

NSW SCIENTIFIC COMMITTEE

Final Determination

The Scientific Committee, established by the Threatened Species Conservation Act, has made a Final Determination to list the Masters' Charopid Land Snail *Mystivagor mastersi* (Brazier, 1872) as a CRITICALLY ENDANGERED SPECIES in Part 1 of Schedule 1A of the Act. Listing of Critically Endangered species is provided for by Part 2 of the Act.

The Scientific Committee has found that:

1. *Mystivagor mastersi* (Brazier, 1872) (family Charopidae) is a relatively small sized snail found on Lord Howe Island with a shell size of 6.5 mm diameter and 4.5 mm tall. Iredale (1944) states that the species is only known from the shell but Hedley (1891) discussed the preserved remnants of the original animal although its condition was too poor to reveal details of the external morphology. The description given by Stanistic *et al.* (2010) reads "Shell small, with reddish brown zigzag flammulations; globosely ear-shaped with a low spire; whorls rounded, the last large and flared, sutures flat; protoconch sculpture of prominent, widely spaced radial ribs and corrugations, teleoconch relatively smooth with irregular growth lines; imperforate; diameter 7 mm".
2. *Mystivagor mastersi* (Brazier) was originally described as *Simpulopsis mastersi* by Brazier (1872) but its generic affiliation was accompanied by a question mark indicating his uncertainty about its placement there. Iredale (1944) commented on it being a "strange little shell" and created the new genus *Mystivagor* Iredale for it. *Mystivagor* remains monotypic and restricted to Lord Howe Island (Smith 1992).
3. Little is known about the biology and ecology of this species. Hedley (1891) recorded the type specimen having been collected amongst dead leaves and the species was rare. Smith (1992) notes that it lives in litter in woodland. Iredale (1944) suggested that it might live in trees. Stanistic *et al.* (2010) state that the species lives in rainforest habitat and is possibly arboreal. As a member of the family Charopidae, the species is non-carnivorous (Tillier 1989).
4. *Mystivagor mastersi* is endemic to Lord Howe Island. Australian Museum collection records range from near the summit of Mount Lidgbird in the south (two collections), to Blinky Beach (two collections) and north to Old Settlement Beach (two collections). The geographic distribution of *Mystivagor mastersi* is very highly restricted. The extent of occurrence and area of occupancy for *Mystivagor mastersi* were estimated to be approximately 12 km². The area of occupancy is based on three 2 x 2 km grid cells, the scale recommended for assessing area of occupancy in the IUCN (2011).
5. The total number of specimens of Masters' Charopid Land Snail collected between 1869 and 2002 from Lord Howe Island and lodged in the Australian Museum collection is 17. This is a very small number of specimens compared with the number of specimens of other snail taxa collected from Lord Howe Island. It is possible that the relative abundance of the species is naturally low compared to other species of snail on Lord Howe Island. Uncertainty about the species' habitat requirements, however, makes this uncertain (TSSC 2008). Population size is estimated to be <500 individuals though there have been no recent surveys (J. Stanistic pers. comm. August 2013).
6. The key threat to Masters' Charopid Land Snail is likely to be predation by introduced rats although the evidence is largely circumstantial. The Black Rat, *Rattus rattus*, also known as the Ship Rat, was

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accidentally introduced to the island in 1918 from a wrecked ship and was prolific across the Island by 1930 (Billing 1999). Rats are voracious predators of invertebrates and have been implicated in the extinction of at least 13 invertebrates, including two endemic land snails (Ponder 1997, in Lord Howe Island Board 2009). Ponder & Chapman (1999) reported that Black Rats prey extensively on the endangered Lord Howe Island Flax Snail, *Placostylus bivaricosus*, particularly on juvenile snails, and are considered to be a major predator to the species and a significant threat to its survival. Wilkinson & Priddel (2011) state that several species of land snails on Lord Howe Island, including *Mystivagor mastersi*, "are so threatened by rat predation, if rats are not removed they are likely to become extinct". The recovery plan for the Lord Howe Island Flax Snail (NSW NPWS 2001) also identifies habitat clearing and modification for development, predation and habitat disturbance by exotic bird fauna (Common Blackbird (*Turdus merula*), Song Thrush (*Turdus philomelos*), domestic chickens), use of snail bait against the introduced Garden Snail (*Helix aspersa*) and trampling by cattle as threats to the survival of that species but most of these are associated with human habitation and may be less threatening to Master's Charopid Land Snail because of its location on the higher parts of the island.

7. *Mystivagor mastersi* (Brazier, 1872) is eligible to be listed as a Critically Endangered species as, in the opinion of the Scientific Committee, it is facing an extremely high risk of extinction in New South Wales in the immediate future as determined in accordance with the following criteria as prescribed by the *Threatened Species Conservation Regulation 2010*:

Clause 7 Restricted geographic distribution and other conditions

The geographic distribution of the species is estimated or inferred to be:

- (a) very highly restricted
- and
- (d) a projected or continuing decline is observed, estimated or inferred in the key indicator:
 - (b) the geographic distribution, habitat quality or diversity, or genetic diversity.

Dr Mark Eldridge
Chairperson
Scientific Committee

Exhibition period: 22/05/15 – 17/07/15

Proposed Gazettal date: 22/05/15

References:

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ESTABLISHED UNDER THE THREATENED SPECIES CONSERVATION ACT 1995

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