

## Approved Conservation Advice for *Pneumatopteris truncata*

(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 and draft plans, records or management prescriptions for this species.

### Description

*Pneumatopteris truncata*, family Thelypteridaceae, is a large terrestrial fern with an upright stem and fronds growing in a crown 80 to 120 cm long. The fronds have aerophores (respiratory structures) at the base of the pinnae (leaflets) (Du Puy, 1993).

### Conservation Status

*Pneumatopteris truncata* is listed as critically endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) under the name *Pneumatopteris truncata* (a Christmas Island fern). It was found eligible for listing as “it is found within Australia only on Christmas Island. The geographic distribution of this species is very restricted. There is no evidence of continuing decline in the population or of extreme fluctuations in the number of mature individuals despite the threat of damage from cyclones. The total number of mature individuals is extremely low (45 mature individuals)” (TSSC, 2004).

### Distribution and Habitat

*Pneumatopteris truncata* has a fragmented distribution over Asia and Malesia (Du Puy, 1993). The Australian distribution is restricted to Christmas Island, where it is known from two localities on the south-west side of the island (Du Puy, 1993; Holmes & Holmes, 2002). The known extent of occurrence is approximately 40 ha and area of occupancy approximately 34 m<sup>2</sup> (TSSC, 2004). However, the distribution is not well known and there is the possibility of undiscovered sites.

Two populations were identified within the Christmas Island National Park in a survey in 2002 (Holmes & Holmes, 2002). There are also two historical records: one with no precise locality and one from the Waterfall (Du Puy, 1993). A total of 45 plants divided between two small localities (Hugh’s Dale and the Blowholes) was recorded in the 2002 survey (Holmes & Holmes, 2002).

*Pneumatopteris truncata* grows in colonies on permanently moist sites in semi-deciduous closed forest between 50 and 140 m elevation (Du Puy, 1993; Holmes & Holmes, 2002). There is little information on the habitat requirements of this species.

This species occurs within the Territory of Christmas Island Natural Resource Management Region. The distribution of this species is not known to overlap with any EPBC Act-listed threatened ecological community.

### Threats

The very small known population size, fragmented distribution and lack of accurate location data make *Pneumatopteris truncata* vulnerable to a wide range of threats and to changes in its habitat.

Threats include:

- removal or modification of habitat through vegetation clearing and disturbance e.g. road construction, developments or mining
- invasive species e.g. weeds, giant African land snails and crazy ants (which reduce numbers of red crabs which prey on snails)
- the introduction of new invasive species
- climate change (Hyder Consulting Pty Ltd, 2008). Potential impacts of climate change on Christmas Island include likely increases in coral bleaching and changes in the reproductive biology and behaviour of marine and terrestrial species, increases in the intensity of cyclones and other storms, and inundation of low lying areas due to rising sea level (Hyder Consulting Pty Ltd, 2008). Increased intensity and frequency of fires represents an additional threat with higher temperatures (Hyder Consulting Pty Ltd, 2008).

The level of impact of each threat and potential threat is unknown.

### Research Priorities

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

- Conduct research to better quantify threats, including on existing and potential invasive species
- Assess and identify physical and biological habitat requirements
- Monitor populations to detect any declines (including for possible *ex situ* action)
- Conduct population surveys to determine size and location and collect additional habitat/site data, as well as targeted surveys for additional populations
- Seek advice regarding the feasibility of *ex situ* cultivation, and if feasible, determine triggers for implementing *ex situ* cultivation
- Implement *ex situ* actions and investigate potential re-introduction areas if *ex situ* cultivation is triggered

### Priority Actions

The following priority recovery and threat abatement actions can be done to support the recovery of *Pneumatopteris truncata*:

#### Habitat Disturbance and Modification, including Invasive species

- Continue to assess the environmental impacts of proposals in accordance with relevant legislation.
- Improve biosecurity to maintain effective quarantine against the introduction of further invasive species. This includes rapidly controlling pests that may enter and assessing the risk of threat.
- Monitor invasive species, such as crazy ants, weeds and giant African land snails, to avoid or mitigate threats and negative impacts to populations.

#### Conservation Information

- Communicate with and engage the community and stakeholders regarding conservation of *Pneumatopteris truncata*.
- Coordinate implementation, including manage and analyse data, review the progress of recovery and effectiveness of management actions, and adapting actions if necessary.
- Implement national translocation protocols (Vallee et al., 2004) if establishing additional populations is considered feasible and necessary.

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

### Existing Plans/Management Prescriptions that are Relevant to the Species

- Monitoring through the biennial island-wide survey and targeted surveys

Threat abatement actions needed to address the crazy ant invasion on Christmas Island are identified in:

- Christmas Island National Park Management Plan. The Christmas Island National Park, including visitor use, is managed to preserve the natural condition of the area (EA, 2002)
- Draft Christmas Island Biodiversity Conservation Plan (DNP, 2014)
- The action plan for invasive ants on Christmas Island (Slip, 2002)
- Threat abatement plan for tramp ants (including crazy ants) (DEH, 2006)

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

### References

Department of Environment and Heritage (DEH) (2006). *Threat abatement plan to reduce the impacts of tramp ants on biodiversity in Australia and its Territories*. Department of the Environment and Heritage, Canberra.

Available on the Internet at:

<http://www.environment.gov.au/resource/reduction-impacts-tramp-ants-biodiversity-australia-and-its-territories>

Du Puy DJ (1993). Thelypteridaceae. In *Flora of Australia: Oceanic Islands*. 50:551-553. AGPS Canberra.

Environment Australia (EA) (2002). *Christmas Island National Park management plan*. Department of the Environment and Heritage, Canberra.

Holmes J and Holmes G (2002). *Conservation status of the flora of Christmas Island, Indian Ocean*. Report to Environment Australia/Parks Australia North.

Hyder Consulting Pty Ltd (2008). *The impacts and management implications of climate change for the Australian Government's protected areas*.

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Slip D (2002). *Invasive ants on Christmas Island action plan, February 2000-February 2003*. Parks Australia North, Christmas Island.

Threatened Species Scientific Committee (TSSC) (2004). *Commonwealth Listing advice on Pneumatopteris truncata (fern)*.

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<http://www.environment.gov.au/biodiversity/threatened/species/p-truncata.html>.

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.