

Approved Conservation Advice for
***Azorella macquariensis* (Macquarie Cushions)**

(s266B of the *Environment Protection and Biodiversity Conservation Act 1999*)

This Conservation Advice has been developed based on the best available information at the time this conservation advice was approved; this includes existing plans, records or management prescriptions for this species.

Description

Azorella macquariensis, Family Apiaceae, also known as Macquarie Cushions or Macquarie Azorella, is a perennial herb that forms extensive cushions and tight mats, and can vary in size from a few centimetres to several metres in diameter. There are two distinct forms of the species – hairy and non-hairy. The leaf blade is kidney-shaped in outline, with usually 3 or sometimes 5 lanceolate lobes that are hairless or sparsely and coarsely hairy on the upper surface. The petiole is 3–4 mm long and broadly winged. The bisexual flowers are solitary or sometimes paired. The fruit is hidden by upper leaves and is yellow-brown, almost sessile or on a 1 mm long pedicel. The species flowers from December to February, and fruits from January to April (Orchard, 1989; Hnatiuk, 1993; DPIPWE, 2009;).

Conservation Status

Macquarie Cushions is listed as **critically endangered**. This species is eligible for listing as critically endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) as it is likely to undergo in the immediate future a very severe reduction in numbers, and has a very restricted geographic distribution which is precarious for its survival given the nature of ongoing threats (TSSC, 2009).

Macquarie Cushions is also pending being listed as endangered under the *Tasmanian Threatened Species Protection Act 1995*.

Distribution and Habitat

Macquarie Cushions is endemic to Macquarie Island, a sub-Antarctic Island approximately 1500 km south-south-east of Tasmania. The extent of occurrence of the species is less than 90 km² (PWS, 2006; DPIPWE, 2009).

The population size of the species is unknown. It is likely there were many thousands of individual plants, prior to the dieback event that was discovered in December 2008, but the exact number is difficult to estimate as the species forms cushions that vary enormously in both size and number of individuals (DPIPWE, 2009; Threatened Species Section, 2009). An assessment of cushions remaining in good health is planned for the 2009–2010 summer, after the plants emerge from winter senescence (DPIPWE, 2009; Threatened Species Section, 2009).

Macquarie Cushions occurs largely along the 200–400 m altitude plateau in feldmark vegetation, which covers approximately half of Macquarie Island in the most wind-exposed areas of the plateau region and upland areas (PWS, 2006; DPIPWE, 2009). Feldmark vegetation on Macquarie Island is comprised of dwarf flowering plants, mosses, lichens, liverworts and a significant amount of bare ground. Macquarie Cushions is the dominant vascular plant and forms a major structural component of feldmark vegetation (AAD, 2009; DPIPWE, 2009). Macquarie Cushions is also occasional on isolated rock stacks at lower elevations.

Cushions of the species are composed of numerous individuals derived from seedlings, and some plants are capable of limited vegetative reproduction (DPIPWE, 2009; Threatened Species Section, 2009).

The species occurs within the South Natural Resource Management region. The distribution of this species is not known to overlap with any EPBC Act-listed threatened ecological community.

Threats

The key threat to the species is a significant dieback epidemic, discovered in December 2008 on Macquarie Island. The cause of the dieback is unknown, and is currently being investigated by plant pathologists (DPIPWE, 2009; Threatened Species Section, 2009). Rabbit and rodent activity may also be a threat to this species. Potential threats are the introduction of alien species and climate change (DPIPWE, 2009; Threatened Species Section, 2009).

Research Priorities

Research priorities that would inform future regional and local priority actions include:

- Determine the nature, source and vectors of dieback affecting the species.
- Conduct fencing trials of some areas to determine whether this can arrest the decline of the species.
- Design and implement a monitoring program or, if appropriate, support and enhance existing programs.
- More precisely assess population size, geographic distribution, ecological requirements, and the relevant impacts of threatening processes, including:
 - the species' response to disturbance (e.g. scraping by rabbits)
 - factors that influence the level of flowering, pollination, seed production and fruit development for the species
 - longevity of plants and time taken to reach maturity
 - the reproductive strategies, phenology and seasonal growth of the species
 - other relevant mortality and morphological data for the species.
- Undertake seed germination and vegetative propagation trials to determine the requirements for successful establishment.

Priority Actions

The following priority recovery and threat abatement actions can be done to support the recovery of Macquarie Cushions.

Habitat Loss, Disturbance and Modification

- Monitor known populations to identify key threats.
- Minimise inappropriate disturbance in areas where Macquarie Cushions occurs.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.

Rabbit and rodent impacts

- Continue to implement the Macquarie Island pest eradication plan for the control and eradication of rabbits, rats and mice in the region.
- Where appropriate, manage rabbit and rodent impacts at important/significant sites through exclusion fencing or other barriers.

Diseases and Alien Species

- Develop and implement suitable hygiene protocols to protect known sites from further outbreaks of dieback.

- Continue stringent biosecurity controls to prevent the introduction of alien species to Macquarie Island.
- Implement biosecurity controls to minimise the risk of spread of any pathogen that may be implicated in the dieback, from Macquarie Island to other subantarctic islands or to Tasmania.

Conservation Information

- Raise awareness of Macquarie Cushions with expeditioners on Macquarie Island through site visits, signage, and posters/information brochures.

Enable Recovery of Additional Sites and/or Populations

- Continue to undertake appropriate seed collection and storage.
- Continue to maintain live plants in cultivation.
- Investigate options for establishing additional populations.
- Implement national translocation protocols (Vallee et al., 2004) if establishing additional populations is considered necessary and feasible.

This list does not necessarily encompass all actions that may be of benefit to Macquarie Cushions, but highlights those that are considered to be of highest priority at the time of preparing the Conservation Advice.

Existing Plans/Management Prescriptions that are Relevant to the Species

- Plan for the Eradication of Rabbits and Rodents on Subantarctic Macquarie Island (PWS, 2007).
- The Macquarie Island Nature Reserve and World Heritage Area Management Plan (PWS, 2006).

These prescriptions were current at the time of publishing; please refer to the relevant agency's website for any updated versions.

Information Sources:

AAD (Australian Antarctic Division) (2009). Macquarie Island Flora. Plateau Uplands.

Australian Antarctic Division, Tasmania. Viewed: 31 August 2009. Available on the Internet at: <http://www.aad.gov.au/default.asp?casid=1977>

DPIPWE (Department of Primary Industries, Parks, Water and Environment) (2009). Records held in DPIPWE's Threatened flora files. Department of Primary Industries, Parks, Water and Environment, Tasmania.

Hnatiuk RJ (1993). Subantarctic Islands. Flora of Australia. Oceanic Islands 2. George AS, Orchard AE and Hewson HJ. Australian Government Publishing Service, Canberra.

Orchard AE (1989). *Azorella* Lamarek (Hydrocotylaceae) on Heard and Macquarie Islands. *Muelleria* 7: 15–20.

PWS (Parks & Wildlife Service) (2006). Macquarie Island Nature Reserve and World Heritage Area Management Plan. Department of Primary Industries, Parks, Water and Environment, Hobart.

PWS (Parks & Wildlife Service) (2007). Plan for the eradication of rabbits and rodents on subantarctic Macquarie Island. Department of Primary Industries, Parks, Water and Environment, Hobart.

Threatened Species Section (2009). Notesheet for *Azorella macquariensis* (Macquarie Cushions). Department of Primary Industries, Parks, Water and Environment, Hobart. Viewed: 31 August 2009.

Available on the Internet at: <http://www.dpiw.tas.gov.au/threatenedspecieslists>

TSSC (Threatened Species Scientific Committee) (2009). Listing advice for *Azorella macquariensis*.

Vallee L, Hogbin T, Monks L, Makinson B, Matthes M and Rossetto M (2004). Guidelines for the translocation of threatened plants in Australia - second edition. Australian Network for Plant Conservation, Canberra.