

**NORFOLK ISLAND VEGETATION MAPPING PROJECT**  
Towards conserving and enhancing the island's unique plants

**BACKGROUND REPORT**



**Dr Kevin Mills**

**October 2018**

Cover (Plate 1): The view looking south from Mount Bates towards Phillip and Nepean Islands in the distance.

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The views expressed in this report are those of the author and do not necessarily reflect those of the Norfolk Island Regional Council or the funding body.

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# 1 INTRODUCTION

The Norfolk Island Vegetation Mapping Project aims to develop an accurate digitised vegetation map of Norfolk Island as a guide for future conservation programs on the island. An accurate map is considered essential for these programs to be efficiently and successfully developed and implemented. Most particularly, a map allows for the prioritisation of conservation works, an important aspect in the funding-poor environment as exists on Norfolk Island.

The Draft Norfolk Island Environment Strategy 2018-2023 (Norfolk Island Regional Council 2018) proposes the following action under Theme 6: Biodiversity; the planned mapping study is consistent with this objective.

“7.8.1 Planning for future monitoring and measuring of Environmental Theme 6: Biodiversity

7.8.1.1 Flora

Baseline data is required to determine the extent of native vegetation present on Norfolk Island, and the vegetation communities present within it. Action 2.6a of the Environment Strategy recommends a formal GIS mapping project of Norfolk Island to determine the extent of native vegetation present, and the various vegetation communities present, consistent with Australian vegetation mapping guidelines. Once this project is complete, the following indicators can then be established and monitored for change over time:

- Total native vegetation cover present
- Total area of habitat for threatened plant and animal species
- Total area of native vegetation being restored

Should vegetation restoration be undertaken in the National Park, public reserves and elsewhere, monitoring of vegetation condition could then be undertaken. This could be based on the GIS mapping, with subsequent GIS mapping specifically designed to detect changes in vegetation condition. Alternatively, on ground survey transects could be established at strategic locations for long term monitoring. This kind of on ground vegetation monitoring is resource intensive, and it is likely that external funding would be required to sustain such a program.”

The proposed vegetation mapping is set as a Priority 1 Action, as stated in Section 9.1 of the Strategy document.

This report is prepared to provide background information for the mapping project; it is essentially a bringing together of existing relevant information as a basis for beginning the mapping project.

Much recent information on the flora of the Norfolk Island Group, i.e. since the *Flora* prepared by Green (1994), has been documented in a series of 18 papers by Mills (2007-2016), and a report on Phillip Island (Mills 2009). Other work by the author, including a series of reports on the public reserves (Mills 2017), along with investigations by others (e.g. de Lange *et al.* 2005) add further to the overall modern information on the island’s plants.

## 2 A BOTANICAL HISTORY

The first Europeans to sight Norfolk Island were probably the crew of the ship *Endeavour*, master Captain James Cook, that visited the island in October 1774 during Cook's second voyage around the Pacific. The ship had on board the father and son botanical team of Johan Reinhold Forster (1729-1798) and Johan Georg Adam Forster (1754-1794), commonly known as Georg. The Forsters published a most detailed account of the voyage in 1777 (Thomas & Berghof 2000) and were responsible for naming many plants in the Australasian region, including two from Norfolk Island, namely *Gynopogon alyxia* (now *Alyxia gynopogon*) and *Blackburnia pinnata* (now *Zanthoxylum pinnatum*).

Phillip Gidley King (1758-1808) in charge of a small contingent of soldiers and convicts settled the island in March 1788, two months after Sydney on the east coast of Australia was settled. King's journal (Fidlon & Ryan 1980) contains some interesting botanical observations, but these are made by a non-botanist and add little to the information on the plants existing at that time.



**Figure 2. Drawing of *Dianella intermedia* attributed to convict John Doody, c. 1792.**

The taxon is considered to be endemic to Norfolk Island.

Mitchell Library, Sydney, NSW.

The arrival of officer William Paterson (1755-1810) and his convict servant John Doody a few years later in 1791 was to lead to the first attempt to document the flora of the island. Paterson had Doody paint 50 coloured drawings of the plants found on the island, to which he added notes on each drawing; see **Figure 2**. While few taxonomic names were available for the taxa at that time, and fewer still seem to have been known to Paterson, the drawings and the accompanying notes provide a most important contribution to the early botany of the island. Paterson's contribution has been acknowledged in the naming of White Oak *Lagunaria patersonia*, which is a common species of tree on Norfolk Island.

Not long after the turn of the century, Austrian botanical artist and collector Ferdinand Bauer (1760-1826) visited Norfolk Island in the summer of 1804 - 1805. The specimens and drawings made by Bauer were to form the basis for the first flora for the islands prepared by Stehanus Ladislaus Endlicher (1804-1849), professor of Botany at Vienna almost 30 years later.

Endlicher, who never visited Norfolk Island, published his *Prodromus Florae Norfolkicae* in 1833, the treatment based almost entirely on the collections made by Ferdinand Bauer. Prior to Endlicher's publication, few Norfolk Island species had been formally described and named. The *Prodromus* named 50 new taxa for Norfolk; today many still retain Endlicher as an authority. It would be another 163 years before Endlicher's preliminary *Flora* was replaced with the current *Flora* in 1994 (Green 1994). Several island species are named after Endlicher by other botanists.

Botanist George Caley (1770-1839) visited Norfolk Island between October - November 1805. He kept a diary during his two weeks stay on the island, providing notes on the plants the encountered.

Allan Cunningham (1791-1839), government botanist and explorer, visited Norfolk Island in mid-1830, staying for several months, partly because a ship was unable to land due to rough weather. Cunningham left a detailed journal of his time on Norfolk Island (Mills 2012); this is a most valuable documentation of the island in the year 1830. Allan Cunningham was probably the first person to systematically list the plants of Norfolk Island. At the time of his visit, very few of the endemic plants had been named, the majority being described and named by the Austrian botanist Stephano Endlicher three years later, in 1833. Cunningham's description of the vegetation present on Phillip Island is of great interest, and of considerable scientific value as the only early description of the plants growing there prior to the denudation of the island that took place later in the 19<sup>th</sup> century.

The Quaker James Backhouse (1794-1869) visited Norfolk Island in early 1835 during his extensive travels in Australia inspecting the conditions under which convicts were being kept. Backhouse published his experiences several years later in 1843 after his return to England in a book titled *A Narrative of a Visit to the Australian Colonies*. Backhouse was a keen naturalist and amongst his religious writings made comments on the plants and animals he observed wherever he ventured on his travels. The publication contains many named species as he had the advantage of Endlicher's recently published *Prodromus*. A sketch in his book, later

reproduced in colour, illustrates several readily recognisable and unique plants found on Norfolk Island; see **Figure 3**.

Joseph Henry Maiden (1859-1925) followed in the footsteps of Allan Cunningham as Superintendent of the Royal Botanic Gardens at Sydney 58 years later, holding the position from 1896 to 1924. Maiden prepared a list of plants for Norfolk Island following his visit to the island in December 1902 (Maiden 1904). Indigenous and introduced species were documented and some spurious species records discarded after careful assessment.

Robert Malcolm Laing (1865-1941), the New Zealand botanist, visited in the early 1900s, prompted by the residence of his father on the island. The plant list published in 1914 (Laing 1914) was similar to that prepared by Maiden. Laing also published notes on Norfolk Island seaweeds (Laing 1900, 1905), the physiographic features of the island (Laing 1912) and the island species of the fern genus *Pteris* (Laing 1915).

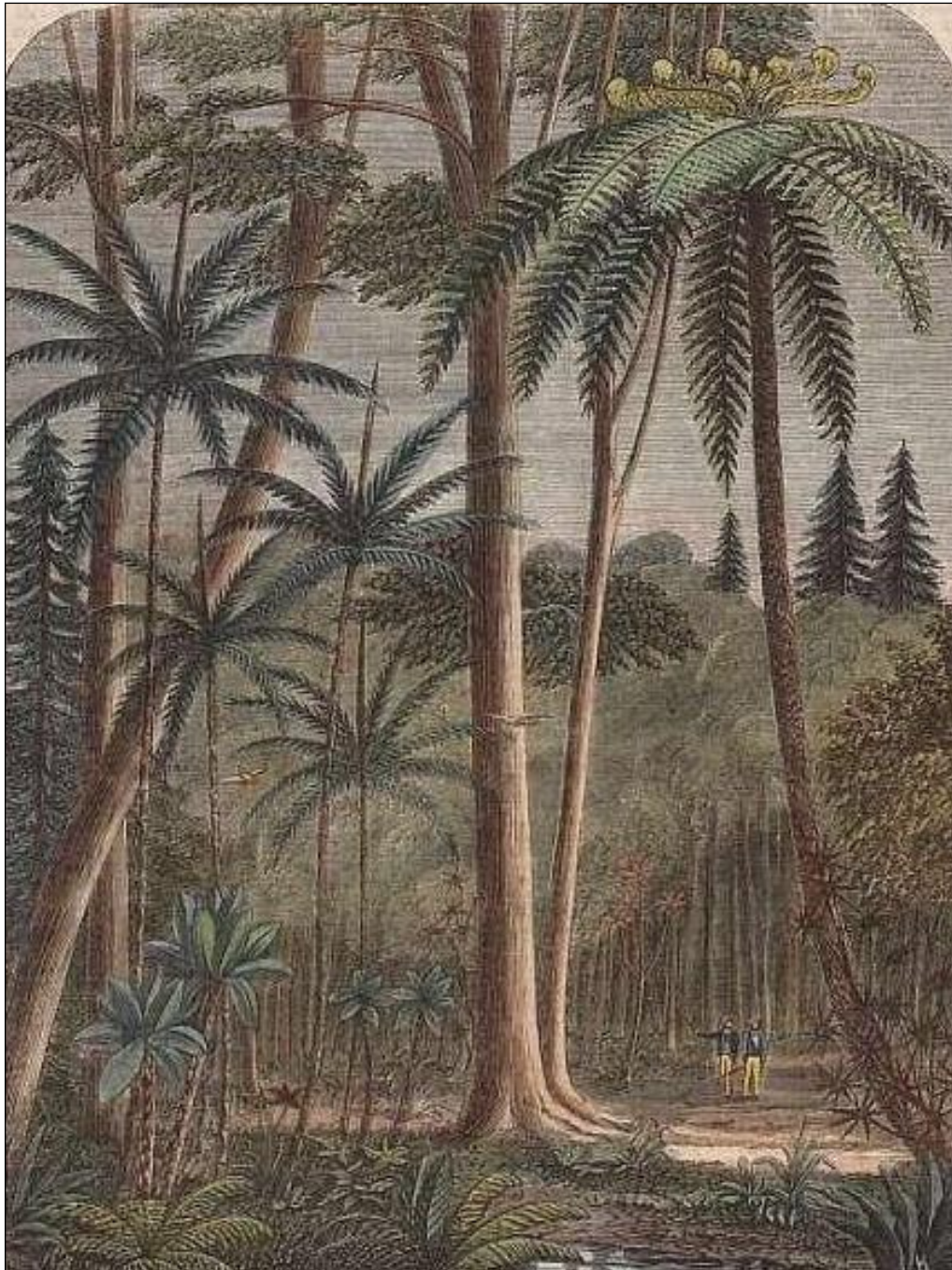
Some sixty years were to elapse following the visits of Maiden and Laing before any further detailed investigation of the flora was carried out. The English botanist Peter Shaw Green (1920-2009) took an interest in the botany of the island and began writing about it in the 1980s to 1990s. He produced various taxonomic papers describing the plants on the island. The most recent comprehensive flora for the Norfolk Island Group is that prepared by Peter Green, and published as part of the *Flora of Australia* Series; this was Volume 29 Oceanic Islands 1. That publication provided a most comprehensive treatment of the plants of the island, including all of the known naturalised plants.

Around the time the Green was working on the plants, other botanists and naturalists on and off the island were investigating the plants. This work assisted Green in his task and added much new information on the island's plants, as the previous work by Maiden and Laing was over 60 years previously. Names such as Owen and Beryl Evans and Ruurd Dirk Hoogland are remembered in some of the plants named around that time, *Senecio evansianus* and *S. hooglandii*.

The study of the flora of Norfolk Island has continued since 1994, with various Australian, New Zealand and local islanders contributing to botanical knowledge. One area of knowledge that has expanded greatly in recent times is the appreciation of the number of naturalised species that have become established on the island (e.g. Mills 2007; Lepschi, Collins & Cowley 2014).

Newly recognised endemic species have also been described following taxonomic studies, the species having previously been included in more widespread species. Examples are *Streblus pendulinus*, separated from *S. brunonianus* (Conn 2015), and distinction of *Taeniophyllum norfolkianum* from *T. muelleri* (Jones & Gray 2006).

The currently recognised number of plant species on the Norfolk Island Group is 180 indigenous and about twice this number of naturalised species, representing a considerable increase in the total number of species covered in the 1994 *Flora*.



**Figure 3. A coloured version of the sketch of the forest on Norfolk Island made in 1835.**

This same scene as a black and white drawing that appeared in Backhouse's 1843 book *A Narrative of a Visit to the Australian Colonies*. Several of the island's distinctive plants can readily be identified in the sketch, which appears to be lowland rainforest (note what may be two peaks in the background). These are *Meryta latifolia* (lower left), *Rhopalostylis baueri* (palm), *Cyathea brownii* (tree fern), *Ptisana salicina* (front centre), *Cordyline obtecta* (lower rear), *Araucaria heterophylla* (middle right) and *Freycinetia baueriana* (lower right, climbing on base of tree fern). The large trees are most likely *Celtis paniculata* or *Lagunaria patersonia*, both common trees in the lowland rainforest.

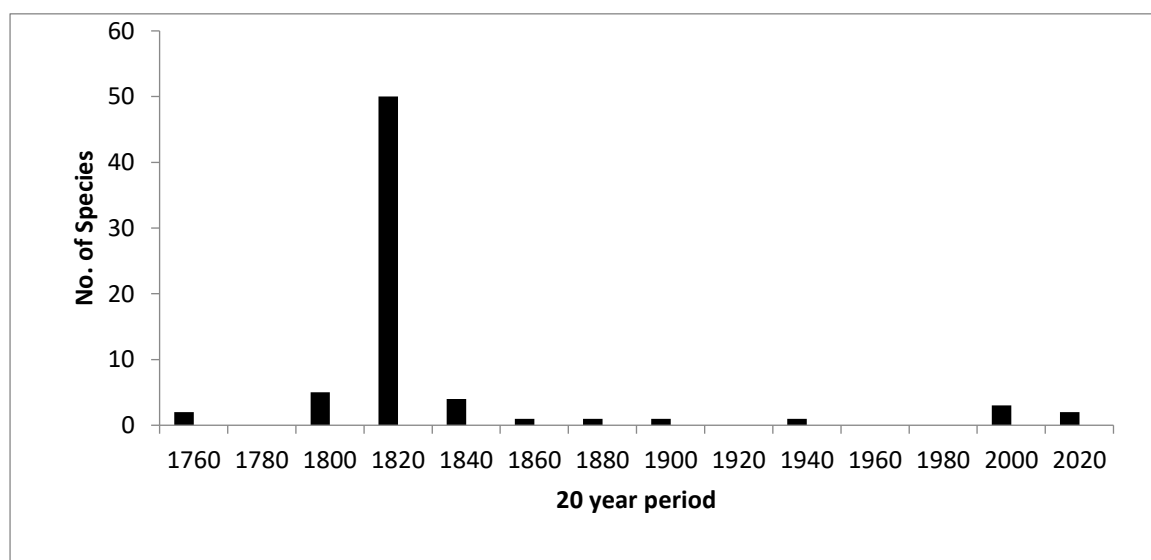


### 3 THE INDIGENOUS FLORA

The current *Flora* for Norfolk Island was published in 1994 (Green 1994). Since that time much work has been carried out on identifying the naturalised flora of the island and many new introductions have been identified on the island. A few taxonomic changes have been made to the indigenous flora since 1994 and several new endemic species described. While recognising the importance of the introduced flora in the ecology of the island, which is double the number of species in the indigenous flora, this section deals only with the indigenous flora.

#### Naming the Flora

The first plant to be named from Norfolk Island was by the Forsters, father and son, who travelled to the island with James Cook in October 1774. The species was the non-endemic tropical tree *Zanthoxylon pinnatum*, originally named *Blackburnia pinnata* by the Forsters in 1775. The majority of the endemic species and several other more widespread species were named by Endlicher in 1833; these amounted to 72 taxa or 40 percent of the indigenous flora; see **Figure 4**. The endemic species number 44 taxa or 24 percent of the total indigenous flora, not an unusually high percentage for a remote island.



**Figure 4. Naming of endemic taxa and ‘type’ taxa found on Norfolk Island.**

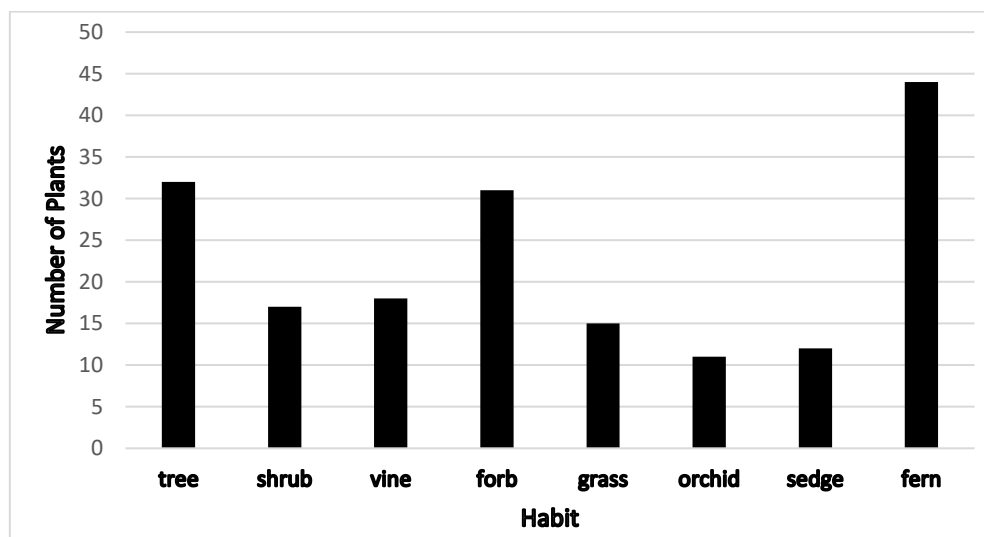
As more investigation is carried out on the flora of the island and elsewhere, taxonomic changes are being made; for example, the two endemic species noted above and the treatment of the fern family Blechnaceae by de Gasper *et al.* (2016) have meant recent changes to the names of the local plants.

## The Indigenous Plant List

The indigenous plant list provided at **Appendix 1** was updated in late 2018, based on the names used in the Australian Plant Census (APC), maintained by the Australian National Botanic Gardens, Canberra, Australia. The number of indigenous island species based on growth habit is presented in **Table 1**; this same information is expressed graphically in **Figure 5**.

<b>Growth Habit</b>	<b>No.</b>	<b>Percent</b>	<b>Endemic</b>	<b>Threatened</b>
Trees	32	18%	14	15
Shrubs	17	9%	10	10
Vines/Creepers	18	10%	3	3
Forbs	31	17%	5	5
Grasses	15	8%	-	1
Orchids	11	6%	4	4
Sedges/Rushes	12	7%	1	-
Ferns	44	24%	7	8
Total Flora	180	100%	44	46

The ferns, with 44 species or 24 percent of the total flora, is the largest plant group; 14 species are described from Norfolk Island (i.e. type specimens were gathered on that island). Seven species or 16 percent of the ferns are endemic taxa. Ferns are spread by spores that can be blown very long distances, which explains (i) the relatively high number of species, and (ii) the reason for the low number of endemic ferns.



**Figure 5. Number of indigenous plant species on Norfolk Island by growth habit.**

There have been eight known plant extinctions from Norfolk; three species are extinct while five species occur elsewhere. The extinct species are *Solanum bauerianum*, *Streblorrhiza speciosa* and, if accepted as endemic, a species of *Corybus* (*Nematoceras*).

## Conservation - Plant Species

A total of 46 plant taxa, 26 percent of the indigenous flora of the island, is listed as threatened under the *Environment Protection and Biodiversity Conservation Act, 1999* (Commonwealth of Australia) (EPBC Act). The number of taxa within plant groups is set out in **Table 1**. One endemic species, *Streblorrhiza speciosa* (Fabaceae), is extinct on the island but is not listed under the EPBC Act.

As can be seen in **Table 1**, there is a high percentage of both trees and shrubs that are listed as threatened species; i.e. both representing over 50 percent of all species in each plant group. These are also the same two plant groups that have a high endemic component; see **Table 1**.

The 12 endemic species not listed as threatened are, with the exception of the extinct *Streblorrhiza speciosa*, all quite common on the island, for example *Araucaria heterophylla*, *Cyathea brownii*, *Korthalsella disticha* and *Dendrobium macropus*.

The most important taxa are two mono-specific species where the genera are endemic to the island, namely the extinct *Streblorrhiza speciosa* (Fabaceae) and the locally common tree *Ungeria floribunda* (Malvaceae).

The threat categories for each listed threatened species are stated in the last column of the list at **Appendix 1**. Each category has a specific definition under the EPBC Act. These categories are defined below in **Table 2**, which also provides several examples of Norfolk Island species in each category.

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**Table 2**  
**EPBC threat categories, definitions and examples from Norfolk Island**

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Category	Definition	Example
Critically Endangered	"facing an extremely high risk of extinction in the wild in the immediate future"	<i>Achyranthes arborescens</i> <i>Hibiscus insularis</i> <i>Wikstoemia australis</i> <i>Calystegia affinis</i>
Endangered	"facing a very high risk of extinction in the wild in the near future"	<i>Marattia salicina</i> <i>Pennantia endlicheri</i> <i>Coprosma pilosa</i> <i>Zehneria baueriana</i>
Vulnerable	"facing a high risk of extinction in the wild in the medium-term future"	<i>Tmesipteris norfolkensis</i> <i>Meryta angustifolia</i> <i>Myrsine ralstoniae</i> <i>Taeniophyllum norfolkianum</i>

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*Achyranthes arborescens*  
Tree, endemic and critically endangered.



*Coprosma baueri*  
Shrub, endemic and endangered.



*Pteris zahlbruckneriana*  
Fern, endemic and endangered.



*Taeniophyllum norfolkianum*  
Orchid, endemic and vulnerable.



*Boehmeria australis* subsp. *australis*  
Tree, endemic subspecies, critically endangered.



*Calystegia affinis*  
Creeper, indigenous and critically endangered

**Figure 6. Examples of threatened plant species.**

## **Conservation - Plant Communities**

### **Conservation - Plant Communities**

The plant communities that are found on Norfolk Island have evolved over the past 2.5 to 3 million years. While close relationships exist between the island's flora and that of the closest land masses, the combination of species and the presence of a high proportion of endemic species represent a unique flora and unique plant communities. The earliest European observations described a thick rainforest covering the whole island; clearly subtropical rainforest was originally the dominant type of vegetation on the island. Within this broad category, the character of the rainforest varies across the island, depending upon altitude, rainfall, nearest to the sea and probably soil types.

A preliminary identification of plant community types for Norfolk Island is presented in the next section of the report.

## **4 PREMININARY PLANT COMMUNITY IDENTIFICATION**

### **Previous Mapping**

There is no island wide map of the extant vegetation occurring on Norfolk Island. A vegetation map, prepared quite some time ago, does exist for the Norfolk Island National Park and a map of the native forest in the Forestry Section of the Park has been prepared.

The public reserves were investigated by Mills (2017), who prepared some basic maps of the locations containing native vegetation.

Maps of the vegetation cover on Phillip Island have been prepared for several years, as the island recovers from denudation by introduced feral animals (Mills 2009; Mills et al. 2015).

### **Preliminary Identification of Plant Communities**

A preliminary list of plant community types has been prepared and is provided in Appendix 2. This list may not transpire as the final mapping units used in the project, but are presented as a starting point for further discussion.

## **5 THE NEXT STEP**

The first steps in the mapping project require careful consideration as these are critical to how the project will progress and meet its aims. The following are offered as initial considerations for starting of project in November 2018:

1. Review existing mapping (geology, soils, topography, vegetation) and what use can be made of this.
  2. Identify plant community types and those that will be used as mapping units.
  3. Test the use of the mapping units on several sites.
  4. Finalise mapping units and produce a field guide.
  5. Prepare base map (aerial) for mapping purposes.
  6. Prepare field maps.
  7. Undertake local publicity about the project and encourage participation by the community.
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**APPENDIX 1**  
**LIST OF INDIGENOUS PLANT SPECIES FOR NORFOLK ISLAND GROUP**  
**WITH UPDATED TAXONOMY AS AT SEPTEMBER 2018**

Kevin Mills, Jamberoo, NSW.

**PLANT GROUP/FAMILY**

<b>Species</b>	<b>Common Name</b>	<b>Habit</b>	<b>Abundance</b>	<b>Status<sup>1</sup></b>
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Notes:

1. Status under the *EPBC Act 1999* given as: C.End. - critically endangered; End. - endangered; Vul. - vulnerable.

Nomenclature generally follows Australian Plant Census, with some recent changes not incorporated therein.

No. of indigenous taxa listed = 180 (includes 8 extinct taxa). Endemic taxa shown in **bold** = 44 (24% of all taxa).

Taxa underlined have type specimen from Norfolk Island Group = 72 (40% of all taxa).

**CONIFERS**

ARAUCARIACEAE

<u><i>Araucaria heterophylla</i></u> (Salisb.) Franco	Norfolk Island Pine	Tree	Abundant	-
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**PTERIDOPHYTA (Ferns and Fern Allies)**

ASPLENIACEAE

<i>Asplenium australasicum</i> (J.Sm.) Hook.f. <i>australasicum</i>	Birds Nest Fern	Fern	uncommon	-
<i>Asplenium australasicum</i> (J.Sm.) Hook.f. <u><i>robinsonii</i></u> (F.Muell.) P.S.Green	Crispy Birds Nest Fern	Fern	in cultivation	-
<i>Asplenium difforme</i> R.Br.	Coastal Fern	Fern	mod. Common	-
<b><u><i>Asplenium dimorphum</i></u></b> Kunze	Twofrond Fern	Fern	common	-
<i>Asplenium polyodon</i> G.Forst.	Sicklefern	Fern	uncommon	-

BLECHNACEAE

<i>Austroblechnum norfolkianum</i> (Heward) Gasper & V.A.O.Dittrich	Norfolk Island Water Fern	Fern	uncommon	End.
<i>Doodia aspera</i> R.Br.	Prickly Rasp Fern	Fern	rare	-
<i>Doodia australis</i> (Parris) Parris	Common Rasp Fern	Fern	abundant	-

CYATHEACEAE

<i>Cyathea australis</i> (R.Br.) Domin <b><u>ssp. norfolkensis</u></b> Holttum	Rough Tree Fern	Fern	uncommon	-
<b><u><i>Cyathea brownii</i></u></b> Domin	Norfolk Island Tree Fern	Fern	abundant	-

PLANT GROUP/FAMILY Species	Common Name	Habit	Abundance	Status <sup>1</sup>
<b>DENNSTAEDTIACEAE</b>				
<i>Histiopteris incisa</i> (Thunb.) J.Sm.	Bats-wing Fern	Fern	rare	-
<i>Hypolepis dicksonioides</i> (Endl.) Hook.	Ground Fern	Fern	rare	Vul.
<i>Hypolepis tenuifolia</i> (G.Forst.) Bernh. ex C.Presl.	Ground Fern	Fern	rare	-
<i>Pteridium esculentum</i> (G.Forst.) Cockayne	Bracken	Fern	uncommon	-
<b>DRYOPTERIDACEAE</b>				
<i>Arachniodes aristata</i> (G.Forst.) Tindale	Prickly Shieldfern	Fern	abundant	-
<i>Lastreopsis calantha</i> (Endl.) Tindale	Shieldfern	Fern	uncommon	End.
<b>GLEICHENIACEAE</b>				
<i>Dicranopteris linearis</i> (Burm.f.) Underw.	Dicranopteris	Fern	rare	-
<b>HYMENOPHYLLACEAE</b>				
<i>Cephalomanes bauerianum</i> (Endl.) P.S.Green	Large Filmy Fern	Fern	rare	-
<i>Crepidomanes saxifragoides</i> (C.Presl.) P.S.Green	Small Filmy Fern	Fern	rare	-
<i>Polyphlebium endlicherianum</i> (C.Presl.) Ebihara & K.Iwats.	Middle Filmy Fern	Fern	rare	End.
<b>LOMARIOPSIDACEAE</b>				
<i>Nephrolepis flexuosa</i> Colenso	Pop Rock Fern	Fern	rare	-
<b>LYCOPODIACEAE</b>				
<i>Lycopodiella cernua</i> (L.) Pic.Serm.	Scrambling Clubmoss	Fern	rare	-
<b>MARATTIACEAE</b>				
<i>Ptisana salicina</i> (Sm.) Murdock	King Fern	Fern	uncommon	End.
<b>OPHIOGLOSSACEAE</b>				
<i>Ophioglossum reticulatum</i> L.	Adders Tongue	Fern	rare	-
<b>POLYPODIACEAE</b>				
<i>Microsorium pustulatum</i> (G.Forst.) Copel. ssp. <i>pustulatum</i>	Kangaroo Fern	Fern	abundant	-
<i>Pyrrosia confluens</i> (R.Br.) Ching ssp. <i>confluens</i>	Felt Fern	Fern	abundant	-

PLANT GROUP/FAMILY Species	Common Name	Habit	Abundance	Status <sup>1</sup>
<b>PSILOTACEAE</b>				
<i>Psilotum nudum</i> (L.) P.Beauv.	Skeleton Forkfern	Fern	uncommon	-
<i>Tmesipteris norfolkensis</i> P.S.Green	Hanging Forkfern	Fern	uncommon	Vul.
<b>PTERIDACEAE</b>				
<i>Adiantum diaphanum</i> Blume	Threefrond Maidenhair Fern	Fern	common	-
<i>Adiantum hispidulum</i> Sw. var. <i>pubescens</i> (Schkuhr) Large & Braggins	Rough Maidenhair	Fern	abundant	-
<i>Cheilanthes distans</i> (R.Br.) Mett.	Bristly Cloakfern	Fern	uncommon	-
<i>Cheilanthes sieberi</i> Kunze	Mulga Fern	Fern	rare	-
<i>Pellaea rotundifolia</i> (G.Forst.) Hook.	Button Fern	Fern	rare	-
<i>Pteris kingiana</i> Endl.	King's Brakefern	Fern	uncommon	End.
<i>Pteris tremula</i> R.Br.	Tender Brakefern	Fern	mod. common	-
<i>Pteris zahlbruckneriana</i> Endl.	Netted Brackefern	Fern	uncommon	End.
<i>Vittaria elongata</i> Sw.	Tape Fern	Fern	uncommon	-
<b>TECTARIACEAE</b>				
<i>Arthropteris tenella</i> (G.Forst.) J.Sm. ex Hook.f.	Climbing Fern	Fern	abundant	-
<b>THELYPTERIDACEAE</b>				
<i>Christella dentatus</i> (Forssk.) Brownsey & Jermy.	Binung	Fern	abundant	-
<i>Christella parasiticus</i> (L.) H.Lev	Christella	Fern	mod. common	-
<i>Macrothelypteris torresiana</i> (Gaudich.) Ching	-	Fern	rare	-
<b>WOODSIACEAE</b>				
<i>Deparia petersenii</i> (Kunze) M.Kato ssp. <i>congrua</i> (Brack.) M.Kato	Deparia	Fern	rare	-
<i>Diplazium assimile</i> (Endl.) Bedd.	Upside-Down Fern	Fern	rare	-
<i>Diplazium australe</i> (R.Br.) N. A. Wakef.	Large Upside-Down Fern	Fern	uncommon	-

PLANT GROUP/FAMILY Species	Common Name	Habit	Abundance	Status <sup>1</sup>
<b>ANGIOSPERMS - Dicotyledons</b>				
<b>AIZOACEAE</b>				
<i>Carpobrotus glaucescens</i> (Haw.) Schwantes	Pigface	Herb	abundant	-
<i>Tetragonia implexicoma</i> (Miq.) Hook.f.	Native Spinach	Herb	common	-
<i>Tetragonia tetragonoides</i> (Pall.) Kunze	Native Spinach	Herb	abundant	-
<b>AMARANTHACEAE</b>				
<b><i>Achyranthes arborescens</i></b> R.Br.	Soft Wood, Chaff Tree	Tree	uncommon	C.End.
<i>Achyranthes aspera</i> L.	Chaff-flower	Herb	abundant	-
<b><i>Achyranthes margaretarum</i></b> de Lange	Phillip Island Chaff-flower	Shrub	rare	C.End.
<i>Alternanthera nahui</i> Heenan & de Lange				
<b>APOCYNACEAE</b>				
<b><i>Alyxia gynopogon</i></b> Roem. & Schult.	Evergreen	Shrub	abundant	-
<b><i>Melodinus baueri</i></b> Endl.	Big Creeper	Vine	abundant	-
<i>Tylophora biglandulosa</i> (Endl.) F.Muell.	Hoya	Vine	uncommon	-
<b>ARALIACEAE</b>				
<i>Delarbrea paradoxa</i> Veill. (indigenous?)	Delarbrea	Tree	rare	-
<b><i>Meryta angustifolia</i></b> (Endl.) Seem.	Narrow-leaved Meryta	Tree	abundant	Vul.
<b><i>Meryta latifolia</i></b> (Endl.) Seem.	Broad-leaved Meryta	Tree	uncommon	C.End.
<b>ASTERACEAE</b>				
<i>Cotula australis</i> (Sieber ex Spreng.) Hook.f.	Common Cotula	Herb	common	-
<i>Euchiton involucratus</i> (G.Forst.) Holub	Star Cudweed	Herb	uncommon	-
<i>Euchiton sphaericus</i> (Willd.) Holub	Cudweed	Herb	uncommon	-
<i>Pseudognaphalium luteoalbum</i> (L.) Hilliard & B.L.Burt.	Jersey Cudweed	Herb	uncommon	-
<b><i>Senecio australis</i></b> Willd.	Yellow Daisy	Herb	uncommon	Vul.
<b><i>Senecio evansianus</i></b> Belcher	Yellow Daisy	Herb	rare	End.
<b><i>Senecio hooglandii</i></b> Belcher	Yellow Daisy	Herb	uncommon	Vul.
<i>Wollastonia uniflora</i> (Willd.) Orchard	Mile-a-Minute	Herb	abundant	-

PLANT GROUP/FAMILY Species	Common Name	Habit	Abundance	Status <sup>1</sup>
CAMPANULACEAE				
<i>Lobelia anceps</i> L. f.	Lobelia	Herb	common	-
<i>Wahlenbergia gracilis</i> (G.Forst.) A.DC.	Bluebell	Herb	rare	-
<i>Wahlenbergia vernicosa</i> J.A.Petterson	Bluebell	Herb	rare	-
CANNABACEAE				
<i>Celtis paniculata</i> (Endl.) Planch.	Whitewood	Tree	common	-
CAPPARACEAE				
<i>Capparis nobilis</i> (Endl.) F.Muell. ex Benth.	Devil's Guts	Vine	abundant	-
CELASTRACEAE				
<i>Elaeodendron curtispiculum</i> Endl.	Maple	Tree	abundant	-
CHENOPODIACEAE				
<i>Sarcocornia quinqueflora</i> (Bunge ex Ung.-Strenb.) A.J.Scott ssp. <i>quinqueflora</i>	Samphire	Herb	rare	-
CONVOLVULACEAE				
<i>Calystegia affinis</i> Endl.	Bindweed	Creeper	rare	C.End.
<i>Calystegia soldanella</i> (L.) Roem. & Schult.	Beach Calystegia	Creeper	rare	-
<i>Dichondra repens</i> J.R.Forst & G.Forst.	Kidney Weed	Herb	uncommon	-
<i>Ipomoea pes-caprae</i> (L.) R.Br. ssp. <i>brasiliensis</i> (L.) Ooststr.	Goats-foot Morning Glory	Creeper	uncommon	-
CUCURBITACEAE				
<i>Diplocyclos palmatus</i> (L.) C.Jeffrey ssp. <i>affinis</i> (Endl.) P.S.Green	Native Cucumber	Creeper	rare	-
<i>Sicyos australis</i> Endl. (extinct on island)	Star Cucumber	Creeper	extinct	-
<i>Zehneria baueriana</i> Endl.	Native Cucumber	Creeper	abundant	End.
EUPHORBIACEAE				
<i>Baloghia inophylla</i> (G.Forst.) P.S.Green	Bloodwood	Tree	abundant	-
<i>Euphorbia norfolkiana</i> Boiss.	Norfolk Island Euphorbia	Shrub	rare	C.End.
<i>Euphorbia obliqua</i> Endl.	Spurge	Herb	uncommon	Vul.

PLANT GROUP/FAMILY Species	Common Name	Habit	Abundance	Status <sup>1</sup>
<i>Excoecaria agallocha</i> L.	Melky Tree	Tree	uncommon	-
FABACEAE				
<i>Caesalpinia bonduc</i> (L.) Roxb. (extinct on island)	Tartary Maw	Vine	extinct	-
<i>Callerya australis</i> (Endl.) Schot	Samson's Sinews	Vine	uncommon	-
<i>Canavalia rosea</i> (Sw.) DC.	Norfolk Island Bean	Creeper	uncommon	-
<b><i>Streblorrhiza speciosa</i></b> Endl. (extinct)	Phillip Island Glory Pea	Shrub	extinct	-
<i>Vigna marina</i> (Burm.) Merr.	Coastal Bean	Creeper	uncommon	-
LAMIACEAE				
<i>Vitex trifolia</i> L. var. <i>trifolia</i> (extinct on island)	Coastal Vitex	Shrub	extinct	-
LORANTHACEAE				
<i>Ileostylus micranthus</i> (Hook.f.) Tiegh.	Mistletoe	Shrub	uncommon	Vul.
MALVACEAE				
<b><i>Abutilon julianae</i></b> Endl.	Norfolk Island Abutilon	Shrub	rare	C.End.
<i>Hibiscus diversifolius</i> Jacq.	Swamp Hibiscus	Shrub	rare	-
<b><i>Hibiscus insularis</i></b> Endl.	Phillip Island Hibiscus	Shrub	rare	C.End.
<i>Hibiscus tiliaceus</i> L.	Pulau	Tree	rare	-
<i>Lagunaria patersonia</i> (Andrews) G.Don.	White Oak	Tree	abundant	-
<b><i>Ungeria floribunda</i></b> Schott. & Endl.	Bastard Oak	Tree	uncommon	Vul.
MELIACEAE				
<i>Dysoxylum bijugum</i> (Labill.) Seem.	Sharkwood	Tree	abundant	Vul.
MORACEAE				
<b><i>Streblus pendulinus</i></b> (Endl.) F.Muell.	Siah's Backbone	Tree	uncommon	End.
NYCTAGINACEAE				
<i>Pisonia brunoniana</i> Endl.	Wai-wai, Birdcatcher	Tree	rare	-

PLANT GROUP/FAMILY Species	Common Name	Habit	Abundance	Status <sup>1</sup>
OLEACEAE				
<i>Jasminum simplicifolium</i> G.Forst. ssp. <i>australiense</i> P.S.Green	Jasmine	Vine	abundant	-
<i>Nestegis apetala</i> (Vahl.) L.A.S.Johnson	Ironwood	Tree	abundant	-
OXALIDACEAE				
<i>Oxalis exilis</i> A.Cunn.	Oxalis	Herb	rare	-
PASSIFLORACEAE				
<i>Passiflora aurantia</i> G.Forst. var. <i>pubescens</i> F. M. Bailey	Norfolk Island Passionfruit	Vine	uncommon	-
PENNANTIACEAE				
<b><i>Pennantia endlicheri</i></b> Reissek	Pennantia	Tree	common	End.
PIPERACEAE				
<i>Macropiper excelsum</i> (G.Forst.) Miq. ssp. <i>psittacorum</i> (Endl.) Sykes	Pepper Tree	Shrub	abundant	-
<i>Peperomia tetraphylla</i> Hook. & Arn.	Four-leaved Peperomia	Herb	uncommon	-
<i>Peperomia urvilleana</i> A.Rich	Two-leaved Peperomia	Herb	uncommon	-
PITTOSPORACEAE				
<b><i>Pittosporum bracteolatum</i></b> Endl.	Oleander	Tree	abundant	Vul.
PLUMBAGINACEAE				
<i>Plumbago zeylanica</i> L.	Native Plumbago	Shrub	rare	-
POLYGONACEAE				
<i>Muehlenbeckia australis</i> (G.Forst.) Meisn.	Shrubby Creeper	Creeper	common	End.
<i>Persicaria decipiens</i> (R.Br.) K.L. Wilson	Slender Knotweed	Herb	uncommon	-
PRIMULACEAE				
<b><i>Myrsine ralstoniae</i></b> (P.S.Green) Jackes	Beech	Tree	abundant	Vul.
<i>Samolus repens</i> (J.R.Forst. & G.Forst.) Pers.	Creeping Brookweed	Herb	uncommon	-

PLANT GROUP/FAMILY Species	Common Name	Habit	Abundance	Status <sup>1</sup>
RANUNCULACEAE				
<u><i>Clematis dubia</i></u> (Endl.) P.S.Green	Norfolk Island Clematis	Creepers	uncommon	C.End.
RUBIACEAE				
<u><i>Coprosma baueri</i></u> Endl.	Coastal Coprosma	Shrub	uncommon	End.
<u><i>Coprosma pilosa</i></u> Endl.	Mountain Coprosma	Tree	uncommon	End.
RUTACEAE				
<u><i>Melicope littoralis</i></u> (Endl.) T.G.Hartley	Shade Tree	Tree	uncommon	Vul.
<u><i>Sarcomelicope simplicifolia</i></u> (Endl.) T.G.Hartley ssp. <i>simplicifolia</i>	Big Yellow Wood	Tree	uncommon	-
<u><i>Zanthoxylum pinnatum</i></u> (J. R. Forst. & G. Forst.) W. R. B. Oliv.	Little Yellow Wood	Tree	rare	-
SANTALACEAE				
<u><i>Exocarpos phyllanthoides</i></u> Endl. var. <i>phyllanthoides</i>	Isaacwood	Tree	uncommon	-
<u><i>Korthalsella disticha</i></u> (Endl.) Engl.	Mistletoe	Herb	common	-
SAPINDACEAE				
<i>Dodonaea viscosa</i> Jacq. ssp. <i>viscosa</i>	Tea-tree	Shrub	abundant	-
SAPOTACEAE				
<u><i>Planchonella costata</i></u> (Endl.) Pierre	Bastard Ironwood	Tree	uncommon	End.
SCROPHULARIACEAE				
<u><i>Myoporum obscurum</i></u> Endl.	Popwood	Tree	rare	C.End.
SOLANACEAE				
<i>Solanum aviculare</i> G.Forst. (extinct on island)	Kangaroo Apple	Shrub	extinct	-
<u><i>Solanum bauerianum</i></u> Endl. (extinct)	Bridal Flower	Shrub	extinct	-
<u><i>Solanum laciniatum</i></u> Aiton (extinct on island)	Large-flower Kangaroo Apple	Shrub	extinct	-
THYMELAEACEAE				
<u><i>Wikstroemia australis</i></u> Endl.	Kurrajong	Tree	uncommon	C.End.



PLANT GROUP/FAMILY Species	Common Name	Habit	Abundance	Status <sup>1</sup>
URTICACEAE				
<i>Boehmeria australis</i> Endl. <b>ssp. <u>australis</u></b>	Nettle tree	Tree	uncommon	C.End.
<i>Elatostema montanum</i> Endl.	Mountain Procris	Herb	rare	C.End.
<i>Parietaria debilis</i> (Nees) Blume	Pellitory	Herb	uncommon	-
VIOLACEAE				
<i>Melicytus latifolius</i> (Endl.) P.S.Green	Norfolk Island Mahoe	Tree	common	C.End.
<i>Melicytus ramiflorus</i> J.R.Forst & G.Forst. <b>ssp. <u>oblongifolius</u></b> (A.Cunn. ex Heward) P.S.Green	Whiteywood	Tree	uncommon	Vul.
<i>Viola betonicifolia</i> Sm. <i>ssp. novaguineensis</i> D.M.Moore	Wild Violet	Herb	uncommon	-
AMARYLLIDACEAE				
<i>Crinum pedunculatum</i> R.Br.	Swamp Lily	Herb	rare	-
<b>ANGIOSPERMS - Monocotyledons</b>				
ARECACEAE				
<i>Rhopalostylis baueri</i> (Seem.) H.Wendl & Drude	Palm	Tree	abundant	-
ASPARAGACEAE				
<i>Cordyline obtecta</i> (Graham) Baker	Ti	Tree	abundant	Vul.
COMMELINACEAE				
<i>Commelina cyanea</i> R.Br.	Forget-Me-Not	Herb	abundant	-
CYPERACEAE				
<i>Bolboschoenus fluviatilis</i> (Torr.) Sojak	Marsh Club-rush	Sedge	rare	-
<i>Carex breviculmis</i> R.Br.	Sedge	Sedge	rare	-
<i>Carex inversa</i> R.Br.	Common Sedge	Sedge	common	-
<i>Carex neesiana</i> Endl.	Norfolk Island Carex	Sedge	common	-
<i>Cyperus lucidus</i> R.Br.	Moo-oo Grass	Sedge	abundant	-
<i>Eleocharis acuta</i> R.Br.	Common Spike-rush	Sedge	rare	-

PLANT GROUP/FAMILY Species	Common Name	Habit	Abundance	Status <sup>1</sup>
<i>Ficinia nodosa</i> (Rottb.) Goetgh., Muasya & D.A.Simpson	Knobby Club-rush	Sedge	abundant	-
<i>Isolepis inundata</i> R. Br.	Club-rush	Sedge	rare	-
<i>Isolepis cernua</i> (Vahl) Roem. & Schult.	Nodding Club-rush	Sedge	rare	-
<i>Schoenoplectus tabernaemontani</i> (C.C.Gmel.) Palla	River Club-rush	Sedge	uncommon	-
HEMEROCALLIDACEAE				
<b><i>Dianella intermedia</i></b> Endl.	Dianella	Herb	common	-
<i>Geitonoplesium cymosum</i> (R.Br.) A.Cunn. ex R. Br.	Scrambling Lily	Creeper	uncommon	-
<i>Phormium tenax</i> J.R.Forst & G.Forst.	Flax	Herb	abundant	-
JUNCACEAE				
<i>Juncus continuus</i> L.A.S.Johnson	Rush	Rush	uncommon	-
ORCHIDACEAE				
<b><i>Bulbophyllum argyropus</i></b> (Endl.) Roch.f. ( <i>Adelopetalum argyropus</i> )	One-leaf Orchid	Orchid	rare	-
<b><i>Dendrobium brachypus</i></b> (Endl.) Roch.f. ( <i>Thelyphyton brachypus</i> )	Short-caned Orchid	Orchid	rare	End.
<b><i>Dendrobium macropus</i></b> (Endl.) Roch.f. <b>ssp. <i>macropus</i></b> ( <i>Thelyphyton macropus</i> )	Long-caned Orchid	Orchid	common	-
<i>Microtis unifolia</i> (G.Forst.) Rchb.f. ( <i>Ophrys unifolia</i> )	Onion Orchid	Orchid	rare	-
<i>Corybas</i> ( <i>Nematoceras</i> ) ? <i>acuminatum</i> M.A.Clem. & Hatch. (extinct)	Spider Orchid	Orchid	extinct	-
<i>Oberonia titania</i> Lindl.	Norfolk Island Oberonia	Orchid	rare	-
<b><i>Phreatia limenophylax</i></b> (Endl.) Benth.	Norfolk Island Phreatia	Orchid	rare	C.End.
<i>Phreatia paleata</i> (Rchb.f.) Rchb.f. ex Kraenzl.	Phreatia	Orchid	uncommon	End.
<b><i>Taeniophyllum norfolkianum</i></b> D.L.Jones, B.Gray & M.A.Clem.	Minute Orchid	Orchid	common	Vul.
<i>Thelymitra longifolia</i> J.R.Forst. & G.Forst.	Sun Orchid	Orchid	rare	-
<i>Tropidia viridifusca</i> Kraenzl.	Ground Orchid	Orchid	uncommon	-
PANDANACEAE				
<b><i>Freycinetia baueriana</i></b> Endl.	Mountain Rush	Shrub	common	-

PLANT GROUP/FAMILY				
Species	Common Name	Habit	Abundance	Status <sup>1</sup>
POACEAE				
<i>Anthosachne multiflora</i> (Banks & Sol. ex Hook.f.) C.Yen & J.L.Tang				
subsp. <i>kingiana</i> (Endl.) Barkworth & S.W.L.Jacobs	Phillip Island Wheatgrass	Grass	rare	C.End.
<i>Cenchrus caliculatus</i> Cav.	Hillside Burr-grass	Grass	rare	-
<i>Cymbopogon refractus</i> (R.Br.) A.Camus	Barbwire Grass	Grass	uncommon	-
<i>Dichelachne crinita</i> (L.f.) Hook.f.	Longhair Plume-grass	Grass	uncommon	-
<i>Dichelachne micrantha</i> (Cav.) Domin	Shorthair Plume-grass	Grass	common	-
<i>Digitaria setigera</i> Roth ex Roem. & Schult.	Panic Grass	Grass	rare	-
<i>Echinopogon ovatus</i> (G.Forst.) P.Beauv.	Forest Hedgehog Grass	Grass	rare	-
<i>Lachnagrostis filiformis</i> (G.Forst.) Trin.	Blown Grass	Grass	uncommon	-
<i>Lepturus repens</i> (G.Forst.) R.Br.	Lepturus	Grass	rare	-
<i>Microlaena stipoides</i> (Labill.) R.Br. var. <i>stipoides</i>	Weeping Grass	Grass	uncommon	-
<i>Oplismenus hirtellus</i> (L.) P.Beauv.	Basket Grass	Grass	abundant	-
<i>Panicum effusum</i> R.Br.	Hairy Panic	Grass	rare	-
<i>Paspalum scrobiculatum</i> L.	Ditch Millet	Grass	rare	-
<i>Sporobolus virginicus</i> (L.) Kunth	Salt Couch	Grass	abundant	-
<i>Trisetum arduanum</i> Edgar & A.P.Druce	Bristle Grass	Grass	rare	-
TYPHACEAE				
<i>Typha orientalis</i> C.Presl.	Flags	Reed	uncommon	-

**APPENDIX 2**  
**PLANT COMMUNITIES ON NORFOLK ISLAND - A PRELIMINARY LIST**

<b>Group</b>	<b>Name</b>	<b>Key species</b>	<b>Secondary species</b>	<b>Occurrence</b>	<b>Significant plants</b>
<b>Native: Treed Vegetation</b>	Moist Upland Hardwood Forest	<i>Dysoxylon bijugum</i> <i>Myrsine ralstoniae</i> <i>Nestegis apetala</i> <i>Pittosporum</i> <i>bracteolatum</i>	<i>Araucaria</i> <i>heterophylla</i> <i>Meryta angustifolia</i> <i>Cordyline obtecta</i> <i>Ungeria floribunda</i> <i>Pennantia endlicheri</i>	Slopes and valley sides on the mountains.	<i>Wikstroemia australis</i> <i>Ungeria floribunda</i> <i>Coprosma pilosa</i> <i>Melicytus latifolia</i> <i>Lastreopsis calantha</i> <i>Melicope littoralis</i>
	Upland Pine Forest	<i>Araucaria heterophylla</i> As above	As above	Primarily ridges on the mountains.	<i>Wikstroemia australis</i> <i>Coprosma pilosa</i>
	Moist Palm Forest	<i>Rhopalostylis baueri</i> <i>Cyathea brownii</i>	<i>Cyathea australis</i> <i>Ptisana salicina</i> <i>Freycinetia baueriana</i>	Mountain valleys, floor and lower slopes, reaching highest ridge on southern side of mountains.	<i>Ptisana salicina</i> <i>Blechnum norfolkiana</i> <i>Polyphlebium endlicherianum</i> <i>Elatostema montanum</i> <i>Phreatia limenophylax</i>
	Lowland Viny Hardwood Forest	<i>Celtis paniculata</i> <i>Baloghia inophylla</i> <i>Planchonella costata</i> <i>Callerya australis</i>	<i>Achyranthes</i> <i>arborescens</i>	Mid-altitude valleys and slopes; primarily Mission Road area and up slope into the National Park.	<i>Achyranthes arborescens</i>
	Plateau Hardwood Forest	<i>Araucaria heterophylla</i> <i>Lagunaria patersonia</i> <i>Elaeodendron</i> <i>curtipendula</i>		Level topography, Steels Point and Duncombe Bay area	<i>Melicytus latifolia</i>

Group	Name	Key species	Secondary species	Occurrence	Significant plants
	Sheltered Coastal Forest	<i>Araucaria heterophylla</i> <i>Lagunaria patersonia</i> <i>Celtis paniculata</i> <i>Baloghia inophylla</i>	<i>Capparis nobilis</i> <i>Pteris kingiana</i> <i>Pisonia brunoniana</i>	Sheltered valleys and slopes just back from coast.	<i>Meryta latifolia</i> <i>Pteris kingiana</i> <i>Pisonia brunoniana</i> <i>Hypolepis tenuifolia</i> <i>Streblus brunonianus</i>
	Exposed Coastal Forest	<i>Araucaria heterophylla</i> <i>Lagunaria patersonia</i>	<i>Tetragonia implexicomis</i>	Exposed coastal cliffs and slopes.	<i>Euphorbia norfolkiana</i> <i>Senecio australis</i> <i>Coprosma baueri</i> <i>Excoecaria agallocha</i>
<b>Native: Treeless Vegetation</b>	White Oak Exposed Shrubland	<i>Lagunaria patersonia</i>	<i>Sporobolus virginicus</i> <i>Tetragonia implexicomis</i>	Exposed headlands.	<i>Senecio australis</i>
	Sandy Beach Herbland	<i>Sporobolus virginicus</i> <i>Ipomoea pes-caprae</i> <i>Wollastonia uniflora</i> <i>Spinifex hirsuta</i> *	<i>Tetragonia tetragonioides</i> <i>Ficinia nodosa</i>	Sandy beaches, Emily Bay, Cemetery Beach, Anson Bay.	<i>Euphorbia obliqua</i> <i>Ipomoea pes-caprae</i> <i>Vigna marina</i>
	Coastal Grassland	<i>Sporobolus virginicus</i> <i>Carpobrotus glaucescens</i> <i>Achyranthes aspera</i>	<i>Senecio australis</i> <i>Lobelia anceps</i>	Extensive on the lower coastal slopes down to high tide limit.	<i>Senecio australis</i>
	Moo-oo Sedgeland	<i>Cyperus lucidus</i> <i>Carpobrotus glaucescens</i> <i>Achyranthes aspera</i>	<i>Phormium tenax</i>	Northern islets, mainly on Phillip Island.	-
	Fresh Swamp	<i>Schoenoplectus tabernaemontani</i> <i>Typha orientalis</i> <i>Eleocharis acuta</i>	<i>Carex neesiana</i> <i>Hibiscus diversifolia</i>	Along the lower catchment of a limited number of watercourses.	<i>Hibiscus diversifolia</i>

Group	Name	Key species	Secondary species	Occurrence	Significant plants
<b>Un-natural: Treed Vegetation</b>	Woody Weed Thicket with emergent native trees	<i>Olea europaea</i> * <i>Schinus terebinthifolius</i> * <i>Psidium cattleianum</i> *	<i>Araucaria heterophylla</i> <i>Lagunaria patersonia</i>	Extensive across island.	-
	Exotic Planation	Kentia Palm Silky Oak	-	Scattered across island.	-
<b>Un-natural: Treeless Vegetation</b>	Woody Weed Thicket	<i>Olea europaea</i> * <i>Schinus terebinthifolius</i> * <i>Psidium cattleianum</i> *	<i>Ageratina riparia</i> *	Extensive across island.	-
	Exotic Grassland	<i>Cenchrus clandestinus</i> * <i>Stenotaphrum secundatum</i> *	Wide range of introduced herbaceous species.	Extensive across island.	-