Coronidium gunnianum

swamp everlasting

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Image by H & A Wapstra ©

Scientific name: ***Coronidium gunnianum*** (Hook.) N.G.Walsh, *Muelleria* 32: 20 (2014)

Previous names: *Coronidium* aff. *scorpioides* (Hobart airport), *Coronidium* aff. *scorpioides* (Midland wetlands), *Coronidium* sp. Lowland Swamps, *Helichrysum rutidolepis*, *Helichrysum* aff. *scorpioidies*

Common name: swamp everlasting

Group: vascular plant, dicotyledon, family Asteraceae

Status: *Threatened Species Protection Act 1995*: **endangered**

Environment Protection and Biodiversity Conservation Act 1999: not listed

Distribution: Biogeographic origin: not endemic to Tasmania

Tasmanian Natural Resource Management regions: North, South

Tasmanian IBRA Bioregions (V6): Northern Midlands and South East

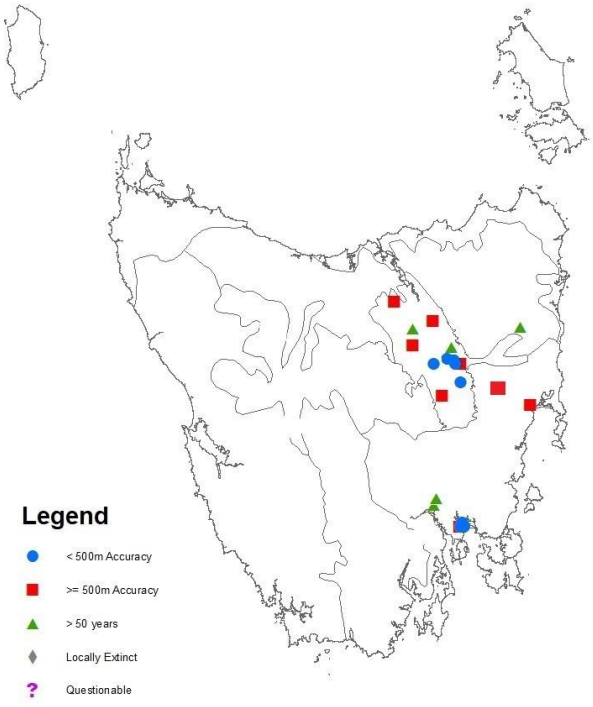

Figure 1. Distribution of *Coronidium gunnianum* in Tasmania showing IBRA bioregions (V6)

Plate 1. *Coronidium gunnianum* at Campbell Town Image by G. Daniels ©

SUMMARY: *Coronidium gunnianum* (swamp everlasting) is an erect, clump-forming, perennial daisy with round yellow daisy flowers. It occurs in native grasslands and riverine woodlands on heavy clay soils that are often inundated. In Tasmania, it ranges from Cambridge in the south-east to Westbury in the north, with most occurrences concentrated in the Midlands, around Campbelltown. The species has a restricted range and is suspected to be in decline, with numerous subpopulations already presumed extinct. Threats to the species include agriculture, road works, development, and climate change.

IDENTIFICATION AND ECOLOGY

Description

Coronidium gunnianum is a rhizomatous, perennial daisy that grows up to about 50 cm high. The stems and leaves are usually covered in appressed, cottony hairs. The leaves are a different colour on the upper and lower sides, firm and about 20 to 65 mm long and 1 to 4 mm wide. They are linear to oblanceolate with a pointed apex and the margins are recurved to revolute. The lower surface has abundant glands that may be obscured by fine hairs. The flowerheads are solitary, from nearly globe-shaped to cone-shaped and about 13 to 20 mm in diameter.

The yellow bracts below the flowerhead are 6 to 10.5 mm long, about 1.5 to 2 mm wide, occur in 5 to 8 rows, and are transversely wrinkled. The florets within the flowerhead have corollas 3.5 to 5 mm long. Some of the outer florets are female only and do not contain anthers. The seeds are somewhat cylindrical, 1.3 to 1.9 mm long, not hairy, and 4-ribbed. The pappus is about the same length as the florets. The pappus of the female florets may be reduced or lacking [description based on Walsh 2014].

Taxonomy

Coronidium gunnianum was described in 2014, with the type specimen from Tasmania (Walsh 2014). It was previously included in *Coronidum scorpioides*, although many considered it to be a separate taxon, often referred to as *Coronidium* aff. *scorpioides* or epithets such as 'Midlands wetlands', 'Hobart Airport', or 'Lowland Swamps'. The name *Helichrysum rutidolepis* was also previously misapplied to the species. Note that the genus *Coronidium* was only erected in 2008, with the species formerly included in *Helichrysum scorpioides* and *Helichrym rutidolepis.*

Coronidium gunnianum has been noted as being quite variable in Tasmania, with populations in the Midlands having smaller flowers and leaves than those at Cambridge (G. Daniels pers. comm.). Further study is required to determine whether these forms represent separate taxa.

Ecology

Coronidium gunnianum reproduces vegetatively from rhizomes, often forming circular clumps. Individuals may persist for many years, with an average lifespan estimated to be around 20-50 years, but it could live much longer. The species is pollinated by insects (Hingston & McQuillan 2000) and the seeds are wind-dispersed. Seed germination tests performed on *Coronidium gunnianum* by the Royal Tasmanian Botanical Gardens indicate that this species does not have a dormancy period. As such, the potential of the species to form a soil seedbank is considered low. In the laboratory, *Coronidium gunnianum* seed germinates well under alternating temperature regimes, and less so at constant temperatures (Wood pers. comm.).

Plate 2. Circular growth habit of *Coronidium gunnianum.* Image by G. Daniels ©

Coronidium gunnianum has been observed to respond well to fire, and flowers prolifically the following season (G. Daniels pers. comm.). It appears to be reasonably tolerant of disturbance, often growing along roadsides and on disturbed ground. It is likely that seed germination is promoted by disturbance, such

as fire, soil disturbance and flooding, as is the case with other grassland daisies.

Survey techniques

Coronidium gunnianum is most readily detected and identifiable when in flower, although its circular clump-forming habit is highly distinctive, and the species is detectable throughout the year. In Tasmania, the species has been observed flowering from October to early May, with peak flowering from February to April.

Confusing species

Coronidium gunnianum can be confused with other *Coronidium* species that occur in Tasmania, namely *Coronidium scorpioides* and *Coronidium monticola*. While these species are morphologically and ecological distinct, intermediates have been recorded between *C. gunnianum, C. monticola* and *C. scorpioides* (Walsh 2014).

The closely related *Coronidium scorpioides* has larger flowerheads, mostly >25 mm in diameter. It has a basal rosette of leaves, and the surface of the leaves have short bristles, unlike the smooth surface of *C. gunnianum*. *C. scorpioides* occurs in lowland heathy woodlands and forests, rarely in grasslands (Walsh 2014).

Coronidium monticola is smaller and hairier than *C. gunnianum*, appearing grey-white overall. The involucral bracts below the flowerhead are usually a darker, richer yellow to orange, than those of *C. gunnianum*. The aerial stems are more freely branched, and the leaves have a sharper point (Walsh 2014). *C. monticola* occurs at higher elevations, usually over 1000 m above sea level (ASL).

DISTRIBUTION AND HABITAT

In Tasmania, *Coronidium gunnianum* is currently known from 15 subpopulations. These are mostly in the northern Midlands within the vicinity of Campbell Town, Conara, and Lake Leake, with a disjunct occurrence at Cambridge near Hobart. It was previously recorded from Westbury, Evandale, Longford, and Cressy in the 1980s, and from Cranbrook on the east coast in 1979, but it is suspected that most of these subpopulations may have been lost given the degree of land modification in these areas. There are also historic records from Brighton and Pontville in 1899, Fingal in 1914, and Epping Forest in 1877, which are presumed extinct (Figure 1, Table 1).

Coronidium gunnianum is not endemic to Tasmania, also occurring in New South Wales, Australian Capital Territory, Victoria, and South Australia (Figure 2).

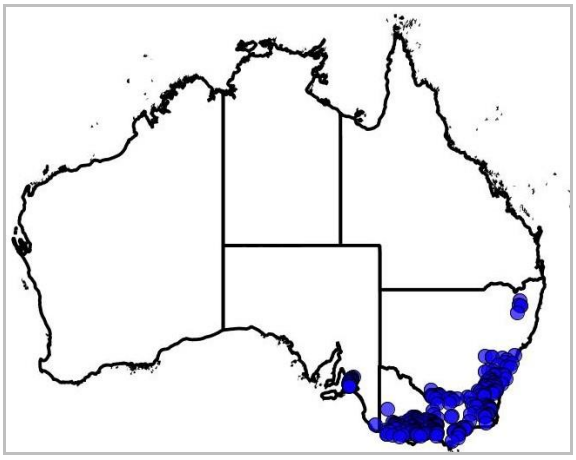

Figure 2. Distribution of *Coronidium gunnianum* on mainland Australia (map from Atlas of Living Australia CC BY 3.0 AU)

Plate 3. Habitat of *Coronidium gunnianum* at Cambridge. Image by H & A Wapstra ©

Coronidium gunnianum occurs in native grasslands and riverine woodlands on heavy clay soils, often near the margins of wetlands or in sites that are seasonally inundated (Plate 3). It usually occurs at elevations below 100 m ASL but has been recorded near 600 m ASL at Lake Leake, and some mainland populations occur above 700 m ASL (Walsh 2014).

Table 1. Population summary for *Coronidium gunnianum* in Tasmania

Locality	Subpopulation	Tenure	NRM region	1:25000 mapsheet	Year last (first) seen	Area occupied (ha)	Number of plants
Conara	1. Diprose Lagoon	Diprose Lagoon Informal Reserve & Conservation Covenant	North	Cleveland	1998	> 1	unknown
	2. Smiths Lagoon	Conservation Covenant & private land	North	Cleveland	2010 (2005)	> 1	<1,000
	3. Conara Park	Crown Land (State Growth)	North	Conara	2020 (2016)	< 1	3
	4. Blanchards Creek	Conservation Covenant	North	Conara	2005	unknown	unknown
	5. Midland Highway	Crown Land (State Growth)	North	Conara	2022	<1	unknown
	6. Valleyfield Road	Private land	North	Conara	2021	unknown	unknown
Stewarton	7. Stewarton Bridge	Crown Land	North	Conara	2017	< 1	unknown
Campbell Town	8a. Campbell Town	private land	North	Campbell Town	2021 (1992)	< 1	17
	8b. Campbell Town golf course	Conservation Covenant	North	Campbell Town	2021	< 1	1,050
	9. Hoggs Ford Road	private reserve	North	Campbell Town	2021	< 1	6
	10. Macquarie Road	private land	North	Campbell Town	2021	<1	5
Forest Lagoon	11. Verwood Road	private land	North	Ellinthorp	1981	unknown	'common'
Lake Leake	12. Kearney Bogs	private land	South	Snow	2020 (2012)	< 1	dozens of stems
Cambridge	13a. Hobart Airport	Commonwealth land (Airport)	South	Carlton	2022 (2005)	40	>5,000
	13b. South of Hobart Airport	Private land	South	Carlton	2022 (1996)	10	3,800
	13c. Tasman Highway roundabout	Crown Land (State Growth) & Informal Reserve	South	Hobart	2016 (2001)	>1	unknown
North of Westbury	14. Pipers Lagoon Creek	private land	North	Bridgenorth	1986	unknown	unknown
Cressy	15. Brumbys Creek	unknown	North	Cressy	1985	unknown	unknown
Longford	16. Wilmores Lane	private land	North	Longford	pre-1980	unknown	possibly extinct
Evandale	17. Evandale Bridge	private land	North	Evandale	1980	unknown	possibly extinct
North of Swansea	18. Didos Hill	private land	South	Cranbrook	1979	unknown	possibly extinct
Fingal	19. Mathinna Rd	unknown	North	St Marys	1914	presumed extinct	
Brighton	20. Brighton	unknown	South	Tea Tree	1899	presumed extinct	
	21. Pontville	private land	South	Tea Tree	1899	presumed extinct	
Epping Forest	22. Clyne Vale	private land	North	Cleveland	1877	presumed extinct	

POPULATION PARAMETERS*

Number of subpopulations: 15
Number of localities: 14
Extent of occurrence: 4,272 km^2
Area of occupancy (2x2 km grid squares): 76 km^2
Number of mature individuals: >10,500
Largest sub-population: 8,800
*Estimates are based on post-1980 records (refer to Appendix A for more information).

The total population size is estimated to be >10,500. However, estimating the number of mature individuals is complicated by the rhizomatous growth of *Coronidium gunnianum*. The number of patches is usually counted as mature individuals, although in some cases large patches may comprise multiple overlapping individuals.

It is estimated that there has been a 52% reduction in extent of occurrence, a 27% reduction in area of occupancy and a 25% reduction in the number subpopulations respectively since 1980. There has been a continuing decline in area and quality of habitat, mostly due to impacts from roadworks and development.

CONSERVATION ASSESSMENT

Coronidium gunnianum is listed as endangered on the Schedules of the Tasmanian *Threatened Species Protection Act 1995* meeting the following criteria: B1ab(ii,iii,iv) + B2ab(ii,iii,iv).

B. 1. Extent of occurrence <5,000 km^2;

B. 2. Area of occupancy <500 km^2 and:
a. severely fragmented;
b. continuing decline inferred in:
ii. area of occupancy;
iii. area, extent and/or quality of habitat;
iv. number of locations or subpopulations

Refer to Listing Assessment in Appendix A for more details.

RESERVATION STATUS

Coronidium gunnianum occurs within an informal reserve at Diprose Lagoon that is managed by the Tasmanian Parks and Wildlife Service, as well as on three private properties in areas covered by perpetual conservation covenants under the Tasmanian *Nature Conservation Act 2002* (Table 1).

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

Agriculture

More than 50% of sub-populations occur on agricultural land and are at risk from farming activities such as stock grazing, cropping, herbicide spraying, construction of dams and other farm infrastructure culverts, bridges, tracks, or fences. Farming activities that impact waterways and wetlands (e.g. dams) are most likely to threaten *C. gunnianum*. Low-level livestock grazing is generally not a threat, as the species is likely to benefit from periodic grazing to maintain open habitat. However, prolonged heavy grazing is likely to reduce plant abundance. Habitat modification through the invasion of pasture grasses and agricultural weeds is also a threat on agricultural land.

Climate change

An increase in the frequency, duration and intensity of drought, influenced by climate change, is likely to impact *Coronidium gunnianum*. The species is strongly associated with ephemeral wetlands, waterways and floodplains which are dependent on seasonal rainfall. Prolonged drought or low rainfall could dry out the species' habitat and inhibit growth, vegetative spread, and recruitment. *Coronidium* species have also been recorded flowering later in Victoria due to increased temperatures in July, putatively due to climate change (Keatley & Hudson 2007), which may affect pollination and recruitment.

Transportation and service corridors

Several subpopulations occur along roadsides and in utilities easements and are at risk from roadworks and infrastructure development. For example, the subpopulation at the Tasman Highway roundabout near Hobart Airport was impacted during road widening works in 2021. Roadside occurrences are also threatened by competition with weeds that frequently invade such highly disturbed sites, and from herbicide spraying.

Residential and commercial development

The largest known subpopulation occurs within the Hobart Airport and is at potential risk from future development proposals at the site. The subpopulation at the airport is also frequently mown, which could prohibit flowering and seed-set. Other subpopulations on private land could also be at risk from future development proposals, especially those close to urban areas e.g. Cambridge, Campbell Town, and Conara.

Lack of recruitment: Reproduction is mainly asexual, via the spreading of rhizomes. Recruitment from seed appears to be very limited. Many daisy species have mechanisms that prevent self-fertilisation, which negatively affects seed production and subsequently reduces recruitment in small populations. If this self-incompatibility occurs in *Coronidium gunnianum* it may be contributing to decline in the species, particularly in small subpopulations. It is also likely that some form of ecological disturbance, such as fire, may be required to promote seed germination, as is the case with many other grassland daisies. Therefore, exclusion of such disturbance events could lead to population decline.

MANAGEMENT STRATEGY

Management objectives

By 2033, all sub-populations are protected and threats managed, with an increase in the size of sub-populations, and key knowledge gaps addressed to enable more effective management actions and recovery of *Coronidium gunnianum*.

What has been done?

Seed was collected for long-term conservation storage at the Tasmanian Seed Conservation Centre (based at the Royal Tasmanian Botanical Gardens, Hobart) in 2011.

What is needed?

Agencies, groups or individuals may assist with some or all of the following recovery actions (coordinated efforts may achieve the best and most efficient results):

- avoid impacts to the species during roadworks and development, especially small or outlying subpopulations;
- undertake targeted surveys of known subpopulations to determine their status, especially at sites which have not been observed recently;
- conduct extension surveys in potential habitat near known sites and historical occurrences;
- monitor known sites for evidence of recruitment, decline and threats;
- engage with landowners to discuss management agreements or conservation covenants;
- undertake research into the ecology of the species, especially determining the causes of limited seed recruitment and response to disturbance;
- collect seed from additional sites to further supplement the collection held for long-term conservation storage at the Tasmanian Seed Conservation Centre; and
- provide information and extension support to relevant Natural Resource Management committees, local councils, government agencies, the local community and development proponents on the locality, significance and management of known subpopulations and potential habitat.

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Prepared in 2023 by the Threatened Species & Private Land Conservation Section under the provisions of the Tasmanian *Threatened Species Protection Act 1995*.

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Version	Date	Author	Reason/purpose
1.0	5/06/2024	J. Quarmby (TSS)	The first version submitted and endorsed by the Threatened Species Scientific Advisory Committee.

Appendix A – Listing Assessment for *Coronidium gunnianum*

ASSESSMENT PARAMETERS SUMMARY

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Number of mature individuals	>10,500	10,000	15,000	Estimates are based on NVA data, but most records do not indicate numbers of mature individuals. It is difficult to measure the number of mature individuals due to rhizomatous growth. Some observers have estimated numbers by extrapolating from quadrat sampling e.g. 1-2 plants per 100m² in low density areas and 5-7 plants per 100m² in high density areas.
Trend	Suspected decline, but insufficient data to determine magnitude of decline.			There is limited information on the size or trends of most populations. Given the loss of historical subpopulations it is suspected that there has been a decline in the number of mature individuals, however it is difficult to estimate the magnitude of the decline.
Generation length (years)	20-50 years	20 years	>100 years	It is difficult to estimate generation length due to clonal growth. But the species has the potential to be very long-lived. The Victorian assessment for this species used 100-year generation length.
Extent of occurrence	4,272 km2	2,617 km2	8,909 km2	Estimate based on minimum convex polygon around known occurrences (excludes possibly or presumed extinct occurrences). Min value excludes records pre-1980 and Max value includes all records.
Trend	52% decline in EOO since 1980.			Estimate based on presumed extinction of outlying historic occurrences e.g. Fingal & Brighton
Area of Occupancy	76 km²	68 km²	104 km²	Estimate based on occupied 2 x 2 km grid squares (excludes possibly or presumed extinct occurrences). Min value excludes records pre-1980 and Max value includes all records.
Trend	27% decline in AOO since 1980			Estimate based on presumed extinction of historic occurrences e.g. Fingal & Brighton
Number of subpopulations	15	12	22	See basis of assessment below. Min value excludes records pre-1980 and Max value includes all records.
Trend	31% decline in number of sub-populations since 1980			Estimate based on the loss of historic occurrences e.g. Fingal & Brighton
Basis of assessment of subpopulation number	Subpopulations were calculated using a 1km radii around records of occurrences i.e. records <2 km apart were considered to be the same sub-population. While it is possible for Asteraceae seed to disperse over large distances, the likelihood of *C. gunnianum* seed or pollen transferring between sites separated by >2km is very low given the rarity of habitat this species occupies.			

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
No. locations	14	11	19	Threats used to determine locations with subpopulations affected in parentheses: 1. Agriculture (6, 8a, 9, 10, 11, 12, 13b, 14, 15) 2. Climate change (1, 2, 4, 7) 3. Transportation and service corridors (5, 13c) 4. Residential and commercial development (3, 13a)
Trend	Inferred decline in number of locations.			Historical subpopulations would have been classed as separate locations because of their geographic disjunction from current locations, and therefore a decline in locations is inferred due to the loss of historic locations.
Basis of assessment of location number	Subpopulations where the most plausible threat is agriculture were counted as separated locations as they occur on different farms. Subpopulations where the most plausible threat is climate change were counted as a single location as they all occur in a similar climate region (Midlands). Subpopulations where the most plausible threat is roadworks or development were treated as separate locations as they are unlikely to be impacted by the same event.			
Fragmentation	The species is considered to be severely fragmented as per the IUCN definition because most subpopulations are small and isolated. The species preferred habitat is highly localised, and reproduction is mostly asexual so the chances of dispersal between sub-population is very low. >50% subpopulations occur in habitat patches that are too small to be viable and are isolated (separated by >2 km).			
Fluctuations	Not subject to extreme fluctuations in EOO, AOO, number of subpopulations, locations or mature individuals.			

CONSERVATION ASSESSMENT

Overall Assessment Result:
Endangered under Criterion B1ab(ii, iii. Iv) + B2ab(ii, iii, iv)

CRITERION 1

Population size reduction (reduction in total numbers)
Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4

	Critically Endangered Very severe reduction	Endangered Severe reduction	Vulnerable Substantial reduction
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

Assessment result
Data deficient

Justification
While it is likely that there has been a population size reduction, there is insufficient data to estimate the magnitude of the reduction. There has been a reduction in EOO, AOO and number of subpopulations due to the loss of historic subpopulations, but there is no information about the size of the subpopulation prior to their loss. It cannot be discounted that the number of mature individuals in some extant sites may have increased due to changes in local conditions e.g. increased inundation.

CRITERION 2:

Geographic distribution is precarious for either extent of occurrence AND/OR 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; (number of mature individuals			

Assessment result

Endangered under Criterion B1 & B2ab(ii, iii, iv)

Justification

EOO is <5000 km² and AOO is <500 km²; a) it is severely fragmented; b (ii) inferred continuing decline in area of occupancy area, (iii) extent and quality of habitat, and (iv) number of subpopulations. Refer to Assessment Parameters Summary for further justification for estimates used in the assessment.

CRITERION 3

Small population size and decline		Critically Endangered Very low	Endangered Low	Vulnerable Limited
Estimated number of mature individuals		**< 250**	**< 2,500**	**< 10,000**
AND either (C1) or (C2) is true				
C1	An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future	**Very high rate 25% in 3 years or 1 generation (whichever is longer)**	**High rate 20% in 5 years or 2 generation (whichever is longer)**	**Substantial rate 10% in 10 years or 3 generations (whichever is longer)**
C2	An observed, estimated, projected or inferred continuing decline AND its geographic distribution is precarious for its survival based on at 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			

Assessment result
Criterion not met.

Justification
Population size is >10,000.

CRITERION 4:

Very small population	Critically Endangered Extremely low	Endangered Very Low	Vulnerable Low
Number of mature individuals	**< 50**	**< 250**	**< 1,000**

Assessment result
Criterion not met.

Justification
Population size >1000.

CRITERION 5

Quantitative Analysis			
	Critically Endangered Immediate future	**Endangered Near future**	**Vulnerable Medium-term future**
Indicating the probability of extinction in the wild to be:	**≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)**	**≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)**	**≥ 10% in 100 years**

Assessment result
Data deficient.

Justification
No quantitative analysis of extinction risk has been undertaken.