Threatened Species Assessment

Craspedia aurantia var. *aurantia*
Orange Billy-buttons

Taxonomy

Craspedia aurantia var. *aurantia* J. Everett & Joy Thomps.

Previously *C. aurantia*

Current conservation status

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

Proposed conservation status

Endangered in Victoria

Criteria B1ab(i,ii,iii,iv,v)+2ab(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, spathulate, 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. Differs from *C. aurantia* var. *jamesii* by having orange flowers.

This taxon occasionally hybridizes with *C. crocata* and *C. gracilis* (VicFlora 2019).

Generation Length

The generation length of *Craspedia aurantia* var. *aurantia* 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 at higher subalpine levels on the Bogong High Plains and adjacent uplands (VicFlora 2019).

Habitat

The taxon is locally common in higher subalpine grassland, and occasionally extends above the treeline in sheltered places (VicFlora 2019). It tends to occur in native vegetation but not on road verges (Hill and Pickering 2006; Growcock 2005).

Threats

The taxon is relatively resistant to trampling by walkers (Growcock 2005), yet 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 likely to be low and subject to depletion with regular disturbance.

It does not appear to be sensitive to a single fire (Walsh and McDougall 2004), and 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 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, particularly horses in the east alps, is likely to continue to be a key threat, along with increasingly drier 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%

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

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.

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*]

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.

based on any of the following:

(a) direct observation [*except A3*]

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

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.

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 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²
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 Endangered

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 4,452 km², based on accepted, post-1970 records from the Victorian Biodiversity Atlas (VBA).

The taxon is estimated to have 2 locations, as climate change and deer are likely to impact on most subpopulations in a similar way, however horse activity in the east alpine area is sufficiently severe that it should be considered a separate location.

It has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the defined threats, with the east alpine areas and 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 84 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

As above, the taxon has 2 locations, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above.

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 estimated that there are 25,000 to 75,000 mature individuals, which exceeds the thresholds for criterion C.

Criterion D. Very small or restricted population			
	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 km2 or number of locations ≤ 5

Evidence:

Ineligible under Criterion D

It is estimated that there are 25,000 to 75,000 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

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