# Threatened Species Assessment

## *Dianella longifolia* var. *grandis*
## Flax-lily

### Taxonomy

*Dianella longifolia* var. *grandis* R.J.F.Hend

Synonyms are *Dianella* sp. aff. *longifolia* (Benambra) and *Dianella perfragrans* ms.

### Current conservation status

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

### Proposed conservation status

Critically Endangered in Victoria

Criteria A2ace+3ce+4ce

### Species Information

#### Description and Life History

Plants to 1.3 m tall, tufts solitary or forming loose patches to c. 40 cm wide. Leaves glaucous, rather thick-textured and firm, 12-25 mm wide at midpoint when flattened. Flowers Nov.-Dec. It is a facultatively deciduous, long lived perennial.

#### Generation Length

The generation length of *Dianella longifolia* var. *grandis* is inferred to be 60 to 90 years. In undisturbed pre-European conditions the taxon would have almost indefinite longevity. It does not readily recruit and the generation time is likely to be 50-100 years or more (VicFlora 2017).

#### Distribution

A widespread taxon, occurring in the Central Victorian Uplands, the Dundas Tablelands, East Gippsland Uplands, Goldfields, Highlands Northern and Southern Falls, Northern Inland Slopes (NIS), Snowy Mountains, Victorian Riverina (VRiv), Wimmera and Victorian Volcanic Plains (VVP). It was once exceedingly abundant on the VVP, VRiv, NIS, southern Wimmera, and the outwash plains of the Grampians.

#### Habitat

The taxon occurs in lowland plains grassland and grassy woodlands (e.g. Volcanic Plain and Riverina) and grassy forests, as well as around rocky outcrops at higher altitudes than var. *longifolia* (e.g. between Swifts Creek and Omeo, Benambra-Corryong district, Don River near Launching Place).

#### Threats

The identified threats to the taxon are land clearing and habitat degradation, urban development, physical disturbance of sites, weeds, heavy grazing (although the taxon is relatively tolerant of light grazing), unsuitable fire regimes, demographics of small populations and climate change. Of these, physical disturbance and weed invasion are probably the most immediate threats to most populations. Most of the populations are small and fragmented.

In early 2019 all plants of *D. longifolia* var. *grandis*, *D. amoena* and *D. laevis* were observed to be infested by a thrip-type insect that was deforming the flowers and preventing seed production. This was observed in small

numbers in 2018 at Sunshine and Matthews Hill, but in 2019 all plants, and others in sites around Melbourne and in the west were severely infested.

## 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 Critically Endangered**

The population reduction over the past 180 to 270 years is inferred to be 85 to 95%, based on (a), (c) and (e) above.

The taxon occurs in grassy ecosystems, which are the most cleared ecosystems in the state. Given its wide distribution across Victorian grassy ecosystems, the taxon was probably common prior to European settlement, and its reduction can be tied to the loss of more than 90% of grassy ecosystems.

The causes of the reduction may not have ceased, be understood or be reversible.

**Eligible under Criterion A3 as Critically Endangered**

The population reduction over the next 100 years is projected to be 40 to 80%, based on (c) and (e) above.

The projected decline is a based on the continual loss of grassy ecosystems across Victoria as a result of land clearing, habitat loss and degradation. The loss of members of the taxon can be correlated with the loss of grasslands and grassy woodlands across its range.

**Eligible under Criterion A4 as Critically Endangered**

The population reduction over any 180 to 270 year period, including both past and future (up to 100 years in the future), is inferred to be 50 to 90%, based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

| 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 B2 as Vulnerable**

The Area of Occupancy (AoO) is estimated to be 767 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented. There are multiple small, isolated subpopulations that are all at risk from habitat loss of degradation, such that there is increased extinction risk and little or no probability of recolonisation should subpopulations become extinct.

It has continuing decline in (i), (ii), (iii), (iv), (v) above, based on the current and projected impact of the identified threats.

| 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**

The number of mature individuals is possibly fairly large, but there is insufficient evidence to support an estimate of total population size.

| 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:

**Ineligible under Criterion D**

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

**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 (2017). Flora of Victoria, Royal Botanic Gardens Victoria: *Dianella longifolia* var. *grandis*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/f1086f96-0684-4534-b78d-04b26a2925a9