Threatened Species Assessment

Clarkcoma australis
Brittle Star species

Taxonomy

Clarkcoma australis Clark, 1928

This taxon was formerly known as *Ophiocomina australis*. Several genetic studies (Naughton et al 2014, O'Hara et al 2017) establish that this is a valid species in the genus *Clarkcoma*.

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 2003).

Categorised as Vulnerable in the 2009 Advisory list of threatened invertebrate fauna in Victoria (DSE 2009).

Assessed as vulnerable under IUCN criteria B2c by O'Hara (2002) due to its small distribution.

Proposed conservation status

Critically Endangered in Victoria

Criteria: B1ab(iii,v)+2ab(iii,v)

There is very little information about the taxon. On the basis of its restricted distribution it could be VU D2, or on the basis of a small range and a possible decline in condition of its seagrass habitat, it could be assessed as CR. The Scientific Advisory Committee has recommended a precautionary approach.

Species Information

Description and Life History

The taxon is a broadcast spawner and has a potentially very mobile pelagic larval phase in open water.

Generation Length

The generation length of *Clarkcoma australis* is inferred to be 2 to 5 years, based on body size.

Distribution

The taxon occurs in Corner Inlet and Nooramunga in Gippsland Region, Victoria (O;Hara 2002). It also occurs in Spencer Gulf and St Vincent Gulf in south Australia (Clark 1928).

Habitat

Seagrass beds are the main habitat of this brittle star.

Threats

This taxon lives in dead detrital material within seagrass beds, so it is vulnerable to seagrass dieback through eutrophication, turbidity, sea level rise and disturbance by boats/seine nets. Fishing and harvesting aquatic resources, recreational activities, climate change and severe weather are the main threats.

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

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

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 B1 as Critically Endangered

The Extent of Occurrence across the taxon's range is estimated to be 8 km², based on accepted, post-1970 records in the Victorian Biodiversity Atlas. The EoO has been made equal to the AoO to ensure consistency with the definition of AoO as an area within EoO.

The taxon is suspected to have one location. Since it is only known from one site, it is presumed to have only one location, where the threats of coastal development, loss of seagrass beds and increasing sea temperatures may impact all members of the taxon present.

It is inferred to have a continuing decline in (iii) and (v) above. Although there is no available estimate of the current, past or future population size and the habitat is not well understood. There is expected to be a decline in the quality of habitat, and therefore numbers, due to the likely impacts from global warming.

Eligible under Criterion B2 as Critically Endangered

The Area of Occupancy across the taxon's range is estimated to be 8 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA, As above, it has I location and has a continuing decline in (iii) and (v).

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

It is suspected that there are 10,000 mature individuals, but this qualifier is too weak and other thresholds have not been met.

Population size based on the taxon's habitat range, and its infrequent collection.

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 Dw as Vulnerable.

The taxon is inferred to be very restricted.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

References

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