

Threatened Species Assessment

Craspedia aurantia var. *jamesii* Green Billy-buttons

Taxonomy

Craspedia aurantia var. *jamesii* (J. Everett & Joy Thomps.) Schmidt-Leb.

Previously *C. jamesii*

Current conservation status

Categorised as Rare in the 2014 Advisory list of rare or threatened flora (DEPI 2014).

Proposed conservation status

Endangered in Victoria

Criterion B2ab(i,ii,iii,iv,v)

Species Information

Description and Life History

Herb with a single flowering scape 15-60 cm high; roots thick, tomentose. Leaves mainly basal, spatulate, 2-16 cm long, 2-25 mm wide, acute to broad-acuminate, attenuate at the base, with one main vein and a few obscure lateral veins, sparsely covered with multiseptate hairs or glabrous. Inflorescence yellow to orange-brown, spherical to hemispherical, 1.5-3 cm wide, with c. 40-90 capitula; scape straw- to red-brown, variously glandular to sparsely silky hairy. Capitula with 5-10 florets; bract subtending capitulum broadly triangular to ovate, margins and lobes membranous, stereome usually ovate, base hairy. Cypselas 0.5-1.5 mm long, 0.1-0.8 mm wide; pappus 2-5 mm long. Flowers summer. This taxon differs from *C. aurantia* var. *aurantia* by having yellow flowers. It occasionally hybridizes with *C. crocata* and *C. gracilis* (VicFlora 2019).

Generation Length

The generation length of *Craspedia aurantia* var. *jamesii* is estimated to be 10 to 40 years. DELWP's Vital Attribute Data suggest that the taxon can resprout after fire, but also regenerates from long-lived seed with all seeds in the soil germinating. It is tolerant of plant competition during establishment, takes one year to reach reproductive maturity, lives up to 10 years, and survives in the soil seed bank for perhaps 100 years.

Fire is historically rare in the alps, occurring perhaps once or twice a century, hence most plants should live to maximum reproductive age in undisturbed vegetation, and can then persist as seeds in the soil even in the absence of above-ground material. The taxon is likely to have a similar generation length to *Argyrotegium* with comparable vital attributes, which is estimated as 10 to 40 years.

Distribution

The taxon is locally common in grassland and low open heathland in alpine and higher subalpine areas through the state (VicFlora 2019).

Habitat

The taxon is found in grassland and low open heathland (VicFlora 2019). It tends to occur in native vegetation but not on road verges (Hill and Pickering 2006).

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Threats

The taxon is relatively resistant to trampling by walkers (Growcock 2005), yet it tends to be found in native vegetation rather than road verges (Hill and Pickering 2006), so it appears to prefer protection from surrounding plants rather than exposed conditions. It may have high levels of seed predation by insects (Pickering 2009), so the soil seed bank is likely to be low and subject to depletion with regular disturbance.

The taxon does not appear to be sensitive to a single fire (Walsh and McDougall 2004), and it may be relatively resistant to successive fires, therefore increased fire with climate change may not pose a great threat. It has increased resistance to freezing over the growing season (Venn et al 2013), so may be able to avoid some late season frost damage without a protective layer of snow.

The taxon is not selected to any extent by hares (Green et al 2013), but its stature and prominent inflorescence makes it highly likely to be grazed by cattle, horses, and deer. Indeed, daisies in general, which make up much of the wildflower display in the alps, have been depleted by a long history of grazing. Grazing by ungulates is likely to continue to be a key threat in the long term, along with increasingly dryer conditions from a changing climate.

IUCN Criteria

Criterion A. Population size reduction. Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	Critically Endangered	Endangered	Vulnerable
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3, A4	≥ 80%	≥ 50%	≥ 30%
<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.</p> <p>A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3]</p> <p>A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.</p> <p style="text-align: center;"><i>based on any of the following:</i></p> <p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>			

Evidence:

Eligible under Criterion A2 as Vulnerable

The population reduction over the past 30 to 120 years is estimated to be 10 to 30%, based on (c) and (e) above.

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Criterion B. Geographic range in the form of either B1 (extent of occurrence) and/or B2 (area of occupancy)			
	Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited
B1. Extent of occurrence (EOO)	< 100 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
AND at least 2 of the following 3 conditions:			
(a) Severely fragmented OR Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

Evidence:

Eligible under Criterion B1 as Vulnerable

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 12,836 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to have 3 locations, as climate change is likely to impact on most subpopulations in a similar way. However, feral horse activity in the east alps is sufficiently severe, and deer activity around Baw Baw is sufficiently low, that those two areas could be considered separate locations.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above, as a result of the defined threats, with drier, marginal, lower-elevation habitat at most risk.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 185 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon has 3 locations, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

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Criterion C. Small Population size and decline		Critically Endangered	Endangered	Vulnerable
Number of mature individuals		< 250	< 2,500	< 10,000
AND at least one of C1 or C2				
C1	An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future):	25% in 3 years or 1 generation (whichever is longer)	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)
C2	An observed, estimated, projected or inferred continuing decline AND least 1 of the following 3 conditions:			
(a)	(i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
	(ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%
(b)	Extreme fluctuations in the number of mature individuals			

Evidence:

Ineligible under Criterion C

It is inferred that there are 50,000 to 150,000 mature individuals, which exceeds the thresholds for criterion C.

Criterion D. Very small or restricted populations			
	Critically Endangered	Endangered	Vulnerable
Number of mature individuals (observed or estimated)	< 50	< 250	< 1,000
D2. Only applies to the VU category Restricted area of occupancy or number of locations with a plausible future threat that could drive the species to critically endangered or Extinct in a very short time.	-	-	D2. Typically: AoO < 20 km ² or number of locations ≤ 5

Evidence:

Ineligible under Criterion D

It is inferred that there are 50,000 to 150,000 mature individuals, which exceeds the thresholds for criterion D.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

References

DEPI (2014) *Advisory list of rare or threatened plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne.



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