

**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)**

*Advena campbellii campbellii* (a snail)

**2. Reason for Conservation Assessment by the Committee**

This advice follows assessment of information provided by a public nomination to list *Advena campbellii campbellii*.

*Advena campbellii campbellii* 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 subspecies' inclusion in the critically endangered category in the EPBC Act list of threatened species.

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

**3. Summary of Conclusion**

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

**4. Taxonomy**

The description of this subspecies is by Hyman (2005). It is yet to be published in a scientific journal.

This document does not constitute a publication for the purposes of the International Code of Zoological Nomenclature.

The holotype used to describe the subspecies is registered as specimen number BMNH 1982239 at the British Museum of Natural History (Hyman 2005).

**5. Description**

*Advena campbellii campbellii* is a small land snail which usually has an elevated, fawn spire and a black, round base. A typical specimen is about 17 mm in diameter and 11 mm high.

**6. National Context**

*Advena campbellii campbellii* 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 km<sup>2</sup>, 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 the Norfolk Island 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).

Phillip Island lies approximately 7 km south of Norfolk Island and is approximately 2 km by 2 km. The vegetation on the island has been severely degraded by the grazing of pigs, goats and rabbits released there for food and sport during early colonisation of the islands by Europeans. Pigs and goats were removed in the early 20<sup>th</sup> century, but rabbits were not removed until 1988 (DEH undated (a)).

*Advena campbellii campbellii* was once widespread over Norfolk and Phillip Islands, but has been recorded in recent times only in Norfolk Island National Park, the eastern side of Captain Cook Memorial and in the Norfolk Island Botanic Gardens. The subspecies may still occur on Phillip Island.

The species *Advena campbellii nepeanensis* is only known from fossil material on Nepean Island (Hyman 2005).

## 7. Relevant Biology/Ecology

Little is known about the biology and ecology of this subspecies. The generation length of *Advena campbellii campbellii* is not known. It is known to live under rotting logs.

## 8. Description of Threats

The key threat to *Advena campbellii campbellii* 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 *Advena campbellii campbellii* 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 *Advena campbellii campbellii* as it is not undertaken across the subspecies' entire range.

The subspecies' 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 (*Solanum mauritianum*) (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 *Advena campbellii campbellii* remains threatened, as weed control is not undertaken across the entire range of the subspecies. Anecdotal evidence also suggests that populations of *Advena campbellii campbellii* may have been affected by the construction of a stormwater drain leading off the Mount Pitt road. The construction process caused top soil to be washed away and encouraged weed growth by washing weed seeds into previously uninfested areas.

Land clearance is likely to have drastically altered habitat available to *Advena campbellii campbellii*, and caused a decline in the subspecies' 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 *Advena campbellii campbellii* 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 *Advena campbellii campbellii* should they be introduced and become established on Norfolk Island. The likelihood such species being introduced and becoming established is unknown but remains a potential threat. Although part of the habitat of *Advena campbellii campbellii* is protected in Norfolk Island National Park, the subspecies 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 subspecies 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 219 specimens of *Advena campbellii campbellii* have been collected from Norfolk and Phillip Islands and lodged at the Australian Museum and the Natural History Museum of London. Based on examinations of fossil deposits, dating from prior to a brief period of Polynesian settlement until European settlement, *Advena campbellii campbellii* was once commonly found in the Emily Bay and Cemetery Bay areas of Norfolk Island. A large number of specimens (91) of the subspecies were collected from Phillip Island prior to 1834 and lodged in the Natural History Museum in London as syntypes. This would suggest that the subspecies was relatively common on Phillip Island at the time of its original collection.

In recent times, the number of specimens of *Advena campbellii campbellii* collected has declined, despite an overall increase in collecting activity of native land snails on Norfolk Island. Although an estimate of the subspecies' numbers is not available, collection records (of predominantly dead specimens) suggest that there may have been a higher number of individuals of the subspecies between 1945 to 1980 (when 98 specimens were collected) than 1981 to the present time (during which 9 specimens have been collected).

*Advena campbellii campbellii* is common in fossil deposits compared to the number of specimens collected over more recent times, which suggests that the subspecies has undergone a reduction in numbers. The reduction in numbers of *Advena campbellii campbellii* is likely to be due to land clearance and decline in habitat due to weed invasion, and the introduction of rats and poultry, which prey upon the subspecies.

To establish the current impact of threats on the numbers of *Advena campbellii campbellii*, however, it is necessary to examine population trends over an appropriate timeframe. An appropriate period for examining past declines in the number of *Advena campbellii campbellii* is three generations. Although the generation length of *Advena campbellii campbellii* 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 *Advena campbellii campbellii* (growing to heights of 115 mm compared to 11 mm for *Advena campbellii campbellii*) their generation length is likely to be longer. However, even if the generation length of *Advena campbellii campbellii* was in the order of five years, the decline in the subspecies' numbers, as suggested by collection data, is likely to have taken place more than three generations ago (since at least 1981, as the number of specimens collected since then is considerably lower than the period 1945 to 1981).

Although there is likely to have been a decline in the subspecies' 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 subspecies has undergone a recent reduction in numbers. Although the Committee judges that the subspecies 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 subspecies 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 *Advena campbellii campbellii* suggest that the subspecies' former distribution was more widespread than its current distribution. Fossils are known from the Cemetery Bay, Emily Bay and Point Hunter areas of Norfolk Island (Varman 1991), but the locations of specimens lodged at the Australian Museum collected from 1979 onwards suggest that the subspecies is now restricted to a few sites within Norfolk Island National Park and the eastern side of Captain Cook Memorial. A population of *Advena campbellii campbellii* was also identified in 1997 in the Norfolk Island Botanical Garden.

The subspecies was also originally collected from Phillip Island prior to 1834, but has not been recorded there since. However, very little survey work has been undertaken on Phillip Island to confirm if the subspecies persists there. Although an estimate of the subspecies' extent of occurrence is not currently available, given the isolation of its island location, the small area of Norfolk Island and Phillip Island combined (a total of approximately 37 km<sup>2</sup>), and the clear reduction of the subspecies' range within this small area, the Committee considers that *Advena campbellii campbellii* has a very restricted geographic distribution.

As discussed under Criterion 1, *Advena campbellii campbellii* is currently threatened by predation by Ship Rats and Polynesian Rats on Norfolk Island, although an extensive rat control program within Norfolk Island National Park has been undertaken since 1992.

The Committee considers that the subspecies has a very restricted geographic distribution, which is precarious for the survival of the subspecies due to predation by rats and the potential threats outlined above. Therefore, the subspecies 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 219 specimens of *Advena campbellii campbellii* have been collected from Norfolk and Phillip Islands. As the number of specimens collected over time has declined, despite an overall increase in collecting activity of native land snails on Norfolk Island, it is likely that the total number of mature individuals of *Advena campbellii campbellii* on Norfolk Island has declined. Little survey work has been undertaken on Phillip Island to confirm if the subspecies persists there.

There are, however, insufficient data available to estimate whether the total number of mature individuals is very low, low or limited. Therefore, as the subspecies 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, a total of 219 specimens of *Advena campbellii campbellii* have been collected from Norfolk and Phillip Islands. Whilst survey work in more recent times suggests that the subspecies' numbers may have declined, there is no estimate of the total number of mature individuals of the subspecies 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 subspecies 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 subspecies in the wild over a relevant timeframe. Therefore, as the subspecies 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**

Based on fossil evidence, *Advena campbellii campbellii* was previously widespread on Norfolk and Phillip Islands. However, the subspecies has been recorded in recent times only in Norfolk Island National Park, the eastern side of Captain Cook Memorial and in the Norfolk Island Botanic Gardens. Further surveys are required to establish if the subspecies persists on Phillip Island. The decline in the distribution of *Advena campbellii campbellii* is likely to be due to habitat clearance, habitat degradation by weeds and predation by rats. The subspecies is currently threatened by ongoing predation by rats and feral poultry, as well as the ongoing invasion of habitat by weed species. The Committee considers that the subspecies has a very restricted geographic distribution, which, in view of continuing threats, is precarious for the survival of the subspecies. Therefore, the subspecies 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 subspecies 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:

*Advena campbellii campbellii*

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

Associate Professor Robert J.S. Beeton

Chair

Threatened Species Scientific Committee

### 13. References cited in the advice

Department of Environment and Heritage (DEH). (2000). Norfolk Island National Park and Norfolk Island Botanic Garden Plans of Management. DEH, Canberra, ACT.

Department of Environment and Heritage (DEH). (2004). What the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) means for Norfolk Island. DEH, Canberra, ACT.

Department of Environment and Heritage (DEH). Undated (a). Australia's World Heritage *The Lord Howe Group (Inscribed 1982)* Accessed from:  
<http://www.deh.gov.au/heritage/worldheritage/sites/lhi/index.html> (17 May 2006).

Department of Environment and Heritage (DEH). Undated (b). Lord Howe Island Group World Heritage Values. Accessed from:  
<http://www.deh.gov.au/heritage/worldheritage/sites/lhi/values.html> (17 May 2006).

Hyman, I. (2005). Taxonomy, systematics and evolutionary trends in Helicarionida (Mollusca, Pulmonata). PhD thesis, University of Sydney. Pp.i-xvii, 1-583.

NSW National Parks and Wildlife Service 2001. Lord Howe *Placostylus Placostylus bivaricus* (Gaskoin, 1855) Recovery Plan. NSW National Parks and Wildlife Service, Coffs Harbour.

Parrish R., Sherley, G. and Aviss, M. (1995). Giant Land Snail Recovery Plan *Placostylus* spp., *Paraphanta* sp. Threatened Species Recovery Plan Series No. 13. Threatened Species Unit, Department of Conservation, New Zealand.

Ponder, W.F. (1997). Conservation status, threats and habitat requirements of Australian terrestrial and freshwater Mollusca *Memoirs of the Museum of Victoria* 56(2): 421-430.

Varman, R.V.J.P. (1991). Conchological Survey 1983-90: Manuscript of Land Mollusca Fossiliferous and Present Day. Unpublished manuscript.