Threatened Species Assessment

Rowedota shepherdi
Sea-cucumber species

Taxonomy

Rowedota shepherdi (Rowe, 1976)

This is was formerly known as *Trochodota shepherdi* Rowe 1976.

Current conservation status

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

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

Proposed conservation status

Critically Endangered in Victoria

Criterion B1ab(iii,v)

O'Hara and Brumby (2000) considered that their national assessment of the taxon satisfied criterion D2 as Vulnerable. Given its dependence on a highly threatened seagrass community, its restricted distribution and the likelihood of ongoing habitat damage, it could be assessed as CR. The Scientific Advisory Committee has recommended a precautionary approach.

Species Information

Description and Life History

The family Chiridotidae is cosmopolitan family of eight genera of which five are recorded for Australian waters. The family is distinguished from other ophiurid families by the following combination of characteristics: body smooth or warty; ossicles comprise wheels with six spokes and curved or sigmoid rods, ossicles sometimes absent. It is a benthic, in-shore detritus feeder and preferring protected bay habitats.

Generation Length

The generation length of *Rowedota shepherdi* is suspected to be 1 year. It is a small, presumably short-lived animal living on annual algal epiphytes growing on seagrass.

Distribution

To date, the taxon has only been recorded from a small area in Nooramunga (Corner Inlet) (O'Hara and Barmby 2000). Within this area it is only known by five specimens. Elsewhere it has been recorded from upper Spencer Gulf and Port Lincoln in South Australia.

Habitat

This taxon has been found living within foliose algal epiphytes growing on *Zostera tasmanica/nigricaulis* seagrass fronds (O'Hara 2002).

Threats

Since the taxon occurs in *Zostera* seagrass beds, it is vulnerable to seagrass dieback through eutrophication, turbidity, sea-level rise and disturbance by boats/seine nets.

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 16 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 the AoO as an area within the EoO.

The taxon is suspected to have one location as all key identified threats, particularly loss of seagrass beds, apply across its range and can rapidly affect all individuals of the taxon present.

It is inferred to have a continuing decline in (iii) and (v) above. Given the restricted area the taxon occupies, and its reliance on vulnerable seagrass beds, it is likely that the taxon will undergo continuing declines.

Eligible under Criterion B2 as Endangered

The Area of Occupancy across the taxon's range is estimated to be 16 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 100,000 mature individuals, which exceeds the thresholds for criterion C.

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 area of occupancy is estimated to be 16 km² and the number of locations is inferred to be 1.

The taxon inferred to be subject to threats, notably habitat damage or loss, which could drive it to become Critically Endangered or Extinct within a time frame of one or two generations. Arguably it is already CR.

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

References

DSE (2009). *Advisory list of threatened invertebrate fauna in Victoria - 2009*. Department of Sustainability and Environment, Melbourne.

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O'Hara, T. and Barmby, V. (2000) *Victorian Marine Species of Conservation Concern: Molluscs, Echinoderms and Decapod crustaceans*. p. 35 Parks Flora and Fauna Division. Department of Natural Resources and Environment: Melbourne.

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Rowe F.W.E. (1976). Restriction of the chiridotid genus *Trochodota* Ludwig (1891) (Holothurioidea: Apodida), with the description of a new species from South Australia. *Trans. Roy. Soc. S. Aust.* 100,203-206.

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