

Oreobolus oxycarpus subsp. *oxycarpus* Tuft-rush

Taxonomy

Oreobolus oxycarpus subsp. *oxycarpus* S.T. Blake

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

The taxon is a small, mat-forming herb to 10 cm high. Leaves apparently spirally arranged; sheaths with rounded auricles; pseudopetiole slightly concave, 5-17 mm long; blade 7-26 mm long, 0.5-1 mm wide, densely covered with stomata adaxially and with 2 faint ribs or ribs absent; apex obtuse. Inflorescence with 1-3 spikelets. Spikelets 4-12 mm long; glumes 3, whitish with green leaf-like apex to pale brown, occasionally tinged dark red-brown; lowest glume 3.7-10 mm long; innermost glume 2.5-5 mm long; hypogynous scales straw-coloured; anthers 1-3 mm long. Nut ovoid, with long-tapering conical apex often collapsing at maturity, yellow-brown or with apex blackish, 1.8-2.9 mm long, 0.7-1.1 mm diam. The taxon flowers in summer (VicFlora 2021).

Generation Length

The generation length of *Oreobolus oxycarpus* subsp. *oxycarpus* is estimated to be 35 to 50 years, based on a plausible longevity exceeding 40 years and the inference that vegetative resprouting is likely to be as important as seed-based recruitment for population maintenance under pre-settlement conditions. The pre-settlement fire interval was probably in the 50-100 year range or more, with fire affecting only a mosaic proportion of plants at any one site. Seed-based recruitment is likely to be opportunistic in response to localised site disturbance events and seasonal conditions.

Distribution

The taxon is restricted in Victoria to the Alpine region where it is often co-extensive with *Oreobolus distichus*. It is reliably recorded at Lake Mountain, the Baw Baw Plateau, the Snowy Range, Mt Buffalo, the Nunniong Plateau and the Cobberas. A 2008 James Shannon quadrat record near Buckety Plain on the south-east edge of the Bogong High Plain at 1550 m elevation and a 1995 John Davies quadrat record at 1180 m elevation east of Shannonsville suggest the taxon does occur in the Bogong High Plains area. This is supported by a 1947 Willis collection at MEL from the head of Wild Horse Creek on the eastern edge of the Bogong High Plains. It also occurs in New South Wales and Tasmania (VicFlora 2021).

Habitat

The taxon occurs in bogs and on swampy ground in alpine areas, often co-extensive with *Oreobolus distichus* (VicFlora 2021). Site data in the Victorian Biodiversity Atlas (VBA) indicate that the taxon typically occurs at low



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density with projective foliage cover either less than 1% or in the 1-5% range, only exceptionally exceeding 5% projective foliage cover at the quadrat scale.

Threats

Alpine grazing of cattle on the Snowy Range, Bogong High Plains and the Nunniong Plateau has been a major historic threat resulting in widespread destruction of wetland habitats and facilitating exotic weed invasion. Although the direct impact of cattle grazing ceased with the cancellation of grazing licences throughout the Alpine National Park, with a likely recovery of the population of the taxon and its habitat, the legacy of weed invasion persists. At many sites, the taxon is likely to have been heavily trampled and severely pugged by cattle. The frequent association with *Carex gaudichaudiana* (Fen Sedge), which is targeted by cattle, and with *Sphagnum cristatum* (Peat Moss), which is highly susceptible to trampling and pugging, emphasise the vulnerability of the habitat of the taxon to cattle grazing.

Occurrences on the Nunniong Plateau continue to be threatened by cattle grazing. Occurrences on the Cobberas and the Nunniong Plateau and, to a lesser degree, those further west, are increasingly threatened by feral horses with similar impacts on the fragile wetland habitat of the taxon to those of cattle.

The taxon is increasingly threatened also by Sambar Deer (*Rusa unicolor*) which, in recent years, have been observed within the habitat of the taxon across the Alpine region where their pugging and wallowing behaviour is highly destructive.

The taxon continues to be threatened by weed invasion, as a legacy of past stock grazing and pugging within the Alpine National Park, facilitated by cattle grazing on the Nunniong Plateau and increasingly throughout its range by feral horses and Sambar Deer. Fortunately, site data in the VBA indicates that, almost without exception, sampled sites are essentially weed-free at the quadrat scale, suggesting that sites subject to historic cattle grazing have recovered well following the cancellation of alpine grazing licences.

The taxon is a habitat specialist highly dependent on the hydrological stability of its riparian, bog, or wetland habitat. The key current and future threat to the taxon is the long-term impact of climatic drying, coupled with increasing temperatures, leading to shrub invasion of subalpine to alpine wet heath or bog communities, exacerbated by imposed anthropogenic and climate-induced increases in fire frequency, intensity, and landscape scale.

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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>based on any of the following:</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:

Ineligible under Criterion A

There is insufficient evidence to determine whether there has been or will be a reduction sufficient to meet any threshold for criterion A.

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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 15,200 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

The taxon is estimated to be severely fragmented naturally at the subregional and landscape scales with all geographically isolated stands occurring at separations likely to exceed the dispersal range of the taxon, which has no specialised mechanism for long-distance dispersal. This precludes the possibility of recolonisation in the event of local extinction.

It is estimated to have 2 locations, and has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on the impact of the current and projected threats, such as cattle grazing, damage by Sambar Deer, climatic drying, and increased fire.

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 188 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA. As above, it is severely fragmented, has 2 locations and has a continuing decline in (i), (ii), (iii), (iv) and (v).

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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 as Data Deficient

There is insufficient evidence to determine the number of mature individuals.

| 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:

Eligible under criterion D2 as Vulnerable

The taxon is estimated to be very restricted.

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. Retrieved from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf



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VicFlora (2021). Flora of Victoria, Royal Botanic Gardens Victoria: *Oreobolus oxycarpus* subsp. *oxycarpus*.
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