

**Advice to the Minister for the Environment, Water, Heritage and the Arts
from the Threatened Species Scientific Committee (the Committee)
on Amendment to the list of Threatened Species
under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)**

1. Scientific name (common name)

Mathewsoconcha suteri (a snail)

2. Reason for Conservation Assessment by the Committee

This advice follows assessment of information provided by a public nomination to list *Mathewsoconcha suteri*.

Mathewsoconcha suteri is not listed as threatened under the New South Wales *Threatened Species Conservation Act 1995*. The Committee provides the following assessment of the appropriateness of the species' inclusion in the critically endangered category in the EPBC Act list of threatened species.

This is the Committee's first consideration of the species under the EPBC Act.

3. Summary of Conclusion

The Committee judges that the species has been demonstrated to have met sufficient elements of Criterion 2 to make it **eligible** for listing as **critically endangered**.

4. Taxonomy

The species is conventionally accepted as *Mathewsoconcha suteri*.

5. Description

Mathewsoconcha suteri is a small land snail that is 9 to 10 mm in diameter and 6 to 6.5 mm high. It has an orange-brown to fawn coloured shell with a narrow white peripheral band and a depressed spire (Hyman 2005).

6. National Context

Mathewsoconcha suteri occurs in the Territory of Norfolk Island, which is 1700 km north-east of Sydney in the South Pacific Ocean. The Territory includes Norfolk Island, which is approximately 35 km², as well as Nepean and Phillip Islands, which are smaller, uninhabited islands to the south of Norfolk Island (DEH 2000). The islands are volcanic in origin, formed by masses of basalt which arose from the ocean floor, a process which began about 3 million years ago and extended over 700 000 years. With the passage of time, the islands have been colonised by plants and animals (DEH undated (a)).

Norfolk Island has been intermittently occupied by various settlers who have dramatically altered the environment, predominantly by land clearing for agriculture and housing (DEH undated (b)). Approximately 80% of the original vegetation has been cleared, and the invasion of remnants by weed species has been extensive. Much of Norfolk Island's landscape has been transformed from a densely vegetated sub-tropical island to a highly

modified pastoral landscape characterised by grazed kikuyu pastures bordered by remnant woodland (DEH 2000; 2004).

Mathewsoconcha suteri occurs in a few isolated localities on Norfolk Island, including Norfolk Island National Park and Rocky Point (100 Acre) Reserve.

7. Relevant Biology/Ecology

Little is known about the biology and ecology of this species. The generation length of *Mathewsoconcha suteri* is not known. Specimens have been found inside hollowed out tree branches on the ground.

8. Description of Threats

The key threat to *Mathewsoconcha suteri* is predation by introduced rats. The Polynesian Rat (*Rattus exulans*) is presumed to have been introduced thousands of years ago by Polynesian visitors to Norfolk Island. The Ship Rat (*Rattus rattus*) was introduced later, possibly around 1943 (DEH 2000). Both species are likely to have caused a decline in the numbers of *Mathewsoconcha suteri* by direct predation. An extensive rat control program has been operating on Norfolk Island since 1992. This baiting program, however, is unlikely to completely mitigate the effect of predation by rats on *Mathewsoconcha suteri* as it is not undertaken across the species' entire range.

The species' habitat is also likely to be declining in quality due to the presence of weed species on Norfolk Island. Over 200 species of introduced vascular plants have been recorded on Norfolk Island, including lantana, 'William Taylor' weed (*Ageratina riparia*) and wild tobacco (Hyman 2005). Parks Australia is currently implementing a weed control program involving the broad scale treatment and rehabilitation of weed infested areas, however it is likely that the habitat of *Mathewsoconcha suteri* remains threatened, as weed control is not undertaken across the entire range of the species.

Land clearance is likely to have drastically altered habitat available to *Mathewsoconcha suteri*, and caused a decline in the species' numbers. Land clearance since European settlement has been extensive on Norfolk Island, with approximately 80% of the original vegetation having been cleared for agriculture and housing (DEH 2004).

An additional potential threat to *Mathewsoconcha suteri* is feral poultry, which have become common in Norfolk Island National Park. Anecdotal evidence suggests that feral poultry prey on snails and may reduce population numbers quickly. Other invasive species, such as ants and the African or Giant Land Snail, pose potential threats to *Mathewsoconcha suteri* should they be introduced and become established on Norfolk Island. The likelihood of introduction and becoming established is unknown but remains a potential threat. Although part of the habitat of *Mathewsoconcha suteri* is protected in Norfolk Island National Park, the species is also potentially threatened by wildfire and trampling, disturbance and collection by visitors.

9. Public Consultation

The nomination used in this assessment was made available for public exhibition and comment for 30 business days. No comment from the public was received.

10. How judged by the Committee in relation to the criteria of the EPBC Act and Regulations

The Committee judges that the species is **eligible** for listing as **critically endangered** under the EPBC Act. The assessment against the criteria is as follows:

Criterion 1: It has undergone, is suspected to have undergone or is likely to undergo in the immediate future a very severe, severe or substantial reduction in numbers

A total of 68 specimens (predominantly dead specimens) of *Mathewsoconcha suteri* have been collected from Norfolk Island and lodged at the Australian Museum, the most recent of which was lodged in 2002. Relative to the total number of all snail specimens collected from Norfolk Island, this is a small number which suggests that *Mathewsoconcha suteri* may have occurred at low numbers from the time of the first collections in 1865. However, fossils of *Mathewsoconcha suteri* suggest that the species was previously common prior to a brief period of Polynesian settlement until European settlement.

The change in abundance of *Mathewsoconcha suteri* between the fossil deposits and as suggested by more recent collection suggests that the species has undergone a reduction in numbers. This is likely to be due to habitat clearance following European settlement of Norfolk Island and predation and habitat degradation caused by the introduction of several invasive species of plants and animals, including rats to Norfolk Island.

To establish the current impact of threats on the numbers of *Mathewsoconcha suteri*, however, it is necessary to examine population trends over an appropriate timeframe. An appropriate period for examining past declines in the number of *Mathewsoconcha suteri* is three generations. Although the generation length of *Mathewsoconcha suteri* is not known, *Placostylus* species from New Zealand reach maturity at three to five years and may live for 20 years or more (Parrish et al. 1995). As these *Placostylus* species are substantially larger than *Mathewsoconcha suteri* (growing to heights of 115 mm compared to 6.5 mm for *Mathewsoconcha suteri*) their generation length is likely to be longer. However, even if the generation length of *Mathewsoconcha suteri* was in the order of five years, the decline in the species' numbers, as suggested by collection data, is likely to have taken place more than three generations ago (probably before 1914, when the species was noted as being 'exceedingly rare' (Iredale 1944)).

Although there is likely to have been a decline in the species' numbers in more recent times due to predation by rats and ongoing decline in habitat quality due to weed invasion, which may continue in the future, there are no quantitative data available to judge that the species has undergone a recent reduction in numbers. Although the Committee judges that the species is likely to undergo a reduction in numbers, there are insufficient data available to judge whether the reduction would be very severe, severe or substantial. Therefore, the species has not been demonstrated to have met each of the required elements of Criterion 1, and is **not eligible** for listing in any category under this criterion.

Criterion 2: Its geographic distribution is precarious for the survival of the species and is very restricted, restricted or limited

Fossils of *Mathewsoconcha suteri* suggest that the species' former distribution was more widespread than its current distribution. Fossils are known from the Cemetery Bay and Emily Bay areas of Norfolk Island, where the species was noted as being 'very common' (Varman 1991). These fossil deposits date from prior to a brief period of Polynesian settlement until

European settlement. Collections made between 1865 and 1945 show that the species' distribution also included Ball Bay and Cascade Reserve. The current distribution of the species, based on collections made since 1945, suggest that *Mathewsoconcha suteri* is now restricted to a few isolated localities in Norfolk Island National Park and Rocky Point (100 Acre) Reserve. Although an estimate of the species' extent of occurrence is not currently available, given the isolation of its island location, the small area of Norfolk Island (approximately 35 km²) and the clear reduction of the subspecies' range within this small area, the Committee considers that *Mathewsoconcha suteri* has a very restricted geographic distribution.

As indicated under Criterion 1, *Mathewsoconcha suteri* has undergone a decline in numbers due to land clearing and predation and habitat degradation caused by introduced invasive species. While habitat destruction caused by landclearing is no longer an ongoing threat for the species, predation by rats continues, as does decline in habitat quality caused by weed invasion.

Although the habitat of *Mathewsoconcha suteri* is protected in a reserved area and in Norfolk Island National Park, the species is also potentially threatened by wildfire and trampling, disturbance and collection by visitors.

The Committee considers that the species has a very restricted geographic distribution, which is precarious for the survival of the species due to predation by rats and the potential threats outlined above. Therefore, the species has been demonstrated to have met the relevant elements of Criterion 2 to make it **eligible** for listing as **critically endangered**.

Criterion 3: The estimated total number of mature individuals is limited to a particular degree; and either
(a) evidence suggests that the number will continue to decline at a particular rate; or
(b) the number is likely to continue to decline and its geographic distribution is precarious for its survival

As discussed under Criterion 1, a total of 68 specimens of *Mathewsoconcha suteri* have been collected from Norfolk Island and lodged at the Australian Museum, the most recent of which was lodged in 2002. Relative to the total number of snail specimens collected from Norfolk Island, this is a small number, and suggests that *Mathewsoconcha suteri* has occurred at low numbers from the time of the first collections in 1865.

There are, however, insufficient data available to estimate whether the total number of mature individuals very low, low or limited. Therefore, as the species has not been demonstrated to have met this required element of Criterion 3, it is **not eligible** for listing in any category under this criterion.

Criterion 4: The estimated total number of mature individuals is extremely low, very low or low

As discussed under Criteria 1 and 3, the number of specimens of *Mathewsoconcha suteri* collected since 1865, relative to the total number of all snail specimens collected, suggests that the population number of the species may always have been low. However, there is no estimate of the total number of mature individuals of the species available at this time and therefore there are insufficient data available to estimate whether the total number of mature individuals is very low, low or limited. Therefore, as the species has not been demonstrated to have met this required element of Criterion 4, it is **not eligible** for listing in any category under this criterion.

Criterion 5: Probability of extinction in the wild that is at least:

- a) **50% in the immediate future; or**
- b) **20% in the near future; or**
- c) **10% in the medium-term future.**

There are insufficient data available to estimate a probability of extinction of the species in the wild over a relevant timeframe. Therefore, as the species has not been demonstrated to have met the required elements of Criterion 5, it is **not eligible** for listing in any category under this criterion.

11. CONCLUSION

Listing category

Mathewsoconcha suteri is endemic to Norfolk Island, where collections made since 1945 suggest that it is now restricted to a few isolated localities in Norfolk Island National Park and Rocky Point (100 Acre) Reserve. Based on the fossil record, the species' geographic distribution has contracted since settlement of Norfolk Island, most likely as a result of habitat clearance, degradation due to invasion of weed species and predation by feral animals such as rats. Although rat control is being carried out in Norfolk Island National Park, rats remain a threat to the species, as does predation by feral poultry. The Committee considers that the species has a very restricted geographic distribution, which, in view of the continuing threats, is precarious for the survival of the species. Therefore, the species has been demonstrated to have met sufficient elements of Criterion 2 to make it **eligible** for listing as **critically endangered**.

Recovery Plan

The Committee considers that there should not be a recovery plan for this species because a draft recovery plan for Norfolk Island is in preparation, and because the 'Threat Abatement Plan to reduce the impacts of exotic rodents on biodiversity on Australian offshore islands of less than 100 000 ha' is in preparation.

12. Recommendations

- (i) The Committee recommends that the list referred to in section 178 of the EPBC Act be amended by **including** in the list in the **critically endangered** category:

Mathewsoconcha suteri

- (ii) The Committee recommends that there should not be a recovery plan for this species.

Associate Professor Robert J.S. Beeton

Chair

Threatened Species Scientific Committee

13. References cited in the advice

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