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)**:**	***Commersonia apella***
Nomination for (addition, deletion, change)**:**	**Addition**
Nominated conservation category and criteria:	**CR: B2ab(iii,iv); C2a(i,ii); D**

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:	*Commersonia apella*			
Common name:	Many-flowered Commersonia			
Family name:	Malvaceae		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	2013	Critically Endangered	A4ac; B2ab(iv); C2a(ii); D
	2. WA	2016	Critically Endangered	A4ac; B2ab(iii,iv); C2a(i,ii); D
	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:	There have been no further surveys of the species since 2014, however the surveys undertaken up to that time are considered adequate to inform the assessment.
• 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, criteria remains current with additional sub-criteria added.
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?	**B2ab(iii,iv); C2a(i,ii); D**	
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)	• A decline in the species overall is inferred as it was historically collected from eight sites, with only one disjunct subpopulation now containing living plants in the eastern extremity of its range, however the time period for the historical declines is not known. • There is insufficient information available to reliably show rate of decline within the extant subpopulation as it has only been fully surveyed on one occasion in 2014, but the trend of ongoing decline is expected to continue. • **Insufficient information to assess**
B.	Geographic range (EOO and AOO, number of locations and evidence of decline)	• Currently known from 1 extant location which is found in an area of 1km^2. The area of occupancy is thus 4 km^2 using the IUCN 2x2 grid calculation. A second site has had no plants recorded since 2003 and is being monitored for regeneration of plants. • Ongoing decline in number of locations and subpopulations known. The species was historically collected from eight locations of which only two locations (Denmark, Esperance) contained live plants when subsequently surveyed (2003 and 2011). No live plants have been observed at the Denmark location since 2003, despite numerous surveys including a post fire survey. Decline in condition of habitat due to salinity and weeds. • May be regarded as one location assuming extinction of second site, but also considered severely fragmented as subpopulations are very small, discontinuous and fragmented. They occurred in several localities scattered over a wide area from Pemberton and Mitchell River Bridge (north of Denmark) to New Island Bay Esperance, Cape Le Grand NP. • **Meets CR:B2ab(iii,iv)**
C.	Small population size and decline (population size, distribution and evidence of decline)	• Known from 31 mature plants (100%) in one location in Esperance. Small population size renders the species vulnerable to stochastic events such as fire and drought. • Ongoing historic decline in number of locations. • Subpopulation at Esperance site only fully surveyed in 2014, therefore long term population trends are not able to be determined. • **Meets CR:C2a(i,ii)**

D.	Very small or restricted population (population size)	• 31 mature plants • **Meets CR:D**
E.	Quantitative analysis (statistical probability of extinction)	• No data

Summary of assessment information

EOO	445 km^2 based on historic locations or 4km^2 based on current location	AOO	4km^2 (using 2x2km grid method) (mapped area of subpopulation <1km^2)	Generation length	-

No. locations	1	Severely fragmented	Yes ☒ No ☐ Unknown ☐
No. subpopulations	1	No. mature individuals	31

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)*
Refer to table at end.		

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 (in prep) Many-flowered Commersonia (*Commersonia apella*) Draft 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.

- Liaise with Tourism WA to ensure proposed New Island Bay track and development does not impact on the species and its habitat;
- Liaise with road managers to minimise disturbance to remnant vegetation when maintaining road;
- Installation of markers at extinct road reserve location near Denmark to protect habitat when maintaining road;
- Monitor the population for evidence of weed and disease impacts, or changes in plant or site health;

- Protect the site from fire unless required for ecological reasons, and implement early intervention in any wildfires which may threaten the site;
- Previous collection of *ex situ* material from extinct location;
- Propagation of cuttings for *ex situ* living collection at Australian National Botanic Gardens (ANBG) in Canberra;
- Survey of remnant areas at extinct locations, particularly following fire;
- Implementation of hygiene measures to protect susceptible habitat from disease introduction.

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

- Control infestations of weeds that might impact the population;
- Collect seed and/or tissue culture material for storage and *ex situ* propagation;
- Establish new populations on secure tenure through implementation of translocations;
- Stimulate germination of species in wild, particularly at extinct locations.

Research

- Determine the species susceptibility to *Phytophthora cinnamomi*;
- Confirm the species status through morphological and genetic studies;
- Determine species response to disturbance events through regeneration trials.

Nomination prepared by:	
Contact details:	
Date submitted:	4/7/2016

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	AOO	Site / habitat Condition	Threats *(note if past, present or future)*	Specific management actions
New Island Bay. Cape Le Grand	National Park	2011: <50 2014: 31	<1 km^2	Good condition. Plants are tall, scraggly, a growth habit caused from lack of light and dense vegetation.	Past • N/A Current • Proposal of eco-resort for tourism • *Phytophthora* Future • Infrastructure development • Weeds • Frequent fire	As above
Denmark-Mount Barker Road at Mitchell River Bridge	Main Roads WA road reserve	2003: 1 2007: 0 2013: 0 (likely extinct)	0	Weedy woodland, approximately 50m from river bank.	Past • Weeds • Inappropriate fire regimes • Road maintenance (habitat) Current • Weeds • Inappropriate fire regimes • Road maintenance (habitat) Future • Weeds • Inappropriate fire regimes • Road maintenance (habitat)	As above

Department of
Environment and Conservation

Our environment, our future

Form to nominate a Western Australian species for listing as threatened, change of category or delisting 2012 (Updated 2016).

NOTICE: Incomplete forms may result in delays in assessment, or rejection of the nomination. To fill out this form you must refer to the Guidelines and contact the relevant Officer in the DEC Species and Communities Branch. DEC staff can advise you on how to fill out the form and may be able to supply additional, unpublished information.

Answer all relevant sections, filling in the white boxes and indicating when there is no information available. **Note**, this application form applies to both flora and fauna species, and hence some questions or options may not be applicable to the nominated species – for these questions, type "N/A".

To mark boxes with a **cross**, double click the box and select not checked or checked.

SECTION 1. NOMINATION

1.1. Nomination for:

Flora ☒ | **Fauna** ☐ | **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.

Commersonia apella C.F.Wilkins

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

'many-flowered commersonia'

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

	IUCN Red List Category e.g. Vulnerable	**IUCN Red List Criteria e.g. B1ab(iv);D(1)**
International IUCN Red List	none	none
National EPBC Act 1999	none	none
State of Western Australia	[CR (2013)]	[A4; B2ab(iv); C2a(ii); D]

State of WA Priority	1☒	2☐	3☐	4☐	5☐

1.5. Nominated Conservation Status.

	IUCN Red List Category e.g. Vulnerable	**IUCN Red List Criteria e.g. B1ab(iv);D(1)**
State of Western Australia	Critically Endangered	A4ac; B2 ab(iv): C2 a(ii); D (see Appendix 2)

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** ☐

1.6. Reasons for the Nomination.
Briefly summarise the reasons for the nomination in dot points. Please include details relevant to the IUCN Categories and Criteria where appropriate.

- The only known population with live plants is located at New Island Bay, which is c. 445 km east of the nearest known populations at Denmark. This appears to be a small population (population size estimated c. 50 plants, estimated AOO $\leq$ 1km$^{2)}$.
- Recent searches at all other known population locations have failed to find live plants (including one post fire survey) (C. Wilkins, per. comm.).
- Wilkins and Whitlock (2011) recommended that this species be nominated for threatened species (DRF) status because of the limited number of known populations and concerns about observed declines within those populations.
- The only other known living plants of *Commersonia apella* are in cultivation, having been grown from cuttings at the Australian National Botanic Gardens in Canberra.

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 species was first collected by Max Koch in 1921 at Big Brook, Pemberton (Koch 2434), and housed at the Western Australia Herbarium as *Rulingia corylifolia*. During the taxonomic revision of the genera *Rulingia* and *Commersonia,* Wilkins identified a new taxon similar to *Rulingia corylifolia* and submitted this as a new species with the manuscript name *Rulingia apella* ms (Wilkins and Whitlock 2011). *Rulingia* and *Commersonia* were combined as *Commersonia* and subsequently *Commersonia apella* published as a new species (Wilkins and Whitlock 2011).

A group of taxa (*C. apella*, *C. grandiflora*, *C. corylifolia* and *C. erythrogyna*) share some morphological similarities, and notably the woody style extension on the apex of the carpel and seed with a smooth, glossy exotesta and white flowers (Wilkins and Whitlock 2011). A molecular phylogeny finds that these four *taxa* form a subclade with *C. rotundifolia,* and places *C. apella* as mostly closely related to *C. corylifolia* (Wilkins and Whitlock 2011).

The distinguishing features of *C. apella* include having the petal base scarcely gibbous above petal-attachment point, with scattered white stellate hairs on inside of ligule and outer surface of petal base, the leaves are ovate or elliptic with a serrulate leaf margin and densely hairy adaxial surface. Both *C. apella* and *C. corylifolia* share a similar ovate leaf shape, densely hairy adaxial leaf indumentums, fruits almost enclosed within the calyx. *Commersonia apella* differs from *C. corylifolia* by having smaller, more abundant flowers and a non-gibbous petal base as opposed to the deep, gibbous pouch that is present at the base of the petal in *C. corylifolia* (Wilkins and Whitlock 2011). *C. corylifolia* has a larger calyx (>5.5mm long rather than <4.5 mm long).

C. grandiflora and C. erythrogyna both differ from *C. corylifolia* and *C. apella* in having the adaxial surface of the leaf that is velvety tomentose rather than densely hairy, fruits are larger and well exposed above the calyx, rather than almost enclosed within the calyx (Wilkins and Whitlock 2011). Similar to *C. apella*, the calyx of *C. grandiflora* is > 4mm long, and the petals of both *C. grandiflora* and *C. erythrogyna* are not prominently gibbous. However, the petals are moderately gibbous in both *C. grandiflora* and *C. erythrogyna* as opposed to being scarcely gibbous in *C. apella* (Wilkins and Whitlock 2011).

Commersonia erythrogyna differs from *C. corylifolia, C. grandiflora and C. apella* in having petals with both a glabrous ligule and glabrous inner surface of calyx, whereas the latter three species have stellate hairs on the base of petals and petal ligule, dense white stellate hairs at the base of inner surface of calyx, and pinkish-red ovary hairs as opposed to white (Wilkins and Whitlock 2011).

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 ☒

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

None observed

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).

Shrub erect, spreading, 1.5–2_x 1–2.5 m, stellate hairy*. Mature leaf* petiole 2.8–4 mm long; blade scarcely discolorous, greyish-green above paler greyish-green, ovate, entires, 8–30 x 4–14 mm; both surfaces densely stellate hairy. Margin irregularly serrulate, apex acute or obtuse. *Juvenile leaf* trilobed and ~ 3 x adult size. *Inflorescence* leaf-opposed along flowering branch, 7.5–23.5mm long, flowers 3–15 per inflorescence. *Bud* base obtuse; apex rounded, strongly ribbed. *Calyx* green towards base, lobes white; total length 3.3–4.5 mm; tube 0.6–1.2mm long; lobes ovate, 2.6–3.8 x 1.9–2.2 mm, 70–84% of total length, apex acute; both surfaces stellate hairy. *Petals* creamy-yellow throughout, 2.2–2.7 x 1.1–1.6 mm; base scarcely gibbous (cupped) above point of attachment, apical ligule narrowly oblong to narrowly spathulate, 1.4–1.8 x 0.4–0.45 mm, with scattered, white, stellate hairs on inner surface of ligule and outer surface of base, apex not recurved and just longer than calyx tube. *Staminal tube* present. *Staminodes* 1 between each stamen, white, ovate to narrowly ovate, 1.3–1.4 x 0.55–0.6 mm; outer surface densely stellate hairy. *Filaments* 0.4–0.5 x 0.15–0.25 mm, glabrous. *Anthers* yellowish-cream and dark red towards centre, 0.3–0.5 x 0.4–0.5 mm; pollen yellow. *Ovary* 5-loculate, globose, 0.5–0.6 x 0.6–0.7 mm, outer surface with pre-setae (bristle) outgrowths. *Ovules* 2 per locule. *Styles free,* 0.5–0.8mm long, fused at stigmas. *Fruit* ellipsoid, ~2.3_4.5 mm, wings on dehiscence lines ~0.4mm long, outer surface with dense, soft, white stellate hairs beneath hairy setae up to 0.4 mm long, on the wing and towards apex of fruit; *seed* ellipsoid, 1.5 x 0.8–0.9 mm; exotesta black, smooth, glossy; *aril* a white, translucent lobe ~0.5 x 0.7mm (Wilkins and Whitlock 2011).

2.3. Distribution

Describe the distribution of the species <u>in Australia</u> and, if possible, provide a map.

Commersonia apella has been recorded from several localities near Esperance, Pemberton, Walpole and Denmark, in the southwest of Western Australia (the Western Australian Herbarium 1998-, Figure 1). Within past five years, only one population has been confirmed as having living plants, this being in Cape Le Grand National Park.

2.4. Habitat

Describe the non-biological habitat (e.g. aspect, topography, substrate, climate) and biological habitat (e.g. forest 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.

Non-biological habitat

Sites often associated with banks of streams or rivers in humic, greyish–brown, clayey sand.

Biological habitat

Open jarrah-wandoo woodland, karri-marri forest and coastal *Eucalyptus angulosa, E. conferruminata and E. cornuta* mallee shrubland.

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?

Unknown

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?

The flowering period is October to December, with fruiting in January. *Commersonia apella* possibly requires fire or ground disturbance for reproduction. Cuttings of this species were taken from WA in 1968 by J. Wrigley (Voucher *J.Wrigley 68/4519*), and are in the living collection at the Australian National Botanic Gardens in Canberra.

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).

Little is known on the population dynamics of *Commersonia apella*, although it is assumed that this species recruits after fire but it is unknown if it regenerates from seed or from resprouting. Despite other more distantly related species of *Commersonia* being clonal, close relatives of *C. apella* are not clonal and *C. apella* has not been observed to be clonal (vegetatively reproductive). Close relatives are sexually reproductive the next winter-spring rains after fire, and are usually prolific after fire and decline in number in the subsequent years after fire / inter fire period.

The New Island Bay population was found in late 2011, two years after a hot summer fire had burnt the area. A few mature plants (1 - 2 m tall) still with juvenile foliage but also in flower, were observed within a small area growing in an area which had been severely burnt. No smaller seedlings were noted. A single mature plant observed at Mitchell River Bridge in a post fire area in 2003 has since died by 2007 (the Western Australian Herbarium 1998-, Appendix 1). No seedlings or clonal regrowth were observed at this site (Mitchell River Bridge).

The seed is arilate, so it is possibly ant dispersed.

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.

Does not occur outside of Australia; restricted to the south-west Western Australia.

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?

100% of global population occurs in Australia.

SECTION 4. CONSERVATION STATUS AND MANAGEMENT

4.1. Population

What is the total population size in terms of number of mature individuals? Has there been any known reduction in the size of the population, or is this likely in the future? – provide details. 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).

The only living plants known occur in New Island Bay population, in Cape Le Grand National Park. More precise estimates of population size unknown, but a survey in spring 2011 recorded a sparse population of a few adult plants under thick mallee regrowth along a narrow strip of creekline (Markey 2012). Given the intensity of the New Island Bay Survey and the low frequency at which this species was encountered, it is estimated that this population could possibly number $\leq$ 50 plants [31, 2014]. The area of occupation is estimated to be $\leq$ 1km^2.

The size of the Mitchell River population (which consists of two subpopulations) declined steadily from being recorded as occasional in 1995 to a single plant in 2003. By 2007, no live plants were recorded (Table 1).

The other localities are known from older herbarium records only, and no living plants have been recorded within the past decade from these localities (Table 1).

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

In 1968, cuttings taken by Wrigley from Torbay headland, near Albany, were grown and are still present in the living collection at ANBG.

How many locations do you consider the species occurs in and why? Where a species is affected by more than one threatening event, location should be defined by considering the most serious plausible threat.

The species has been historically recorded with certainty from eight sites (the Western Australian Herbarium 1998-, Figure 1, Table 1), and from a further two unverifiable locations (Table 1). Only one population is currently known to have living plants, this being the New Island Bay, Cape Le Grand National Park.

Threatening processes underway at the sites between Pemberton and Albany include weed invasion and habitat degradation. The Mitchell River sites were noted to be weedy (C. Wilkins, pers. comm.)

Potential threats to the New Island Bay population includes possible future infrastructure developments, weed invasion and habitat degradation, frequent fire, potential increases in severity of hot, dry weather and drought, and dieback (we are unsure as to how *C. apella* is affected by dieback disease, but *Phytophthora* which will at least impact the plant community in which this species occurs).

For flora, and where applicable, for fauna, detail the location, land tenure, estimated number of individuals, area of occupancy, and condition of site for each known date, location or occurrence.

*References to more recent survey added 2016.

Date of last survey	Location	Land status	Number of individuals at location	Area of occupancy at location	Condition of site
21/11/2007	Mitchell River Bridge (1A)	Mt Lindesay NP	0	1.5 m^2	Weedy woodland, c. 50 m from river bank
21/11/2007	Mitchell River Bridge (1B)	Mt Lindesay NP	0 (Last remaining plant recorded on 9/3/2003 noted as dead 12/2003)	0	Weedy woodland, c. 50 m from river bank
10/1/2014	New Island Bay	Cape Le Grand NP	31 (Est <50, Oct 2011)	Less than 1km^2	Good condition. Two years post-fire.
September 2008	Shannon River Crossing at SW Coastal Hwy	Shannon National Park	0 Not relocated	0	Weedy open woodland
Sept-Dec 2004 - 2008	Valley of the Giants	Walpole-Nornalup NP	0 Not relocated	0	Closed forest
c. late 2003	Big Brook near Goddard's farm	Farmland	0 Not relocated	0	Degraded farmland. Last recorded in 1958
2007 – 2008 (regional survey)	E headland Torbay Inlet	Shire Reserve	0 Not relocated	0	Woodland
21/11/2007	Denmark	Unknown	0 Not relocated	0	Degraded road verges
c. late 2003	Walpole	Walpole-Nornalup NP	0 Not relocated	0	Good condition Karri forest and degraded farmland.

Has the number of individuals been counted, or is this an estimate? Provide details of the method of determining the number of individuals.

Individuals were counted at the Mitchell River population, but only an estimate is available for New Island Bay [31 counted, 2014].

Has there been any known reduction in the number of locations, or is this likely in the future? – provide details.

There has been a reduction from one to zero plants at the Mitchell River Bridge population in recent years. No recent records for other south-western populations in Denmark-Pemberton region.

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. Include estimates of past, current and possible future extent of occurrence.

Only known from a recent survey at New Island Bay (Markey 2012) and cultivated plants grown in Australian National Botanic Gardens. The actual area of occupancy (AOO) is not known but is likely to be <1 km^2. This was calculated by estimating the approximate area within which the plants occur (length x width). Using the 2kmx2km IUCN method, the AOO is 8km^2.

The extent of occurrence (EOO) is 445km^2.

If available, include data that indicates the percentage decline over 10 years or 3 generations (whichever is longer) that has occurred or is predicted to occur.

Mitchell River – decline from several to zero plants (100% decline) between 1995 and 2007.

No data available for the newly discovered New Island Bay population.

Is the distribution of the species severely fragmented? Why?

Populations are very small, discontinuous and fragmented and most are apparently extinct. They occur in several localities scattered from Pemberton and Mitchell River Bridge (north of Denmark) to New Island Bay Esperance, Cape Le Grand NP (Figure 1).

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.

The New Island Bay is a key breeding population to maintain genetic diversity as the only other population is in cultivation at Canberra Botanical Gardens and is thought to be cuttings from one plant.

4.2. Survey effort

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

The most recent surveys were done in flowering season (C. Wilkins, per. comm.).

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

Karri-Marri-Peppermint (*Agonis*) forest, Jarrah-wandoo woodland, riparian *Eucalyptus macrocapra / E. patens* forest, jarrah/marri forest, *Eucalyptus angulosa, E. conferruminata and E. cornuta* mallee shrubland Shrub is c. 1.5 m tall and has a grey-green stellate hairy appearance with many inflorescences of many tiny white flowers.

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.

As a priority one species, general threatened flora conservation surveys by DEC have not relocated this species. It does not appear that other targeted surveys for this taxon have been undertaken by DEC staff or other organisations/individuals except those by Carol Wilkins and Brenda Hammersley.

The greatest survey effort for *C. apella* has been from Carol Wilkins and the late Brenda Hammersley (http://www.anbg.gov.au/biography/hammersley-brenda.html), both with a high level of expertise in this species and taxonomic group. They both covered suitable sites in Pemberton, Denmark and Walpole searching for both *C. apella* (Table 1) the closely related and morphologically similar *C. corylifolia* (Table 1, Table 3, Appendix 1).

Sandiford & Barrett (2010) covered the Torbay area in the regional survey of Albany, and did not locate *C. apella* in the Torbay area. The Albany regional survey covered Torbay and Albany areas - but *Commersonia apella* did not turn up in this survey, although *Commersonia corylifolia* did.

Markey (2012) located the new population at New Island Bay, in Cape Le Grand National Park. This was not a targeted survey, and was an unexpected find of this species in a location disjunct from other locations.

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?).

Weeds, land degradation, inappropriate fire regimes, disease, road maintenance (habitat) and clearing.

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

Location	Past threats	Current threats	Potential threats	Management requirements (see section 4.4)
New Island Bay. Cape le Grand	N/A	Proposal of eco-resort for tourism, *Phytophthora*.	Infrastructure development, weeds, frequent fire.	Only living population located
Mitchell River Bridge	Weeds, inappropriate fire regimes.	Weeds, inappropriate fire regimes.	Weeds, inappropriate fire regimes, road maintenance.	
Shannon River Crossing	Weeds, road run off, degraded vegetation.	Weeds, road run off, degraded vegetation.	Weeds, road run off, degraded vegetation.	
Torbay Inlet East Headland	Not seen	Not seen	Not seen	

Big Brook, Goddard's farm, Pemberton	Clearing, weeds, inappropriate fire regimes.	Weeds, inappropriate fire regimes.	Weeds, inappropriate fire regimes.	
Valley of the Giants	Tourism threat Inappropriate fire regimes	Tourism threat, inappropriate fire regimes.	Tourism threat, weeds, *Phytophthora,* inappropriate fire regimes.	

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.

Unknown

4.4. Management

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

If seed can be harvested from the ANBG plants in Canberra and the New Island Bay populations, translocation to a protected site is proposed to conserve this species.

Management requirements include:

- Maintain liaison with Tourism WA to ensure proposed New Island Bay track and development does not impact on the species and its habitat;
- Maintain liaison with road managers to minimise disturbance to remnant vegetation at historic sites when maintaining roads;
- Monitor the population for evidence of weed and disease impacts, or changes in plant or site health;
- Protect the site from fire unless required for ecological reasons, and implement early intervention in any wildfires which may threaten the site;
- Propagation of cuttings for *ex situ* living collection at Australian National Botanic Gardens (ANBG) in Canberra;
- Survey any newly identified areas of suitable habitat, in addition to extinct locations, following fire;
- Protect susceptible habitat from disease introduction by implementing hygiene measures.
- Control infestations of weeds that might impact the population;
- Collect and store seed;
- Establish new populations on secure tenure through implementation of translocations;
- Stimulate germination of species in wild, particularly at extinct locations;
- Undertake morphological and genetic studies to confirm the species taxonomic status.

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

No

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

Only known living plants are at New Island Bay, where an eco-resort had been proposed, and in the Australian National Botanic Gardens. Staff in Canberra have been alerted to the presence of a rare plant in their gardens and are protecting it and collecting seed.

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

We recommend a proposal to propagate and translocate plants, if it is possible to harvest sufficient seed or tissue culture from the New Island Bay population and from the cultivated plant at ANGB. A tissue culture protocol has been developed for other *Commersonia* species by Nikabadi *et al.* (2010).

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

Only known native living plants are under threat from a building proposal is the key reason for this nomination.

SECTION 5. NOMINATOR

Nominator(s) name(s)	
Organisation(s)	
Address(s)	
Telephone number(s)	
Email(s)	
Date	

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

N/A

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.

Markey AS (2012). A *targeted spring flora survey of New Island Bay, Cape Le Grand National Park.* Unpublished report to Tourism Branch, Department of Environment and Conservation. Department of Conservation and Environment, Kensington.

Nikabadi S, Bunn E, Turner, S, Stevens, J & K. Dixon (2010). Development of an in vitro propagation protocol for *ex situ* conservation of two critically endangered species of *Commersonia* (Malvaceae) from Western Australia. *Australian Journal of Botany* **58:** 565-574.

Sandiford E.M. & S. Barrett (2010) *Albany Regional Vegetation Survey: Extent, type and status.* Unpublished report to Department of Environment and Conservation, Western Australia.

Western Australian Herbarium (1998–) *Florabase – The Western Australian Flora*. Department of Environment and Conservation, http://florabase.dec.wa.gov.au/ [last accessed 4th May 2010]

Wilkins CF & Whitlock BA (2011) A revision of *Commersonia* including *Rulingia* (Malvaceae *s.l.* or Byttneriaceae). *Australian Systematic Botany* **24**, 226 – 283.

Table 1: Summary of population information for *Commersonia apella*. Detailed information is given in Appendix 1.

DEFL database population No.	Location	District	Land status	No. of plants	Last survey	Comments/condition
1A and 1B	Mitchell River Bridge	Frankland	MRD/LGA	0	21/11/2007	No live plants found at last 2007 survey. Extinct?
	Denmark	Frankland	?	na	2003	Not relocated/found in 2003 survey, last seen/collected 1978
	Goddard's Farm, Pemberton, Big Brook	Frankland	?	Na	c. 2003	Not relocated/found in 2003, last seen/collected Nov 1958
	Torbay Inlet, East Headland, Darling District	Albany	LGA		c. 2007-2008 (regional survey)	Not relocated/found in 2007-2008. Last seen/collected 1968
	Valley of the Giants	Frankland	NP		c. 2004-2008	Not relocated/found in 2004-2008. Last seen/collected 1968
	Shannon River Crossing	Frankland	NP		2008	Not relocated/found in 2008. Last seen/collected in 1974.
	Deep River, Walpole	Frankland	NP		c. 2003	Not relocated/found in 2003. Last seen/collected 1958
	New Island Bay, Cape Le Grand NP	Esperance	NP	<50 31	October 2011 10/1/2014	New population found, needs accurate survey/census (done 2014)

In addition to table 1, there are two old herbarium records with vague, unverifiable locations:
1: Albany area, W.H. Nicholls s.n., Oct. 1946 (MEL)
2: Denmark, A. Meebold 1144, Nov. 1928 (M, NY)

Note: the Valley of the Giants site is an indeterminate location, since extensive surveys by C. Wilkins failed to locate *C. apella* within the VOTG walk facilities and wider area when searching for *C. corylifolia* between 2004 and 2008 (Table 3).

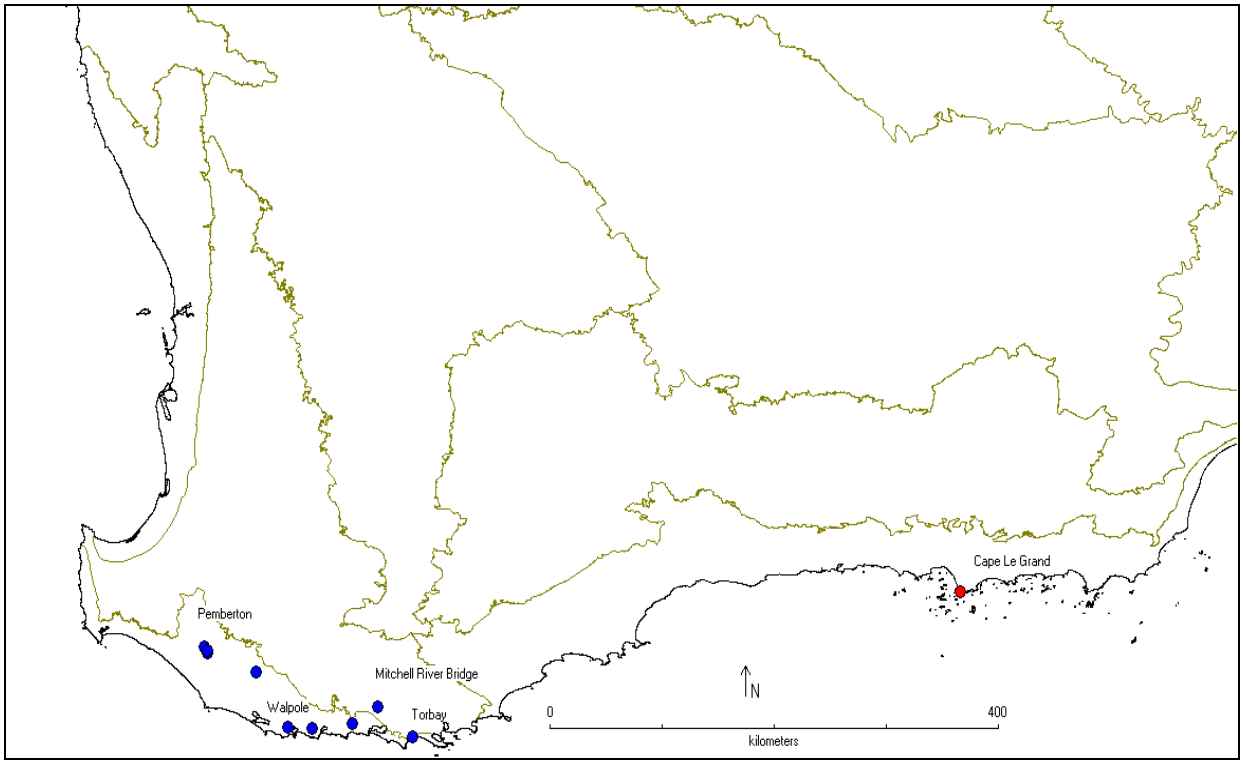

Figure 1: Map of populations of known occurrences of *Commersonia apella* (dots), with blue dots indicating populations with no recent record (since 2008) for living plants and red indicating recent (2011) record of living plants.

Appendix 1: Summary of known populations of and survey effort for *Commersonia apella*.

Dates surveyed - surveyor - population count / estimate

Population	Population Code	Location	Herbarium Voucher	Survey 1	Survey 2	Survey 3	Survey 4	Survey 5	count plants last census	Threats to population	Date of last fire	Reason why population is believed to be extinct or under threat
Mitchell River Bridge	1A	Road Verge. Denmark Mount Barker Road at Mitchell river Bridge. On the track to the old timber bridge. Denmark	PERTH 04832345,	11/11/1995 - BG Hammersley Freq: occasional	9/11/ 2003 - BG Hammersley Freq: no plants	21/11/2007- C. Wilkins, J. Wege, Freq: no plants			0	Threats: roadworks, disease, prescribed burning. Needs further resurveying. Potential for reclass.	summer 2003	Latest survey could not find living plants
	1B	Denmark Mount Barker Road at Mitchell river Bridge. On the track to the old timber bridge. Denmark	PERTH 06813038, PERTH 07701578	9/3/2003 - BG Hammersley Freq: 1 plant only	25/09/2003 - C. & S. Wilkins; Blake, S.; Hammersley, B- Freq: one plant	9/11/2003 - BG Hammersley Freq: one plant, fruits collected	Late 2003? B. Hammersley, B. No plants (C. Wilkins pers. comm.)	21/11/2007 - C. Wilkins, J. Wege, Freq: no plants	0	Threats: roadworks, disease, prescribed burning. Needs further resurveying. Weeds, inappropriate fire regimes. Potential for reclass.	summer 2003	Latest survey could not find living plants
Denmark	near population 1	15 km W of Denmark	PERTH 08241597, PERTH 01748270	9 October 1978 - Cranfield, R.J. Freq: not stated	21/11/2007 - C. Wilkins, J. Wege, Freq: no plants				unknown, possibly none?	population still extant?	unknown	Precise location unknown. C. Wilkins spoke to R. Cranfield about location in 2003, but he could not recall the specific site of the 1978 collection. C. Wilkins attempted to find the approximate location in 2003, but found only degraded road verges.
Goddard's Farm, Pemberton, Big Brook	HERB 1	Big Brook, near Goddard's farm	PERTH 02811626	October 1921 - Koch, M. Freq: not stated	c. 2003- BG Hammersley Freq: no plants				possibly none	Degraded farmland - population still extant?	unknown	Degraded farmland - land changes since 1920s. B. Hammersley searched the Big Brook area in the years preceding and including 2003.
	HERB 2, HERB 5	Pemberton (same lot/long as PERTH 02811626), [Near Goddards farm] Pemberton	PERTH 02811642, PERTH 02813491	December 1919 - Koch, M. Freq: not stated	December 1920 - Koch, M. Freq: not stated	c. 2003- BG Hammersley Freq: no plants			possibly none	Degraded farmland - population still extant?	unknown	Degraded farmland - land changes since 1920s. B. Hammersley searched the Big Brook area in the years preceding and including 2003.
	HERB 4	1 mile N of Pemberton on main road	PERTH 02813424	November 1958 - Churchill, D. Freq: not stated	c. 2003- BG Hammersley Freq: no plants				possibly none	Degraded farmland - population still extant?	unknown	Degraded farmland - land changes since 1920s. B. Hammersley searched the Big Brook area in the years preceding and including 2003.
Torbay	ANBG, CANB	Torbay Inlet, East Headland, Darling District, WA Coll. J. Wrigley 68/4518. Parent CBG 84/0373, OPAR - ANBG 683746,	PERTH 08117977	1968, Wrigley - not stated	2007 – 2009 regional survey				unknown	population still extant?	unknown	Species was not noted in Albany regional survey (Sandiford & Barrett 2010). More survey effort would be required to target creeklines within the area. Precise locality of 1968 collection unknown.
Valley of the Giants	CANB	Valley of the Giants	CANB	*E. Canning WA/ 68 6441*, 14 Oct 1968 - not stated	2008				unknown	population still extant?	unknown	Indeterminate location - has not been relocated in wider area around VotG since 1968. C. Wilkins has not sighted *C. apella* around the VotG walk facilities and area when searching for *C. corylifolia between* 2004-2008.
Shannon River Crossing	HERB 6	Shannon River Crossing	PERTH 06610684	Annels, A.R. 6/11/1974 - not stated	2008				none	Weeds, road run off, degraded vegetation. Population still extant?	unknown	C. Wilkins (pers. comm.) visited the site in c. 2008 and found no sign of *C. apella* and the site to be degraded and weedy.
Walpole	HERB 3	Tinglewood-Deep River, ca 3 miles W of Walpole	PERTH 02813416	November 1958 - Churchill, D. Freq: not stated	c. 2003- BG Hammersley Freq: no plants				none	population still extant?	unknown	C. Wilkins (pers. comm.) is certain that B. Hammersley visited the site during her extensive searches for *C. apella* in the region. If present, B. Hammersley would have reported this. Nothing has been reported for this site since 1958.
New Island Bay	NIB	New Island Bay, Cape Le Grand	**PERTH 08357064**	October 2011 - A. Markey & S. Dillon. Freq: sparse, few individuals. Requiring more survey					sparse - few (c. 2) individuals.	Development, inappropriate fire regimes, dieback disease	Jan-09	Extant population. Should be monitored, seeds and cuttings taken for propagation.

Dates for survey by B. Hammersley are estimates from C. Wilkins' recollections. I am unsure if there are fieldnotes in which Brenda kept exact dates and locations.

Appendix 1: continued.

old and unverified locations	Herbarium label	Possible locations - based on other collections by same collector on same date
Albany	Albany area, *W.H. Nicholls s.n.*, Oct. 1946 (MEL);	Upper King River, 10 miles N of Albany, Opposite Airdrome, outside Albany, toward Pongerup [Porongurups] or Albany
Denmark	Denmark, *A. Meebold 1144, Nov. 1928* (M, NY)	Denmark

Appendix 2: IUCN criteria (A-E) used to evaluate taxon.
A4ac: B2 ab(iv); C2 a(ii); D

A population reduction
A4. Population reduction observed / suspected in the past and predicted to continue where causes of reduction may not be understood or may not be reversible (habitat degradation), based on a and c. Declines of 100% observed at one population, no recent relocations of live plants at other sites/locations and one recently located population has not been assessed.

B Geographic range in form of Area of Occupancy (AOO)
B2: Area of Occupancy = < 10 km^2
a: known historically from $\leq$ 10 locations, currently live plants confirmed at only 1 location.
b: continuing decline in iv) number of locations or subpopulations

C Small population size and decline
C: Number of mature individuals <250
C2. A continuing decline and aii) % individuals in one subpopulation = 90 – 100%

D: Very small or restricted population
Note that D applies, as the number of mature individuals is estimated to be < 50 (pending more survey at Cape Le Grand)