Abridged Threatened Species Nomination Form

For nominations/assessments 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 for Assessment)*

Species name (scientific and common name)**:**	***Stylidium coroniforme* subsp. *amblyphyllum***
Nomination for (addition, deletion, change)**:**	**Addition**
Nominated conservation category and criteria:	**EN: B1ab(iii)+2ab(iii)**

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	•	
B.	Geographic range	•	
C.	Small population size and decline	•	
D.	Very small or restricted population	•	
E.	Quantitative analysis	•	

Outcome*:*			
Scientific committee Meeting date:			
Scientific committee comments:			
Recommendation:			
Ministerial approval:		*Date of Gazettal/ Legislative effect:*	

Nomination/Proposal summary *(to be completed by nominator)*

Current conservation status				
Scientific name:	*Stylidium coroniforme* subsp. *amblyphyllum*			
Common name:	None			
Family name:	Stylidiaceae		Fauna ☐	Flora ☒
Nomination for:	Listing ☒	Change of status/criteria ☐		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)				
National (EPBC Act)				
State / Territory	1. WA	2015	Critically Endangered	B1ab(iii)+2ab(iii)
	2. WA	28/9/2016	Critically Endangered	B1ab(iii)
	3. WA	Assessed TSSC 10/4/2018	Endangered	B1ab(iii)+2ab(iii)

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:	Further survey showed an increase in the known number of mature individuals from 400 in total previous to 2014, to 434 in 2015, then 943 plants in 2018.
• 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:	Assessment is consistent with 2015, however, criterion B2 no longer applies to CR as the estimated AOO using the 2x2km grid is 28 km^2. Number of locations 3 based on the clustered

	arrangement of the subpopulations which may be subject to the same threatening process, but severely fragmented. Endorsed WA TSSC 28/9/2016. Surveys in 2016 and 2017 located two new subpopulations, increasing the extent and distribution of the subspecies. The EOO increased from 98 km^2 to 333 km^2, which exceeds the threshold for listing as CR under criterion B. Endorsed WA TSSC 10/4/2018.

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?	**B1ab(iii)+B2ab(iii)**

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)	• The known number of mature individuals increased at two subpopulations (3a, 3b and 5). However the known number also decreasedat two subpopulations (Populations 4 and 8). Insufficient information is available overall to reliably show rate of decline as a number of the subpopulations have not been regularly surveyed. • **Insufficient data to assess.**
B.	Geographic range (EOO and AOO, number of locations and evidence of decline)	• (B1) Using Minimum Convex Polygon (MCP) the EOO is approximately 333 km^2 which was calculated by drawing a polygon around the plants. • (B2) Area of Occupancy is estimated 28 km^2 using the 2km x 2km grid method. • (a) The subspecies is known from 4 locations. The locations are severely fragmented as each site is an isolated area of remnant vegetation on shallow soils of lateritic breakaways due to extensive clearing of the Avon Wheatbelt region. • (b) Continuing decline in habitat condition observed and projected: • (iii) Ongoing threats to habitat condition and extent from fire, habitat degradation, grazing, poor recruitment and a drying climate. • **Meets criteria for Endangered B1ab(iii)+B2ab(iii)**
C.	Small population size and decline (population size, distribution and evidence of decline)	• Known from 943 mature individuals in total. • Plant numbers fluctuate significantly depending on rainfall. This may reflect a transfer between life stages (standing plant and seedbank), and thus a fluctuation related to the life history of the subspecies rather than a significant risk factor. • Insufficient information is available to reliably show rate of decline as not all subpopulations have been regularly surveyed. • 33% of plants in one subpopulation.

		• **Insufficient data to assess.**
D.	Very small or restricted population (population size)	• 943 mature individuals • **Meets Vulnerable D1.**
E.	Quantitative analysis (statistical probability of extinction)	• No information to assess.

Summary of assessment information					
EOO	333 km^2 (MCP)	AOO	28 km^2 (2 km x 2 km grid), mapped area of subpopulations <0.55 km^2.	Generation length	-

No. locations	4	Severely fragmented	Yes ☒ No ☐ Unknown ☐
No. subpopulations	11	No. mature individuals	943
Percentage global population within Australia		100	
Percentage population decline over 10 years or 3 generations		Unknown	

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)*
Habitat degradation • Fertiliser application and chemical drift, trampling of habitat and plants from stock, and weeds. Past and present	Whole population	Severe
Rabbits and kangaroos • Grazing of flowering scapes has been observed, impacting on the establishment of seedlings and thereby limiting natural recruitment. • Disturbance to plants and roots from rabbit diggings. Past, current and future	Whole population	Severe
Altered fire regimes • However, fire is likely to kill mature plants (though some resprouting may potentially occur if stems are buried) and frequent fire would deplete the soil seed store. Fire is likely to facilitate weed invasion and should be followed up with appropriate weed control. Past, current and future	Whole population	Severe

Poor recruitment • The subspecies appears to require a disturbance to recruit, but if disturbance is too frequent, occurs at the wrong time of the year or is followed by a drought, then the populations are likely to be severely impacted. Past, present, future	Whole population	High
Drought • Equivalent to a major disturbance. • May delay surveys for additional populations given that plants are unlikely to flower and be more difficult to detect. Past, present, future	Whole population	Severe

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).

- Department of Parks and Wildlife (2016 DRAFT) *Stylidium coroniforme* subsp. *amblyphyllum* Interim Recovery Plan 2016–2021. Interim Recovery Plan No. #. Department of Parks and Wildlife, Western Australia.

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

- Monitoring and surveys have been carried out to determine plant numbers and impact of threats;
- Liaison with private land owner to protect remnant vegetation on which the subspecies occurs;
- Protecting the sites from fire unless required for ecological reasons, and implemented early intervention in any wildfires which may threaten the site;
- Monitoring the populations for evidence of rabbit or weed impacts, or changes in plant or site health;
- Surveying for additional populations;
- Collecting approximately 1,000 seed for storage at Parks and Wildlife's Threatened Flora Seed Centre.

List further recommended management or research actions, if any, that would benefit the conservation of the species. Please ensure that this section addresses all identified threats.

Management

- Liaise with land managers to ensure protection of subpopulations from farming practices;
- Ongoing monitoring and observations of subpopulations and threats;
- Develop and implement a fire management strategy, including associated weed control measures and the need for and method of the construction and maintenance of firebreak;
- Install fencing at subpopulations to reduce grazing and trampling by rabbits and kangaroos and allow recruitment within a larger area of habitat;
- Collect and store additional seeds to guard against the extinction of natural populations. Collections should aim to sample and preserve the maximum range of genetic diversity possible;
- Develop a translocation proposal and select a disease free translocation site;

- Map habitat critical to the survival of the subspecies to facilitate its protection and appropriate management;
- Improve security through placement of conservation covenants;
- Promote awareness of the subspecies with general public.

Research

- Research biology and ecology of the subspecies, with a focus on pollination effectiveness, seed viability, conditions required for natural germination, response to threats and disturbances and reproductive biology.
- Improve understanding of the species responses to fire frequency, severity and season to inform the preparation of a fire management strategy.

Nomination prepared by:	
Contact details:	
Date submitted:	11/4/2018

If the nomination has been refereed or reviewed by experts, please provide their names and contact details:

Summary of subpopulation information *(detailed information to be provided in the relevant sections of the form)*						
Location *(include coordinates)*	Land tenure	Survey information: Date of survey and No. mature individuals ( ) = number of seedlings/juveniles	Area of subpopulations	Site / habitat Condition	Threats *(note if past, present or future)*	Specific management actions
Location 1: Population 1, WNW of Quairading	Private property	2002: localised 2004: 75	**Total location 1= 0.3489km^2** <0.1km^2	Moderate	Habitat degradation (past, present, future) Fire (past, present, future) Grazing (rabbits, kangaroos) (past, present, future) Plant and root disturbance from rabbit diggings (past, present, future) Lack of recruitment (past, present, future) Climate change (future)	Install fencing Develop a fire management plan Collect seed and test viability, conduct regeneration trials Baiting program to be completed Improve security through conservation covenants
Population 2: WNW of Quairading	Private property	2007: occasional	<0.1km^2		Habitat degradation (past, present, future) Fire (past, present, future) Grazing (rabbits, kangaroos) (past, present, future) Plant and root disturbance from rabbit diggings (past, present, future) Lack of recruitment (past, present, future) Climate change (future)	Install fencing Develop a fire management plan Collect seed and test viability, conduct regeneration trials Baiting program to be completed Improve security through conservation covenants

Population 3a: WNW of Quairading	Private property	2013: 15 (23) 2015: 43 2017: 75	0.008km^2	Excellent	Habitat degradation (past, present, future) Fire (past, present, future) Grazing (rabbits, kangaroos) (past, present, future) Plant and root disturbance from rabbit diggings (past, present, future) Lack of recruitment (past, present, future) Climate change (future)	Install fencing Develop a fire management plan Collect seed and test viability, conduct regeneration trials Baiting program to be completed Improve security through conservation covenants
Population 3b: WNW of Quairading	Private property	2014: 9 2015: 10 2017: 57	0.0104km^2 0.0005km^2 (2014)	Excellent	Habitat degradation (past, present, future) Fire (past, present, future) Grazing (rabbits, kangaroos) (past, present, future) Plant and root disturbance from rabbit diggings (past, present, future) Lack of recruitment (past, present, future) Climate change (future)	Install fencing Develop a fire management plan Collect seed and test viability, conduct regeneration trials Baiting program to be completed Improve security through conservation covenants
Population 4: WNW of Quairading	Private property	2013: 15 (3) 2015: 139 2017: 15	0.005km^2	Good	Habitat degradation (past, present, future) Fire (past, present, future) Grazing (rabbits, kangaroos) (past, present, future) Plant and root disturbance from rabbit diggings (past, present, future)	Install fencing Develop a fire management plan Collect seed and test viability, conduct regeneration trials Baiting program to be completed

					Lack of recruitment (past, present, future) Climate change (future)	Improve security through conservation covenants
Population 5: WNW of Quairading	Nature reserve	2013: 71 (40) 2015: 139	0.016km^2	Good	Habitat degradation (past, present, future) Fire (past, present, future) Grazing (rabbits, kangaroos) (past, present, future) Plant and root disturbance from rabbit diggings (past, present, future) Lack of recruitment (past, present, future) Climate change (future)	Install fencing Develop a fire management plan Collect seed and test viability, conduct regeneration trials Baiting program to be completed Improve security through conservation covenants
Population 6: WNW of Quairading	Private property	2004: 36 2008: 52	<0.1km^2		Habitat degradation (past, present, future) Fire (past, present, future) Grazing (rabbits, kangaroos) (past, present, future) Plant and root disturbance from rabbit diggings (past, present, future) Lack of recruitment (past, present, future) Climate change (future)	Install fencing Develop a fire management plan Collect seed and test viability, conduct regeneration trials Baiting program to be completed Improve security through conservation covenants
Population 7: WNW of Quairading	Private property	2004: 18	0.005km^2	Good	Habitat degradation (past, present, future) Fire (past, present, future) Grazing (rabbits, kangaroos) (past, present, future)	Install fencing Develop a fire management plan Collect seed and test viability, conduct regeneration trials

					Plant and root disturbance from rabbit diggings (past, present, future) Lack of recruitment (past, present, future) Climate change (future)	Baiting program to be completed Improve security through conservation covenants
Population 11: WNW of Quairading	Private property	2017: 312 (117)	0.0045km^2	Excellent	Habitat degradation (past, present, future) Fire (past, present, future) Grazing (rabbits, kangaroos) (past, present, future) Plant and root disturbance from rabbit diggings (past, present, future) Lack of recruitment (past, present, future) Climate change (future)	Install fencing Develop a fire management plan Collect seed and test viability, conduct regeneration trials Baiting program to be completed Improve security through conservation covenants
Location 2: Population 8: NW of Quairading	Private property	2013: 16 (6) 2015: 31 2018: 30	0.0035km^2	Degraded	Habitat degradation (past, present, future) Fire (past, present, future) Grazing (rabbits, kangaroos) (past, present, future) Plant and root disturbance from rabbit diggings (past, present, future) Lack of recruitment (past, present, future) Climate change (future)	Install fencing Develop a fire management plan Collect seed and test viability, conduct regeneration trials Baiting program to be completed Improve security through conservation covenants
Location 3: Population 9: SE of Youndegin	Private property	2012: 40-50	<0.1km^2		Habitat degradation (past, present, future) Fire (past, present, future)	Install fencing Develop a fire management plan

					Grazing (rabbits, kangaroos) (past, present, future) Plant and root disturbance from rabbit diggings (past, present, future) Lack of recruitment (past, present, future) Climate change (future)	Collect seed and test viability, conduct regeneration trials Baiting program to be completed Improve security through conservation covenants
Location 4: Population 10a&b: SE of York	Private property	2016: 120	0.011km^2	Good	Habitat degradation (past, present, future) Fire (past, present, future) Grazing (rabbits, kangaroos) (past, present, future) Plant and root disturbance from rabbit diggings (past, present, future) Lack of recruitment (past, present, future) Climate change (future)	Install fencing Develop a fire management plan Collect seed and test viability, conduct regeneration trials Baiting program to be completed Improve security through conservation covenants

Threatened species nomination

For nominations to the WA Threatened Species Scientific Committee (and the Minister for Environment) to amend threatened species listings under the WA *Wildlife Conservation Act 1950* or their IUCN Red List threat status.

Cover Page *(Office use only)*

Species name (scientific and common name)**:**	*Stylidium coroniforme* subsp. *amblyphyllum*
Nomination for (addition, deletion, change)**:**	Addition
Nominated conservation category and criteria:	Endangered, B1ab(iii) +B2ab(iii)

WA TSSC assessment of eligibility against the criteria:		
A.	Population size reduction	• No data - does not meet criteria
B.	Geographic range	• EOO is c. 333 km^2, the AOO is < 28 km^2 and the habitat of the subspecies is severely fragmented, occurring as small pockets of bushland, in a highly cleared landscape. • This subspecies is naturally separated due to the location of suitable habitat. However clearing between areas of suitable habitat may be limiting pollinators and therefore causing severe fragmentation. • The nomination also included extreme fluctuations however this subspecies was determined to be ineligible for listing based on this sub-criterion (c(iv)) as the species is a disturbance opportunist, with fire stimulated germination, and naturally short lived. • Surveys in 2016 and 2017 located two new subpopulations, increasing the extent and distribution of the subspecies. The EOO increased from 98 km^2 to 333 km^2, exceeding the threshold for listing as CR under criterion B.
C.	Small population size and decline	• No data - does not meet criteria
D.	Very small or restricted population	• No data - does not meet criteria
E.	Quantitative analysis	• No data - does not meet criteria

Outcome*:*	
TSSC Meeting date:	10 April 2018
TSSC comments:	The TSSC supported the recommended change of category of the subspecies from Critically Endangered, CR B1ab(iii)+2ab(iii) to Endangered, EN B1ab(iii)+B2ab(iii).

Recommendation:	Change of category to Endangered, EN B1ab(iii)+2ab(iii) accepted.		
Ministerial approval:	21 October 2015	*Government Gazette:*	3 November 2015

Department of Parks and Wildlife

Form to nominate a Western Australian species for listing as threatened, change of category or delisting 2015 (Updated 2018).

SECTION 1. NOMINATION

1.1. Nomination for:

Flora ☒ | **Fauna** ☐ | as: **Threatened / DRF** ☒ **Change of category** ☐ **Delisting** ☐

1.2. Scientific Name
This name will be used to identify the species on all official documentation. Use the approved name used by the Western Australian Museum or Herbarium, if possible.

Stylidium coroniforme (F.L.Erickson & J.H.Willis) subsp. *amblyphyllum* Wege

1.3. Common Name
If the species has a generally accepted common name, please show it here.

Quairading Triggerplant (here proposed)

1.4. Family Name

Stylidiaceae

1.5. Current Conservation Status. If none, type 'None'.

	IUCN Red List Category e.g. Vulnerable	IUCN Red List Criteria e.g. B1ab(iv); D1
International IUCN Red List	None	None
National EPBC Act 1999	None	None
State of Western Australia	Critically endangered	B1ab(iii)

State of WA Priority	1☐	2☐	3☐	4☐	5☐

1.6. Nominated Conservation Status.

	IUCN Red List Category e.g. Vulnerable	IUCN Red List Criteria e.g. B1ab(iv);D1
State of Western Australia	Endangered	B1ab(iii)+B2ab(iii)

State of WA Priority	1☐	2☐	3☐	4☐	5☐

Is the species listed as 'Threatened' in any other Australian State or Territory? If Yes, list these States and/or Territories and the status for each.

No ☒ **Yes** ☐ **Details:**

1.7. Reasons for the Nomination.
Briefly summarise the reasons for the nomination in dot points. Please include details relevant to the IUCN Category and each Criteria.

This taxon is confined to shallow soils on lateritic breakaways in Western Australia's highly cleared Avon Wheatbelt area.

Eleven subpopulations are known, of which 10 are on private property and one in a small nature reserve surrounded by private property.

The current EOO is c. 333 km^2, the AOO is 28 km^2 and the total number of individuals is

approximately 943 (434 in 2015), with populations varying in size from 15–312 individuals (10-139 in 2015). The habitat of the taxon is severely fragmented occurring as small pockets of bushland in a highly cleared landscape.

Current and future threats are poor rainfall, grazing and rabbit disturbance, habitat degradation, and inappropriate disturbance regimes (e.g. absence of fire) leading to poor recruitment and extreme fluctuations in the number of mature individuals.

The subspecies was originally nominated as Critically Endangered under IUCN Criteria B1ab(iii)+2ab(iii) in 2015 as the EOO was < 100 km^2, AOO < 10 km^2, the subpopulations were severely fragmented, and there was a projected decline in quality of habitat, particularly due to poor rainfall and grazing. Surveys in 2016 and 2017 located two new subpopulations, increasing the extent and distribution of the subspecies. The EOO has increased from 98 km^2 to 333 km^2 which exceeds the threshold for listing as CR under criterion B.

The subspecies is nominated as Endangered under IUCN Red List Criteria B1ab(iii)+B2ab(iii) (EOO < 5,000 km^2, AOO < 500 km^2, severely fragmented, and projected decline in quality of habitat, particularly due to poor rainfall and grazing).

SECTION 2. SPECIES

2.1. Taxonomy.

Describe the taxonomic history, using references, and describe the key distinguishing features that can be used to separate this taxon from closely related taxa. Include details of the type specimen, changes in taxonomy, scientific names and common names used for the species.

This taxon was named in 2007 following its discovery in 2002 as part of the WWF Woodland Watch surveys of private property in the Avon Wheatbelt. It differs from the typical subspecies (which is also listed as Threatened), and from all other species in the genus, in its unique leaves, which are linear to narrowly oblanceolate, fibrous, marginate and with blunt to shortly mucronate apices. Unlike allied taxa, the floral bracts have similarly blunt or shortly mucronate apices (Wege & Coates 2007).

Is this species conventionally accepted? If no, explain why. For example, is there any controversy about the taxonomy? For undescribed species, detail the location of voucher specimens (these should be numbered and held in a recognised institution and be available for reference purposes).

No ☐ Yes ☒

Stylidium coroniforme subsp. *amblyphyllum* is recognised on Western Australia's vascular plant census and is represented by 11 voucher specimens and 3 photographic records at the Western Australian Herbarium (Western Australian Herbarium 1998–).

Describe any known hybridisation with other species in the wild, indicating where this occurs and how frequently.

No hybrids have been documented; hybridisation is rare in *Stylidium*.

2.2. Description

Describe the physical appearance, habit, behaviour/dispersion and life history. Include anatomy or habit (e.g. size and/or weight, sex and age variation, social structure) and dispersion (e.g. solitary, clumped or flocks etc), and life history (eg short lived, long lived, geophytic, etc).

Perennial herb 7–20 cm high, with compact to shortly elongated stems becoming shallowly buried as the plants age. Leaves rosetted, linear to narrowly oblanceolate,1–2.5 cm long, 0.8–1.5 mm wide, blunt or very shortly mucronate, marginate, glabrous. Scape glandular-hairy above lowest flower, inflorescence racemose or paniculate. Hypanthium cylindric, glandular-hairy, sterile in one loculus. Corolla lobes yellow (more rarely pinkish) and with 1 set of red throat markings, paired laterally, bearing 2 filiform throat appendages. Stigma prominently stalked.

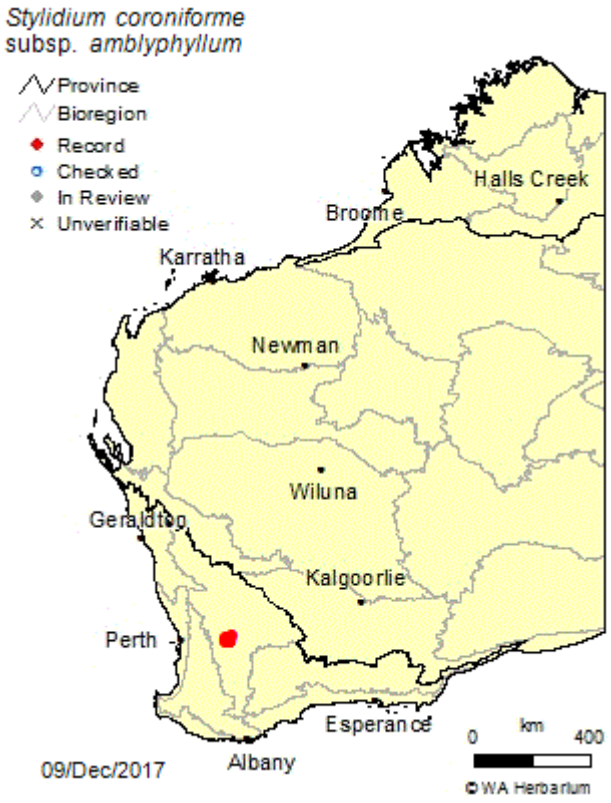
Precise longevity data is lacking although the size of the stems and the pattern of adventitious root production on some herbarium specimens indicates plants can live at least 5 years, if not longer.

The lifeform of *Stylidium coroniforme* subsp. *amblyphyllum* is comparable to subsp. *coroniforme* and *S. amabile* which, like many triggerplants, are known disturbance opportunists (Coates 1992; Chant

& Page 2010). Fire response is unknown: it is not inconceivable that individuals where stem tissue is buried may be able to resprout following fire.

2.3. Distribution
Describe the distribution of the species in Australia and, if possible, provide a map.

Stylidium coroniforme subsp. *amblyphyllum* is endemic to the Central District of the Avon Wheatbelt in the south-west of Western Australia, occurring west of Quairading, near Youndegin and southeast of York (see map below from Western Australian Herbarium (1998–)).



2.4. Habitat
Describe the non-biological habitat (e.g. aspect, topography, substrate, climate) and biological habitat (e.g. vegetation type, associated species, sympatric species). If the species occurs in various habitats (e.g. for different activities such as breeding, feeding, roosting, dispersing, basking etc) then describe each habitat. Note if the habitat has a special defining characteristic. If possible estimate the area of habitat, or the relative abundance of the habitat, and note if a critical habitat requirement (eg breeding habitat) is restricted in its availability to the species.

Non-biological habitat

Lateritic breakaways. Plants favour shallow soils over sheet laterite or small cracks on sheet laterite.

Biological habitat

Open *Eucalyptus argyphea* woodland (sometimes also with *E. wandoo*), *E. astringens* woodland, or mallee shrubland or heath, with associated species including *Banksia armata, B. nobilis, Grevillea insignis* and *Hakea subsulcata*.

Does the (fauna) species use refuge habitat e.g. in times of fire, drought or flood? Describe this habitat.

n/a

Is the species part of, or does it rely on, a listed threatened ecological community? Is it associated with any other listed threatened species?

n/a

2.5. Reproduction
Provide an overview of the breeding system.
For fauna: Provide an overview of the breeding system and breeding success, including: when does it breed; what conditions are needed for breeding; are there any breeding behaviours that may make it vulnerable to a threatening process?
For flora: When does the species flower and set fruit? Is the seed produced viable? What conditions are needed for this? What is the pollinating mechanism? If the species is capable of vegetative reproduction, a description of how this occurs, the conditions needed and when. Does the species require a disturbance regime (e.g. fire, ground disturbance) in order to reproduce?

Stylidium coroniforme subsp. *amblyphyllum* flowers from mid-September to mid-October, with peak flowering toward the end of September and into early October. Like many other perennial triggerplants, it is unlikely to flower under dought conditions. Individuals produce 1–c. 20 flowering scapes and each scape produces c. 5–75 flowers. Like other triggerplants, it effects pollen transfer via a mobile floral column. While this promotes cross pollination, geitonogamy (resulting in self-pollination) is likely to occur. Self-pollination is likely to result in significantly higher levels of postzygotic seed abortion than cross pollination due to recessive lethal factors (James 1979). Specific pollinators have not been documented, but are most likely to be beeflys and/or native bees.

Stylidium coroniforme subsp. *amblyphyllum* fruits in late November. Seed was collected for the Threatened Flora Seed Centre on 23 November 2013 from two populations (PERTH 08599912 & 08600031). The former population yielded c. 2300 seed from 18 plants (the latter has not yet been cleaned). Viability tests have not yet been conducted.

This taxon is thought to be a disturbance opportunist like subsp. *coroniforme* and the allied species *S. amabile*. Populations of these taxa (and many other perennial triggerplants) typically go through bottleneck-flush cycles associated with temporary habitat perturbations such as fire, resulting in extreme fluctuations in the number of individuals (Coates 1992; Chant & Page 2010).

2.6. Population dynamics
Provide details on ages of sexual maturity, extent of breeding success, life expectancy and natural mortality. Describe population structure (presence of juveniles/seedlings, mature and senescing individuals). Estimate generation length.

Some juvenile plants and seedlings were recorded by Bert Hort during surveys in 2013; this regeneration may have been the result of localised soil disturbance.

Questions 2.7 and 2.8 apply to fauna nominations only

2.7. Feeding
Summarise food items or sources and timing/availability.

n/a

Briefly describe feeding behaviours, including those that may make the species vulnerable to threatening processes.

n/a

2.8. Movements
Describe any relevant daily or seasonal pattern of movement for the species, including relevant arrival/departure dates if migratory. Provide details of home range/territories.

n/a

SECTION 3. INTERNATIONAL CONTEXT

For species that are distributed both in Australia and in other countries.

3.1. Distribution
Describe the global distribution.

n/a

Provide an overview of the global population size, trends, threats and security of the species outside of Australia.

n/a

Explain the relationship between the Australian population and the global population. What

percentage of the global population occurs in Australia? Is the Australian population distinct, geographically separate or does part, or all, of the population move in/out of Australia's jurisdiction? Do global threats affect the Australian population?

n/a

SECTION 4. CONSERVATION STATUS AND MANAGEMENT

Conservation status and management information is required for the national extent of the species, however, greater detail is expected for the WA occurrences. If the taxon is considered to be endemic to Western Australia, please provide supporting evidence.

4.1. Population

What is the total national/State population size in terms of number of mature individuals? Has the number of individuals been counted, or is this an estimate? Provide details of the method of determining the number of individuals. Are there other useful measures of population size and what are they? Or if these are unavailable, provide an estimate of abundance (e.g. scarce, locally abundant etc).

Note: The term 'population' is used in a specific sense in the Red List Criteria that is different to its common biological usage. Population is here defined as the total number of mature individuals of the taxon. In the case of taxa obligately dependent on other taxa for all or part of their life cycles, biologically appropriate values for the host taxon should be used. (IUCN 2001)

The total population (i.e. number of mature individuals) is c. 943 (434 in 2015).

How many subpopulations or locations do you consider the species occurs in and why?

Note: 'Subpopulations' are defined as geographically or otherwise distinct groups in the population between which there is little demographic or genetic exchange (typically one successful migrant individual or gamete per year or less). 'Locations' are defined as a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon present. The size of the location depends on the area covered by the threatening event and may include part of one or many subpopulations. Where a taxon is affected by more than one threatening event, location should be defined by considering the most serious plausible threat. (IUCN 2001) Refer to Red List Guidelines 9.0

The number of subpopulations is 11 (see below) (determined as 4 locations based on the clustered arrangement of the subpopulations which may be subject to the same threatening process: location one includes Subpopulations 1-7 and 11; location 2 includes Subpopulation 8, location 3 includes Subpopulation 9 and location 4 includes Subpopulation 10).

Provide locations of: captive/propagated occurrences or *ex situ* collections; recent re-introductions or introductions to the wild; and sites for proposed re-introductions or introductions. Have these sites been identified in recovery plans?

n/a

For <u>flora</u>, and where applicable, for <u>fauna</u>, detail the location, land tenure, estimated number of individuals, area of occupancy, and condition of site for each known date, location or occurrence. More specific detail is expected for WA occurrences for taxa that are not endemic to WA.

Date of survey	Location Description (include coordinates of the site)	Land status	Number of mature individuals at location	Area of occupancy at location	Condition of site
2004	Subpopulation 1 WNW of Quairading	Private property	75	<0.1 km^2	Moderate; little understorey due to prior grazing
2007	Subpopulation 2 WNW of Quairading	Private property	Not recorded ('occasional')	<0.1 km^2	Unknown

2013 2015 2017	Subpopulation 3a WNW of Quairading	Private property	38 43 75	0.008 km^2	excellent
2014 2015 2017	Subpopulation 3b WNW of Quairading	Private property	9 10 57	0.0005 km^2 0.0104 km^2	excellent
2013 2015 2017	Subpopulation 4 WNW of Quairading	Private property	15 (3 seedlings) 139 15	0.005 km^2	good
2013 2015	Subpopulation 5 WNW of Quairading	Nature reserve (surrounded by private property)	71 (40 seedlings) 139	0.016 km^2	good
2008	Subpopulation 6 WNW of Quairading	Private property	52	<0.1 km^2	unknown
2004	Subpopulation 7 WNW of Quairading	Private property	18	0.005 km^2	good
2013 2015 2018	Subpopulation 8 NW of Quairading	Private property	16 (6 seedlings) 31 30	0.0035 km^2	degraded
2012	Subpopulation 9 SE of Youndegin	Private property (covenant)	c. 40–50	<0.1 km^2	unknown
2016	Subpopulation 10a (new) SE of York	Private property	23	0.011 km^2 (including 10a&b)	good
2016	Subpopulation 10b (new) SE of York	Private property	97		good
2017	Subpopulation 11 (new) WNW of Quairading	Private property	312 (117 seedlings)	0.0045 km^2	excellent
What is the total area of occupancy (in km^2) for the species; explain how it was calculated and datasets used. If an accurate estimate is unavailable, provide a range of values or a					

minimum or maximum area estimate. Where separate breeding habitat is applicable, if possible, also provide area of breeding habitat.
AOO is 28 km^2 using the 2x2km grid system. Estimated AOO = < 0.55 km^2. Calculated using data gathered on foot by Bert Hort for Subpopulations 3–5, 7 and 8. Estimated at < 0.1 km^2 for the remaining subpopulations based on area of available habitat.
What is the extent of occurrence (in km^2) for the species; explain how it was calculated and datasets used. If an accurate estimate is unavailable, provide a range of values or a minimum or maximum area estimate.
EOO = c. 333 km^2 (roughly calculated from an ArcGIS polygon that encompassed all known populations).
Identify important occurrences necessary for the long-term survival and recovery of the species? This may include: key breeding populations, those near the edge of the range of the species or those needed to maintain genetic diversity.
All occurrences are important in view of the reduced number of individuals known.
Is the distribution of the species severely fragmented? Why?
The individuals occur in small and isolated populations resulting in an increased extinction risk. This is in part due to clearing for agriculture and grazing of stock (mostly sheep), but also due to their specific habitat preference.
Is the taxon subject to extreme fluctuations? If so, provide evidence.
Unknown.
Has there been any known decline in the species within WA or nationally, or is this likely in the future? – provide details in relation to the elements detailed below, including how the decline has been measured or inferred. Is there a presumption of continuing decline? If so, provide details of the decline and how it relates to the specific Red List Categories and Criteria version 3.1. Note: A continuing decline is a recent, current or projected future decline (which may be smooth, irregular or sporadic) which is liable to continue unless remedial measures are taken. Fluctuations will not normally count as continuing declines, but an observed decline should not be considered as a fluctuation unless there is evidence for this. (IUCN 2001) Refer to Red List Guidelines 9.0
A future decline is likely in response to climate change, habitat decline, poor recruitment, inappropriate fire regimes, grazing by rabbits and kangaroos and digging by rabbits.
Has there been a decline in the size of the population (number of mature individuals)?
Unknown.
- can the rate of population size reduction be determined over the last 10 years or 3 generations (whichever is the longer)? If so, state whether the determination is based on quantitative data (observed), estimated (provide data and calculations), inferred or suspected.
No.
- can the rate of population size reduction be estimated for the next 10 years or 3 generations and in any 10 year or 3 generation period (up to a maximum of 100 years into the future)? If so, state how the reduction is estimated (provide data and calculations), inferred or suspected.
No.
Has there been a decline in the number of locations, extent of occurrence or area of occupancy?
Unknown.
Has there been a decline in the area or quality of habitat?
Yes, possibly due to grazing by stock and rabbits, and poor winter rainfall.

4.2. Survey effort

Describe the methods to conduct surveys. For example, season, time of day, weather conditions; length, intensity and pattern of search effort (including where species not encountered); any limitations and expert requirements.

Surveys have been conducted via foot and in areas of suitable habitat during the taxon's flowering time to maximise detection.

Provide details on the distinctiveness and detectability of the species, or the distinctiveness of its habitat, that would assist survey success.

The subspecies occurs in a highly specific habitat and has distinctive basal leaves which are unique in the genus, this allowing for a good level of detectability and field identification.

Has the species been reasonably well surveyed? Provide an overview of surveys to date (include surveys of known occurrences and surveys for additional occurrences) and the likelihood of its current known distribution and/or population size being its actual distribution and/or population size. Include comments on potential habitat and surveys that were conducted, but where the species was not present/found.

Yes.

Bert Hort has conducted extensive ground surveys over several years of all likely, accessible habitat in the district (only limited by access to private property by owners).

Mike Griffiths has conducted extensive surveys of private property in the region and more broadly in the Avon Wheatbelt since discovering this taxon in 2002 (Subpopulation 1) as part of the WWF Woodland Watch initiative. In the course of this work, he has discovered just 3 additional populations (Subpopulations 2, 7 and 9).

Surveys of private property by DBCA and York Wildflower Society were undertaken in 2016 and resulted in the discovery of Subpopulation 10 .

4.3. Threats

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

a). how and where they impact this species

b). what the effect of the threat(s) has been so far (indicate whether it is known or suspected

c). present supporting information/research

d). does it only affect certain populations?

e). what is its expected effect in the future (is there supporting research/information; is the threat only suspected; does it only affect certain populations?).

If possible, provide information threats for each current occurrence/location:

Location	Past threats	Current threats	Potential threats	Management requirements (see section 4.4)
All Subpopulations	habitat degradation	same as past threats		
	poor recruitment	poor rainfall		
	inappropriate fire regimes			
	grazing by rabbits and kangaroos (particularly the flowering scapes)			
	plants and root disturbance from rabbit diggings			

Identify and explain why additional biological characteristics particular to the species are

threatening to its survival (e.g. low genetic diversity). Identify and explain any models addressing the survival of the species.

Like *S. coroniforme* subsp. *coroniforme*, and the allied species *S. amabile*, *S. coroniforme* subsp. *amblyphyllum* is likely to be a disturbance opportunist with populations going through bottleneck-flush cycles associated with temporary habitat perturbations such as fire. A lack of disturbance is likely to result in poor recruitment and population decline (Coates 1992; Chant & Page 2010).

4.4. Management

Identify key management documentation for the species e.g. recovery plans, conservation plans, threat abatement plans etc.

There is no management documentation for this taxon, although an interim recovery plan exists for *S. coroniforme* subsp. *coroniforme* (Stack *et al*. 2003).

Does this species benefit from the management of another species or community? Explain.

n/a

How well is the species represented in conservation reserves or covenanted land? Which of these are actively managed for this species? Provide details.

This taxon is poorly represented on protected lands. Of the 11 known subpopulations, only 1 occurs in a nature reserve (surrounded by private property), with the remainder on private property (one protected by a conservation covenant).

Are there any management or research recommendations that will assist in the conservation of the species? Provide details.

Protection of plants from grazing and protection of habitat (see Coates 1992; Stack *et al*. 2003). Chant and Page (2010) report on the success of burn trials in increasing the number of mature individuals of the allied taxon *S*. *amabile*.

Management requirements to include:

- Maintain liaison with private landowners to minimise disturbance to remnant vegetation from farming practices;
- Install fencing at subpopulations to reduce grazing and trampling by rabbits and kangaroos and allow recruitment within a larger area of habitat;
- Monitor the subpopulations for evidence of weed impacts, or changes in plant or site health;
- Protect the sites from fire unless required for ecological reasons, and implement early intervention in any wildfires which may threaten the site;
- Collect and store seed;
- Survey any newly identified areas of suitable habitat;
- Establish new subpopulations in more secure locations, if a suitable location can be found;
- Determine fire response;
- Improve security through placement of conservation covenants;
- Undertake systematic monitoring of populations to determine population trends.

4.5. Other

Is there any additional information that is relevant to consideration of the conservation status of this species?

SECTION 5. NOMINATOR

Nominator(s) name(s)	
Organisation(s)	
Address(s)	
Telephone number(s)	
Email(s)	
Date	Updated 11/4/2018

If the nomination has been refereed or reviewed by experts, provide their names and contact

details.

SECTION 6. REFERENCES

What references or sources did you use to prepare your nomination? Include written material, electronic sources and verbal information. Include full references, address of web pages and the names and contact details of authorities with whom you had verbal communications.

Chant, A. & Page, C. (2010). Stylidium amabile disturbance trial. Watsnu 16(1): 4–5.
Coates, D.J. (1992). Genetic consequences of a bottleneck and spatial genetic structure in the triggerplant Stylidium coroniforme (Stylidiaceae). Heredity 69: 512–520.
James S.H. (1979). Chromosome numbers and genetic systems in the triggerplants of Western Australia (Stylidium; Stylidiaceae). Australian Journal of Botany 27: 17–25.
Stack, G., Willers, N. & Brown, A. (2003). Wongan Hills Triggerplant (Stylidium coroniforme) interim recovery plan 2003–2008 (Department of Conservation and Land Management: Wanneroo, WA).
Wege, J.A. & Coates, D.J. (2007). Observations on the rare triggerplant Stylidium coroniforme (Stylidiaceae) and the description of two allied taxa of conservation concern. Nuytsia 17: 433–444.
Western Australian Herbarium (1998–). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. http://florabase.dpaw.wa.gov.au .

Mike Griffiths