

NSW SCIENTIFIC COMMITTEE

Final Final Determination

The Scientific Committee, established by the Threatened Species Conservation Act, has made a Final Determination to list the Magnificent Helicarionid Land Snail *Gudeoconcha sophiae magnifica* Iredale, 1944 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. *Gudeoconcha sophiae magnifica* Iredale, 1944 (family Helicarionidae) is a relatively large terrestrial land snail found on Lord Howe Island. Iredale (1944) described the new genus *Gudeoconcha* with two species, *G. sophiae* (Reeve), known as the Lord Howe Glass Snail, and *G. magnifica* which appears to have been newly described in that work. *Gudeoconcha sophiae* was originally *Helix sophiae* Reeve, 1854, then transferred to *Helicarion* Férussac and *Nanina* Gray before Iredale (1944) created the genus *Gudeoconcha* for its reception. The description given by Iredale (1944) for *G. magnifica* reads "This is much larger [than *G. sophiae*], mouth more expanded, spire more depressed, shell thinner and sculptured with very fine ripple marks, and of bronze coloration, the shell showing little calcification, the type measuring 39 mm by 19 mm, with the aperture 23 mm by 14 mm. The juvenile of all the forms is seen as a flat-topped shell, the apical whorls slightly elevated, a strong peripheral keel with the base very convex, a small umbilicus, the columella only slightly reflected: first one and a half whorls smoothish ending with a slight varix, the succeeding adult sculpture of obsolete radials, a pronounced small tucker along the edge of the periphery; the under-surface finely radially striate crossed by fine concentric striae. With age the whorls descend, the mouth broadens, peripheral keel disappears and umbilicus almost vanishes."
2. Etheridge (1889) published the name of a subspecies *conica* of *Gudeoconcha sophiae* which had been collected on parts of the Lord Howe Island group. *Gudeoconcha sophiae conica* (Etheridge) (credited to Brazier by Smith 1992) was treated as a variety of *G. sophiae* by Iredale (1944). *Gudeoconcha magnifica* Iredale was treated as a subspecies of *G. sophiae* in an unpublished Ph.D. thesis (Hyman 2005) and this was validated by electronic publication on the Australian Faunal Directory. Smith (1992) treated *G. magnifica* as a synonym of *G. sophiae sophiae* with *G. s. conica* as the only other subspecies. Stanisc *et al.* (2010) note that several subspecies of *G. sophiae* are recognised but provide no details.
3. Little is known about the biology and ecology of this species. Etheridge (1889) noted that it was found in well-wooded localities, but not in the open flats, and it was very plentiful under dead timber, bark and fallen palm leaves. "We particularly noticed its prevalence on soil formed of the decomposed Coral-sand rock, the dead shells in places strewing the ground in thousands." (Etheridge 1889).
4. *Gudeoconcha sophiae magnifica* is endemic to Lord Howe Island. Records from the Atlas of Living Australia indicate the geographic distribution is confined to the southern half of the island extending from the foothills west of Intermediate Hill in the centre of the island to the south of the summit of Mount Gower. The geographic distribution of *Gudeoconcha sophiae magnifica* is very highly restricted. The extent of occurrence and area of occupancy for *Gudeoconcha sophiae magnifica* were estimated to be approximately 16 km². This estimate is based on four 2 x 2 km grid cells, the scale recommended for assessing area of occupancy in the IUCN (2011).
5. Collections of living and dead specimens of *Gudeoconcha sophiae magnifica* total 76 and the limited data suggest a decline in numbers. Collection records indicate 45 specimens from between 1907 to 1915 but 29, predominantly dead specimens, between 1998 and 2002. During the latter three years of that period, no specimens were found on Mount Lidgbird despite collection efforts and it being present there

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in the past. Population size is estimated to be <500 individuals though there have been no recent surveys (J. Stanisc pers. comm. August 2013).

6. The key threat to the Magnificent Helicarionid 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 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 *Gudeoconcha sophiae magnifica*, "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 chicken), 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 the Magnificent Helicarionid Land Snail because of its location on the higher parts of the island.
7. *Gudeoconcha sophiae magnifica* Iredale, 1944 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:
 - (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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- Lord Howe Island Board (2009) Draft Lord Howe Island Rodent Eradication Plan. Lord Howe Island Board, Lord Howe Island.
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