Australian Government
Department of the Environment

# Consultation Document on Listing Eligibility and Conservation Actions

## *Streblus pendulinus*

### Siah's backbone

You are invited to provide your views and reasons supporting related to:

1) the eligibility of *Streblus pendulinus* for inclusion on the EPBC Act threatened species list in the endangered (B1ab(iii,iv,v)+2ab(iii,iv,v); C2a(ii)) category; and

2) the necessary conservation actions for the above species.

Evidence provided by experts, stakeholders and the general public are welcome. Responses can be provided by any interested person.

Anyone may nominate a native species, ecological community or threatening process for listing under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or for a transfer of an item already on the list to a new listing category. The Threatened Species Scientific Committee (the Committee) undertakes the assessment of species to determine eligibility for inclusion in the list of threatened species and provides its recommendation to the Australian Government Minister for the Environment.

Draft information for your consideration of the eligibility of this species for listing as endangered starts at page 3 and information associated with potential conservation actions for this species starts at page 7. To assist with the Committee's assessment, the Committee has identified a series of specific questions on which it seeks your guidance at page 8.

Responses are to be provided in writing either by email to:
species.consultation@environment.gov.au

or by mail to:

The Director
Species Information and Policy Section
Wildlife, Heritage and Marine Division
Department of the Environment
PO Box 787
Canberra ACT 2601

**Responses are required to be submitted by 3 November 2015**.

## General background information about listing threatened species

The Australian Government helps protect species at risk of extinction by listing them as threatened under Part 13 of the EPBC Act. Once listed under the EPBC Act, the species becomes a Matter of National Environmental Significance (MNES) and must be protected from significant impacts through the assessment and approval provisions of the EPBC Act. More information about threatened species is available on the department's website at: http://www.environment.gov.au/biodiversity/threatened/index.html.

Public nominations to list threatened species under the EPBC Act are received annually by the department. In order to determine if a species is eligible for listing as threatened under the EPBC Act, the Threatened Species Scientific Committee (the Committee) undertakes a rigorous scientific assessment of its status to determine if the species is eligible for listing against a set of criteria. These criteria are available on the Department's website at: http://www.environment.gov.au/biodiversity/threatened/pubs/guidelines-species.pdf.

As part of the assessment process, the Committee consults with the public and stakeholders to obtain specific details about the species, as well as advice on what conservation actions might be appropriate. Information provided through the consultation process is considered by the Committee in its assessment. The Committee provides its advice on the assessment (together with comments received) to the Minister regarding the eligibility of the species for listing under a particular category and what conservation actions might be appropriate. The Minister decides to add, or not to add, the species to the list of threatened species under the EPBC Act. More detailed information about the listing process is at: http://www.environment.gov.au/biodiversity/threatened/nominations.html.

To promote the recovery of listed threatened species and ecological communities, conservation advices and where required, recovery plans are made or adopted in accordance with Part 13 of the EPBC Act. Conservation advices provide guidance at the time of listing on known threats and priority recovery actions that can be undertaken at a local and regional level. Recovery plans describe key threats and identify specific recovery actions that can be undertaken to enable recovery activities to occur within a planned and logical national framework. Information about recovery plans is available on the department's website at: http://www.environment.gov.au/biodiversity/threatened/recovery.html.

## Information about this consultation process

Responses to this consultation can be provided electronically or in hard copy to the contact addresses provided on Page 1. All responses received will be provided in full to the Committee and then to the Australian Government Minister for the Environment.

In providing comments, please provide references to published data where possible. Should the Committee use the information you provide in formulating its advice, the information will be attributed to you and referenced as a 'personal communication' unless you provide references or otherwise attribute this information (please specify if your organisation requires that this information is attributed to your organisation instead of yourself). The final advice by the Committee will be published on the department's website following the listing decision by the Minister.

Information provided through consultation may be subject to freedom of information legislation and court processes. It is also important to note that under the EPBC Act, the deliberations and recommendations of the Committee are confidential until the Minister has made a final decision on the nomination, unless otherwise determined by the Minister.

# *Streblus pendulinus*

**Siah's backbone**

## Taxonomy

Conventionally accepted as *Streblus pendulinus* (Endl.) F.Muell. (CHAH, 2015).

*Streblus* subpopulations on mainland Australia and in Melanesia, Micronesia and Polynesia have variously been included with *S. pendulinus* (e.g. Berg, 2006; CHAH, 2007; Green, 1994). More recently, *Streblus brunonianus* has been reinstated for non-Norfolk Island subpopulations (Conn, 2015) and *S. pendulinus* is treated as a Norfolk Island endemic (Conn, 2015). This treatment is adopted by the Council of Heads of Australasian Herbaria (CHAH, 2015).

## Reason for conservation assessment by the Threatened Species Scientific Committee

*Streblus pendulinus* is listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth). In 2003, the species was assessed as eligible for listing as endangered because, at the time, it had very low numbers (less than 250 mature individuals) (TSSC, 2003).

This current assessment is required as *Streblus pendulinus* was included on the Finalised Priority Assessment List 2014 (Department of the Environment, 2014). The species was nominated for delisting assessment due its synonymy with *S. brunonianus*, a species that is common on mainland Australia. This treatment is no longer current and *S. pendulinus* is considered a Norfolk Island endemic.

## Species Information

### Description

*Streblus pendulinus*, family Moraceae, is a dioecious understorey tree or shrub growing to 6 m tall with fleshy red fruit and very rough leaves (DNP, 2010; Williams and Adam, 2010). Mainland *Streblus* species have greenish-white flowers borne in dense spikes, flower with fluctuating intensity at different sites and fail to flower at some sites in some years (Williams and Adam, 2010). Branches/stems exude white latex when damaged (DNP, 2010).

### Distribution

*Streblus pendulinus* is a Norfolk Island endemic (Conn, 2015). Specimens have been collected from five locations on the island (DNP, 2010). The species is moderately common in some parts of Norfolk Island National Park (Mills, 2012). Outside of the park, the species is occasional and occurs as isolated paddock trees in some instances (Mills, 2007).

### Cultural Significance

Other *Streblus* species are used for boomerangs and food on mainland Australia (King, 2011; Little and Skolmem, 1989)

### Relevant Biology/Ecology

*Streblus pendulinus* occurs in Norfolk Island pine (*Araucaria heterophylla*) / white oak (*Lagunaria patersonia* subsp. *patersonia*) coastal forest, hardwood forest, Norfolk Island pine / hardwood forest and viney subtropical rainforest (DNP, 2010). Other *Streblus* species occur in a range of habitat, including rainforest on the wetter parts of ranges, tablelands, slopes and riverine habitats on mainland Australia (Chew, 1989).

Larger *Streblus pendulinus* trees are probably many decades old (Mills, 2015, pers. comm.), and trees in all age classes are observed on the island, which indicates that the species is regenerating (Mills, 2012). *Streblus* species have seed that germinate readily and fruit that is palatable to birds (DNP, 2010). The leaves are very palatable to stock and many trees are male and cannot produce seed (Sykes and Atkinson, 1988, cited in DNP, 2010).

## Threats

*Streblus pendulinus* is threatened by competition from weeds and grazing by cattle (DNP, 2010). A parasite has been observed preventing seed set in many individuals (DNP, 2010). Outside of Norfolk Island National Park, as old *S. pendulinus* trees die, grazing and weeds suppress recruitment (Mills, 2015, pers. comm.).

Historic clearing has significantly reduced the area of potential suitable habitat for *Streblus pendulinus*. It is estimated that two thirds of Norfolk Island's vegetation has been cleared (Abell and Falkland, 1991), mostly prior to 1860 (Olsen, 1996). Prior to clearing, it is likely that the species was widespread on Norfolk Island (Mills, 2015, pers. comm.). Remnant vegetation is mostly forest, open forest and regeneration (Abell and Falkland, 1991) and it is likely that the species occurred in higher densities in the lowland rainforest, a vegetation associated which has been mostly cleared on the island (Mills, 2015, pers. comm.). The majority of known individuals occur in Norfolk Island National Park (TSSC, 2003), however, outside of the park, selective logging may continue (Olsen, 1996).

## Assessment of available information in relation to the EPBC Act Criteria and Regulations

**Criterion 1. Population size reduction (reduction in total numbers)**
Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4

| | Critically Endangered Very severe reduction | Endangered Severe reduction | Vulnerable Substantial reduction |
|---|---|---|---|
| **A1** | **≥ 90%** | **≥ 70%** | **≥ 50%** |
| **A2, A3, A4** | **≥ 80%** | **≥ 50%** | **≥ 30%** |

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.

A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(*a) cannot be used for A3*]

A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.

*based on any of the followin*

(a) direct observation [*except A3*]

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

## Evidence:

There are insufficient data available to judge whether *Streblus pendulinus* has undergone, or is likely to undergo, a reduction in numbers over a period of time relevant to this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

| Criterion 2. Geographic distribution as indicators for either extent of occurrence AND/OR area of occupancy | | | |
|---|---|---|---|
| | **Critically Endangered Very restricted** | **Endangered Restricted** | **Vulnerable Limited** |
| B1. Extent of occurrence (EOO) | **< 100 km$^2$** | **< 5,000 km$^2$** | **< 20,000 km$^2$** |
| B2. Area of occupancy (AOO) | **< 10 km$^2$** | **< 500 km$^2$** | **< 2,000 km$^2$** |
| AND at least 2 of the following 3 conditions indicating distribution is precarious for survival: | | | |
| (a) Severely fragmented OR Number of locations | **= 1** | **≤ 5** | **≤ 10** |
| (b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals | | | |
| (c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals | | | |

**Evidence:**

*Streblus pendulinus* is a Norfolk Island endemic. The species extent of occurrence is 4.41 km$^2$ and its area of occupancy is 16 km$^2$ (Department of the Environment, 2015). As the extent of occurrence is less than 100 km$^2$, the species geographic distribution is very restricted.

The species may be considered to occur at two locations: reserves, where the species is threatened by weed invasion (DNP, 2010), and farmland, where the species is threatened by weed invasion (DNP, 2010), isolated clearing (Olsen, 1996) and grazing (DNP, 2010).

It is unlikely that the severity of fragmentation of *Streblus pendulinus'* distribution inhibits its pollination or dispersal mechanisms. Although insect pollination may occur for this species, *Streblus* species have a flower structure that is specialised for anemophily (wind pollination) (Datwyler and Weiblen, 2004; Williams and Adam, 2010). Similarly, the fruit of the species is palatable to birds (DNP, 2010) and seed of other *Streblus* species is known to be dispersed by birds (White et al., 2003). Given that the species utilises a non-specialised abiotic vector (wind) for pollination and seed dispersal is facilitated by a non-specialised mobile vector (birds), it is possible that the current known maximum distance between subpopulations (less than 2 km) does not inhibit pollen or seed dispersal within or between sites.

*Streblus pendulinus* is possibly secure at present in the national park (Mills, 2012, 2015, pers. comm.). Outside of the park however, sites may be lost as old trees die off and do not regenerate due to recruitment suppression caused by overgrazing and weed invasion (Mills, 2015, pers. comm.). It is inferred that this depletion could result in continuing decline of the species quality of habitat, number of subpopulations or mature individuals.

The data presented above appear to demonstrate that the species is **eligible for listing as endangered (B1ab(iii,iv,v)+2ab(iii,iv,v))** under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

| Criterion 3. Population size and decline | | | |
|---|---|---|---|
| | **Critically Endangered Very low** | **Endangered Low** | **Vulnerable Limited** |
| Estimated number of mature individuals | **< 250** | **< 2,500** | **< 10,000** |
| AND either (C1) or (C2) is true | | | |
| C1 An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future) | **Very high rate 25% in 3 years or 1 generation (whichever is longer)** | **High rate 20% in 5 years or 2 generation (whichever is longer)** | **Substantial rate 10% in 10 years or 3 generations (whichever is longer)** |

| | | | | |
|---|---|---|---|---|
| C2 | An observed, estimated, projected or inferred continuing decline AND its geographic distribution is precarious for its survival based on at least 1 of the following 3 conditions: | | | |
| (a) | (i) Number of mature individuals in each subpopulation | **≤ 50** | **≤ 250** | **≤ 1,000** |
| | (ii) % of mature individuals in one subpopulation = | **90 – 100%** | **95 – 100%** | **100%** |
| (b) | Extreme fluctuations in the number of mature individuals | | | |

**Evidence:**

Transect surveys in Norfolk Island National Park observed 107 *Streblus pendulinus* plants in 15 km of transects (Mills, 2012). Seventy of the plants were greater than 100 cm tall (which may indicate maturity) and regeneration of the species was observed at a number of sites (Mills, 2012). Outside of the park the species occurs in Crown reserves (DNP, 2010), on private property as isolated paddock trees (Mills, 2007). Based on the results of the aforementioned transect surveys, Mills (2015, pers. comm.) infers that there are between 250 to 1000 mature *Streblus pendulinus* plants on Norfolk Island. Consequently, the estimated number of mature individuals is low.

Data presented under Criterion 2 indicates that this species is at risk of continuing decline. More than 95% of mature individuals occur in Norfolk Island National Park, and only few plants occur outside of the park (Mills, 2015, pers. comm.).

The data presented above appear to demonstrate that the species is **eligible for listing as endangered (C2a(ii))** under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

| **Criterion 4. Number of mature individuals** | | | |
|---|---|---|---|
| | **Critically Endangered Extremely low** | **Endangered Very Low** | **Vulnerable Low** |
| Number of mature individuals | **< 50** | **< 250** | **< 1,000** |

**Evidence:**

Data presented under Criterion 3 indicates that there less than 1000 mature *Streblus pendulinus* plants on Norfolk Island. Consequently, the estimated number of mature individuals is low.

The data presented above appear to demonstrate that the species is **eligible for listing as vulnerable (D) under** this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

| **Criterion 5. Quantitative Analysis** | | | |
|---|---|---|---|
| | **Critically Endangered Immediate future** | **Endangered Near future** | **Vulnerable Medium-term future** |
| Indicating the probability of extinction in the wild to be: | **≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)** | **≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)** | **≥ 10% in 100 years** |

**Evidence:**

Population viability analysis appears not to have been undertaken, there are insufficient data to demonstrate if the species is eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

## Conservation Actions

### Recovery Plan

There is an adopted recovery plan for the species, the Norfolk Island Region Threatened Species Recovery Plan (DNP, 2010).

### Primary Conservation Objectives

Increase the abundance and distribution of *Streblus pendulinus* by maintaining and rehabilitating known and potential habitat.

### Conservation and Management Actions

Weed control

- Avoid actions that are likely to exacerbate weed invasion in this species habitat.
- Implement the Norfolk Island National Park Weed Control Strategy (DNP, 2010). Develop and implement a weed control strategy for Norfolk Island public reserves (DNP, 2010). Broad scale weed control should assist dormant individuals (DNP, 2010). There is anecdotal evidence of many seedlings spontaneously occurring in areas of the national park treated for woody weeds (DNP, no date).
- Provide advice to assist landholders to control environmental weeds on private land (DNP, 2010). Weeding on private property has led to the discovery of new occurrences of the species (Mills, 2015, pers. comm.).

Habitat rehabilitation

- Undertake rehabilitation of native vegetation in Norfolk Island National Park and Norfolk Island public reserves (DNP, 2010).
- Promote the use of conservation incentives to restore and protect significant remnant vegetation and threatened species habitat on private land (DNP, 2010).

Livestock management

- Fence subpopulations and isolated paddock trees to reduce grazing pressure and associated recruitment suppression. Implement an appropriate weed control program for fenced areas.

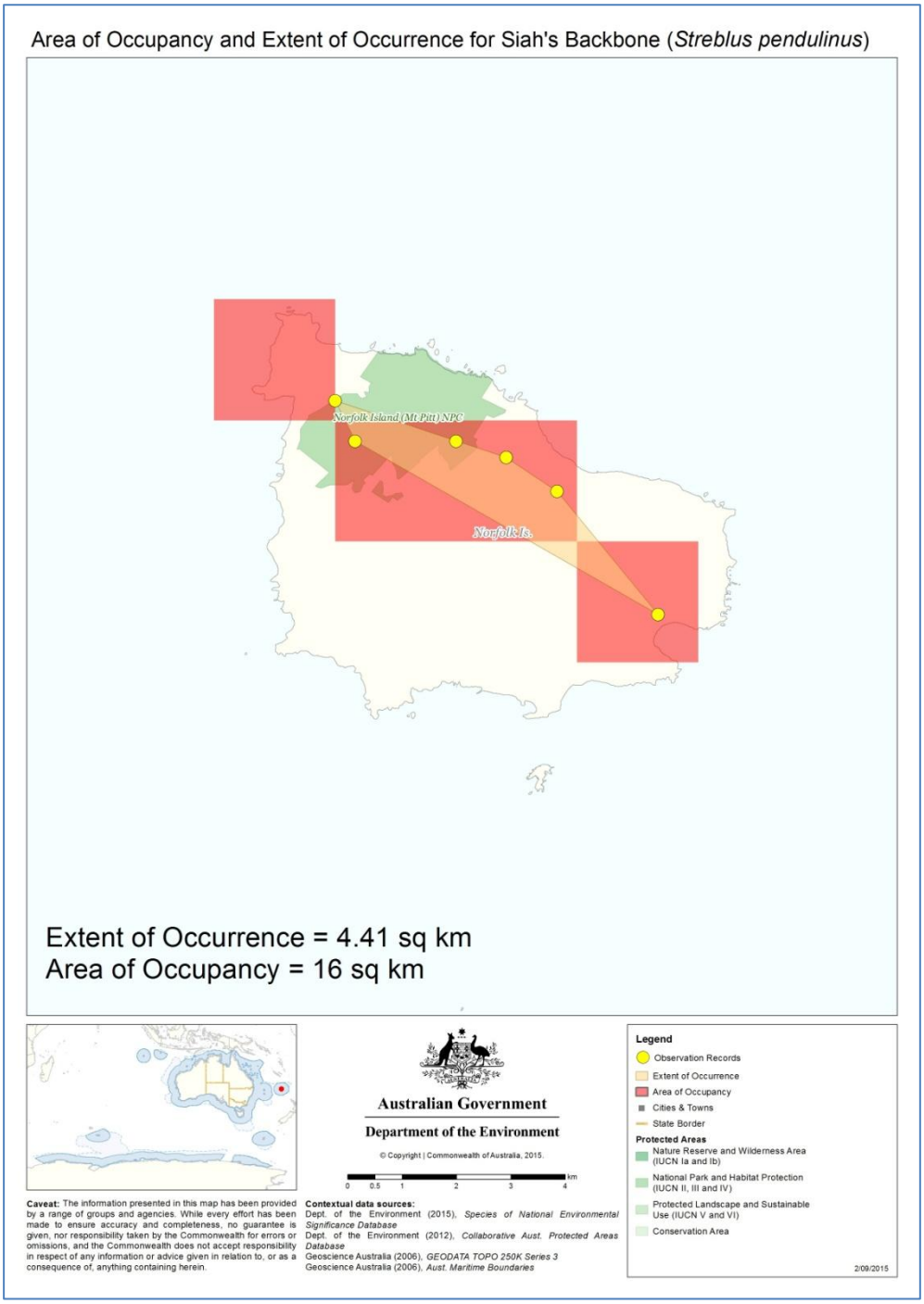
Stakeholder Management

- Provide information on how to maintain and rehabilitate known and potential habitat to managers of Norfolk Island National Park, the Conservator of Public Reserves and private land managers.

### Information and research priorities

- Investigate whether the parasite that may be preventing seed set is a significant threat to the species and, if necessary, determine the best method of treating the parasite (DNP, 2010).
- Investigate impacts to the species of different livestock management and weed control prescriptions. Adapt management techniques accordingly.
- *Streblus* species germinate readily from seed (DNP, 2010). Establish an ex situ subpopulation and investigate options for linking, enhancing or establishing additional subpopulations. Relevant policies should be referred to for guidance for undertaking translocations (e.g. Vallee et al., 2004).

## Observation records held by the Department of the Environment




## Collective list of questions – your views

### Biological information

1. Can you provide any information or estimates on longevity, average life span and generation length?

### Population size

2. Has the survey effort for this species been adequate to determine its national adult population size? If not, please provide justification for your response.
3. Do you agree that more than 95% of mature individuals of the species occur in Norfolk Island National Park?
4. Do you consider the way the population size has been determined is appropriate? Are there any assumptions and unquantified biases in the estimates? Did the estimates measure relative or absolute abundance? Do you accept the estimate of the total population size of the species? If not, please provide justification for your response.

**Current Distribution**

5. Do you agree that this species occurs at two locations[1] (page 5)? If you disagree, please provide an explanation.
6. Do you agree that this species distribution is not severely fragmented[2] (page 5)? This assertion is based on the assumption that distances between sites do not inhibit the movement of pollinators or dispersal of fruit between sites. If you disagree, please provide an explanation.
7. Do you agree with that the species is at risk of continuing decline[3] (page 5)? This assertion is based on the assumption that threats to the species outside of reserves that may cause a reduction of area of occupancy, quality of habitat, the number of subpopulations or number of mature individuals? If you disagree, please provide an explanation.
8. Page 8 includes a map of observation records of the species. Is the species known to occur elsewhere on Norfolk Island? If so, can you provide locality details for inclusion of the record in the Department of the Environment's species observation database?

**General**

9. Can you provide additional data or information relevant to this assessment?

**Management**

10. What planning, management and recovery actions are currently in place supporting protection and recovery of the species? To what extent have they been effective?
11. Can you recommend any additional or alternative specific threat abatement or conservation actions that would aid the protection and recovery of the species?
12. What individuals or organisations are currently, or potentially could be, involved in management and recovery of the species?

**References cited in the advice**


Abell RS and Falkland AC (1991). Hydrogeology of Norfolk Island, South Pacific Ocean. Bulletin 234. Bureau of Mineral Resources, Geology and Geophysics, Canberra.

Berg CC, Corner EJH and Jarrett FM (2006), Moraceae (genera other than *Ficus*). Flora Malesiana Series I 17(1): 49-50.

CHAH (Council of Heads of Australasian Herbaria) (2007). Australian Plant Census. Australian National Herbarium, Australian National Botanic Gardens and Australian Biological Resources Study.
Available from:
http://www.chah.gov.au/chah/apc/index.html

CHAH (2015). Australian Plant Census. Australian National Herbarium, Australian National Botanic Gardens and Australian Biological Resources Study.
Available from:
http://www.chah.gov.au/chah/apc/index.html

Chew W-L (1989). Moraceae. In: George AS (ed.). Flora of Australia 3: 18.


[1] 'Location' is defined by IUCN (2001): *The term 'location' defines a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon present. The size of the location depends on the area covered by the threatening event and may include part of one or many subpopulations. Where a taxon is affected by more than one threatening event, location should be defined by considering the most serious plausible threat*. IUCN (International Union for Conservation of Nature and Natural Resources) (2001). 2001 Categories & Criteria (version 3.1). Available on the internet: http://www.iucnredlist.org/static/categories_criteria_3_1

[2] 'Severely fragmented' is defined by the IUCN (2001): *The phrase 'severely fragmented' refers to the situation in which increased extinction risk to the taxon results from the fact that most of its individuals are found in small and relatively isolated subpopulations (in certain circumstances this may be inferred from habitat information). These small subpopulations may go extinct, with a reduced probability of recolonisation.*

[3] 'Continuing decline' is defined by the IUCN (2001): *A continuing decline is a recent, current or projected future decline (which may be smooth, irregular or sporadic) which is liable to continue unless remedial measures are taken. Fluctuations will not normally count as continuing declines, but an observed decline should not be considered as a fluctuation unless there is evidence for this.*

Conn BJ (2015). Re-straightening the story of *Streblus brunonianus* and *S. pendulinus* (Moraceae). Telopea 18:73-78.

Datwyler SL and Weiblen GD (2004). On the origin of the fig: phylogenetic relationships of Moraceae from ndhF sequences. American Journal of Botany 91(5): 767-777.

Department of the Environment (2014). Finalised Priority Assessment List for the Assessment Period Commencing 1 October 2014. Commonwealth of Australia. Available from: http://www.environment.gov.au/biodiversity/threatened/assessments/fpal

Department of the Environment (2015). Area of Occupancy and Extent of Occurrence for Siah's Backbone (*Streblus pendulinus*). Unpublished report. Commonwealth of Australia.

DNP (Director of National Parks) (2010). Norfolk Island Region Threatened Species Recovery Plan. Canberra, Director of National Parks, Department of the Environment, Water, Heritage and the Arts.

DNP (no date). Plants of Norfolk Island National Park and Botanic Gardens. Norfolk Island National Park, Norfolk Island, Director of National Parks.

Green PS (1994). Norfolk Island and Lord Howe Island. In: Wilson AJG (ed.). Flora of Australia 49: 62.

King WJ (2011). Indigenous Plant Conservation, Guanaba Indigenous Protected Area, Queensland. Australasian Plant Conservation: Journal of the Australian Network for Plant Conservation 19(4): 16-17.

Little Jr EL and Skolmen RG (1989). A'ia'i, Hawaiian false-mulberry. Common Forest Trees of Hawaii (Native and Introduced). United States Forest Service.

Mills K (2007). The Flora of Norfolk Island. 7. Endemic and Threatened Species. Unpublished report. The Author, Jamberoo, New South Wales.

Mills K (2012). The Flora of Norfolk Island. 14. The Endangered Plants in the National Park: Field Survey and Review. Unpublished report. The Author, Jamberoo, New South Wales.

Olsen PD (1996). Re-establishment of an endangered subspecies: the Norfolk Island Boobook Owl *Ninox novaeseelandiae undulata*. Bird Conservation International 6: 63-80.

TSSC (Threatened Species Scientific Committee) (2003). Commonwealth Listing Advice for Norfolk Island Flora - 16 Endangered Species. Commonwealth of Australia.

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

White E, Tucker N, Meyers N and Wilson J (2004). Seed dispersal to revegetated isolated rainforest patches in North Queensland. Forest Ecology and Management 192(2-3): 409-26.

Williams G and Adam P (2010). The Flowering of Australia's Rainforests: A Plant and Pollination Miscellany. Collingwood, Victoria, CSIRO Publishing

**Other sources cited in the advice**

Mills K (2015). Personal Communication via email, July and August 2015. Managing Director, Kevin Mills and Associates, Jamberoo, New South Wales.