Threatened Species Assessment

Dianella tarda
Late-flower Flax-lily

Taxonomy

Dianella tarda P.F. Horsfall & G.W. Carr

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 A2bce+3ce+4bce

The bushfires of 2019/2020 are believed to have impacted the taxon's modelled habitat. However, the overall impacts of the fires are yet to be determined.

Species Information

Description and Life History

The taxon is a robust, densely caespitose perennial herb to 2 metres high, forming clumps to 20 cm wide at the base (Carr and Horsfall, 1995). The tufts sometimes aggregated via short rhizomes to form clumps to c. 20 cm diam.; flowering stems erect, to c. 2 m high. Leaves not or hardly sheathing at base, more or less erect, 35-150 cm long, 6-15 mm wide, usually strongly V-shaped in section, green to slightly glaucous, concolorous, smooth along margins and abaxial midrib, or midrib irregularly scabrous toward leaf tip. Inflorescence distinctly exceeding foliage; panicle c. ovoid, sparse throughout to moderately dense above; pedicels recurved, 4-22 mm long; flowers 15-18 mm wide, pale blue; perianth segments slightly to strongly recurved, 7-9 mm long; stamens 7-9 mm long, filaments 2-3 mm long, kinked, filament swellings (strumae) rich yellow, c. 1. 5 mm long, shorter than the pale-yellow c. 4 mm long anthers. Berry irregularly globular, 3-10 mm long and wide, pale blue or sometimes nearly white; seeds flattened ellipsoid, 2.5-3.5 mm long, smooth, black and glossy. The taxon flowers from November to January (VicFlora, 2017).

The taxon is distinguished by its (usually) tall inflorescence, and narrow, strongly channelled leaves. The flowers are reported to be open from early afternoon to late evening, later than other members of the *D. longifolia* group in Victoria (*D. amoena*, *D. longifolia*, *D. porracea*), which are generally collapsed by mid-afternoon (VicFlora, 2017).

Generation Length

The generation length of *Dianella tarda* is estimated to be 50 to 100 years. This is based, by analogy, on related *Dianella* taxa of comparable habit and habitat range, such as *D. porracea* and *D.* sp. aff. *longifolia* (Benambra), for which the longevity is likely to be indefinite and generation time 50-100 years or more. Carr and Horsfall (1995) noted that recruitment is assumed to be rare or non-existent, judged by the age structure of the populations observed.

Distribution

The taxon is widespread across north-eastern and north-central Victoria (e.g., Mansfield, Euroa, Chiltern, Nagambie, Nathalia areas) and in South Australia (SA) and New South Wales (NSW) (VicFlora, 2017). It has a much depleted and fragmented distribution on the northern plains of Victoria, in the Riverina and Midlands Natural

Regions (Carr and Horsfall, 1995). Recent site records suggest that the taxon extends south of the Divide to sites near Sunbury and Bacchus Marsh north-west of Melbourne.

Habitat

In Victoria, *D. tarda* is a plant of heavy clays, clay loams and sandy loams, mostly on Quaternary fluviatile plains on high alluvium or alluvial terraces. Rainfall is within the 400-500 mm isohyets. Vegetation at the populations observed and from herbarium labels indicates that the taxon prefers grassy *Eucalyptus camaldulensis* riparian flood plain forest. Other vegetation in which this taxon has been recorded include grassy woodland or forest dominated by *E. camaldulensis*, *E. melliodora* and *E. goniocalyx* (Carr and Horsfall, 1995).

Threats

The taxon has suffered very significant historic decline and fragmentation across the northern plains of Victoria through habitat loss to agriculture and habitat modification through agricultural activity (Carr and Horsfall, 1995). Current and future threats include incremental habitat loss associated with agricultural intensification and habitat degradation in response to stock grazing, browsing by rabbits, goats and deer, uprooting of tuberous rootstocks by feral pigs, weed invasion, eutrophication through fertiliser application, fire management activity, roadside agistment of stock and road maintenance activity. In the longer term, climatic drying and warming may increase the risk of adult mortality and recruitment failure in response to extreme drought events. Victorian occurrences are small and threatened by weed invasions, especially by exotic grasses.

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 150 to 300 years is estimated to be 80 to 90%, based on (b), (c) and (e) above.

This is based on the demonstrably high rate of historic habitat loss to agriculture across the ecological and geographic range of the taxon. 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 80 to 90%, based on (c) and (e) above, based on the projected impact of the identified threats.

Eligible under Criterion A4 as Critically Endangered

The population reduction over any 150 to 300 year period, including both past and future (up to 100 years in the future), is estimated to be 80 to 95%, based on (b), (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 Endangered

The Area of Occupancy (AoO) is estimated to be 364 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is inferred to be severely fragmented anthropogenically at the landscape scale. Geographically isolated stands occur at separations typically exceeding 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 1 location. It has a continuing decline in (i), (ii), (iii), (iv) and (v) above based on 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 as Data Deficient

There is no available estimate of population size for the taxon in Victoria.

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:

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

Carr, G.W., and Horsfall, P.F. (1995). Studies in Phormiaceae (Liliaceae) 1: New species and combinations in *Dianella* Lam. ex Juss. *Muelleria, 8*(3), 372-375.

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 tarda*. Retrieved from: https://vicflora.rbg.vic.gov.au/flora/taxon/00145e6d-784a-49bd-87f3-4ccdde5e64e4