal Group (TKMG) at Tumoulin Forest Reserve
4.3 Identify and explain any additional biological characteristics particular to the species that are threatening to its survival.				
N/A				
4.4 Give an overview of how threats are being abated/could be abated and other recovery actions underway/proposed. Identify who is undertaking these activities and how successful the activities have been to date.				
This information is summarised in the national recovery plan (see DERM 2011).				
4.5 Identify key management documentation for the species e.g. recovery plans, conservation plans, threat abatement plans etc.				
National recovery plan for the Yellow-bellied Glider (Wet Tropics) *Petaurus australis* unnamed subspecies (DERM 2011)				
4.6 Are there any management or research recommendations from the documents mentioned in 4.5 or otherwise, that will assist in the conservation of the species?				

DERM (2011) recommends the following actions be implemented:

1.1 Define essential habitat distribution.
2.1 Implement adaptive fire management for Yellow-bellied Glider (Wet Tropics).
3.1 Facilitate the protection and management of habitat outside protected area estate.
3.2 Regenerate habitat corridors between existing glider habitat.
4.1 Conduct research into the impacts of cattle on glider habitat.
4.2 Collate existing data on Yellow-bellied Glider (Wet Tropics) barbed wire incidents and establish a reporting process through WildNet.
4.3 Analyse Yellow-bellied Glider (Wet Tropics) barbed wire incident data to establish level of impact and identify potential hotspot locations for management.
4.4 Implement an extension program for landholders on appropriate grazing regimes and fencing modification in glider habitat.
5.1 Undertake a monitoring program to assess the number of gliders in known habitat.
5.2 Conduct genetic analysis of Yellow-bellied Glider (Wet Tropics) population.
6.1 Investigate impacts of climate change on glider habitat.

Woinarski et al. (2014) indicates the following management actions are required:

- Manage fire to benefit this subspecies
- Reduce impacts of livestock upon habitat
- Restore connectivity to fragmented subpopulations
- Reintroduce individuals to re-establish subpopulations at suitable sites
- Implement integrated monitoring program linked to assessment of management effectiveness
- Develop conservation covenants on lands with high value for this subspecies.

In addition a program of feral cat control should occur through the Yellow-bellied Glider habitat.

Section 5. Compilers, referees and references

5.1 Compiler(s) details	
Name(s)	
Organisation(s)	
Contact details	
Postal address	
Email	
Phone	
Date	

5.2 Has this document been refereed? If so, indicate by whom

5.3 Reference List

Brown, M., Cooksley, H., Carthew, S.M. & Cooper, S.J.B. (2006) Conservation units and phylogeographic structure of an arboreal marsupial, the yellow-bellied glider (*Petaurus australis*). *Australian Journal of Zoology* 54: 305-317.

Cooper, S.G, Helgen, K.M., Saint, K., Russell, R. and Winter, J. (in prep) Reassessment of the subspecific status of the Australian Wet Tropics yellow-bellied glider, *Petaurus australis*. Unpublished manuscript.

Dennis, A.J. (2012). Yellow-bellied Glider. In: Curtis, L.K. Dennis, A.J., McDonald, K.R., Kyne, P.M. & Debus, S.J.S. (eds) *Queensland's Threatened Animals*. Collingwood, Vic: CSIRO Publishing.

Department of Environment and Resource Management (DERM) (2011). National recovery plan for the yellow-bellied glider (Wet Tropics) *Petaurus australis* unnamed subspecies. Report to Department of Sustainability, Environment, Water, Population and Communities, Canberra. Department of Environment and Resource Management, Brisbane.

Goldingay, R.L. (2008). Yellow-bellied Glider *Petaurus australis*. In: Van Dyck, S. & Strahan, R. (eds) *The Mammals of Australia*. Third edition. Sydney: Reed New Holland.

Goldingay, R.L. & Quin, D (2004). Components of the habitat of the yellow-bellied glider in north Queensland. In: Jackson, S. M., & Goldingay, R. L. (eds). *The Biology of Australian Possums and Gliders*. Chipping Norton, NSW: Surrey Beatty & Sons.

Harrington, G.N. and Sanderson, K.D. (1994) Recent contraction of wet sclerophyll forest in the wet tropics of Queensland due to invasion by rainforest. *Pacific Conservation Biology* 1: 319-327.

Harrington, G.N., Bradford, M.G. & Sanderson, K.D. (2006). *The wet sclerophyll and adjacent forests of north Queensland: a directory to vegetation and physical survey data*. Cooperative Research Centre for Tropical Rainforest Ecology and Management, Rainforest CRC, Cairns.

Hedges, A. (2006). Biennial yellow-bellied glider (*Petaurus australis reginae*) census, Daintree National Park: 2005 results and an overview of the census since 1997. A report for the Queensland Parks and Wildlife Service (QPWS), Mossman, Qld, March 2006.

Winter, J.W. (1997) Distribution of the yellow-bellied glider *Petarus australis* and two other sympatric petaurid gliders in the Wet Tropics Region of Queensland. A report to the Wet Tropics Management Authority April 1997.

Winter, J.W. (2004) Forest mammals of northern Queensland: is their conservation status improving? In: Lunney, D. (ed.) *Conservation of Australia's Forest Fauna*, second edition. Mosman, NSW: Royal Zoological Society of New South Wales.

Winter, J.W. (2016) Feral Cats and Yellow-bellied Gliders Yellow-bellied Glider Project. Atherton to Ravenshoe.

Winter, J.W. (2017) Notes on Yellow-bellied Glider (Wet Tropics) STC nomination. November 2017.

Woinarski, J.C.Z., Burbidge, A.A. & Harrison, P.L. (2014) *The Action Plan for Australian Mammals 2012*. Collingwood, Vic: CSIRO Publishing.

Section 6. Declaration

I declare that the information in this nomination and its attachments is true and correct to the best of my knowledge.
Signed:
Date: 9 Feb 2017

This nomination includes updated information provided on 10th October 2018.

Section 7. Lodgement instructions

Completed nominations should be electronically lodged at:

SpeciesTechnical.committee@des.qld.gov.au
The original, signed hard copy of the nomination must be posted to:
Species Technical Committee
C/- The Director
Queensland Herbarium
Department of Environment and Resource Management
Brisbane Botanic Gardens,
Mt. Coot-tha Rd,
TOOWONG, Qld 4066

Attachment A - Area of occupancy and extent of occurrence

Extent of occurrence

Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy (see Figure 1). This measure may exclude discontinuities or disjunctions within the overall distributions of taxa (e.g. large areas of obviously unsuitable habitat) (but see 'area of occupancy', point 10 below). Extent of occurrence can often be measured by a minimum convex polygon (the smallest polygon in which no internal angle exceeds 180 degrees and which contains all the sites of occurrence).

Area of occupancy

Area of occupancy is defined as the area within its 'extent of occurrence' (see point 9 above) which is occupied by a taxon, excluding cases of vagrancy. The measure reflects the fact that a taxon will not usually occur throughout the area of its extent of occurrence, which may contain unsuitable or unoccupied habitats. In some cases (e.g. irreplaceable colonial nesting sites, crucial feeding sites for migratory taxa) the area of occupancy is the smallest area essential at any stage to the survival of existing populations of a taxon. The size of the area of occupancy will be a function of the scale at which it is measured, and should be at a scale appropriate to relevant biological aspects of the taxon, the nature of threats and the available data (see point 7 in the Preamble). To avoid inconsistencies and bias in assessments caused by estimating area of occupancy at different scales, it may be necessary to standardize estimates by applying a scale-correction factor. It is difficult to give strict guidance on how standardization should be done because different types of taxa have different scale-area relationships.

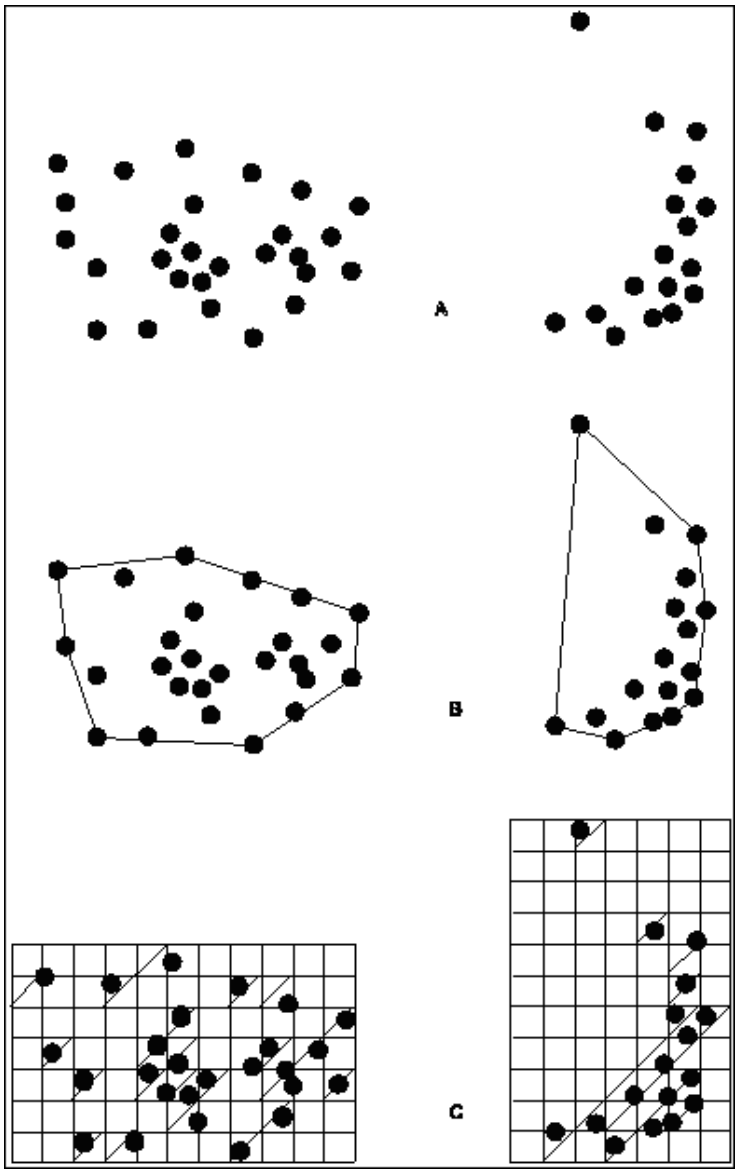


Figure 1. *Two examples of the distinction between extent of occurrence and area of occupancy. (A) is the spatial distribution of known, inferred or projected sites of present occurrence. (B) shows one possible boundary to the extent of occurrence, which is the measured area within this boundary. (C) shows one measure of area of occupancy which can be achieved by the sum of the occupied grid squares.*