# Threatened Species Assessment

## *Gonocarpus mezianus*
## Hairy Raspwort

### Taxonomy

*Gonocarpus mezianus* (Schindl.) Orchard

This taxon has been confused with *G. teucrioides,* but can be distinguished by its less robust habit, thinner subcaudate leaves with coarser teeth, reddish-brown toothed bracteoles, and the flowers all alternate. Hybrids with *G. elatus* have been observed (VicFlora 2019).

### Current conservation status

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

### Proposed conservation status

Vulnerable in Victoria

Criterion D2

### Species Information

#### Description and Life History

The taxon is a perennial herb, erect or ascending, 20-30 cm tall; stems 4-angled, covered with spreading or semi-appressed tuberculate hairs. Leaves opposite, becoming alternate above, broadly ovate to caudate, 0.7-2 cm long, 5-15 mm wide, subsessile, margins thickened, with 8-12 coarse teeth; bracts alternate, lanceolate, 2.3-3.5 mm long, green, margins entire or weakly 2-3-toothed; bracteoles ovate, 0.7-0.9 mm long, red-brown, membranous, margins deeply 3-7-toothed. Pedicel c. 0.4 mm long; sepals reddish-green, triangular to subcordate, 0.5-0.8 mm long, margins thickened, basal callus weak; petals red, 2.0-3.1 mm long; stamens 8, anthers 2-2.4 mm long; ovary globular, 0.8-1.2 mm long, slate-grey, weakly 8-ribbed, with 2 or 3 oblique calluses between ribs, scabrous. Fruit 1-1.3 mm long, silver-grey to slate grey. The taxon flowers mainly from August to February (VicFlora 2019).

#### Generation Length

The generation length of *Gonocarpus mezianus* is estimated to be 20 to 35 years. This is based on a plausible longevity of 5-25 years or more with recruitment from a long-persistent soil-stored seedbank. The taxon has a hard seed like other members of Haloragaceae, hence the seedbank is likely to persist for several decades. Although germination cues and their frequency are unclear, it is likely that generation time exceeds longevity. The taxon is likely to recruit episodically following fire, supplemented by sporadic and opportunistic recruitment in response to seasonal conditions and localised site disturbance events. Pre-settlement fire interval is likely to have been 35-70 years or more, with patchy intensity particularly in rocky sites.

#### Distribution

The taxon occurs patchily from Mt Zero at the northern end of the Grampians, to Mt Sturgeon at the southern end of the Grampians, and from the Black and Victoria Ranges in the west to the Mt William Range in the east.

#### Habitat

In Victoria, the taxon is found in dry rocky soils (VicFlora 2019).

Site data indicates the taxon is frequently associated with *Acacia melanoxylon* (Blackwood), *Callitris rhomboidea* (Oyster Bay Pine), *Calytrix alpestris* (Snow Myrtle), *C. tetragona* (Common Fringe-myrtle), *Correa aemula* (Hairy Correa), *Eucalyptus baxteri* (Brown Stringybark), *E. cypellocarpa* (Mountain Grey-gum), *E. obliqua* (Messmate Stringybark), *Gleichenia microphylla* (Scrambling Coral-fern), *Leptospermum continentale* (Prickly Tea-tree), *L. myrsinoides* (Heath Tea-tree), *L. scoparium* (Manuka), *L. turbinatum* (Shiny Tea-tree), *Melaleuca squarrosa* (Scented Paperbark), *Microlaena stipoides* (Weeping Grass), *Pomaderris apetala* subsp. *apetala* (Grampians Pomaderris), *Pultenaea mollis* (Soft Bush-pea), *Spyridium vexilliferum* (Winged Spyridium), *Stenanthemum conostephioides* (Flame Heath), *S. pinifolium* (Pine Heath), *Thryptomene calycina* (Grampians Thryptomene), and *Xanthorrhoea australis* (Austral Grass-tree). Site data clearly indicates that the habitat range of the taxon frequently includes sheltered sites on deeper soils than is suggested by the VicFlora (2019) account.

Quadrat data indicates the taxon consistently occurs with projective foliage cover of either less than 1% or 1-5% at the quadrat scale, suggesting a relatively low density of mature individuals.

**Threats**

The taxon is unlikely to have suffered significant historic decline through habitat loss to agriculture since almost all records are for sites now protected within the Grampians National Park or the Black Range State Park. There is no convincing or circumstantial evidence of past decline or local extinction.

Current and future threats are difficult to identify with confidence. The taxon is typically associated with soils of low to modest fertility which are not particularly prone to weed invasion, as indicated by relatively few exotic taxa recorded in most quadrat sites. The greatest long-term threat to the habitat of the taxon, however, is likely to be invasion by *Acacia longifolia* subsp. *sophorae* (Coast Wattle) or *A. longifolia* subsp. *longifolia* (Sallow Wattle), which are projected to ultimately invade most habitats throughout the Grampians. The taxon may also be at risk from targeted browsing by feral deer, although clear evidence of this threat is currently lacking.

Climatic drying may contribute to future decline, but not convincingly to a continuing decline in population size or habitat quality since the taxon is likely to be moderately drought-tolerant under current conditions. It is unclear whether the projected increase in fire intensity and frequency poses a significant current or future threat to the taxon since, like many taxa of *Gonocarpus* or *Haloragis*, the taxon is likely to respond favourably to individual fire events which are likely to promote pulse seed recruitment from a long-persistent soil-stored seedbank.

## 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:

**Ineligible under Criterion A**

The past population reduction does not meet the threshold for eligibility under criterion A2. There is insufficient evidence to determine whether will be a future reduction in population size (criterion A3).

| 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:

**Ineligible under Criterion B**

The Extent of Occurrence (EoO) across the taxon's range is estimated to be 2,161 km² and the Area of Occupancy (AoO) is estimated to be 132 km², but other thresholds under this criterion have not been met.

| 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 no available estimate of population size for the taxon in Victoria, although it is likely to be in the thousands.

| 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<br>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:<br>AoO <20 km2 or number of locations ≤5 |

## Evidence:

**Eligible under Criterion D2 as Vulnerable**

The taxon is estimated to be very restricted. The taxon has a restricted distribution, occurring in a single location, such that this restriction makes the taxon capable of becoming Critically Endangered or Extinct within a time frame of one or two generations. This is in response to the impact of the identified long-term threats, notably competition by *Acacia* taxa, possible targeted browsing by feral deer, and climatic drying.

**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.

VicFlora (2019). Flora of Victoria, Royal Botanic Gardens: *Gonocarpus mezianus*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/d90483c1-cabd-4f11-94ae-9f37d0a35640