

## 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)*

<b>Species name</b> (scientific and common name):	<b><i>Androcalva perlaria</i></b>
<b>Nomination for</b> (addition, deletion, change):	<b>Addition</b>
<b>Nominated conservation category and criteria:</b>	<b>Endangered C2(a)(i)</b>

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 <input type="checkbox"/> No <input type="checkbox"/>
<b>A.</b>	Population size reduction	•
<b>B.</b>	Geographic range	•
<b>C.</b>	Small population size and decline	•
<b>D.</b>	Very small or restricted population	•
<b>E.</b>	Quantitative analysis	•

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

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

Current conservation status				
Scientific name:	<i>Androcalva perlaria</i>			
Common name:	Pearl-like Androcalva			
Family name:	Malvaceae	Fauna <input type="checkbox"/>	Flora <input checked="" type="checkbox"/>	
Nomination for:	Listing <input checked="" type="checkbox"/>	Change of status/criteria <input type="checkbox"/>	Delisting <input type="checkbox"/>	
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	2007	Endangered	D
		5/4/2017	Endangered	C2(a)(i)
	2.			
Consistent with Schedule 1, item 2.7 (h) and 2.8 of the Common Assessment Method Memorandum of Understanding, it is confirmed that:				
<ul style="list-style-type: none"> <li>this assessment meets the standard of evidence required by the Common Assessment Method to document the eligibility of the species under the IUCN criteria;</li> </ul>			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:				
<ul style="list-style-type: none"> <li>surveys of the species were adequate to inform the assessment;</li> </ul>			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:	Further surveys were undertaken yearly from 2007 to 2016 with the discovery of 5 new subpopulations. As a result of this survey effort, the number of recorded mature individuals has changed from 60 to 271.			
<ul style="list-style-type: none"> <li>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.</li> </ul>			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:	Since the assessment in 2007, surveys have raised the known number of mature individuals to 271. Therefore the species no longer meets Endangered under criteria D. A decline in the number of mature individuals has occurred at three subpopulations (3, 4 and 6). In addition a projected decline in the area of occupancy, number of locations or subpopulations and the number of mature individuals is expected due to the proposed Southdown Magnetite mining project. This will result in the loss of the whole of Subpopulation 2, consisting of 60 plants. A translocated population into a nature reserve south of Wellstead has been established but has yet to produce a second generation. The plants are not thriving and showing significant signs of stress. Therefore they			

cannot be included in the threat assessment. Now meets criteria Endangered C2(a)(i).		
<b>Nominated national conservation status: category and criteria</b>		
Presumed extinct (EX) <input type="checkbox"/> Critically endangered (CR) <input type="checkbox"/> Endangered (EN) <input checked="" type="checkbox"/> Vulnerable (VU) <input type="checkbox"/>		
None (least concern) <input type="checkbox"/> Data Deficient <input type="checkbox"/> Conservation Dependent <input type="checkbox"/>		
<b>What are the IUCN Red List criteria that support the recommended conservation status category?</b>	<b>C2(a)(i)</b>	
<b>Eligibility against the IUCN Red List criteria (A, B, C, D and E)</b>		
Provide justification for the nominated conservation status; is the species eligible or ineligible for listing against the five criteria. For <b>delisting</b> , provide details for why the species no longer meets the requirements of the current conservation status.		
<b>A.</b>	Population size reduction (evidence of decline)	<ul style="list-style-type: none"> <li>A decline in the number of mature individuals has occurred at three subpopulations (3, 4 and 6), but there are insufficient data to determine a percentage reduction in population at these sites.</li> <li><b>Insufficient information to assess</b></li> </ul>
<b>B.</b>	Geographic range (EOO and AOO, number of locations and evidence of decline)	<ul style="list-style-type: none"> <li>(B1) Using Minimum Convex Polygon (MCP) the Extent of Occurrence (EOO) is approximately 66.1 km<sup>2</sup> which was calculated by drawing a polygon around the subpopulations.</li> <li>(B2) The estimated Area of Occupancy (AOO) is 24 km<sup>2</sup> using the 2km x 2km grid method. The mapped area of subpopulations is 0.03515 km<sup>2</sup> or 3.515 hectares.</li> <li>(a) The species is not severely fragmented. Over half the mature individuals are found in one subpopulation and the species is naturally found in separated locations due to its wetland habitat. Found in six locations as determined by the potential effect of physical habitat disturbance as the primary threat that would be impacting these locations separately.</li> <li>(b) Continuing decline observed and projected:</li> <li>(ii) (iv) (v) There has been a decline in the number of mature individuals in three subpopulations (3, 4 and 6).</li> <li>Projected overall decline in the species' area of occupancy, number of locations or subpopulations, and number of mature individuals due to the current threatening processes which are impacting habitat area and condition, and a future potential decline from the proposed Southdown Magnetite mining project, which has the potential to result in the loss of the whole of Subpopulation 2, consisting of 60 plants.</li> <li><b>Meets criteria for Vulnerable B1ab(ii,iv,v)+B2ab(ii,iv,v)</b></li> </ul>
<b>C.</b>	Small population size and decline (population size, distribution and evidence of decline)	<ul style="list-style-type: none"> <li>(C) Known from 271 mature individuals in total.</li> <li>There has been a decline in the number of mature individuals in three subpopulations (3, 4 and 6).</li> <li>Largest subpopulation contains 150 (55%) mature individuals.</li> </ul>

		<ul style="list-style-type: none"> <li><b>Meets criteria for Endangered C2(a)(i)</b></li> </ul>			
<b>D.</b>	Very small or restricted population (population size)	<ul style="list-style-type: none"> <li>(D) There are 271 mature individuals in total.</li> <li><b>Meets criterion for Vulnerable D1</b></li> </ul>			
<b>E.</b>	Quantitative analysis (statistical probability of extinction)	<ul style="list-style-type: none"> <li>No information to assess.</li> </ul>			
<b>Summary of assessment information</b>					
EOO	66.1 km <sup>2</sup>	AOO	24 km <sup>2</sup> (2 km x 2 km grid). Mapped area of subpopulations 0.03515 km <sup>2</sup> .	Generation length	Unknown
No. locations	6	Severely fragmented	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/>		
No. subpopulations	7	No. mature individuals	271		
Percentage global population within Australia			100		
Percentage population decline over 10 years or 3 generations			Unknown		
<b>Threats</b> (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)	
Grazing <ul style="list-style-type: none"> <li>Grazing (mostly kangaroos and rabbits) causing severe stunting of plants (approximately 10% of the size of plants at other sites) where exposed on private property to adjacent farmland. Soil disturbance during warren construction and increased nutrient levels and introduction of weeds from droppings may impact on populations.</li> </ul> Past, current, future		Whole population		Severe	
Road and firebreak maintenance <ul style="list-style-type: none"> <li>Threats include grading, chemical spraying, construction of drainage channels and slashing of vegetation (which promotes weeds).</li> </ul> Past, current and future		Subpopulations 1, 6 and 8		Severe	
Clearing (mining) <ul style="list-style-type: none"> <li>Is a significant threat for Subpopulation 2 which occurs within the proposed Southdown Magnetite mine site. The subpopulation occurs within the project footprint and would be directly impacted by mining. However, the Environmental Protection Authority (EPA) has advised that the subpopulation is to be excluded from mining activities</li> </ul>		Subpopulation 2		Catastrophic	

and impacts such as dewatering until a viable off-site population is established on a secured reserve. Future		
<b>Fire</b> <ul style="list-style-type: none"> <li>The species appears to be an obligate seeder with a soil-stored seed bank. However, an overly frequent fire regime may be detrimental to populations leading to the exhaustion of the soil seed bank though on other hand in the absence of fire adults may senesce and not be replaced.</li> </ul> Past, current, future	Whole population	Severe
<b>Poor recruitment</b> <ul style="list-style-type: none"> <li>The species appears to require disturbance to recruit. However, if disturbance is too frequent, occurs at the wrong time of the year or too much topsoil is removed, populations are not likely to persist in the long term.</li> </ul> Current, future	Whole population	High
<b>Weeds</b> <ul style="list-style-type: none"> <li>Weeds are a major threat to Subpopulation 5 and minor threat to all other subpopulations. They suppress early plant growth by competing for soil moisture, nutrients and light. They also increase the fire hazard. Grading, stock movement, slashing and spraying greatly promote weeds.</li> </ul> Past, current and future	Whole population	Severe
<b>Altered hydrology and water quality (potential)</b> <ul style="list-style-type: none"> <li><i>Androcalva perlaria</i> is a fringing wetland species and is likely to be sensitive to changes in hydrology through draining or runoff, salinity and nutrient enrichment. Subpopulation 1 is located adjacent several large drains and under extreme conditions may flood locally. Runoff from surrounding farmland may also carry salt and fertilizer into the habitat. Altered hydrology during and following proposed mining is also a threat to Subpopulation 2.</li> </ul> Future	Whole population	Severe
<b>Drought</b> <ul style="list-style-type: none"> <li>This is a threat to the species if it occurs over a number of years.</li> <li>Climate change modelling for the south west predicts a decline in rainfall, and some seasonal shift to summer rainfall events, which is likely to increase the potential impact of drought on the species.</li> </ul> Future	Whole population	Severe
<b>Management and Recovery</b>		
Is there a Recovery Plan (RP) or Conservation Management Plan operational for the species?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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 (2014) Pearl-like Androcalva (*Androcalva perlaria*) Interim Recovery Plan 2014–2019. Interim Recovery Plan No. 341. 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.*

- Threatened flora markers have been installed along the road reserve at Subpopulation 1;
- Fencing/caging installed around Subpopulations 2, 3, 4, 5 and 6;
- Monitoring and surveys have been carried out to determine plant numbers and impact of threats;
- Extensive survey for the species in 124 adjacent wetlands in 2006 and 2007 by Ecologia Environment;
- Over 200,000 seeds have been collected and stored at the Threatened Flora Seed Centre and Botanic Garden and Parks Authority;
- Recruitment burn of the southern section of Subpopulation 1 in September 2012 by Parks and Wildlife staff;
- The Botanic Garden and Parks Authority has 19 plants in their nursery and gardens, grown from seedlings;
- A translocation into a nature reserve was implemented in 2012 and monitoring is ongoing;
- A brochure of the species and seeking assistance with locating new subpopulations was produced by Grange Resources Limited;
- Article on the seed ecology of the species was published in Australian Plant Conservation in 2013.

*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

- Ongoing monitoring and observations of subpopulations and threats, including changes to hydrology and impacts from kangaroos and rabbits;
- Ongoing liaison with Main Roads Western Australia, mining companies (Grange Resources Limited), the local shire and private property owners to ensure that subpopulations of the species are not accidentally damaged or destroyed, and the habitat is maintained in a suitable condition for the conservation of the species;
- Undertake weed control at subpopulations;
- 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 threatened flora markers at Subpopulation 8;
- Collect and store further seed to guard against the extinction of natural populations. Collections should aim to sample and preserve the maximum range of genetic diversity possible;
- Undertake surveys in areas of potentially suitable habitat;
- Continue to undertake translocations;
- Map habitat critical to the survival of the species to facilitate its protection and appropriate management;
- Continue to promote awareness of the species with general public.

#### Research

- Undertake systematic monitoring of populations to determine population trends;
- Research biology and ecology of the species, with a focus on pollination effectiveness, seed viability, conditions required for natural germination, response to threats and disturbances and reproductive biology.

**Nomination prepared by:**

**Contact details:**

<b>Date submitted:</b>	5/12/2016
<i>If the nomination has been refereed or reviewed by experts, please provide their names and contact details:</i>	

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
Subpopulation 1: east of Wellstead	Main Roads road reserve	2006: 50 2007: 55 2008: 58 2009: 53 2010: 64 2011: 58 2012: 52 2013: 78 2014: 130 2015: 160 2016: 150	0.63 ha	Healthy. Habitat burnt in 2012 (control burn). Recent germinants found, death of some plants occurring-drought?	Road maintenance (past, present, future) Weeds (past, future) Fire (past, present, future) Grazing (past, future) Drought (past, future) Altered hydrology (future) Climate change (future)	Install markers Control weeds Install caging/fencing if required Liaise with MRWA to ensure protection of plants and habitat Develop a fire management plan Establish new populations through translocation
Subpopulation 2: west of Wellstead. On proposed magnetite minesite.	Private property	2005: 1 2006: 0 2010: 10 2011: 2 2012: 6 2013: 8 2014: 12 2015: 62 2016: 60	0.62 ha	Healthy, habitat fenced, some individuals caged	Clearing (mining) (present, future) Grazing (future) Fire (past, present, future) Altered hydrology (future) Climate change (future)	Liaise with property owners to ensure protection of plants and habitat Install caging/fencing if required Develop a fire management plan Establish new populations through translocation
Subpopulation 3: NE	Private	2007: 18	0.005 ha	Moderate, previously	Grazing (past, present, future)	Liaise with property owners to



of Wellstead	property	2010: 12 2011: 9 2012: 9 2013: 7 2016: 7		heavily grazed with plants severely stunted and 10% of normal size, habitat fenced (possibly inadequate), some individuals caged	Fire (past, present, future) Lack of recruitment (past, present, future) Altered hydrology (future) Climate change (future)	ensure protection of plants and habitat Develop a fire management plan Install caging/fencing where required Undertake regeneration trials Establish new populations through translocation
Subpopulation 4: NE of Wellstead.	Private property	2007: 25 2010: 7 2011: 8 2012: 8 2013: 8 2016: 8	1 ha	Moderate, some cages installed	Grazing (past, future) Fire (past, present, future) Lack of recruitment (past, present, future) Altered hydrology (future) Climate change (future)	Liaise with property owners to ensure protection of plants and habitat Develop a fire management plan Install caging/fencing where required Undertake regeneration trials Establish new populations through translocation
Subpopulation 5: SW of Wellstead.	Private property	2014: 2 2015: 3 2016: 6	0.16 ha	Moderate, plants grazed, habitat fenced, weedy ( <i>Acacia longifolia</i> , thistle, African lovegrass and Fleabane)	Grazing (kangaroos, rabbits) (past, present, future) Weeds (present, future) Fire (past, present, future) Lack of recruitment (present, future) Altered hydrology (future) Climate change (future)	Control rabbits Install fencing/caging Control weeds Develop a fire management plan Undertake regeneration trials Liaise with property owners to ensure protection of plants and habitat Establish new populations through translocation

Subpopulation 6: SSW of Wellstead.	Private property	2014: 44 2015: 26 2016: 30	1 ha	Moderate. Habitat disturbed by firebreak maintenance, weeds and grazing	Firebreak maintenance (past, present, future) Grazing (past, present, future) Weeds (past, present, future) Fire (past, present, future) Lack of recruitment (present, future) Altered hydrology (future) Climate change (future)	Install caging/fencing Undertake weed control Liaise with property owners to ensure protection of plants and habitat Develop a fire management plan Control rabbits Undertake regeneration trials Establish new populations through translocation
*Subpopulation 7: south of Wellstead (* translocated subpopulation)	Nature reserve	2012: 235 2014: 57		Poor. Plants not thriving and showing significant signs of stress.		
Subpopulation 8: Wellstead	Shire road reserve	2015: 10	0.1 ha	Healthy	Road maintenance (past, present, future) Fire (past, present, future) Grazing (future) Altered hydrology (future) Climate change (future)	Install markers Develop a fire management plan Liaise with local shire to ensure protection of plants and habitat Control rabbits



## Nomination of a Western Australian species for listing as threatened, change of status or delisting (Updated 2016).

To fill out this form you must refer to the attached Guidelines. Incomplete forms will result in delays in assessment, or rejection of the nomination.

Answer all relevant sections, 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 or write “N/A”.

Some questions on the form have additional information in a **Help** box and these are marked with an asterisk (\*). If you require additional information, place your cursor in the text box into which you type your answer, press F1 and a Help box will pop-up.

<b>SECTION 1. NOMINATION</b>		
<b>1.1. Nomination information</b>		
Flora <input checked="" type="checkbox"/>	Fauna <input type="checkbox"/>	Nomination for <b>Addition</b>
<b>1.2. Scientific Name*</b>		
<i>Androcalva perlaria</i> C.F. Wilkins		
<b>1.3. Common Name*</b>		
Pearl-like Androcalva		
<b>1.4. Current Conservation Status</b>		
Endangered		
<b>International</b>		
IUCN Red List Categories and Criteria applicable to the highest rank category only e.g. B1ab(iv);D None		
<b>National (EPBC Act 1999)</b> None		
<b>State of Western Australia</b> Wildlife Conservation Notice: None IUCN Ranking: <b>EN: D</b>		
Is the species listed as ‘Threatened’ in any other Australian State or Territory No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> If Yes, list the States and/or Territories and the status for each		
Does the species have specific protection (e.g. listed on an annex or appendix) under any other legislation, inter-governmental or international arrangements e.g. CITES? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> If yes, please provide details		
<b>1.5. Nominated Conservation Status</b>		
Select one category for each of the five fields. If none, select ‘None’.		
International IUCN Red List : Categories and Criteria applicable to the highest rank category only: None		
National (EPBC Act 1999) Endangered; C2(a)(i).		
State of WA IUCN Status Endangered; C2(a)(i).		

<p><b>1.6. Reasons for the Nomination</b></p> <p>Briefly summarise the reasons for the nomination in dot points. Please include details relevant to the IUCN Categories and Criteria where appropriate.</p> <ul style="list-style-type: none"> <li>• This species appears to be very restricted in terms of geographic extent and area of occupancy. Extensive targeted survey in 2006 failed to locate more than one small new population.</li> <li>• Further surveys undertaken yearly from 2007 to 2015 discovered 5 new subpopulations. The number of mature individuals increased as a result of survey effort from 60 in 2007 to 275. Therefore the species no longer meets Endangered under criteria D.</li> <li>• A decline in the number of mature individuals has occurred at three subpopulations (3, 4 and 6). In addition a projected decline in the area of occupancy, number of locations or subpopulations and the number of mature individuals is expected due to the proposed Southdown Magnetite mining project. This will result in the loss of the whole of Subpopulation 2, consisting of 62 plants (equates to 22% total loss within 3 years). Now meets criteria Endangered C2(a)(i). No populations occur on Conservation Estate.</li> <li>• The <i>Eucalyptus occidentalis</i> woodland / wetland habitat in which it grows, while relatively common is in variable condition due to grazing, hydrological and weed impacts.</li> </ul>
<p><b>SECTION 2. SPECIES</b></p>
<p><b>2.1. Taxonomy</b></p> <p>Describe the taxonomic history, using references, and describe the key distinguishing features that can be used to separate this taxa from closely related taxa.</p> <p>Previously known as, and originally listed as threatened flora as, <i>Commersonia</i> sp. Mt Groper.</p> <p>A single specimen (Cranfield and Kabay 9157) was located by Wilkins in a common species folder of <i>Commersonia crispa</i> at PERTH. Wilkins could not relocate this distinct species at the Cranfield site or in other wetlands in the area. Wilkins proposed this species to DEC as a possible threatened flora in Feb 2006. This new species did not match the type of <i>C. crispa</i> or synonyms and was a sp nov. that differs from <i>C. crispa</i> in having a pale-grey tomentose adaxial leaf surface rather than medium density stellate hairs; a mainly cuneate mature leaf shape rather than mainly elliptic; smaller flowers (calyx lobe length 1.8-2.5 mm rather than 2.5-4.2 mm); shorter peduncles (1-1.8 mm long, rather than 1.8-3 mm) and shorter pedicels (1-4.2 mm rather than 2-8 mm long). This species was given a manuscript name of <i>Commersonia perlaria</i> CF Wilkins ms. Epithet is based on Latin adj. <i>perlarius</i> = pearly, due to the species' habit being a rounded luminescent pearl-grey shrub scattered in sedge wetlands. (Dr Carol Wilkins UWA Jan 2007).</p> <p>The taxonomic description was published by Wilkins and Whitlock in 2011 under the name <i>Androcalva perlaria</i>.</p> <p>Is this species conventionally accepted?* No <input type="checkbox"/> Yes <input checked="" type="checkbox"/></p> <p>Describe any known hybridisation with other species in the wild, indicating where this occurs and how frequently.</p> <p>None known</p>
<p><b>2.2. Description</b></p> <p>Describe the physical appearance, habit, behaviour/dispersion and life history.*</p> <p>Erect woody shrub to 0.5 m, cream flowers, pale green foliage, readily observed and recognised.</p>

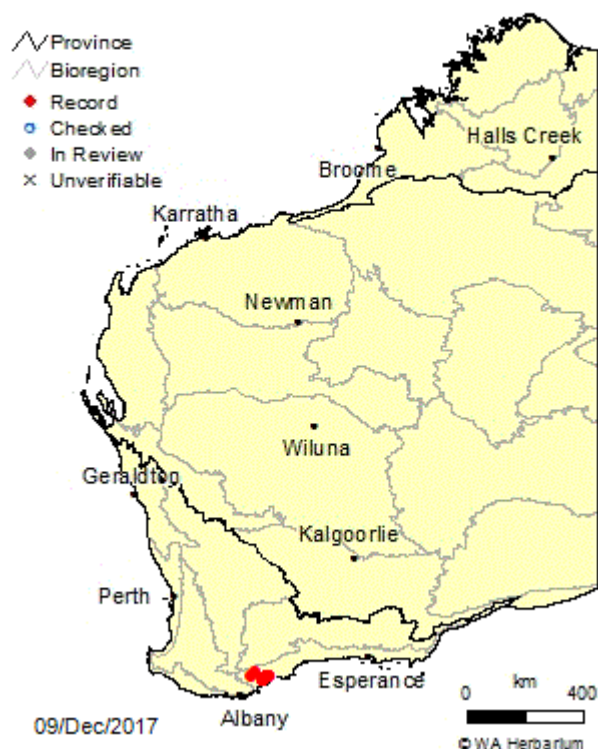
### 2.3. Distribution

Describe the distribution of the species in Australia and, if possible, attach a map.

Occurs in the south coast region of Western Australia over a range of approximately 35 km between the Pallinup River and Wellstead.

**Figure 1.** Distribution of *Androcalva perlaria* (from Western Australian Herbarium (1998–).

#### *Androcalva perlaria*



### 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:

Seasonally inundated clay basin, brown-black peaty sand /clay soil, located in the Pallinup Sandplain on Tertiary sediments.

Biological habitat

*Eucalyptus occidentalis*, *Melaleuca cuticularis* woodland over low sedge / rushes and herbs. Understorey species include *Anarthria laevis*, *Baumea juncea*, *Cyperchloa hirsuta*, *Tricostularia compressa*, *Goodenia filiformis*, *Villarsia parnassifolia*, *Anthotium humile*, *Actinodium calocephalum*.

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

N/A

<p>Is the species part of, or does it rely on, a listed threatened ecological community? Is it associated with any other listed threatened species?</p> <p>The species occurs in association with the Priority flora species <i>Lasiopetalum parvuliflorum</i> (Priority 3). <i>Goodenia filiformis</i> (P4) has been recorded at the proposed minesite subpopulation.</p> <p>The species also occurs in association with a Priority Ecological Community (PEC) Swamp Yate (<i>Eucalyptus occidentalis</i>) woodlands in seasonally inundated clay basins (Priority 3).</p>
<p><b>2.5. Reproduction</b></p> <p>Provide an overview of the breeding system.</p> <p>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?</p> <p>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?</p> <p><i>Androcalva perlaria</i> flowers in spring and sets seed in late November. Pollinators are unknown, however observation ex situ have found that flowers are protandrous and are less likely to be exclusively reliant on self fertilisation. Research is currently being undertaken by BGPA to quantify the mating system.</p> <p>Seed was collected for the first time in late November 2006 from Subpopulation 1 for the Threatened Flora Seed Centre (TFSC). Preliminary investigations have found that seeds are physically dormant and respond to either nicking or hot water treatment and germinate readily (&gt;80%) and rapidly (7–42 days) (Anne Cochrane pers. comm., Shane Turner pers. comm.).</p> <p><i>Androcalva perlaria</i> is believed to be a re-seeder as significant quantities of seeds are produced under field and nursery conditions (Anne Cochrane pers. comm). However, it remains unknown whether it is an obligate or facultative re-seeder as plants under field conditions have also been observed to reshoot vigorously from the basal stem after stress. Additionally, it is also unknown whether adult plants are killed by fire as no research is known to have been conducted on the taxon's response to fire. However, seedlings germinated after a prescribed burn in September 2012 at a site where one adult had last been observed in 2007 and regeneration is therefore likely to be largely from seed. Newly emerged seedlings commenced flowering within eight months after the burn.</p>
<p><b>2.6. Population dynamics</b></p> <p>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).</p> <p>Population structure was assessed in the road verge Subpopulation 1, plants appeared to be even-aged and all mature with no evidence of inter-fire / disturbance recruitment.</p>
<p><b>SECTION 3. INTERNATIONAL CONTEXT</b></p>
<p><b>For species that are distributed both inside and outside Australia</b></p>
<p><b>3.1. Distribution</b></p> <p>Describe the global distribution.</p> <p>N/A</p>
<p>Give an overview of the global population size, trends, threats and security of the species outside of Australia.</p> <p>N/A</p>

<p>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?</p> <p>N/A</p>
<p><b>SECTION 4. CONSERVATION STATUS AND MANAGEMENT</b></p>
<p><b>4.1. Population</b></p>
<p>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? – give details.*</p> <p>Known from 50-100 individuals in 2006. Unable to assess trends in population size, however, Population No. 3 is known from a herbarium specimen and has not been relocated indicating that populations may fluctuate considerably in relation to disturbance cycles.</p> <p>In 2016, known from 271 mature individuals. A decline in the number of mature individuals has occurred at three subpopulations (3, 4 and 6). A future decline is likely due to the proposed Southdown Magnetite mining project, which will result in the loss of 60 plants.</p>
<p>Give locations of: captive/propagated occurrences or <i>ex situ</i> collections; recent re-introductions to the wild; and sites for proposed re-introductions. Have these sites been identified in recovery plans?</p> <p>Over 200,000 seed has been collected and stored at the Threatened Flora Seed Centre and Botanic Garden and Parks Authority.</p>

How many locations do you consider the species occurs in and why?\*

In 2006, known from three locations based on herbarium specimens and survey.

In 2016, known from six locations (7 subpopulations) which are naturally separated due to their wetland habitat.

A translocated population into a nature reserve has been undertaken however, the plants not thriving and showing significant signs of stress, and have yet to produce a second generation. The translocation may be confirmed as another subpopulation (location) and hence be included in the threat assessment once it has been shown to be self- sustainable and showing recruitment.

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

Location	Land status	Date of most recent survey	Number of individuals at location	Area of occupancy at location	Condition of site
Subpopulation 1: East of Wellstead	Main Roads	16/10/06 2016	60+/- 150	<3 ha 0.63 ha	Healthy, hydrology altered by culvert. Habitat burnt in 2012, some recent deaths from drought?
Subpopulation 2: West of Wellstead, proposed magnetite mine site	Private property	2006 2016	0 60	< 1ha 0.62 ha	Previously in moderate condition as grazing apparent. Currently healthy, habitat fenced
Subpopulation 3: NE of Wellstead	Private property	2007 2016	18 7	0.005 ha	Moderate condition, habitat fenced
Subpopulation 4: NE of Wellstead	Private property	2007 2016	25 8	1 ha	Moderate condition, habitat fenced
Subpopulation 5: SW of Wellstead	Private property	2014 2016	2 6	0.16 ha	Moderate, plants grazed, habitat weedy ( <i>Acacia longifolia</i> , thistle, African lovegrass and Fleabane)
Subpopulation 6: SSW of Wellstead	Private property	2014 2016	44 30	1 ha	Moderate. Habitat disturbed by firebreak maintenance, weeds and grazing
Translocated population: south of Wellstead	Nature reserve	2012 2014	235 57		Poor. Plants not thriving and showing significant signs of stress.
Subpopulation 8: Wellstead	Shire road reserve	2015	10	0.1 ha	Healthy
4 km north of Mt Groper (extinct location)	Proposed conservation estate	2006	0 (? Soil-stored seed bank)	< 1ha	

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

Population 1 was counted in 2006 by botanical consultant Cate Tauss (Ecologia) by direct count of population. Similar estimate made by S. Barrett Jan 2006.

In 2015 and 2016, the number of individuals in Subpopulations 5 and 8, were actual counts. For Subpopulations 1, 2, 3, 4 and 6, in 2016 estimates of the number of individuals were made.



<p>What is the extent of occurrence (in km<sup>2</sup>) 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.*</p> <p>EOO = 66 km<sup>2</sup> roughly calculated from an ArcGIS polygon that encompassed all known subpopulations. This figure does not include the translocated subpopulation as it is not yet self-sustainable and regenerating.</p>
<p>What is the area of occupancy (in km<sup>2</sup>) 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.*</p> <p>The mapped area of subpopulations is 0.03515 km<sup>2</sup> or 3.515 hectares. Estimated AOO is 24 km<sup>2</sup> using the 2km x 2km grid method. This figure does not include the translocated subpopulation as it is not yet self-sustainable and regenerating.</p>
<p>Is the distribution of the species severely fragmented? Why?</p> <p>No, the species is not severely fragmented as over half the mature individuals are found in one subpopulation, and the species is naturally found in separated locations due to its wetland habitat.</p>
<p>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.</p> <p>All occurrences are necessary for the long-term survival of the species.</p>

<b>4.2. Survey effort</b>
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.
<p>Surveys in 2006 and 2007 of 125 wetlands within the Wellstead area by Ecologia resulted in the discovery of a number of new subpopulations on private property and on a road reserve (Ecologia 2008).</p> <p>Survey of private property locations in 2014 by botanists from Maia Environmental Consultancy resulted in the discovery of two new subpopulations.</p> <p>A survey undertaken by Keith Smith located new subpopulation in 2015 on a road reserve.</p>
Give details on the distinctiveness and detectability of the species, or the distinctiveness of its habitat, that would assist survey success.
Species is easy to detect due to size and specific leaf colour; its yate woodland / wetland habitat is distinctive and readily targeted.
<p>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.</p> <ul style="list-style-type: none"> <li>• Survey efforts attached 2005: C Wilkins and R Davis surveyed the area of Ray Cranfield's original collection, new population of one plant located by consultants Ecologia at proposed Southdowns Magnetite Project, Wellstead;</li> <li>• 2006: Extensive survey undertaken by Ecologia (Cate Tauss), one new population located;</li> <li>• Nov 2006: Banks of Bremer River surveyed by S. Barrett in several locations with similar habitat, failed to relocate <i>Androcalva perlaria</i> noted on previous survey for <i>Boronia clavata</i> (DRF) - possibly same species.</li> <li>• 2006/07: 125 wetlands within the Wellstead area surveyed by Ecologia. New subpopulations on private property located.</li> <li>• 2014: Botanists from Maia Environmental Consultancy located two new subpopulations on private property.</li> <li>• 2015: Survey by K Smith, new subpopulation located on a road reserve.</li> </ul>

### 4.3. Threats

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

1. How and where they impact this species.
2. What the effect of the threat(s) has been so far (indicate whether it is known or suspected; present supporting information/research, does it only affect certain populations?).
3. 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 occurrence/location:

Location	Past threats	Current threats	Potential threats	Management requirements (see section 4.4)
Subpopulation 1: East of Wellstead	Road maintenance, weeds, fire, drought, grazing	Road maintenance, fire	Road maintenance, weeds, fire, grazing, drought, altered hydrology	Main Roads has been notified re population, markers installed, fence/cage if required
Subpopulation 2: Proposed Southdowns mine site	Fire, grazing	Mining, fire	Mining, fire, grazing, altered hydrology	Fence/cage if required, liaise with property owners
Subpopulation 3: NE of Wellstead	Grazing, fire	Grazing, fire, lack of recruitment	Grazing, fire, lack of recruitment, small population size, altered hydrology	Fence/cage if required, liaise with property owners, stimulate recruitment
Subpopulation 4: NE of Wellstead	Grazing, fire, lack of recruitment	Fire, lack of recruitment	Grazing, fire, lack of recruitment, altered hydrology	Fence/cage if required, liaise with property owners, stimulate recruitment
Subpopulation 5: SW of Wellstead	Grazing, weeds, fire	Grazing, weeds, fire, lack of recruitment	Grazing, weeds, fire, lack of recruitment, altered hydrology	Fence/cage if required, liaise with property owners, control weeds, stimulate recruitment
Subpopulation 6: SSW of Wellstead	Firebreak maintenance, grazing, weeds, fire	Firebreak maintenance, grazing, weeds, fire, lack of recruitment	Firebreak maintenance, grazing, weeds, fire, lack of recruitment, altered hydrology	Fence/cage if required, liaise with property owners, control weeds, stimulate recruitment
Subpopulation 8: Wellstead	Road maintenance, fire	Road maintenance, fire	Road maintenance, fire, grazing, altered hydrology	Notify Shire re subpopulation, fence/cage if required, install markers
4 km north of Mt Groper (extinct location)			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.

None known.

<p><b>4.4. Management</b></p> <p>Identify key management documentation for the species e.g. recovery plans, conservation plans, threat abatement plans etc.</p> <p>Department of Parks and Wildlife (2014) Pearl-like Androcalva (<i>Androcalva perlaria</i>) Interim Recovery Plan 2014–2019. Interim Recovery Plan No. 341. Department of Parks and Wildlife, Western Australia.</p> <p>Does this species benefit from the management of another species or community? Explain.</p> <p>No.</p> <p>How well is the species represented in conservation reserves or covenanted land? Which of these are actively managed for this species? Give details.</p> <p>No occurrences currently within conservation reserves or covenanted land. A translocation has been undertaken in a nature reserve however, it is not yet self-sustaining and regenerating.</p> <p>Are there any management or research recommendations that will assist in the conservation of the species? Give details.</p> <p>Management actions:</p> <ul style="list-style-type: none"> <li>• Ongoing monitoring and observations of subpopulations and threats, including changes to hydrology and impacts from kangaroos and rabbits;</li> <li>• Ongoing liaison with Main Roads Western Australia, mining companies (Grange Resources Limited), the local shire and private property owners to ensure that subpopulations of the species are not accidentally damaged or destroyed, and the habitat is maintained in a suitable condition for the conservation of the species;</li> <li>• Undertake weed control at subpopulations;</li> <li>• 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;</li> <li>• Install threatened flora markers at Subpopulation 8;</li> <li>• Collect and store further seed to guard against the extinction of natural populations. Collections should aim to sample and preserve the maximum range of genetic diversity possible;</li> <li>• Undertake surveys in areas of potentially suitable habitat;</li> <li>• Continue to undertake translocations;</li> <li>• Map habitat critical to the survival of the species to facilitate its protection and appropriate management;</li> <li>• Continue to promote awareness of the species with general public.</li> <li>• Undertake systematic monitoring of populations to determine population trends;</li> <li>• Research biology and ecology of the species, with a focus on pollination effectiveness, seed viability, conditions required for natural germination, response to threats and disturbances and reproductive biology.</li> </ul>
<p><b>4.5. Other</b></p> <p>Is there any additional information that is relevant to consideration of the conservation status of this species?</p> <p>No.</p>

<b>SECTION 5. NOMINATOR</b>
Nominator(s) name.
Signature(s) – This is not needed for emailed nominations as your email is proof of your identity.
Organisation (s)
Address
Telephone
Email
Date 3/1/07 Updated 23/11/2016 by Species and Communities Branch
If the nomination has been refereed or reviewed by experts, provide their names and contact details:
<b>SECTION 6. REFERENCES</b>
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.
<p>Ecologia (2006) Assessment of the flora and vegetation of the proposed minesite and pipeline corridor, Grange Resources Ltd, Southdowns Magnetite Proposal.</p> <p>Ecologia (2008) <i>Commersonia</i> sp. Mt Groper searches, Grange Resources Ltd, Southdowns Magnetite Proposal.</p> <p>Western Australian Herbarium (1998–) <i>FloraBase – The Western Australian Flora</i>. Department of Environment and Conservation. <a href="http://florabase.calm.wa.gov.au/">http://florabase.calm.wa.gov.au/</a>.</p> <p>Wilkins, C.F. and Whitlock, B.A. (2011) A new Australian genus, <i>Androcalva</i>, separated from <i>Commersonia</i> (Malvaceae s.l. or Byttneriaceae). <i>Australian Systematic Botany</i> 24: 284–349.</p>